

THIRD EDITION

# PLANNING HEALTH PROMOTION PROGRAMS

An Intervention Mapping Approach

L. Kay Bartholomew

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Gerjo Kok

Nell H. Gottlieb

María E. Fernández



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This book is dedicated to the memory of Herman Schaalma, 1960–2009, whose ideas, constructive criticisms, and thoughtful suggestions have significantly contributed to the advancement of the Intervention Mapping planning process. Herman will be remembered for his innovative teaching and his commitment to students. His work and contributions will live on through the many students he has taught and helped to apply behavioral science to finding solutions for promoting health and preventing disease. We remember Herman with great fondness and miss him dearly.

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# **PLANNING HEALTH PROMOTION PROGRAMS**





PART  
**ONE**

**FOUNDATIONS**



# OVERVIEW OF INTERVENTION MAPPING

## LEARNING OBJECTIVES

- Explain the rationale for a systematic approach to intervention development
- Describe ecological and systems approaches to intervention development
- Explain the types of logic models that can be used to conceptualize various phases of program development
- List the steps, processes, and products of Intervention Mapping
- Explain how to use core processes for developing theory- and evidence-based interventions

In this chapter we present the perspective from which Intervention Mapping was conceived as well as its purpose. We also present a preview of the program-planning framework, which is detailed in the remaining chapters.

The purpose of Intervention Mapping is to provide health promotion program planners with a framework for effective decision making at each step in intervention planning, implementation, and evaluation. Health promotion has been defined as combinations of educational, political, regulatory, and organizational supports for behavior and environmental changes that are conducive to health (Green & Kreuter, 2005), and health education is a subset of health promotion applications that are primarily based on education. We recognize this distinction but also the fact that many people in the health field practice health promotion; some of them specialize in health education. Often the boundaries are quite blurred. This book uses the terms *health educator*, *health promoter*, and *program planner* interchangeably when a subject is needed to mean someone who is planning an intervention meant to produce health outcomes. An intervention can be designed to change environmental or behavioral factors related to health, but the most immediate impact of an intervention is usually on a set of well-defined determinants of behavior and environmental conditions.

## BOX 1.1

### MAYOR'S PROJECT

Imagine a health educator in a city health department. The city's mayor, who has recently received strong criticism for inattention to a number of critical health issues, has now announced that a local foundation has agreed to work with the city to provide funding to address health issues. Youth violence, childhood obesity, adolescent smoking, and other substance abuse as well as the high incidence of HIV/AIDS are among the many issues competing for the mayor's attention. Not only does the allocated sum of money represent a gross underestimation of what is needed to address these issues, but also the city council is strongly divided on which health issue should receive priority. Council members do agree, however, that to dilute effort among the different issues would be a questionable decision, likely resulting in little or no impact on any single issue. As a response to increasing pressures, the mayor makes a bold political move and presents a challenge to the interest groups lobbying for public assistance. The mayor agrees to help secure funds on a yearly basis, contingent on the designated planning group's demonstrating significant, measurable improvements in the issues at hand by the end of each fiscal year.

The head of the health promotion division of the city health department has appointed the health educator to lead the project. Although apprehensive about the professional challenge as well as the complications inherent in facilitating a highly visible, political project, the health educator is encouraged by the prospect of working with community and public health leaders.

The first step the health educator takes is to put together the planning group for the project. She considers the stakeholders concerned with health in the city. These are individuals, groups, or other entities that can affect or be affected by a proposed project. She develops a list of community and public health leaders and invites these individuals to an initial meeting, the purpose of which is to expand this core group. She uses a "snowball" approach whereby each attendee suggests other community members who may be interested in this project. The superintendent of schools begins the process by suggesting interested parents, teachers, and administrators. Later these individuals may have additional suggestions. After the first meeting, the health educator has a list of 25 people to invite to join the planning group.

Twenty-five people is a lot for one group, and the health educator knows that this multifaceted group will have to develop a common vocabulary and understanding, work toward consensus to make decisions, maintain respect during conflicts, and involve additional people throughout the community in the process. Members must be engaged, create working groups, believe that the effort is a

partnership and not an involuntary mandate, and work toward sustainability of the project (Becker, Israel, & Allen, 2005; Cavanaugh & Cheney, 2002; Economos & Irish-Hauser, 2007; Faridi, Grunbaum, Gray, Franks, & Simoes, 2007). The health educator knows that she has taken on a complex task, but she is energized by the possibilities.

The composition of the city's planning group is diverse, and group members are spurred by the mayor's challenge and enthusiastic to contribute their expertise. With this early momentum, the group devotes several weeks to a needs assessment, guided by the PRECEDE model (Green & Kreuter, 1999). The members consider the various quality-of-life issues relevant to each of the health problems, the segments of the population affected by each issue, associated environmental and behavioral risk factors for each health problem, and determinants of the risk factors.

Planning group members recognize the relative importance of all of the health issues discussed by the group and they want to work with community members to ascertain what problem might be most relevant to the community and most feasible to implement.

Even though the planning group comprises many segments of the city's leadership, health sector, and neighborhoods, the members realize that they do not have a deep enough understanding of what health problems might be of most relevance in their community. A subgroup takes on the role of community liaison to meet with members of various communities within the city to discuss health problems. The community liaison group wants to understand community members' perceptions of their needs, but it is equally concerned with understanding the strengths of the communities and their unique potential contributions to a partnership to tackle a health problem. The subgroup invites members of each interested neighborhood to join the planning group. Jointly, the planning group, the communities, and the funders agree to select a problem as the focus of a health education and promotion intervention.

The group's initial work on the needs assessment identified childhood obesity as the most important problem in the community. This initial work facilitated group cohesion and cultivated even greater enthusiasm about generating a solution for the health problem; however, considerable needs assessment work remained to be done (see Mayor's Project, Chapter Four). Several members of the group even began to imagine the victory that would be had if the group were to produce a change in half the allotted time because so much of the needed background information had already been gathered. The health educator remained apprehensive about the time frame yet comfortable with the group's pace and productivity. Now that the group has decided which issue to address, it faces the challenge of moving to the program-planning phase. In her previous work the health educator had implemented and evaluated programs designed by others, but she had not

created new programs. Bolstered by its good work, the group schedules the first program-planning meeting.

What the health educator hadn't anticipated was that in the course of conducting the initial part of the needs assessment, each group member had independently begun to conceive of the next step in the planning process as well as to visualize the kind of intervention that would be most suitable to address the problem. The day of the meeting arrived, and on the agenda was a discussion of how the group should begin program planning. What follows is a snapshot of dialogue from the planning group that illustrates several differing perspectives.

*School Board Member:* As we see from the work of our community liaison group, parents are concerned about obesity in children. According to community development techniques, we have to start where the people are. I think we should begin by conducting a series of focus groups with parents and have them tell us what to do.

*City Council Representative:* But we also heard a lot about the barriers to eating good food and exercising. Some of these barriers are environmental. I think we ought to develop a program for the Department of Parks and Recreation.

*Community Member Parent:* Well, I think a school-based program is most important. Our children need to learn what to eat.

*Community Member/Teacher:* Yes, educating children is a factor, but what about the quality of food they are served at home and in the schools?

*Community Agency Participant:* I think the program should focus on television watching and sedentary behavior. All community members just need to get up and move!

*Parks and Recreation Representative:* We are talking about one dimension of the problem at a time. This is a very big, very complicated problem. How will we ever address everything? Maybe it is just too big. Maybe we need to take on a simpler problem.

*Religious Leader:* Well, it is big. Maybe we will need an agency coordinator. I say we find a nonprofit group to serve as a community coordinating center from which various interventions and services can be implemented. That way, programs are sustainable and a variety of activities can be offered.

*Youth Club Board Member:* One of the national obesity programs has great brochures and videos—in three languages. We have numerous testimonials from

kids, teachers, and parents about how motivated they were by these interventions. This approach is quick and easy; it's low cost; and I've already made sure we can get the materials. Plus, if the materials come from a national center, they must be effective.

*Community Member:* But, are those materials really powerful enough? How would you address the different levels of the community? Moreover, what is the root of the problem?

*Health Care Provider:* We know it takes more than learning information to change behavior. We have to address factors such as attitudes and self-efficacy. But how do we measure a change in attitudes? I think we should measure behavior directly.

*Educator:* Well, clearly we have to begin by designing a curriculum. What are our learning objectives?

The health educator was undeterred by the cacophony of opinions about program development. She was prepared to lead group members through a series of systematic steps to construct the intervention and realized that the group could work through their differences in the process. She was pleased to have a group with so much cumulative experience. The planning group will continue its work by continuing to work on the needs assessment using an effective model that has been applied to many health issues (Green & Kreuter, 2005). (See Intervention Mapping Step 1, Chapter 4) The members will begin the program-planning phase armed with an ecological perspective, that is, the belief that one must intervene at individual, organizational, community, and societal levels to resolve a problem (Kreuter, De Rosa, Howze, & Baldwin, 2004b; McLeroy, Bibeau, Steckler, & Glanz, 1988; Simons-Morton, Greene, & Gottlieb, 1995). But, as the group dialogue indicates, each group member brought a different set of experiences and training to the meeting. This is a common experience in group activities. Each member makes an important and relevant contribution worthy of consideration in the creation of the intervention. To help the group move to solutions to the problem that they describe in the Needs Assessment, they will specify behavior and environmental conditions that should change and also the determinants of the desired change (Intervention Mapping Step 2, Chapter Five); identify theory and evidence-based change methods and applications (Intervention Mapping Step 3, Chapter Six); design a deliverable program (Intervention Mapping Step 4, Chapter Seven) and specify how it will be implemented (Intervention Mapping Step 5, Chapter Eight); and make plans for program evaluation (Intervention Mapping Step 6, Chapter Nine).

One difficulty which planners may encounter is that of delineating tasks for the development of health promotion or education programs that are based on theory, empirical findings from the literature, and data collected from a population. Existing literature, appropriate theories, and additional research data are basic tools for any health educator, but often it is unclear how and where these tools should be used in program planning. In Intervention Mapping, these tools are systematically applied in the steps of program development.

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## Perspectives

Intervention Mapping is a planning approach that is based on the importance of developing theory- and evidence-informed programs, taking an ecological approach to assessing and intervening in health problems, and community participation.

## Theory and Evidence

We agree with Kurt Lewin's adage that nothing is as useful as a good theory (Hochbaum, Sorenson, & Lorig, 1992). We believe this is especially important in health promotion planning. The use of theory is necessary in evidence-informed health promotion to ensure that we can describe and address the factors to achieve change. In general, the use of theory can help us protect against type III error, that is, failing to find intervention effectiveness because the program is poorly designed or implemented (Green, 2000). Still, given this assertion, more guidance is needed regarding the application of theory in health promotion and health education practice. Few teachers of health promotion would debate the importance of teaching behavioral and social science theories, but some have questioned whether teachers use effective methods to teach students to use theory (McLeroy et al., 1993). Some authors argue that many practitioners find theory nearly irrelevant to their practices (Hochbaum et al., 1992; Jones & Donovan, 2004).

Furthermore, program planners, even those who are scientists, often approach theory in a way that is fundamentally different from either the theory generation or the single theory-testing process. A person who wants to find a solution to a public health problem has a different task from one who wants to test a theory. In a real-world situation, problem-driven applied behavioral or social science may use one or multiple theories, empirical evidence, and new research to assess a problem and to solve or prevent a problem. In this approach the main focus is on problem solving, and the criteria for success are formulated

in terms of the problem rather than the theory. Resulting contributions to theory development may be quite useful, but they are peripheral to the problem-solving process. In Intervention Mapping we work from a problem-driven perspective. Choices have to be made in the process of developing an intervention, and theories are one tool to enable us to make better choices.

Health promotion planners are likely to bring multiple theoretical and experiential perspectives to a problem rather than to define a practice or research agenda around a specific theoretical approach. Teachers of health promotion and education suggest that the field would be well served with better guidance in how to use theory to understand health and social problems (Burdine & McLeroy, 1992; R. J. DiClemente, Crosby, & Kegler, 2002; Earp & Ennett, 1991; Glanz, Rimer, & Viswanath, 2008; Glanz, Rimer, & Lewis, 2002; Hochbaum et al., 1992; Jones & Donovan, 2004; Kok, Schaalma, De Vries, Parcel, & Paulussen, 1996).

To understand a problem, the planner begins with a question about a specific health or social issue (Buunk & van Vugt, 2008; Kok et al., 1996; Veen, 1985). The planner then accesses social and behavioral science theories and research evidence of causation at multiple levels. These or other theories may also suggest intervention points and methods, and the planner proceeds to accumulate evidence for the effectiveness of these methods. By the term *evidence*, we mean not only data from research studies as represented in the scientific literature but also opinion and experience of community members and planners. In this way theoretical and empirical evidence are brought to bear on meeting a health or social need. Intervention Mapping provides a detailed framework for this process.

## Ecological Models and Systems in Health Promotion Program Planning

Systems approaches have emerged as an important analytic and planning tool in public health. Theme issues of the *American Journal of Public Health* (McLeroy, 2006) and the *American Journal of Community Psychology* (American Journal of Community Psychology, 2007) have focused on systems thinking. The Centers for Disease Control and Prevention's Syndemics Prevention Network has encouraged a systems approach to public health (Centers for Disease Control and Prevention, 2008) and the National Cancer Institute has published a monograph, *Systems Thinking in Tobacco Control* (National Cancer Institute, 2007). Consistent with this work, we use broad-based systems thinking as a perspective to inform all aspects of Intervention Mapping (National Cancer Institute, 2007). A system is "the set of actors, activities, and settings that are directly or indirectly perceived to have influence in or be affected by a given problem situation" (Foster-Fishman,

Nowell, & Yang, 2007). We will address systems theory more fully in Chapter Three, but wish to introduce the importance of using a systems approach to assess the needs and strengths of the population, to form a group of stakeholders to plan, conduct, and disseminate an intervention, and to select the most effective leverage points to address a health-related problem. In particular, we agree with the view that interventions are events in systems (Hawe, Shiell, & Riley, 2009) and that other factors within a system can reinforce or dampen the influence of an intervention on the specific behavior or environmental change being targeted. Our logic models are linear, focusing on the presumed cause-effect pathway articulated from theory and empirical research. However, we assume that the intervention, the system activity being targeted, and the proposed outcome are part of a complex multilevel system.

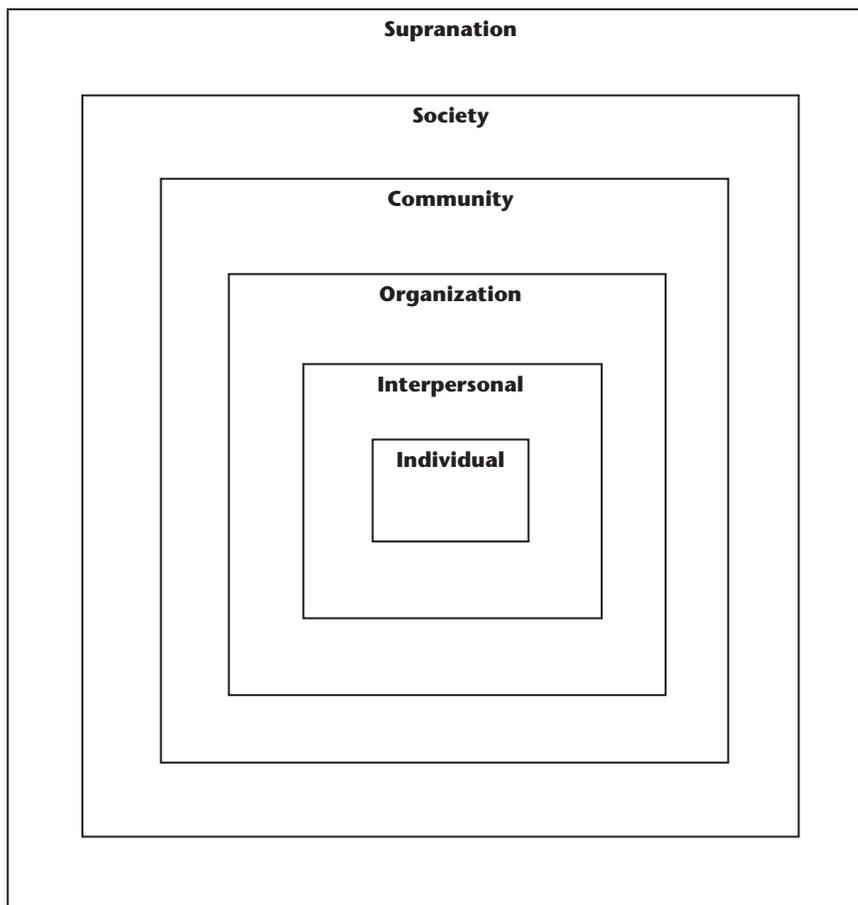
The socioecologic model, which has been used extensively in health promotion (Kok, Gottlieb, Commers, & Smerecnik, 2008) and is consonant with and encompassed by systems thinking (Trochim, Cabrera, Milstein, Gallagher, & Leischow, 2006), continues to be an underpinning for Intervention Mapping. Health is defined as an instrumental value in service of a full, gratifying life (World Health Organization, 1978, 1986) that includes both individual and structural levels (Robertson & Minkler, 1994). In the social ecological model, health is viewed as a function of individuals and of the environments in which individuals live, including family, social networks, organizations, communities, and societies (Berkman & Kawachi, 2000; Marmot, 2000; Stokols, 1996). Individual behavior is influenced by factors at these various environmental levels.

The social ecological paradigm focuses on the interrelationships among individuals with their biological, psychological, and behavioral characteristics and their environments. These environments include physical, social, and cultural aspects that exist across the individual's life domains and social settings. A nested structure of environments allows for multiple influences both vertically across levels and horizontally within levels. The picture that emerges is a complex web or system of causation as well as a rich context for intervention. Looking for the most effective leverage points within this web, across levels, reduces the complexity and is necessary for the development of effective multilevel interventions.

Planners can look at the relationship between individuals and their environments in two ways. First, mechanistically, the individual and the environment can be viewed as mechanisms in a general system in which small changes in the social environment, for example, can lead to large changes in individual behavior (L. W. Green, personal communication, February 26, 1997). This view tends toward an emphasis on higher-order intervention leverage points, such as policy or social norms, as determinants of the individual's behavior, health, and quality of life. Second, the various levels are viewed as embedded systems. In Figure 1.1,

higher-order systems set constraints and provide inputs to lower-order systems, and the lower-order systems provide inputs to systems at a higher level. New properties emerge at each system level, but each level incorporates the lower levels of embedded systems. For example, social norms exist independently of the individual even though the individual perceives them. An intervention may influence both levels (that is, the actual norms and the individual perception), and these may, in turn, influence both health behavior and health.

**FIGURE 1.1** Schematic of the Ecological Approach in Health Promotion Programs



Multiple levels may be influenced by an intervention at one level. For example, a program aimed at convincing organizations to conduct health-related lobbying may influence a legislature to pass laws that may influence individual health behavior. In illustration, one of our colleagues worked with a coalition in a large metropolitan area to use media and social advocacy to influence the police department and the U.S. Department of Labor to crack down on the use of young Hispanic children as dancers in bars and nightclubs (an activity that can lead to such health risk behaviors as substance abuse and prostitution). In this example, intervention at the individual or interpersonal levels would have been difficult. Families felt helpless to control the girls' activities, and the monetary incentives to dance were strong in impoverished neighborhoods. However, once social change began to occur, parents expressed more empowerment to manage their children.

A program may be aimed at any ecological level and have effects on that level and all the levels nested within it. For example, individuals may not engage in physical activity due to determinants at each level: personal lack of self-efficacy for exercise, lack of social support from family and friends at the interpersonal level, lack of fitness norms and facilities at the worksite or organizational level, and barriers to physical activity in the built environment at the community level. Figure 1.1 denotes embedded reciprocal systems with individual, group, organization, community, society, and supranational levels. This figure indicates that the individual exists within groups, which, in turn, are embedded within organizations and higher-order systems. The individual is influenced by these systems and can, in turn, influence them directly or through groups and organizations. We acknowledge the hazards of trying to plan from such a complex formulation, but we judge the hazards of oversimplification to be greater. We understand that complexity can lead to frustration and we encourage the reader to bear with the process. Intervention Mapping helps the planner take on this complexity in a structured systematic way, thereby making it more manageable without oversimplifying.

### Agency in the Environment

We draw the approach to change at the various ecological levels from three traditions. The first is that of Kurt Lewin, who focused on the gatekeepers within channels (McGrath, 1995). The second is social exchange theory, which focuses on the positions or roles of persons within the social system (Coleman, 1990), and the third is the MATCH model that has been used to plan multilevel interventions for health education (Simons-Morton et al., 1995; Simons-Morton, Simons-Morton, Parcel, & Bunker, 1988).

In each of these views, the key to understanding social reality at each of the ecological levels and how to change conditions at each level is tied to understanding the positions that comprise the level and exert influence on its conditions. For example, Lewin described two channels by which food gets to a family's table: the grocery channel and the garden channel (McGrath, 1995). In the grocery channel, various gatekeepers act to influence what foods are selected to move along the channel, from the food manufacturers' product line managers to the buyers at the wholesale grocers, to the grocery chain buyers, to the individual store managers, to the shopper for the family. At each point an array of forces helps or hinders passage through the gates along the channel. The product line manager, for example, acts on findings from consumer marketing surveys, cost and availability of ingredients, and fit to the company's manufacturing facilities. Consumer demand for low-fat products could influence the food manufacturer to produce these foods. Moving down the channel to the end of the line, the family shopper may be influenced by forces that include motivations to provide healthful food for the family, to please the family, to save money, and to purchase food that is easily prepared. By understanding the determinants of these gatekeeper behaviors at several levels, the health educator is better able to plan where to intervene to create the most effective and efficient interventions for change. Throughout the book, we have adopted the approach of Simons-Morton and colleagues (1988) of looking at agents (decision makers or role actors) at each systems level: interpersonal (for example, parents), organizational (for example, managers of school food services), community (for example, newspaper editors), or societal (for example, legislators). Interventions at the various levels focus on agents (individuals or groups, such as boards or committees) in positions to exercise control over aspects of the environment.

## Participation in Health Promotion Planning

All health promotion program development, adaptation, implementation, and evaluation should be based on broad participation of community members (Hunt, Lederman, Potter, Stoddard, & Sorensen, 2000; Israel et al., 2003; Krieger et al., 2002; Minkler, Thompson, Bell, Rose, & Redman, 2002; Minkler, 2005; Sullivan et al., 2003; Yoo et al., 2004). Equitable community participation helps to ensure that program focus reflects concerns for the local community; can bring a greater breadth of skills, knowledge, and expertise to the project; can make sure that the research topic comes from, or reflects, a major concern of the local community; and will improve external validity of interventions and evaluation by recognition of the local knowledge of community members (Israel, Schulz, Parker,

& Becker, 1998; Israel et al., 2003). Green and Mercer (2001) also suggested that evidence-based health promotion interventions may be more acceptable to communities and potential participants when the research that has produced the evidence does not originate under special circumstances in distant places. In a discussion of environmental health promotion, Kreuter, De Rosa, Howze, and Baldwin (2004b) describe community participation as particularly important for “wicked problems . . . wherein stakeholders may have conflicting interpretations of the problem and the science behind it, as well as different values, goals and life experiences. Accordingly, policy makers, public health professionals, and other stakeholders who grapple with these problems cannot expect to effectively resolve them by relying solely on expert-driven approaches to problem solving” (p. 44).

A number of principles for facilitating community action and partnerships have been suggested by Israel and colleagues (1998, 2003) and used by others to evaluate community-based participatory program efforts (Belansky, Cutforth, Chavez, Waters, & Bartlett-Horch, 2009; Horn, McCracken, Dino, & Brayboy, 2008; Israel et al., 2005). Their principles are to

1. Recognize a partner community as a unit of identity
2. Build upon community strengths and resources
3. Facilitate collaborative, equitable decision making in which partners negotiate desired roles in all project phases and attend to social inequalities
4. Foster co-learning among partners
5. Balance knowledge generation with community benefit
6. Focus on ecological perspectives, local problems, and multiple determinants of health
7. Develop systems using an iterative process
8. Disseminate information, results, and benefits to all partners
9. Develop a commitment and long-term process

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## The Need for a Framework for Intervention Development

We believe that everyone with a health education or health promotion role must have the knowledge and skills to develop effective interventions. Anyone with the responsibility to help individuals or communities change health risk behavior, initiate health-promoting behavior, change environmental factors, or manage illnesses must design or adapt existing effective interventions and develop plans to implement them. A systematic process is important in these endeavors.

The complexity of intervention development has been somewhat overlooked in health education training. When we began the development of Intervention Mapping, researchers and practitioners seldom wrote in depth about the process of intervention development, and complicated interventions were often reduced to several sentences in evaluation articles. This situation is slowly changing, and health promotion and other journals have become more hospitable to articles about intervention development. The introduction of a practice-oriented journal in the field has been particularly useful for the description of interventions and their development (Dodge, Janz, & Clark, 2002; Levy et al., 2004b; Lytle & Perry, 2001; van Empelen, Kok, Schaalma, & Bartholomew, 2003).

### Evidence-Based Practice

A systematic process of intervention development can also help with documentation and ultimately move the health education field toward evidence-based practice (Davidson et al., 2003; Schaalma & Kok, 2009). Abraham and colleagues have urged journal editors to require description of behavioral interventions that provide enough detail to enable replication, and they recommend that readers have access to the intervention developers' theoretical considerations and intentions regarding change processes in addition to details about the intervention including recipients, deliverers, setting, mode of delivery, intensity, and fidelity to implementation protocol (Abraham & Michie, 2008; Workgroup for Intervention Development and Evaluation Research [WIDER group], 2009). When full manuals of operation for interventions have been developed, they should also be widely available for review (West, 2008). In a systematic review of programs to change health care provider behavior, Bartholomew et al. (2010) found wide variation within categories of effective interventions and suggested that at least the Intervention Mapping concepts of theoretical methods, practical applications, delivery channels, dose (including elements of time and intensity), and content of the program messages be routinely reported.

With the movement toward best practices and evidence-based public health, some health educators may think that they are superfluous and that their careers are over (Briss et al., 2000a, 2000b; Cameron, Jolin, Walker, McDermott, & Gough, 2001; Centers for Disease Control and Prevention & Oak Ridge Institute for Science and Education, 2003; Diffusion of Effective Behavioral Interventions, n.d.; Green & Kreuter, 2002; International Union for Health Promotion and Education & European Commission, 1999; Task Force on Community Preventive Services, 2000; Truman et al., 2000; Zaza, Briss, & Harris, 2005). Nothing could be further from the truth. First, there are certainly not enough

well-evaluated and effective interventions to meet every need, or even most needs. Furthermore, a number of health promotion experts have argued that effective interventions should be adapted for implementation in new communities (Backer, 2001; Castro, Barrera, & Martinez, 2004; McLeroy et al., 2006). The United States Task Force on Community Preventive Services systematically reviewed many interventions (Task Force on Community Preventive Services, 2010; Zaza et al., 2000, 2005). In 50% of the interventions reviewed for the first edition of the Guide, however, there was insufficient evidence to make any recommendation, and planners may face a problem for which there is little intervention guidance.

Furthermore, although collections of interventions reviewed by the task force were grouped to be as similar as possible, in view of the diverse interventions tested in the original studies, program planners will still be faced with some need for planning exactly what to adopt, adapt, and implement for their communities (Lee, Altschul, & Mowbray, 2008; Task Force on Community Preventive Services, 2010; Zaza et al., 2000, 2005). Even when interventions or categories of interventions are well described, a planning group still has to determine whether the intervention is a fit to the health problem and its behavioral and environmental causes as well as to the priority population, community characteristics, and goals. Some authors have asserted that any program that has been labeled as effective must undergo a process for selection for a new use and be adapted for each new community and implementation (Glasgow, Lichtenstein, & Marcus, 2003; Glasgow, Marcus, Bull, & Wilson, 2004b; Green, 2001; Kahan & Goodstadt, 1998, 2001). However, once a decision to adopt a program is made, programs must be implemented with attention to fidelity so that adaptations do not alter elements that are essential to program effectiveness (Backer, 2001; Botvin, 2004; Elliott & Mihalic, 2004; Lee et al., 2008).

Best practices for intervention are often labeled as such based on reviews that emphasize the importance of their internal validity rather than generalizability. Currently there is considerable push in the health promotion community for greater external validity in intervention testing—labeled *practice-based evidence* as a facilitator of evidence-based practice (Glasgow, Fisher, Skaff, Mullan, & Toobert, 2007; Green, 2007; Green & Glasgow, 2006; McDonald & Viehbeck, 2007). Some best practices are actually planning processes as described by Freudenberg and colleagues (1995), who suggested that programs be developed in a participatory, ecological approach that links health to quality-of-life concerns. The program development should also build on and develop participant and community capacity. Finally, the intervention development process should seek to institutionalize successful intervention components and replicate them in other settings.

## Ethical Practice of Health Promotion

A systematic planning process can also address the need for ethical practice of health promotion. Kass (2001) has presented a framework for the evaluation of public health interventions in terms of their ethical integrity. She suggests the following evaluation scheme for ethical public health interventions:

1. Include goals related to the health of the public
2. Present a reasonable chance of effectiveness (including a basis in solid evidence)
3. Address the known and potential burdens of the program including risks to privacy and confidentiality, liberty, self-determination and justice
4. Minimize burdens by adopting alternate approaches
5. Ensure fair allocation of the program and its benefits
6. Balance program benefits and burdens (Kass, 2001, pp. 1777–1782).

Each of these principles suggests a thoughtful planning approach. For example, basing programs on clear evidence is related to potential effectiveness, and Kass suggests that when our programs are based on the most intuitively “obvious” assumptions, we are at the most risk of developing programs that do not work (2001). We struggle throughout the Intervention Mapping process with the question of what quantity and quality of data are “enough.” Planning should also include judgments about tolerable levels of intervention and evaluation burden as well as an acceptable balance of burden-to-risk based on community and values. Members of communities will not necessarily agree on risks and benefits, and a participatory planning process is a foundation for the consideration of these principles and guards somewhat against paternalistic practices that suggest that certain values are universally held. Kass (2001) also poses the important issue of equitable availability of intervention to societal groups. Targeted interventions may both introduce the risk of stigma for certain groups (for example, groups at greater risk of HIV or other STIs) and reduce the likelihood that at-risk individuals in groups without excess prevalence or incidence of a problem may be denied program benefits.

In comparison to Kass’s evaluation framework (2001), a professional code of ethics is a more general set of expectations and norms for practice. An example of a professional code of ethics for health educators is the SOPHE Code of Ethics for the Health Education Profession (Society for Public Health Education, 2009). This code states that health educators should practice within a framework of valuing the diversity in society and aspiring to a cross-cultural approach.

Practitioners support the worth, dignity, and uniqueness of all people and ground their practice in the ethical principles of respect for autonomy, promotion of social justice, promotion of good, and avoidance of harm. In the two articles of the code that most pertain to program development and delivery, SOPHE requires that educators support participation by communities in program development and implementation, encourage informed decision making among individuals, and are fair and honest in the disclosure of program benefits and consequences. Furthermore, health educators should act on issues that can adversely affect the health of persons and communities, provide services equitably, and respect the rights of persons to hold diverse values. A systematic planning process can provide part of the road map required to establish ethical health promotion practice.

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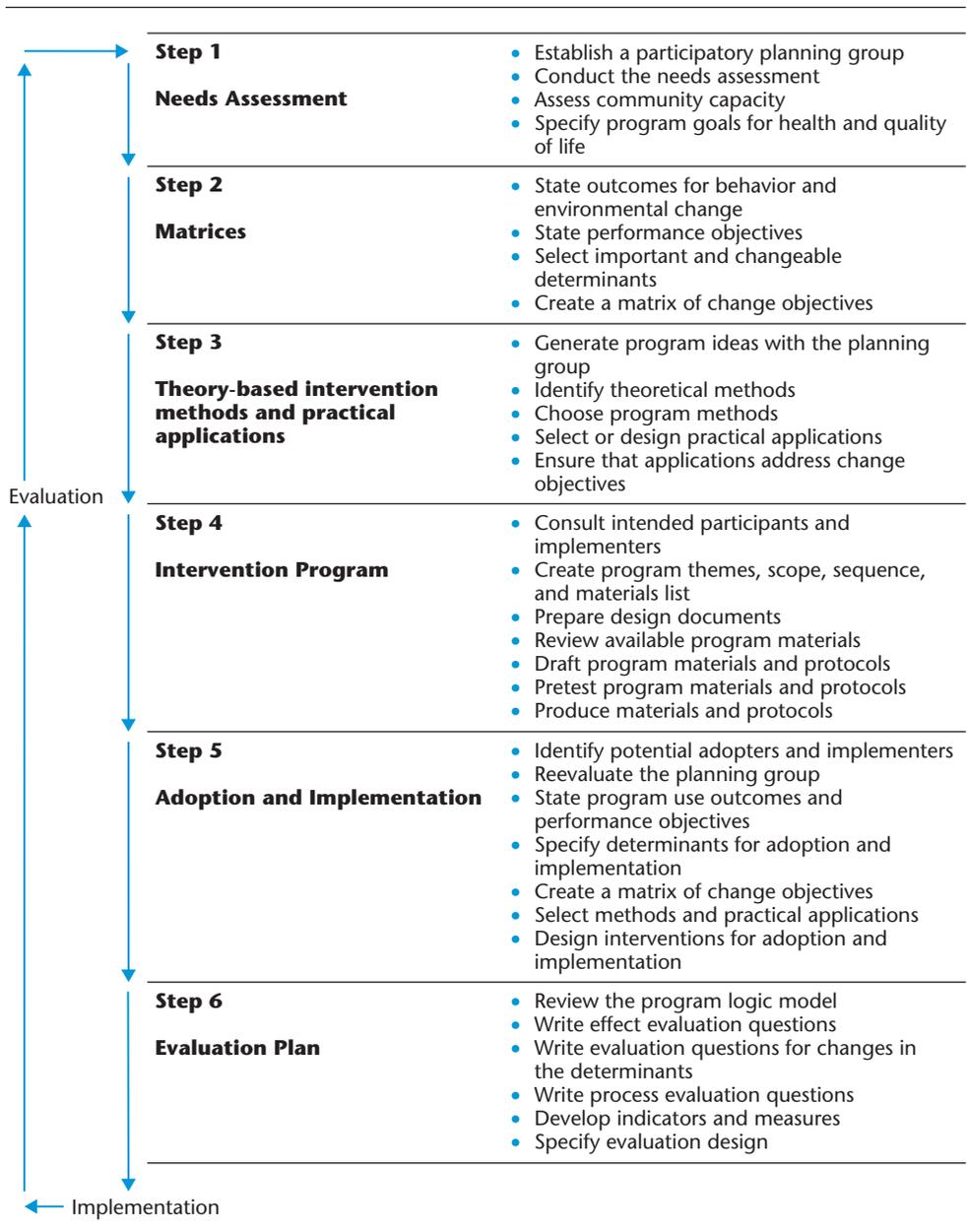
## Intervention Mapping Steps

Each step of Intervention Mapping comprises several tasks (Figure 1.2). The completion of the tasks included in a step creates a product that is the guide for the subsequent step. The completion of all of the steps serves as a blueprint for designing, implementing, and evaluating an intervention based on a foundation of theoretical, empirical, and practical information. Even though we present Intervention Mapping as a series of steps, the process is iterative rather than completely linear. Program developers move back and forth between tasks and steps as they gain information and perspective from various activities. However, the process is also cumulative. Developers base each step on the previous steps, and inattention to a step can jeopardize the potential effectiveness of the intervention by narrowing the scope and compromising the validity with which later steps are conducted. Sometimes planners can get carried away by momentum in the process of the planning group and forget a step, or they may perform a step with less than optimal rigor. Fortunately, most of the time planners can backtrack and include, repeat, or elaborate on a neglected step.

The six fundamental steps of the Intervention Mapping process are the following:

1. Conduct a needs assessment
2. Create matrices of change objectives
3. Select theory-based intervention methods and practical applications
4. Organize methods and applications into an intervention program
5. Plan for adoption, implementation, and sustainability of the program
6. Generate an evaluation plan

FIGURE 1.2 Intervention Mapping Steps and Tasks



## Step 1: Needs Assessment

In Step 1 (Chapter Four) before beginning to actually plan an intervention, the planner assesses the health problem, behavioral and environmental causes of the problem, and determinants of the behavioral and environmental causes. This assessment encompasses two components: (1) an epidemiologic, behavioral, and social analysis of an at-risk group or community and its problems and (2) an effort to get to know and begin to understand the character of the community, its members, its strengths, and its knowledge of the health problem and potential solutions. The product of this first step is a description of a health problem, its impact on quality of life, behavioral and environmental causes, and determinants of behavior and environmental causes.

In Step 1 the planner completes the following tasks:

1. Establish a participatory planning group that includes potential program participants and implementers
2. Conduct the needs assessment using the PRECEDE model (Green & Kreuter, 2005)
3. Balance the needs assessment with an assessment of community capacity
4. Link the needs assessment to program and evaluation planning by specifying health and quality of life goals

## Step 2: Matrices of Change Objectives

Step 2 (Chapter Five) provides the foundation for the intervention by specifying who and what will change as a result of the intervention. The product of Step 2 is a matrix of selected ecological levels (individual, interpersonal, community, or societal) that combines performance objectives for each level with selected determinants to produce change objectives, the most immediate target of an intervention. In order to develop performance objectives for environmental outcomes, planners identify roles of environmental agents at each selected ecological level. For example, superintendents, principals, and teachers may have roles for school environmental change. Statements of what must be changed at each ecological level and who must make the change are more specific intervention foci than are traditional program goals and objectives. For example, in a program to increase fruit and vegetable consumption by children in elementary school, matrices would be created for both the child and the food service. The food service matrix might contain more than one role: for example, the manager's purchasing practices, the dietitian's menu development, and the cooks' food preparation. In Step 2, the planner completes the following tasks:

1. State expected program outcomes for health-related behavior and environmental conditions

2. Subdivide behavior and environmental outcomes into performance objectives
3. Select important and changeable determinants of behavioral and environmental outcomes
4. Create a matrix of change objectives for each level of intervention planning (individual, interpersonal, organizational, community, and societal) by crossing performance objectives with determinants and writing change objectives

### Step 3: Theory-Based Methods and Practical Applications

In Step 3 (Chapter Six), the planner seeks theory-based methods and practical applications to change the determinants of health behavior, behavior of environmental agents, and to change organizational, community, and societal factors to affect the environment. An intervention method is a defined process by which theories postulate and empirical research provides evidence for how change may occur in the behavior of individuals, groups, or social structures. One example of a theory-based method is modeling, which is frequently used to facilitate behavior change. In Step 3 the planner selects intervention methods that correspond to the change objectives developed in Step 2. These are then used to begin to formulate program activities that will result in achieving the change objectives (Chapter Seven). Whereas a method is a theory-based technique to influence determinants, an application is a way of organizing, operationalizing, and delivering the intervention methods. The translation of selected methods into action is completed through the development of applications. Examples include a meeting with community members (application) to encourage community participation (method), role-model stories (application) for modeling (method), and signing a public pledge (application) for commitment (method). A planner working from the food service matrix mentioned in Step 2 might use the methods of persuasion and modeling to influence the food services manager's purchasing practices. Practical applications of modeling might include testimonials by food service personnel who had incorporated healthier buying practices. If the planner discovered that school district policy limited healthier buying practices, he or she would return to Step 2, identify roles at the district level that could influence the policy, write performance objectives for these roles, specify determinants, and construct matrices. These district-level policy changes would then functionally be methods for change at the next lower ecological level, the food service managers and cooks.

In Step 3 the planner completes the following tasks:

1. Generate program ideas with the planning group
2. Identify theoretical methods that can influence changes in determinants and clarify the conditions under which a given method is most likely to be effective
3. Choose theoretical methods for the program

4. Select or design practical applications for applying the methods in the intervention program
5. Ensure that the final applications address the change objectives from the matrices

#### Step 4: Program Production

The products in Step 4 (Chapter Seven) include a description of the scope and sequence of the components of the intervention, completed program materials, and program protocols. This step demands the careful reconsideration of the intended program participants and the program context. It also requires pretesting and pilot testing of program applications and materials with intended implementers and recipients. This step gives specific guidance for communicating program intent to producers (for example, graphic designers, videographers, and writers). The planners of the food service change might organize all their change methods and applications into creating a program called the Creative Cooks for Healthy Kids Cooking School. The “school,” however, might include on-the-job training, policy change, newsletters featuring role models, and social reinforcement—or whatever was planned in Step 3 to produce the changes specified in Step 2.

In Step 4 the planner completes the following tasks:

1. Consult again with the intended participants for a health education and promotion program and consider their preferences for program design
2. Create program themes, scope, and sequence, and a list of needed program materials
3. Prepare design documents to guide the production of program materials and protocols
4. Review available program materials for possible fit or adaptation to address change objectives, methods, and applications
5. Draft program materials and protocols
6. Pretest program materials and protocols
7. Manage final production of materials and protocols

#### Step 5: Adoption and Implementation

The focus of Step 5 (Chapter Eight) is program adoption and implementation (including consideration of program sustainability). Of course, considerations for program implementation actually begin as early as the needs assessment and are revisited in this step. The step requires the process of matrix development

exactly like that done in Step 2, except that these matrices have adoption and implementation performance objectives juxtaposed to determinants. The linking of each performance objective with a determinant produces a change objective to promote program adoption and use. Methods and applications are then matched to these objectives to develop theory-informed plans for adoption and implementation.

For example, the promoters of the food service change would ask the following questions:

- Who is in charge of food service at the school district and at individual schools?
- Who would perceive a need, develop awareness of a program, and choose to adopt the program to make changes in the food service?
- Who would be in charge of implementing the program?
- What, specifically, would these people have to do?

In this example, a principal might have to order the program for review, ask the food service manager for his or her opinion of the program, and form a task force for food service change. The planner then uses theory and evidence to hypothesize determinants of the principal's adoption and implementation performance objectives. The product for Step 5 is a detailed plan for accomplishing program adoption and implementation by influencing behavior of individuals or groups who will make decisions about adopting and using the program.

In Step 5 the planner completes the following tasks:

1. Identify potential adopters and implementers of the health promotion program
2. Reevaluate the planning group to ensure representation of potential program adopters and implementers
3. State program use outcomes and specify performance objectives for program adoption, implementation, and sustainability
4. Specify determinants of program adoption, implementation, and sustainability
5. Create a matrix of change objectives for program adoption, implementation, and sustainability
6. Select methods and practical applications for program adoption, implementation, and sustainability
7. Design interventions for program adoption, implementation, and sustainability

## Step 6: Evaluation Planning

In Step 6 (Chapter Nine), the planner completes an evaluation plan that is actually begun in the needs assessment and is developed along with the intervention map. In the process of Intervention Mapping, planners make decisions about change objectives, methods, applications, and implementation. The decisions, although informed by theory and evidence from research, still may not be optimal or may even be completely wrong. Through effect and process evaluation, planners can determine whether decisions were correct at each mapping step (Patton, 2008; Rossi, Lipsey, & Freeman, 2004; Steckler & Linnan, 2002; Windsor, Clark, Boyd, & Goodman, 2003). To evaluate the effect of an intervention, researchers analyze the change in health and quality-of-life problems, behavior and environment, and determinants of performance objectives. All these factors have been defined in a measurable way during the preceding steps. Effect evaluation may show positive, negative, or mixed effects or show no effect at all. Planners also want to understand the reasons behind the effects that were achieved, regardless of what those effects were. They need to know more about the process and the changes in intermediate variables. They ask such questions as the following:

- Were the determinants well specified?
- Were the practical applications well matched to methods?
- What proportion of the priority population did the program reach?
- Was the implementation complete and appropriate?

The product of Step 6 is a plan for answering these questions.

In Step 6 the planner completes the following tasks:

1. Review the program logic model to guide the formulation of evaluation questions
2. Write effect evaluation questions based on the program outcome objectives for quality of life, health, behavior, and environment
3. Write evaluation questions based on the matrices regarding change in the determinants of behavior and environmental outcomes
4. Write process evaluation questions to assess the appropriateness of methods, practical applications, program components, and implementation
5. Develop indicators and measures to provide answers to the evaluation questions
6. Specify evaluation design

## Core Processes for Applying Theory and Evidence

Sometimes the processes involved in understanding a problem or answering a question with empirical data and theory are complex and time-consuming. Many planners do not persevere through the difficulties. Consequently, understanding often is incomplete, and the intervention is faulty. Therefore, we provide considerable detail about how to undertake these core processes. We introduce them here and then include examples in the Intervention Mapping steps where they are used (Steps 1, 2, and 3). The core processes begin with asking a question, continue through figuring out what the planning team already knows about potential answers to the question (brainstorming), reviewing the literature for both theory- and evidence-based “answers” to the question, assessing and addressing needs for new data, developing a working list of answers, and then moving on to the next question (Buunk & van Vugt, 2008).

The steps of Intervention Mapping are completed using core processes including the following:

1. Posing planning problems as questions
2. “Brainstorming” or “free-associating” answers to planning questions and using current planning group knowledge
3. Searching the literature for empirical evidence and evaluating the strength of the evidence
4. Accessing and using theory
5. Conducting new research for unanswered questions in the planning process
6. Developing the final summary of answers to the posed question

### Posing Questions

The first task for the core processes is to pose a question. The first questions asked are often to analyze causes of the health problem, and later questions concern determinants of behavior and environmental conditions, interventions, and program implementation (Buunk & van Vugt, 2008; Kok et al., 1996; Veen, 1985). To further illustrate the process of posing questions: A work group in one of our health education methods classes began work on a project to prevent HIV and other sexually transmitted infections (STI) transmission and pregnancy among urban adolescents. Over the course of the project, they asked a number of questions including the following:

- *Health problem.* What is the health problem related to HIV and STIs in adolescents (ages 13–18) in the United States?

- *Behaviors.* What are important risk behaviors for the transmission of HIV and STIs and for pregnancy among adolescents? How do these risk behaviors vary for different groups such as boys and girls? (They were thinking of sexual intercourse as the predominant transmission route for the infections, but they also had to consider intravenous [IV] drug use.)
- *Determinants.* After defining the health problem and the behavioral risks, the group asked a question concerning determinants of the risk behavior of not using condoms: Why do adolescents have sexual intercourse without using condoms? As they had discussed several possible group differences in behavior in the previous question, they posed several additional questions to elicit more detailed explanations: Why don't adolescent males use condoms when having vaginal sex with steady girlfriends? Why do girls have sex with boys who do not use condoms? And so forth.
- *Change methods.* Then the focus of the questions shifted to potential solutions or methods: How can we help specific subgroups of adolescents use condoms? Which theoretical methods can be translated into appropriate practical applications?

### Brainstorming Answers

We call the second core process “brainstorming” or “free association.” By this we mean a process for accessing the current knowledge and practice wisdom of members of the planning group. The group members develop a provisional list of answers in response to a specific question. (See example in Table 1.1.) Before searching the literature for empirical evidence and theory, brainstorming clarifies what planning group members already know, or think they know. Of course, this presumes some familiarity with the problem from practice or from the literature.

Making a provisional list of answers to a question is a creative process that primarily involves free association with the aim of generating as many explanations as possible in response to a question (Buunk & van Vugt, 2008; Kok et al., 1996; Veen, 1985). The planners can later drop explanations that are poorly supported in the literature. Planners should avoid getting stuck on a single explanation too soon. In formulating these provisional explanations, health educators, as applied behavioral scientists, typically use theoretical and empirical knowledge, whether consciously or not. Doing so is unavoidable at this stage, but the brainstorming should be as open as possible and should not be limited to data- or theory-informed items.

The group of students working on determinants for condom use generated many answers to the question: Why do adolescents have sexual intercourse without using condoms? The students brainstormed determinants based on what they knew from many sources about condom use. They stimulated creativity by

**Table 1.1 Provisional List of Answers Regarding Condom Use Among Adolescents**

Original Provisional List	Additions from Empirical Literature	Theoretical Additions (Some from Empirical Literature)	Additions from New Research
<ul style="list-style-type: none"> <li>• Lack of knowledge of HIV transmission</li> <li>• Lack of knowledge of STIs</li> <li>• Peers don't use condoms</li> <li>• Perception that condoms don't work</li> <li>• Attitudes toward condom use</li> <li>• Experience with condom use; don't like condoms</li> <li>• Gender; males do not want to use condoms</li> <li>• Lack of salience—not knowing someone with AIDS</li> <li>• Lack of confidence in using condoms</li> </ul>	<ul style="list-style-type: none"> <li>• Do not perceive condoms as pregnancy prevention</li> <li>• Perceive condoms as embarrassing</li> <li>• Did not express personal responsibility for having condoms</li> <li>• Lower family connectedness</li> <li>• Community perceptions of gender inequality in sex</li> <li>• Nonopen communication</li> <li>• Neighborhood characteristics such as high unemployment</li> <li>• Lack of access to family planning services</li> <li>• Lack of parental supervision</li> <li>• Association with deviant peers</li> <li>• Coercive parenting</li> </ul>	<ul style="list-style-type: none"> <li>• Intention to use condoms</li> <li>• Subjective norms</li> <li>• Perceived social norms</li> <li>• Self-efficacy for negotiating and discussing condom use with their partner</li> <li>• Skills</li> <li>• Outcome expectations</li> </ul>	<ul style="list-style-type: none"> <li>• Disconfirmed lack of knowledge about HIV or STIs</li> <li>• Argument that condoms don't work is an excuse, not a belief</li> <li>• Experience with condoms associated with embarrassment</li> <li>• Teens wanted to be more skillful</li> <li>• Girls and boys expressed that condoms were the responsibility of the other gender</li> <li>• Perception of no risk of HIV with only one partner (mistook "serial monogamy" for monogamy)</li> </ul>

asking related questions, by taking the sexually active adolescent's perspective, and by narrowing the question to particular populations and situations. At this stage their answers included a combination of personal beliefs, local knowledge, practice wisdom, and evidence-informed answers.

For this preliminary list, there is no reason to favor one explanation over another. However, in the subsequent steps, health educators should begin to take into account two criteria for good answers: (1) an explanation should describe

a process and (2) it should be plausible. The term *process* means an explanation that suggests a mechanism of causation. For example, socioeconomic status on the students' list may be an important contextual factor or root cause of lack of condom use, but it may need to be explored further to describe a more proximal or immediate explanation of behavior. A useful aid is to represent the explanation in a logic model schematic that shows causation (Earp & Ennett, 1991). A plausible explanation is one that can survive when it is depicted visually and examined critically, using logic to evaluate the relationships between the various elements in the model.

### Reviewing the Literature for Findings from Research

The next steps are to support or refute provisional ideas about answers to the questions that the planning group has asked. Systematic reviews have recently received much attention in public health, with the appearance of reports from the United States Task Force on Community Preventive Services (Zaza et al., 2005). The growing attention to systematic review methods has raised the standard for the conduct of even a traditional literature review, and familiarity with systematic review methods is important in intervention development.

We describe a simple process here, but urge the reader to consult the many expert sources in the burgeoning field of systematic review and evidence-based public health. Basic “how to” guidance is available from the Cochrane Collaboration’s *Handbook* available online at [www.cochrane-handbook.org/](http://www.cochrane-handbook.org/) (Higgins & Green, 2009) and in print (Cochrane, 2008); more advanced advice can be found in the handbook by Cooper, Hedges, and Valentine (2009). Although not a primer, Mullen and Ramirez (2006) cover a number of very important issues in conducting reviews and their work serves as an introduction to systematic reviews. Additional information is available without cost from the Cochrane Collaboration (Cochrane, 2009), and the *Community Guide* (Task Force on Community Preventive Services, 2010) has published a book chapter that serves as a bridge from a systematic review to a guideline recommendation (Briss, Mullen, & Hopkins, 2005).

Basically, any review process should share validity and reliability concerns common to other types of research studies. Although we are not suggesting that every literature review must be a formal systematic study, we do suggest that every literature review should be clearly linked to a question and should specify parameters so that the nature of the numerator (what studies are used in the evidence summary) is understood in terms of the denominator (what studies were conducted or reported). The following questions will help guide a basic review:

1. What question(s) do you want to answer?
2. What evidence will address the questions?

3. What are the inclusion and exclusion criteria for the evidence?
4. How will you find the evidence you want? What is the search strategy?
5. Which evidence from the search process meets your criteria?
6. How will you document answers to your question(s)?
7. What metric will you use to judge strength of the evidence?
8. How will you summarize the findings and draw conclusions based on the data and the limitations?

When planners plan searches of the literature, it may be advisable to include, and then judge the validity of, various levels of evidence. Even though some systematic reviews and meta-analyses adhere to very strict inclusion criteria, others review a wider range of literature and then display results by strength of the study designs (Cochrane, 2008; Task Force on Community Preventive Services, 2010). For example, in two studies by G. J. Peters (Peters, Kok, & Abraham, 2008; Peters & Kok, 2009), results were significantly different based on study inclusion criteria, and authors found both sets of results helpful. The meta-analysis gave very clear criteria for effectiveness but almost no hints regarding intervention direction because almost all studies had been excluded.

Looking at Table 1.1, it is evident that the literature review generated evidence supporting both theory-informed and non-theoretical answers to the question at hand. This may be described as a topical approach to theory. The question that the students asked for their initial literature review was not about theory, but was about the topic at hand—adolescent unprotected sex. When the student group approached the literature they found some issues related to unprotected sex that were not explicitly theory-informed such as not perceiving condoms as pregnancy prevention (Bobrova, Sergeev, Grechukhina, & Kapiga, 2005); perceiving condoms as embarrassing (Bell, 2009); not taking personal responsibility for having condoms (Parkes, Henderson, & Wight, 2005); low family connectedness (Markham et al., 2003); perceptions of gender inequality in sex (Cates. & Spieler, 2001); and closed communication (Crosby et al., 2000). The group also found a number of studies that reported the relation of theoretical constructs to unsafe sex, including intention to use condoms and perceived social norm (Albarracin, Johnson, Fishbein, & Muellerleile, 2001; Bobrova et al., 2005; Villarruel, Jemmott, Jemmott, & Ronis, 2007) and self-efficacy for negotiating and discussing condom use with a partner (Bell, 2009).

From the literature review, the group also became interested in information on the wider social context of why adolescents might not protect themselves against pregnancy and STIs. They found that researchers had demonstrated that community characteristics—such as proportion of families living below the poverty line, low levels of education, and high unemployment—were highly

related to birthrates among young teenagers (Kirby, Coyle, & Gould, 2001). They also discovered that other neighborhood characteristics, such as access to family planning services, had been linked to adolescent contraceptive use (Averett, Rees, & Argys, 2002). This broader search located evidence that lack of parental supervision, association with deviant peers (that is, those participating in other risk behaviors), and coercive parenting were associated with engaging in sexual risk taking (Metzler, Noell, Biglan, Ary, & Smolkowski, 1994).

Sometimes evidence in response to a well-defined question may be scarce. For example, another student working group was interested in the question: “What factors predict cervical cancer screening in young women in Ghana?” The students were disappointed that they could find only three references directly related to the specific question in a defined priority population. They broadened their search in two ways. One was to look for research studies in populations that were arguably similar to young women in Ghana—perhaps young women in other West African countries that might share demographic and cultural characteristics. Another search strategy was to ask the same question about other cancer screenings and similar behaviors in Ghana.

### Accessing and Using Theory

A significant focus of the core processes is how to find and use aspects of theory, and, clearly, from the student group example, theory will be encountered even when searching the literature by topic. Nevertheless, most intervention planning will require specific attention to theory as a part of the planning steps even when some theoretical constructs have appeared as part of a more general search.

Table 1.2 presents examples of types of theories that might be applied for the various decisions in the Intervention Mapping process. Notice that these theories do not apply equally to all steps and that adequate use of the core processes enables a planning group to apply multiple theories or models throughout the planning process. In a problem-driven context, all theories, theoretical models, and constructs are potentially useful within the parameters that the theory describes (Buunk & van Vugt, 2008; Kok et al., 2004).

One challenge is to find the best theory or combination of theoretical constructs first to understand and then to solve the problem at hand. Limiting the pool of candidate theories too soon may lead to an inadequate solution of a practical problem or, worse, to conclusions that are counterproductive. A theory that is helpful in making one decision might not be very helpful for making another.

Both the brainstorming process and the literature search will have turned up theoretical constructs. The next core process task is to continue to refine, add to, and discard provisional answers based on theoretical concepts. We suggest

**Table 1.2 Examples of Theories for Intervention Mapping Steps**

Decision	Example of Theories
<ul style="list-style-type: none"> <li>• Needs assessment</li> <li>• Behaviors</li> <li>• Environmental conditions</li> <li>• Personal determinants</li> <li>• Methods, applications, and intervention</li> <li>• Implementation</li> </ul>	<ul style="list-style-type: none"> <li>• Quality-of-life theories</li> <li>• Self-regulatory theories</li> <li>• Power theories</li> <li>• Value-expectancy theories</li> <li>• Persuasive-communication theories</li> <li>• Diffusion theories</li> </ul>

that the planning group continue with the question-focused approach but to now look specifically for theory-related answers. The student planning group in our example began with a topic-related approach, and some of the answers on the provisional list (Table 1.1) are theoretical in nature. We think of looking for applicable theories and constructs in three ways: topic, construct, and general theories.

The student group has already searched the literature using the topic approach. They accessed some theoretical constructs when they looked at literature pertaining to prevention of HIV, STIs, condom use, and adolescent sexual behavior. Even when searching the literature through the health problem or behavioral topic, theoretical ideas will turn up.

A second approach to accessing theoretical ideas is through concepts that turn up during brainstorming. Even though the ideas from the brainstorming are in lay terms, there may be some advantage to relabeling them with their theoretical labels. The information that can be garnered about a theoretical construct can be somewhat more precise than that related to a simple concept. For example, on the students' original list, the idea of lack of confidence appeared. If by this concept, the students might mean the theoretical construct of self-efficacy, then they might also be able to find out later how self-efficacy might be improved by reading what Bandura has to say about self-efficacy (Bandura, 1986; Mulvihill, 1996). When group members explored the construct of self-efficacy, expressed in their provisional list as confidence, they found considerable useful information. This new information guided them to look at two kinds of self-efficacy—self-efficacy for negotiating condom use as separate from self-efficacy in applying a condom—which they found in their literature search.

Accessing theory from a construct approach can also lead to consideration of the parent theory and a general theories approach to accessing theory. A general theories approach is the process of simply perusing a theory that might offer insight into one's question. The student group might have used the general

theories approach to access Social Cognitive Theory. As it turned out, the group approached this theory through the construct of self-efficacy and also followed the construct of intention back to the parent theory of Theory of Planned Behavior. As the group members explored these theories, they found that self-efficacy is closely related to skills and outcome expectations so they added to the list skills for negotiating condom use and applying a condom (Table 1.1). Further, they encountered methods for influencing self-efficacy and began to think ahead about the intervention. None of this useful information would have been available if the group had not looked beyond the concept of confidence.

### Identifying and Addressing Needs for New Research

At this point the planner will have assembled a set of answers from both the theoretical and empirical literature that fit with, suggest changes to, or add to the provisional explanations. In some cases this information provides insight into the exact processes of the provisional answers. The information may, at the same time, raise questions that the planning team had not thought of before. For example, the planners would want to know whether certain theoretical constructs that look promising were actually explanatory in their population. They would also want to know the particular way an explanation found in published research is operating in their population.

Often, health promotion planners use a combination of qualitative and quantitative techniques to explore the question of interest in their population (Bryman, 2006; Creswell, 2008; De Vries, Weijts, Dijkstra, & Kok, 1992; Morgan, 2006; Steckler, McLeroy, Goodman, Bird, & McCormick, 1992b). For example, for a question regarding determinants, planners first search the available theoretical and empirical literature on the cause of the behavior or environmental condition of interest to find theories and data. They might then use a qualitative method to find out the population's ideas about determinants of their behavior and then conduct a quantitative study using a structured questionnaire with questions that are based on the results of the qualitative phase. Some factors cannot be measured just by asking members of the population because perceptions may be different from reality; planners may need information from key persons and observations. In some situations qualitative methods are used later in the research process to better understand the findings from a quantitative approach (Morgan, 2006, 2007; Steckler et al., 1992b).

The student working group needed more information from their priority population to provide evidence regarding the items on the provisional list—either in support of the association or to question whether the association is valid in their population. They wanted to be more sure of the evidence before deciding

which of their initial factors should be left on the list of determinants. The group conducted individual interviews and focus groups with both boys and girls from their local area. They learned a lot about youth experiences with protected and unprotected sex and the reasons for both occurrences. The new data called into question the adolescents' lack of knowledge about HIV or STIs in their population. The adolescents also felt that the argument that condoms don't work is more of an excuse and less of a belief about effectiveness. The adolescents who had tried condoms expressed some embarrassment with the process of using condoms and a need for a greater level of skills and self-efficacy. With this new information the group was able to move on to the next core process.

### Formulating the Working List of Answers

At this point the planning team is ready to summarize and complete its provisional list of answers into a working list for which the evidence is sufficient. The planners will consider the criteria of plausibility and process, and also judge their answers for relevance and changeability. Relevance is the strength of the evidence for the causal relationship between the determinant and the behavior. Changeability is the strength of the evidence that the proposed change can be realized by an intervention. The latter criterion requires health educators to consider that some determinants may be changed by interventions directed at the individual, and other determinants by interventions directed at the environment. For questions regarding determinants, answers that remain on the list will be factors that are both important and changeable. For a solutions or methods question, answers that remain on the list will be methods that have been shown to produce significant change in similar situations. After this process, the planning group would have enough information to finalize a list of important determinants and depict the causal model as a simple logic model (Earp & Ennett, 1991).

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## Navigating the Book

The process of Intervention Mapping is essentially unchanged from the second edition text. However, we have rearranged the presentation of some aspects of the process. We also have tried to simplify some explanations and discard terms that have caused confusion.

### Organization of the Book

The book is organized in two sections. The first section, Foundations, contains an introductory chapter and two chapters that are reviews of theories often

used in health education and promotion. Chapter Two provides an overview of behavior-oriented theories, which focus on understanding or changing behavior. Chapter Three provides an overview of environment-oriented theories, which focus on understanding or changing environmental conditions. The centerpiece of the book is the six chapters on the Intervention Mapping steps and one chapter on using the steps to adapt evidence-based programs to new settings. Three case study chapters are available at the book's instructor Website.

### Changes from the Previous Editions

Readers familiar with the previous editions of Intervention Mapping will find several changes that may have an impact on their practice and teaching. One change will primarily affect navigation of the book: We introduce Core Processes in Chapter One (rather than in an independent chapter), and in Intervention Mapping Steps 1, 2, and 3 we give examples of using the core processes.

We have made two changes that will be of interest to previous users of the book and of the Intervention Mapping process. For the third edition of the book, we have worked to resolve the confusion that sometimes occurs in making a distinction between external determinants of behavior and environmental factors that also influence behavior. In the previous version of Intervention Mapping, we included both personal and external determinants of behavior (including the behavior of agents in the environment), defining *personal* as those that reside within the individual and are under her or his control and *external* as those outside the individual and not directly under his or her control. In teaching and getting feedback from users of Intervention Mapping, we learned that students and planners often had difficulty in making a distinction between external determinants and environmental factors because, in reality, both are part of the environment. We gave this issue extensive consideration and concluded that for program planning it was not necessary to make this distinction. Therefore, we have revised our conceptualization by moving external determinants to the environment. Typical external determinants that have been used in Intervention Mapping are reinforcement, norms, role models, cues, social support, and economic resources. In the revised version of Intervention Mapping these become part of the analysis of environmental causes as well as environmental outcomes to be influenced by the health promotion program. We have retained the same level of needs assessment and program development emphasis on environmental factors as was present in the previous two editions.

We have replaced the word *strategies* with the word *applications* as it refers to practical ways to deliver theoretical methods of change. Theoretical methods are evidence-based techniques or groups of techniques selected to change or redirect

causal processes that regulate behavior or social change. There are several separate aspects to practical applications (what we called “practical strategies” in the previous edition) including setting, materials, mode of delivery, intensity, and duration.

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## Important Repeating Concepts in the Book

Throughout the book, several key concepts are repeated in different contexts. These are planning matrices, iterative planning, logic models, culture, and evaluation.

### The Formulation of Matrices as a Foundation for Intervention Planning

In *Intervention Mapping*, matrices that combine performance objectives with their determinants are the basis for intervention development. They are used in both planning a program (Step 2) and in planning its adoption and implementation (Step 5). If a theoretical method or practical application used in an intervention is not intended to change the objectives in the matrices, then either it does not belong in the program or the matrix is not adequate and should be revisited. If an evidence-based program is being adapted for use with a new population or in a different setting, a matrix of change objectives serves as a guide for modifications of the original program. Thus, matrices serve as a foundation for the planning of the original program and for program adoption, adaptation, and implementation.

### Planning as an Iterative Process

In order to describe the intervention and program development process, we have laid out a series of steps. This orderly presentation sometimes wrongly suggests to the reader that every step is completed only once and in a rigid order. This is not the case. Even though each step should provide the basis for the next, only rarely does a step need no revision as the next steps are completed. New information is acquired with each step. And with increasing ideas about the program, knowledge about the intended groups to benefit from the program, community participation, and research and theory, a planner often needs to revisit and fine-tune a previous step. For example, a planning group in the Netherlands included in Step 3 a role play by teens in an HIV-prevention program in schools as a practical application of the method of modeling. When working with teachers on the program in Step 4, planning group members discovered that the teachers were uncomfortable leading role playing in the classroom; planners had to revisit Step 3 to rethink some of the applications of modeling before completing the program design.

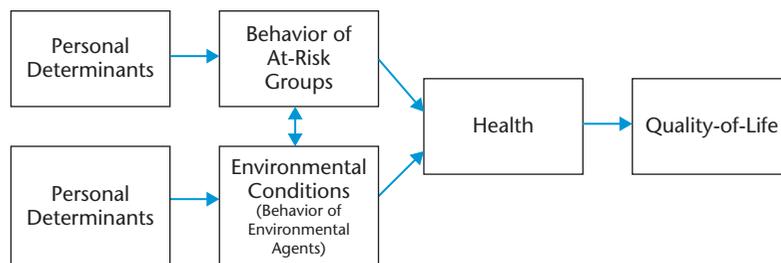
In addition to the process of revisiting prior steps, some “steps” actually weave in and out of the process. For example, evaluation planning begins in the needs assessment and continues in each step until the final plan is completed in Step 6, which is focused on generating an evaluation plan. Likewise, community participation, including that by potential program implementers, begins when the project first starts, is continued in each step, and is revisited in Step 5, adoption, implementation, and sustainability.

## The Use of Logic Models

Logic models are graphic representations of the demonstrated or hypothesized causal relationships between concepts such as program activities, program output, and outcomes or benefits (Chen, 1990; Julian, Jones, & Deyo, 1995; Julian, 1997; Sartorius, 1991). Logic models can help program developers take into account the complexity of health problems and possible solutions; make explicit the implicit pathways of program effects; and make clear the rationale for program activities (Kirby et al., 2004). Logic models are commonly being used in program development and evaluation; they are a requirement for many funding agencies and taught and supported by the Centers for Disease Control and Prevention as the fundamental framework for program evaluation (ActKnowledge & Aspen Institute Roundtable on Community Change, 2003; Centers for Disease Control and Prevention, 2001b; FRIENDS National Resource Center for Community-Based Child Abuse Prevention & Child Welfare Information Gateway, 2009; United Way of the Bay Area, 2009; Valley of the Sun United Way, 2008; W. K. Kellogg Foundation, 1998, 2004).

In the process of Intervention Mapping, the planner will build three types of logic models. The first is an etiologic model or theory of the problem. Figure 1.3 is based on PRECEDE, a model often used in health education and promotion, and presents the first type of logic model: the description of the causes of health and

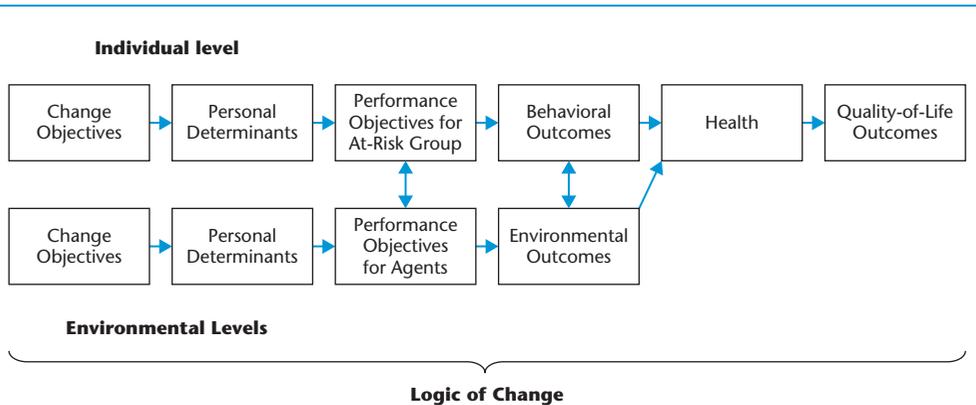
**FIGURE 1.3** Logic Model of the Problem



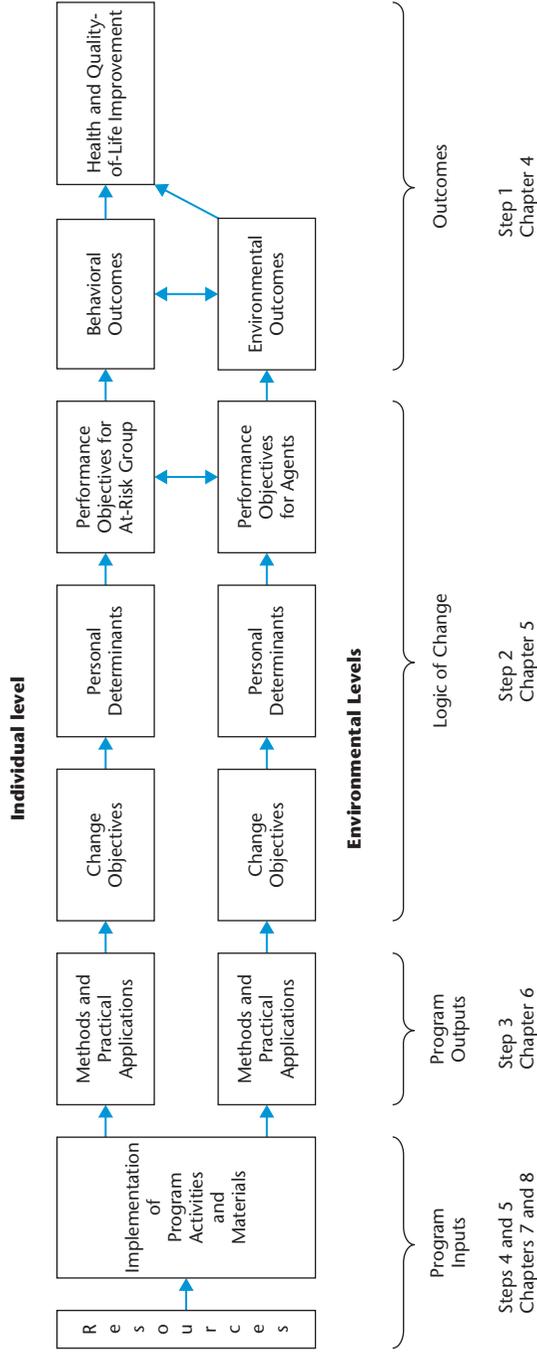
quality-of-life problems. In the needs-assessment step (Chapter Four), the planner analyzes and depicts the health, quality-of-life, behavioral, and environmental problems. The planned changes in these will become the program outcomes (Centers for Disease Control and Prevention & Oak Ridge Institute for Science and Education, 2003; Green & Kreuter, 2005).

In Step 2, we transition from a focus on the problem to a focus on the solution: the intervention. We begin to develop a set of intervention logic models. In Step 2, planners develop a logic model of change (Chapter Five). This model depicts the exact change that the intervention targets in the behavior of the risk group and in the environment, as well as the expected determinants of the change. Some authors refer to this as developing a theory of change, theory of the program, or a tacit theory (Connell & Kubisch, 1996; Rossi et al., 2004; Weiss & Coyne, 1997). We refer to it as the logic of change. These models explain how the program components or activities are thought to influence first the determinants of behavior and environment, then the behavior and environmental factors, and finally the health problem and quality of life. Kirby describes these models as behavior, determinants, intervention (BDI) logic models (Kirby et al., 2004). All of these logic models are intended to carefully describe the factors that must change in order for the program to be effective. Figure 1.4 presents this type of logic model. Finally, in Steps 3, 4, and 5, we complete a model of the intervention logic, and this full “intervention map” is used to plan the evaluation in Step 6. This third type of logic model depicts program theoretical methods, practical applications, components, resources, and activities (program inputs and outputs) along with the outcomes they are meant to effect (see Figure 1.5.)

**FIGURE 1.4 Logic Model of Change**



**FIGURE 1.5 Intervention Logic Model**



In addition to the logic model that is pieced together as intervention development progresses, we present a number of more detailed logic models to help clarify relations among concepts, such as theoretical constructs (Chapters Two and Three). We also use other graphic devices that do not imply causal relations, such as Figure 1.2, a depiction of the steps involved in Intervention Mapping. When a figure is a logic model, that is, it implies causal relations, we clearly label it as such.

## Culture

Another theme that appears in each step of Intervention Mapping is the need to create culturally relevant programs for diverse groups (see Chapters Four and Seven.) Often health educators work with groups of people who are members of a cultural group different from their own; often these are underserved groups. Program planning must be conducted with an awareness of the roles of cultural and power differences and with what some professional fields now label cultural humility (Tervalon, 2003; Tervalon & Murray-Garcia, 1998). Tervalon and Murray-Garcia (Tervalon, 2003; Tervalon & Murray-Garcia, 1998) described cultural humility in the context of physician training and asserted that the idea of competency-based education does not map well to culture. *Competency* implies that it is possible to fully know another culture whereas *humility* indicates that it is impossible to do so (Levi, 2009). Because we can never become fully competent in another culture, an appropriate goal may be lifelong self-evaluation and self-critique. Although Tervalon and Murray-Garcia's approach was originally proposed to redress the power imbalances in patient–physician relationships, it is equally applicable to health promotion (Delemos et al., 2007; Minkler, 2004b; Tervalon, 2003; Tervalon & Murray-Garcia, 1998; Wallerstein & Duran, 2006).

In addition to the firm intention to work within communities and with people who may be the participants in programs, health promotion planners need a commitment toward cultural humility—that is, the recognition that one is never “competent” in this domain—and communication skills that demonstrate flexibility, openness, and self-reflection so that cultural learning is possible (Hixon, 2003). Bennett (1993) suggested six stages of development toward cultural sensitivity (denial, defense, minimization, acceptance, adaptation, and integration), and the characteristics described at each of these stages can be helpful as one begins the process of self-assessment and learning necessary to work with different cultures and build effective programs (Bennett, 1993; Peace Corps, 1999).

There are several important reasons for planners to be able to develop effective programs across cultures, including the expanding diversity within countries, the reality of globalization and global health promotion practice, and the critical issue of health disparities (Fiscella, Franks, Gold, & Clancy, 2000; Institute of Medicine, Board on Health Sciences Policy, Committee on Understanding and Eliminating Racial and Ethnic Disparities in Health Care, 2003; Pamuk, Makuc, Heck, & Reuben, 1998; Thomas, 2001; Vinicor, Burton, Foster, & Eastman, 2000; Williams & Jackson, 2000; Work Group for Community Health and Development, University of Kansas, n.d.b). The U.S. Healthy People 2010 objectives highlighted the health disparities between racial and ethnic groups, with particular emphasis on eliminating those disparities in infant mortality, cancer screening and management, cardiovascular disease, diabetes, HIV/AIDS, and childhood and adult immunizations (U.S. Department of Health and Human Services, 2001), whereas the 2020 report set even more aggressive objectives for the elimination of disparities (Elliot, 2008; Secretary of Health and Human Services' Advisory Committee on National Health Promotion and Disease Prevention Objectives for 2020 & Federal Interagency Workgroup on Healthy People 2020, 2009).

The authors of *The Community Tool Box* suggest that understanding culture is important for community builders and health promoters because attaining significant change requires people working together to build communities that are powerful enough to attain change; working effectively across cultures allows incorporation of the unique strengths and perspectives of many groups; cultural sensitivity can help overcome racial and ethnic divisions which result in lost opportunities; full involvement of diverse groups in decision making can result in more effective programs; appreciation of cultural diversity goes hand in hand with a just and equitable society; and finally, if we do not learn about the influences of cultural groups, we are missing an accurate view of our society and communities. See the Community Tool Box Web site regarding cultural adaptation of interventions at [ctb.ku.edu/en/tablecontents/section\\_1163.htm](http://ctb.ku.edu/en/tablecontents/section_1163.htm) (Work Group for Community Health and Development, University of Kansas, n.d.a) and regarding cultural competence at [ctb.ku.edu/en/tablecontents/chapter\\_1027.htm](http://ctb.ku.edu/en/tablecontents/chapter_1027.htm) (Work Group for Community Health and Development, University of Kansas, n.d.c).

In addition to the explicit association of cultural diversity with race and ethnicity, there are many aspects of diversity, and health educators will need to use the same skills in all program development. Typical considerations include aspects of diversity that have led to discrimination (marginalized groups, nationality, ethnicity, language, race, gender, sexual orientation, class, spiritual or

religious beliefs and practice, and physical and mental ability). Also important, but possibly less often salient, are age, education, family status, health status, style, skills, customs, ideas, military experience, geographic origin, property ownership, occupation, and socioeconomic status (Work Group for Community Health and Development, University of Kansas, n.d.b). For example, in the Netherlands, van Kesteren and colleagues are developing an HIV prevention and sexual health program for HIV-positive men who have sex with men (Van Kesteren, Hospers, Kok, & van Empelen, 2005). Van Kesteren and colleagues described a specific subgroup structure with definable cultural characteristics, social support mechanisms, and organizations that required sensitive interaction and reflection in program development (Van Kesteren et al., 2005; Van Kesteren, Kok, Hospers, Schippers, & De Wildt, 2006).

Each planning step requires a specific aspect of a culturally relevant approach conducted by a self-aware planner and planning group. In Step 1, needs assessment (Chapter Four), we cover aspects of becoming a practitioner with a perspective encompassing the concept of cultural humility as a prerequisite for beginning a needs assessment and encouraging community participation. In Step 1, we also present the idea of cultural assessment as a part of defining the priority population for the program. In Step 2, matrices (Chapter Five), we discuss the importance of working with the priority population to adequately define the performance objectives and determinants. Without the culturally correct matrix components, no program materials will be salient to the intended cultural group. In Steps 3 and 4, methods, applications, and programs (Chapters Six and Seven), we reiterate the importance of maintaining the participation of the intended audience in development of materials, and we discuss approaches to creating culturally relevant materials.

## Program Evaluation

Program evaluation always begins with a thorough description of the program to be evaluated and its proposed causal pathways for change. This description is accomplished step-by-step in Intervention Mapping. First, in the needs assessment, the planner begins to formulate goals for program outcomes in health and quality of life. These become part of the plan for evaluating effects (Chapter Nine). In Step 2 the planner specifies desired changes in behavior and environment as well as their determinants, which again become further outcomes for evaluating effects. Steps 3, 4, and 5 guide the specification of program components and implementation plans that link closely to process evaluation. Step 3

also contains discussion of pretesting and pilot-testing or formative evaluation of the program.

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## Usefulness of Intervention Mapping

We present Intervention Mapping as a series of steps, tasks, and processes to help health promotion and health education planners develop theory- and evidence-based programs. Well-designed and effective interventions should be guided by theory and informed by empirical evidence regarding the targets for change. For example, meta-analyses of cancer-screening interventions have found that larger effect sizes are achieved when interventions are based on theory (Stone et al., 2002; Yabroff, O'Malley, Mangan, & Mandelblatt, 2001; Yabroff & Mandelblatt, 1999). However, no one theoretical model completely predicts or explains health behaviors or environmental changes (Institute of Medicine, Committee on Health Literacy, 2004; Rakowski & Breslau, 2004; Rimer, 2002). Therefore, a system is needed to help intervention developers choose useful theories and integrate relevant constructs from multiple theories to describe health problems and develop health promotion and health education solutions (Kok, Schaalma, Ruiter, van Empelen, & Brug, 2004; van Bokhoven, Kok, & van der Weijden, 2003).

Specifically, Intervention Mapping ensures that theoretical models and empirical evidence guide planners in two areas:

- The identification of determinants of behavioral and environmental causes related to a specified health problem
- The selection of the most appropriate methods and applications to address the identified determinants to achieve changes in behavioral and environmental outcomes related to a health problem

Intervention Mapping has been used to develop many programs, and Table 1.3 presents those discovered in our literature search. Even though Intervention Mapping has not been directly compared to other processes for developing interventions, planners of the referenced projects and others considering guidance for intervention development think that the systematic process has been useful and flexible and that continued use will strengthen future program development (Aro & Absetz, 2009; Belansky et al., 2009; Hoelscher, Evans, Parcel, & Kelder, 2002).

**Table 1.3 Programs Developed Using Intervention Mapping**

Topic	Intervention Title	References
Acute Stroke Therapy	The TLL Temple Foundation Stroke Project	Morgenstern, Bartholomew, Grotta, Staub, King, & Chan (2003) Morgenstern, Staub, Chan, Wein, Bartholomew, King, et al. (2002)
Asthma Self-Management	Watch, Discover, Think, and Act	Bartholomew, Gold, Parcel, Czyzewski, Sockrider, & Fernández (2000b) Fernández, Bartholomew, Lopez, Tyrrell, Czyzewski, & Sockrider (2000b) Shegog, Bartholomew, Parcel, Sockrider, Masse, & Abramson (2001) Bartholomew, Shegog, Parcel, Gold, Fernández, Czyzewski, et al. (2000)
Asthma Management in Hispanic Children	Familias	Fernández, Bartholomew, Linares, Lopez, Sockrider, Czyzewski, Abramson, & Parcel (2000a) Fernández, Bartholomew, Lopez, Tyrrell, Czyzewski, & Sockrider (2000b)
Breast Cancer (going to provider with symptoms)	Promoting Early Presentation of Breast Cancer	Burgess, Bish, Hunter, Salkovskis, Michell, Whelehan, and Ramirez (2008)
Breast Cancer Screening	Project HOME (Healthy Outlook on the Mammography Experience)	Vernon, del Junco, Tiro, Coan, Perz, Bastian, Rakowski, Chan, Lairson, McQueen, Fernández, Warrick, Halder, & DiClemente (2008)
Breast and Cervical Cancer Screening	Cultivando La Salud	Fernández, Gonzales, Tortolero-Luna, Partida, & Bartholomew (2005a)
Breastfeeding	Early Post-natal Breastfeeding Support	Kronborg, Væth, Olsen, Iversen, & Harder (2007)
Blood Pressure Dissemination	Improving Blood Pressure Treatment in the Community	Bartholomew, Cushman, Cutler, Davis, Dawson, Einhorn, Graumlich, Piller, Pressel, Roccella, Simpson, Whelton, Williard, & ALLHAT Collaborative Research Group (2009)
Cervical Cancer Screening	Love Yourself Before You Take Care of Your Family.	Hou, Fernández, & Parcel (2004) Hou, Fernández, Baumler, & Parcel (2002)

(Continued)

Table 1.3 (Continued)

Topic	Intervention Title	References
Colorectal Cancer Screening	Project PCCaSO: Tailored Interactive Intervention to Increase CRC Screening	Vernon (2004)
Cystic Fibrosis	Cystic Fibrosis Family Education Program	Bartholomew, Czyzewski, Swank, McCormick, & Parcel (2000a) Bartholomew, Czyzewski, Parcel, Swank, Sockrider, Mariotto, Schidlow, Fink, & Seilheimer (1997)
Forgetfulness	Determining the Psychosocial Determinants of Forgetfulness	Mol, Ruiter, Frans, Verhey, Dijkstra, & Jolles (2008)
Healthy Lifestyle Promotion	Prescribe Vida Saludable	Sanchez, Grandes, Cortada, Pombo, Balague, & Calderon (2009)
HIV Management	Intervention to Promote Sexual Health	Van Kesteren, Kok, Hospers, Schippers, & De Wildt (2006)
HIV Prevention	AIDS Risk Reduction Program for Dutch Drug Users	Van Empelen, Kok, Schaalma, & Bartholomew (2003)
HIV Prevention	Gay Cruise	Kok, Harterink, Vriens, de Zwart, & Hospers (2006)
HIV testing	Queer Masters	Mikolajczak, Kok, Hospers (2008)
HIV Treatment	Self-management Program to Optimize Long-term Adherence to Antiretroviral Therapy Among Persons Living with HIV	Côté, Godin, Garcia, Gagnon, & Rouleau (2008)
Injection Drug Users	Computer-tailored Intervention to Promote Safer Injection Practices Among Drug Users	Gagnon, Godin, Alary, Bruneau, & Otis (2009)

Table 1.3 (Continued)

Topic	Intervention Title	References
Injury Prevention	iPlay	Collard, Chinapaw, van Mechelen, & Verhagen (2009)
Leg Ulcers	Lively Legs	Heinen, Bartholomew, Wensing, van de Kerkhof, & van Achterberg (2006)
Mental Disorders	Workplace Intervention for Sick-listed Employees with Common Mental Disorders	Van Oostrom, Anema, Terluin, Venema, de Vet, & van Mechelen (2007) Van Oostrom, Anema, Terluin, De Vet, Knol, & van Mechelen (2008)
Nutrition	Fruit and Vegetable Nutrition Program	Cullen, Bartholomew, Parcel, & Kok (1998) Cullen, Bartholomew, & Parcel (1997) Hoelscher, Evans, Parcel, & Kelder (2002)
Nutrition	School-based Interventions to Increase Fruit and Vegetable Intake	Reinaerts, de Nooijer, Candell, & de Vries (2007)
Overweight Management	Minimal Intervention Strategy (MIS) to Address Overweight and Obesity	Fransen, Hiddink, Koelen, van Dis, Drenthen, van Binsbergen, & van Woerkum (2008)
Overweight Prevention	Dutch Obesity Intervention in Teenagers	Singh, Chinapaw, Kremers, Visscher, Brug, & van Mechelen (2006)
Overweight Prevention	Netherlands Research Programme Weight Gain Prevention (NHF-NRG)	Kremers, Visscher, Brug, Chinapaw, Schouten, Schuit, Seidell, Van Baak, Van Mechelen, Kemper, Kok, Saris, & Kromhout (2005) Kwak, Kremers, Werkman, Visscher, van Baak, & Brug (2007)
Overweight Prevention	In-Balance Project: FATaintPHAT	Ezendam, Oenema, van de Looij-Jansen, & Brug (2007)
Overweight Prevention	Step Ahead	Zapka, Lemon, Estabrook, & Jolicoeur (2007) Lemon, Zapka, Li, Estabrook, Rosal, Magner, Andersen, Borg, & Hale (2010)

(Continued)

Table 1.3 (Continued)

Topic	Intervention Title	References
Physical Activity	Stages of Change for Moderate-intensity Physical Activity in Deprived Neighborhoods	Kloek, van Lenthe, van Nierop, Schrijvers, & Mackenbach (2006)
Physical Activity	Worksite Physical Activity Intervention	McEachan, Lawton, Jackson, Conner, & Lunt (2008)
Physical Activity	Active <i>plus</i>	van Stralen, Kok, de Vries, Mudde, Bolman, & Lechner (2008)
Quality Improvement	Designing a Quality Improvement Intervention	Van Bokhoven, Kok, & van der Weijden (2003)
Return-to-Work	Participatory Return-to-Work Intervention for Temporary Agency Workers and Unemployed Workers Sick-listed due to Musculoskeletal Disorders	Vermeulen, Anema, Schellart, van Mechelen, & van der Beek (2009)
Return-to-Work	Return-to-Work Program for Workers with Occupational Low-back Pain	Ammendolia, Cassidy, Steenstra, Soklaridis, Boyle, Eng, Howard, Bhupinder & Côté (2009)
Safety Programs	Minnesota Machine Guarding Program	Brosseau, Parker, Samant, & Pan (2007) Parker, Brosseau, Samant, Vi, Pan, Haugan, & the Study Advisory Board (2009)
Stress Prevention in Children	Learn Young, Learn Fair	Kraag, Kok, Abu-Saad, Lamberts, & Fekkes (2005) Kraag, van Breukelen, Lamberts, Vugts, Kok, Fekkes, & Abu-Saad (2007) Kraag, van Breukelen, Kok, & Hosman (2009)

Table 1.3 (Continued)

Topic	Intervention Title	References
STI/HIV Prevention	Uma Tori!	Bertens, Eiling, van den Borne, & Schaalma (2009) Bertens, Schaalma, Bartholomew, & van den Borne (2008)
STI/HIV Prevention	Programme to Prevent Sexually Transmittable Infections	Wolfers, van den Hoek, Brug, & deZwart (2007)
Sun Protection	Sun Protection Is Fun!	Tripp, Herrmann, Parcel, Chamberlain, & Gritz (2000)
Violence	Padres Trabajando por la Paz	Murray, Kelder, Parcel, & Orpinas (1998)

## Summary

Chapter One explains the rationale for systematic, ecological, and systems approaches to health promotion intervention development. This chapter presents several types of logic models. A logic model of the health problem, a logic model of change, and an evaluation model are developed to guide the process of intervention development.

The chapter lists the steps of Intervention Mapping and defines the process and product of each one. In Step 1, the planner assesses the health problem, the behavioral and environmental causes of the problem, and determinants of the behavioral and environmental causes. Step 2 provides the foundation for the intervention by specifying who and what will change as a result of the intervention. The product of Step 2 is a set of matrices of selected ecological levels (individual, interpersonal, community, or societal) that combines performance objectives for each level with selected determinants to produce change objectives, the most immediate target of an intervention. In Step 3, the planner seeks theory-based methods and practical applications to change the determinants of health behavior, the behavior of environmental agents, and to change organizational, community, and societal factors to affect the environment. The products in Step 4 are the scope and sequence of the intervention, completed program materials, and program protocols. The focus of Step 5 is program adoption and implementation, including consideration of how the program can be maintained and how it can be disseminated after an initial evaluation. In Step 6, the planner

completes an evaluation plan that already had been started during the needs assessment and has been developed along with the intervention map.

Chapter One also highlights the core processes for applying theory and evidence in intervention development:

- Posing planning problems as questions
- Brainstorming or free-associating answers to planning questions
- Using planning group and community knowledge
- Searching the literature for empirical evidence and evaluating the strength of the evidence
- Accessing and using theory
- Conducting new research for unanswered questions in the planning process
- Developing a final summary of answers to the posed question

Finally, Chapter One briefly describes the two important changes from the second to the third edition of the book: (1) the term *external determinants* is no longer used and the related concepts are presented as a part of the environment; (2) the term *practical strategies* has been replaced with *practical applications*.

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## Discussion Questions and Learning Activities

1. Why is it important to apply a systematic approach to the development of health promotion programs? What are the risks if a systematic approach is not used for health promotion program development?
2. Explain what is meant by ecological and systems approaches to intervention development. Give examples of how factors at different ecological levels can have an impact on health.
3. Discuss why so many health promotion programs focus only on behavior change of individuals at risk for a health problem and do not address environmental influences.
4. Using tobacco control as an example, describe the types of interventions that have been used at the individual, organizational, community, and societal levels.
5. When using core processes for Intervention Mapping, planners first pose a question, then brainstorm answers to the question. They also gather evidence from the literature, theory, or new data. To access theories three approaches can be used: the topic-related approach, the concept-related approach, and the general theories approach. Discuss how a planning group can identify theories to answer planning questions using each of these three approaches.

6. Access the Web site for Diffusion of Effective Behavioral Interventions at [www.effectiveinterventions.org/](http://www.effectiveinterventions.org/) (Diffusion of Effective Behavioral Interventions, n.d.) or the Web site for Cancer Control P.L.A.N.E.T. at [cancercontrol.planet.cancer.gov/](http://cancercontrol.planet.cancer.gov/) (Cancer Control P.L.A.N.E.T., n.d.) and select three different health promotion/prevention intervention programs to review and determine which ecological level the program is addressing for change and describe how the intervention will make a change to improve health or prevent a health problem.
7. Select a community you are familiar with (could be where you grew up or currently live) and identify a population in that community that is of interest to you for developing a potential health promotion program. The population can be defined by age group, race and ethnicity, gender, geographical boundaries (such as neighborhoods), patient population (such as children with asthma), organizational membership (such as schools, worksites, or health care institutions), or other shared characteristics. List sources of information you could use to determine important health problems or concerns of this population.
8. Conduct interviews (in person or by phone) of at least two representatives from the selected community and ascertain their views on what are important quality-of-life issues and health problems for members of the community. The representative from the community could be from the local health department, a community-based organization, an elected official, or a member of a population at risk for selected health problems.
9. Based on your knowledge and what you learned about the community you selected in the previous question, identify a health problem, a behavior closely linked to a health problem, or an environmental condition closely linked to a health problem that you can use to practice the Intervention Mapping steps and tasks. Describe the population in the community that is at risk for the health problem or the related behavior and environmental condition.



# BEHAVIOR-ORIENTED THEORIES USED IN HEALTH PROMOTION

## LEARNING OBJECTIVES

- Describe a social ecological approach to health-related behavior and environments
- Identify and use behavior-oriented theories and theoretical constructs to explain behavior of at-risk individuals and agents at each ecological level
- Select behavior-oriented theoretical constructs to inform methods to change determinants of behaviors at each ecological level

The purpose of this and the next chapter is to identify theories that are applicable to health education and promotion problems and solutions. The primary focus is health-related behavior, the supporting social and physical environments for this behavior, and the environments related directly to health. We review theories that help to explain or to change the health-related behavior of the at-risk group or the behavior of individuals who are responsible for health-related aspects of environments.

In this chapter we review behavior-oriented theories: theories in which understanding and changing human behavior are the major processes of interest. In Chapter Three we focus on environment-oriented theories: theories in which understanding and changing environmental conditions for health are the major processes of interest.

In Chapter One we explained that health promoters start with an assessment of health and quality-of-life problems, describe who has the problem and who is at risk for it, and explore behavioral and environmental conditions that contribute to the problem. Planners then must search for causes of the behaviors or conditions

**Table 2.1 When to Use Theory in Intervention Planning**

<b>Task</b>	<b>Examples</b>
Describing the at-risk and intervention groups	Stages of Change Models Diffusion of Innovations Theory Agenda-Building Theory
Understanding the health-promoting behaviors	Theories of Self-Regulation Organizational Development Theory Diffusion of Innovations Theory
Understanding the health-promoting environmental conditions	Social Cognitive Theory Theories of Social Support Organizational Development Theory
Describing possible determinants of both risk and healthful behavior and environments	Theory of Planned Behavior Social Cognitive Theory Health Belief Model
Finding methods to promote change in the determinants, behavior, and environmental conditions	Communication-Persuasion Matrix Organizational Development Theory Conscientization

and choose methods to influence those determinants. In this process the health educator can look to theory for help with the following:

- Describing the at-risk and intervention groups
- Understanding the health-promoting behaviors and environmental conditions
- Describing possible determinants of both risk and healthful behavior and environments
- Finding methods to promote change in the determinants, behavior, and environmental conditions

Table 2.1 presents some uses of theory in health promotion planning and examples of theories for each use. An understanding of theoretical constructs applicable to health promotion can broaden the planner's ability to complete all the planning tasks.

## Perspectives

In this chapter, we focus on the importance of an ecological understanding of health problems and their solutions. We encourage planners to break away from their habitual approaches that use single theories when developing programs, and instead use a variety of theories to enhance their practice.

## Systems Perspective and Ecological Interventions

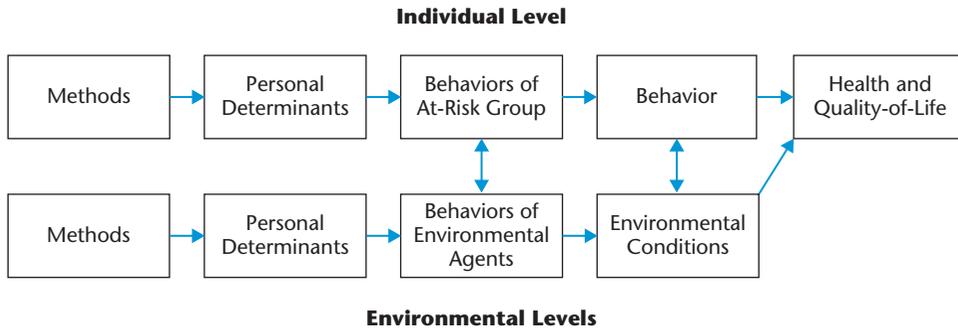
We introduce the major behaviorally oriented theories used in health promotion in this chapter. In current discussions of theory, the limitations of these theories and how they have been used in epidemiological research and intervention design have been raised (Resnicow & Page, 2008; Resnicow & Vaughan, 2006). Other authors have responded that increasing the sophistication of our models and measurement procedures will show the usefulness of our current health behavior theories (Baranowski, 2006; Brug, 2006). We agree that current health behavior theories, along with environmental change theories, provide a basis for understanding and predicting behavior change and designing interventions. At the same time, a systems perspective (Hawe, Shiell, & Riley, 2009) encourages the planner to consider the complexity of behavior change, to develop interventions that focus on change of the behavioral system as a whole, and to use methods that promote changes in behavior. Intervention Mapping is a tool to design ecological interventions that use theoretical methods to affect theoretical variables from multiple levels within a behavioral system.

Once a health educator understands a health problem, including behavioral causes, environmental conditions, and their determinants, the next use of theory is to identify intervention levels and methods. The focus on an environmental level for an intervention to improve health outcomes can depend on the level of the problem and its determinants at one or more of the individual, interpersonal, organizational, community, societal, or supranational environment levels (Kok, Gottlieb, Commers, & Smerecnik, 2008; Richard, Potvin, Kishchuk, Pric, & Green, 1996). (See Figure 1.1.)

As shown in Figure 2.1, we look at the determinants of the behavior of both the at-risk population and of agents who influence the environmental conditions related to the at-risk individuals' behavior, health, and quality of life. Questions regarding what influences the behavior of individuals and environmental decision makers will help to increase our understanding of the determinants of these behaviors as illustrated in the following nutrition example.

At the individual level, we might ask: what influences the individual to eat more fruits and vegetables? At the higher levels, we might ask: what influences the decision-making agent to make the healthful decision? Why, for example, do the decision-making agents buy fruits and vegetables for the home, purchase or modify healthful foods for the school cafeteria, develop feature articles on how families are changing the way they eat for health and well-being, or pass legislation subsidizing healthful school meals for low-income children? As with individual health behavior, agent decision making is influenced by personal determinants and environmental conditions.

**FIGURE 2.1** Logic Model for Methods, Determinants, Behaviors, Environmental Conditions, and Health



At the higher-order system levels, however, complexity increases, and different factors come into play. First, the decisions related to environmental changes are often made by groups, such as school boards or legislatures, composed of environmental agents. Emergent processes unique to each level constrain the behavior of individual agents, and the action by the group changes the environmental condition. Second, individuals at the higher levels act within roles. We discuss this more fully in Chapter Three.

Figure 2.1 presents a logic model for the relationships among theoretical intervention methods, personal determinants, environmental conditions, behaviors, and health. Among the contributors to health are the behavior of the at-risk group and environmental conditions. We search for personal determinants and environmental conditions influencing the at-risk group behavior. We also search for agents who could act on the environmental condition and for the personal determinants and environmental conditions influencing the agents' behavior. Finally, we identify theoretical methods and practical applications that may influence both sets of determinants. As we ask the questions pertinent to each step in the logic model, theories will be one source of answers.

### Political, Practical, and Habitual Influences on Intervention Planners

Health educators often work within settings, such as public health departments, schools, work sites, hospitals, universities, or community agencies, on particular missions and funded projects. Also, health educators may have specialized training or particular skills and talents that influence them to focus on a certain level or type of intervention, such as community organization, media advocacy,

small-group facilitation, or counseling. In addition, health educators often have their own favorite theories or ways of understanding health problems, risk factors, and determinants. Health educators and those who direct their work may intervene habitually with methods and applications based on the one or two theories with which they are most comfortable. However, using a favorite explanation for every problem and intervening in every situation with the same method may be like knowing Grandmother's recipe for only one type of soup. The recipe is familiar, and sometimes it works, depending on what ingredients the cooks have at hand and on their skill in the kitchen. But sometimes it doesn't work, and the cook needs both new ingredients and new recipes (Buunk & van Vugt, 2008; Kok, Schaalma, Ruiter, van Empelen, & Brug, 2004).

### What Is to Come?

In this chapter and the next, we present brief reviews of selected theories to give the reader an overview of the use of theories in health promotion. A description of each theory is followed by a summary of the theory's contribution to our understanding. More than anything, this chapter should alert the reader to the need to delve further into theories (Conner & Norman, 2005; DiClemente, Crosby, & Kegler, 2009; Edberg & APA Publications and Communications Board Working Group on Journal Article Reporting Standards, 2007; Glanz, Rimer, & Viswanath, 2008; Goodson, 2009; Hayden, 2008).

In our summaries of the theories, we indicate the contribution of each theory to the following, if applicable:

- **Intervention groups:** How and why do we differentiate members of a group of program participants into subgroups?
- **Behaviors:** How can we describe relevant behaviors for intervention?
- **Environments:** What are relevant environmental conditions for interventions?
- **Determinants:** What are the determinants of behavior and environments?
- **Methods:** What are appropriate methods to create change in determinants of behavior and environment?

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### Overview of Theories

We have organized this and the next chapter by arranging theories by ecological levels and describing representative theories. In this chapter we present individual- and interpersonal-level theories, and in Chapter Three we review environmental theories as presented in Table 2.2.

## BOX 2.1

### MAYOR'S PROJECT

The mayor's planning committee finds itself in a predicament. Everyone in the planning group has his or her favorite recipe for intervention. They have brainstormed some determinants of obesity-related behaviors such as diet and exercise and used the core processes (Chapter One), but the health educator seems hard-pressed to get the group members to see beyond their own pet theories. Some group members, including the health educator's supervisor, think that using more than one theory is forbidden to academically well-trained individuals. What to do? The health educator is determined to help the group construct a useful model of the problem. She has successfully used this approach in her previous job. She wants to help the group develop a hypothetical causal model of the problem and then to think about intervention levels and methods. But how will she get the group to make progress?

The health educator approaches the group management problem as she would any other planning process question. What are the determinants of the group members' behavior? What is holding them back from really working with theory? She considers that perhaps some group members know only one theory; some want a venue for theory testing; others just want to get the intervention done and aren't sure that theory was helpful at all. Looking at this short list, the health educator decides that if the group members have better knowledge of multiple theories and of ways to apply them to the problem of obesity, they may be more willing to continue with the planning process.

The health educator decides to sort all the literature that the group had gathered by the underlying theories and then by whether the articles present causes of obesity or interventions to decrease obesity. To each set of obesity-related articles, the health educator attaches an article that reviews the relevant theory. She then assigns small groups from the task force to summarize a set of articles and present them to the larger group. The small groups were to answer the following questions: What do these articles say about the causes of obesity-related behavior? Which of these causes are psychosocial determinants of individual behavior, and which are environmental conditions? If the causes are environmental, does the article contain data or theories that suggest the determinants of the environmental cause? With crossed fingers and held breath, the health educator awaits the results.

**Table 2.2 Theories Arrayed by Level**

Intervention Levels	Theories
<i>Chapter Two</i>	
Individual	<ul style="list-style-type: none"> <li>• Learning theories</li> <li>• Theories of information processing</li> <li>• Health Belief Model</li> <li>• Protection Motivation Theory and Extended Parallel Process Model</li> <li>• Theories of Reasoned Action, Planned Behavior and the Integrated Behavioral Model</li> <li>• Goal-Setting Theory</li> <li>• Theories of goal-directed behavior</li> <li>• Theories of automatic behavior, impulsive behavior, and habits</li> <li>• Transtheoretical model of behavior change</li> <li>• Precaution Adoption Process Model and risk communication</li> <li>• Attribution Theory and Relapse Prevention</li> <li>• Communication-Persuasion Matrix</li> <li>• Elaboration Likelihood Model</li> <li>• Theories of self-regulation</li> </ul>
Interpersonal environment	<ul style="list-style-type: none"> <li>• Social Cognitive Theory</li> <li>• Theories of Stigma and Discrimination</li> <li>• Diffusion of Innovations Theory</li> </ul>
<i>Chapter Three</i>	
Multilevel theories	<ul style="list-style-type: none"> <li>• Systems Theory</li> <li>• Theories of power</li> <li>• Empowerment theories</li> </ul>
Interpersonal environment	<ul style="list-style-type: none"> <li>• Social networks and social support theories</li> </ul>
Organization	<ul style="list-style-type: none"> <li>• Stage Theory of Organizational Change and Diffusion of Innovations Theory</li> <li>• Stakeholder Theory</li> </ul>
Community	<ul style="list-style-type: none"> <li>• Coalition Theory</li> <li>• Social Capital Theory</li> <li>• Social norms theories</li> <li>• Conscientization</li> <li>• Community Organization Theory</li> </ul>
Society and government	<ul style="list-style-type: none"> <li>• Agenda-building theory</li> <li>• Multiple Streams Theory</li> <li>• Advocacy Coalition Framework</li> </ul>

## Theories in Relation to System Levels

This presentation is a simplification because theories often link systems levels. For example, Social Cognitive Theory (SCT) includes determinants from the social and physical environments, and the Theory of Planned Behavior (TPB) has as a key predictor of behavior the normative expectations of others (in the environment) as perceived by the individual. The health educator can look outside the more obvious boundaries of a particular theory and work with the causal determinants from higher-order levels. For example, a planner working with concepts from the TPB could think about the sources of the normative beliefs and, moving to a more sociological frame of reference or to communications theory, look at how social norms are created and transmitted. Thus, even though individual theory may not explicitly link levels of analysis, a planner can use an eclectic approach to theory to develop hypothetical causal maps of how systems work to determine specific behavior or environmental changes.

In addition, many theories are potentially applicable to all ecological levels and also to the understanding and promotion of program adoption and implementation. When available, we give examples of applications outside each theory's more common application. The TPB, for example, is often applied to individual health behavior (Godin & Kok, 1996) but can be applied to explain the behavior of environmental agents such as politicians (Flynn et al., 1998; Gottlieb et al., 2003) and program implementers as well (Paulussen, Kok, Schaalma, & Parcel, 1995).

## From Theories of the Problem to Theories of Action

Some theories are primarily explanatory (that is, theory of the problem); some are primarily focused on change (that is, theory of action); and others have elements of both types. Theories of the problem suggest what to change; theories of action ideally tell how to change it. In practice, the jump from objectives about what to change to methods for creating change may sometimes be difficult.

Intervention Mapping suggests a bridge between theories of the problem and theories of action through the link between two steps: matrices of change objectives and theoretical methods. Theories of the problem help planners formulate appropriate objectives ordered by determinant; theories of action point to methods that can change the determinants. For example, using the TPB, the educator may have formulated a program objective in terms of perceived social expectations. Using SCT, the educator may select modeling and guided practice to improve resistance to social pressure. In discussing the theories, we pay attention to methods for change—such as cues, feedback, implementation intentions, persuasion, tailoring, and modeling—that may be linked to only one

theory. In Chapter Six we provide lists of methods, ordered by the determinant that these methods are able to influence. In the discussion of each theory in the current chapter, we first present its contribution to understanding behavior and then its contribution to methods.

### Cultural Sensitivity of Theories

With respect to applying theories across cultures, our position is that theories are descriptions of processes that can be generalized over groups and over cultures. The weight of each different variable in a theory, such as the TPB, may vary over cultures as it varies over subpopulations. In fact, the theory predicts this. The variables in the Health Belief Model (HBM), for example, have been useful in understanding health behavior in various cultures, even though the relative importance of the variables may differ (Champion & Skinner, 2008). The specific content of the variables within theories—surface as well as deep structure variables—may be very different. For instance, the meaning of health, environmental factors, lifestyles, determinants of behaviors, media characteristics, or settings may differ across cultural groups. In other words, beliefs may be different, but beliefs will influence behavior. Self-efficacy expectations may vary, but they will still predict behavior changes. The role models used in interventions will reflect the cultural background of the intended audience, but modeling should be a useful method for change in any culture. Self-management of diseases will take different forms, but the process of monitoring, evaluating, and moving to action is the same (James, Reddy, Ruiter, McCauley, & van den Borne, 2006; Kaaya et al., 2002; Laver, van den Borne, Kok, & Woelk, 1997; Manders et al., 2001; Meyer-Weitz, Reddy, van den Borne, Kok, & Pietersen, 2003; Saleh-Onoya et al., 2008; Sifunda et al., 2008). Pasick, Burke, Barker et al. (2009) argue that our theories are not culture-free. Their qualitative work is impressive but finding specific details that are not part of a general theory does not in itself invalidate the usefulness of the theory. In our view the challenge of applying theories across cultures is in determining the content and the application, not in deciding whether the use of theory in general is advantageous.

### Theories and Common Constructs

Because theories reflect reality, many of the ones we discuss have similar elements but use different names for the constructs. Some agreement is emerging in the health promotion and behavioral health fields regarding important theoretical constructs across theories. For example, five major behavioral science theorists agreed on a set of eight variables as key determinants of behavior, now called the Integrated Behavioral Model, that will be presented later in this

chapter (Fishbein et al., 2001; Institute of Medicine, Board on Neuroscience and Behavioral Health, Committee on Communication for Behavior Change in the 21st Century: Improving the Health of Diverse Populations, 2002; Montañó & Kasprzyk, 2008). The model includes the following:

1. The person has formed a strong positive intention (or made a commitment) to perform the behavior.
2. No environmental constraints make it impossible for the behavior to occur.
3. The person has the skills necessary to perform the behavior.
4. The person believes that the advantages of performing the behavior outweigh the disadvantages (attitude).
5. The person perceives more social (normative) pressure to perform the behavior than not to do so.
6. The person perceives that performing the behavior is more consistent than inconsistent with his or her own self-image (personal norms, personal standards).
7. The person's emotional reaction to performing the behavior is more positive than negative.
8. The person perceives that he or she has the capability to perform the behavior under a number of different circumstances (perceived self-efficacy, perceived behavioral control).

The five theorists saw the first three variables as necessary and sufficient and the remaining five as influencing the strength and direction of intention. Many of these eight key variables have different names in different theories (see Noar & Zimmerman, 2005). For example, attitudes are termed outcome expectations and expectancies in Social Cognitive Theory, benefits and barriers in the HBM, behavioral beliefs and values in the TPB, and pros and cons in the Transtheoretical Model (TTM). When we discuss a theory, we point out similar or related constructs from other theories.

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## Learning Theories

Learning theory is the foundation of most behavioral science theories. The term learning refers to any enduring change in the way an organism responds based on its experience (Kazdin, 2008; Robbins, Schwartz, & Wasserman, 2001; Westen, 1997). Learning theories assume that experiences shape behavior and that learning is adaptive. Two major learning theory perspectives are classical conditioning and operant conditioning.

## Classical Conditioning

Classical conditioning is the learning of an association between an unconditioned stimulus (UCS) and a conditioned stimulus (CS). A UCS produces a response that does not have to be learned (for example, nausea as a result of chemotherapy). A conditioned response is a response that people learn as a result of the paired association of the CS with the UCS (for example, certain food aversions in cancer patients who have eaten the food while they experienced nausea during chemotherapy). In general, the association is most effective when the time interval is short and the CS precedes the UCS. People generalize from one CS to another, in case of similar CSs (for example, one food to another food in the case of chemotherapy nausea; fear of one dog to fear of another dog), but they also discriminate between CSs (for example, fear of dogs but not of cats). Extinction will occur when the stimuli are unpaired, such as when the CS is repeatedly presented without the UCS.

Attitudes toward a stimulus (UCS) may become more positive or negative when that stimulus is spatiotemporally paired with a positively or negatively valued other stimulus (CS), which is called evaluative conditioning. This may be due to implicit misattribution in which people experience a positive feeling because of the CS and misattribute that feeling to the UCS (Jones, Fazio, & Olson, 2009). Evaluative conditioning can be effective in practice. For example, women with high body concern completed a conditioning procedure in which pictures of their bodies were selectively linked to positive social feedback: smiling faces (Martijn, Vanderlinden, Huijding, Roefs, & Jansen, 2009). The result was an increase in body satisfaction, compared to a control group without the conditioning.

## Operant Conditioning

Operant conditioning refers to the consequences of a behavior, resulting in more or less frequent occurrence of the behavior. Whether the behavior increases or decreases in frequency depends on the valence of the outcome of that behavior. Presentation of a stimulus that is rewarding (for example, a gift) is positive reinforcement and makes a behavior more likely to occur, whereas the removal of a stimulus that is punishing (for example, silencing a loud noise) is termed negative reinforcement but has the same positive effect of making the behavior more likely to occur. Punishment, on the other hand, is the application of an unpleasant stimulus and decreases the probability that a behavior will recur. Like classical conditioning, operant conditioning is a form of associative learning in which the behavioral act becomes associated with its outcome: reward or punishment.

There are several important characteristics of reinforcement:

- Reinforcement can be internal to the individual. For example, one may have positive feelings in response to performing a behavior.
- The more continuous the reinforcement schedule is, the faster the learning process. However, the more intermittent (less continuous) the reinforcement schedule is, the stronger the resistance to extinction of the learned behavior.
- A shorter time interval between the behavior and the reinforcement leads to a faster learning process.
- The value of stimuli that serve as reinforcers vary among individuals and among cultures.

People learn to discriminate between situations that lead to reinforcement and situations that do not. People also learn to discriminate between behaviors that are reinforced immediately and those for which reinforcement is delayed (Robbins et al., 2001). Most people will prefer a smaller immediate reward (tasty food) over a large delayed reward (good health). Interestingly, when forced to make a choice between an immediate small reward versus a larger delayed reward far in advance, most people will choose the larger delayed reward. It may thus be helpful to let people make an early commitment to healthier choices and help them develop self-control and the skills to follow through.

The reinforcing effects of positive feelings form the basis for Social Cognitive Theories. The basic assumption of Social Cognitive Theories is that what is crucial to learning is not the environmental stimulus itself but the perception of the environmental stimulus. Perceptions of environmental stimuli include, for instance, outcome expectations and self-efficacy expectations (Bandura, 1986; McAlister, Perry, & Parcel, 2008).

***Mere Exposure.*** Learning occurs in other forms than conditioning. Zajonc (1980, 2001) showed that people become more positive about stimuli the more times they are exposed to them, even if they are not consciously aware of the process. This effect is probably limited to stimuli that are associated with a relatively neutral attitude at the start. One way to change people's attitudes in a more positive direction would be to expose them repeatedly to the new behavior or object. For instance, adolescents could be shown condoms repeatedly in classroom HIV-prevention education; children could be exposed to new foods.

## Methods from Learning Theory

Feedback and reinforcement have been shown to be effective methods to create changes in various determinants and behavior (Bandura, 1986; Kazdin, 2008).

Feedback is information given to the learner regarding the extent to which the learner is accomplishing learning or performance (for example, reduction in fat intake, increase in aerobic exercise) or the extent to which change is having an impact (for example, reduction in blood pressure and weight, increase in physical conditioning). Feedback functions as a method for the learner to become aware of learning and performance, but it can also function to raise the learner's awareness regarding risk. Reinforcement is any component of the intervention that is designed to reward the learner for the behavior after the learner has enacted the behavior. Kazdin (2008) suggests that in a behavior modification program, punishment should be avoided because it may result in negative side effects such as escaping or avoiding the source of the punishment. If punishment is used as a last resort, emphasis should first be placed on positive reinforcement for healthy behavior. Bandura (1986) distinguishes among three types of directly applied reinforcement:

- Social reinforcement: praise from other people
- Vicarious reinforcement: observation of reinforcement of another
- Self-reinforcement: giving oneself a reward

Another relevant prediction of learning theory is that one learns behaviors through positive reinforcement but very slowly unlearns them by lack of reinforcement (Robbins et al., 2001). Deconditioning, letting people experience a lack of reinforcement or even negative outcomes, will not immediately lead to their unlearning a behavior. People accept, for instance, losing a number of sports games (punishment) if they sometimes win (positive reinforcement). Experiencing that an unhealthy behavior sometimes has negative consequences may not have much influence as long as these behaviors sometimes lead to positive reinforcement. To stimulate unlearning of a behavior, it may be necessary to create a continuous lack of positive reinforcement. In many cases this is practically impossible; for example, smoking will result in relaxation, and unsafe sex will result in pleasure.

Direct experience (enactment) can be a method for changing outcome expectations (Maibach & Cotton, 1995). Modeling, as a form of indirect experience, is also powerful, especially if it is clear that the model's behavior resulted in a lower risk and positive health or other attributes. One caution is advisable when using direct experience as a method: although it may enhance positive outcome expectations, direct experience may also enhance negative outcome expectations in the presence of unpleasant results from the behavior (punishment), such as discomfort during a mammogram or decreased sensation during condom use.

## Summary: Learning Theory in Problem Analysis and Intervention Methods

Groups of people with the same learning history may have different behaviors, environmental conditions, and determinants and may need different methods to change. Learning theory applies to all human behavior. Many stimuli originate in the physical and social environment. Determinants include association of conditioned stimuli with unconditioned stimuli, responses to short-term positive reinforcement, negative reinforcement, punishment, and attitude. Methods derived from learning theories are classical conditioning, feedback and reinforcement, short-term positive reinforcement for healthy behaviors, removal of punishing stimuli for healthy behaviors, punishment of unhealthy behaviors, contingent rewards, early commitment, deconditioning, direct experience, modeling, and repeated exposure.

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## Theories of Information Processing

Conventional wisdom long held that giving people information could help them change their behavior and thereby solve health and social problems. However, knowledge does not generally lead directly to behavior change. Furthermore, ensuring that the members of the population attain knowledge is not necessarily an easy task. Theories of information processing, such as Semantic Network Theory (Kintsch & Van Dijk, 1978) and Mental Model Theory (Mayer, 1989), provide several concepts that suggest methods for successfully conveying information. The health education field could make much better use of the evidence-based principles related to the coherence of textual material (Kools, Ruiter, van de Wiel, & Kok, 2004).

### Chunking

Theories of information processing are concerned with how information is perceived, stored, and retrieved. Drawing from the Gestalt school of psychology (Koffka, 1935), these theories suggest that the senses perceive information in the context of what people already know. People perceive information actively to make sense of incomplete stimuli. For instance, someone who sees only eyes and a forehead will tend to perceive a face in order to complete the expected pattern in the act of perception. Theorists suggest that people then use their short-term memory, also called working memory, to complete the pattern. Working memory is a small “space,” and its effectiveness can be increased by a method called chunking (Garrison, Anderson, & Archer, 2001; Smith, 2008). A chunk is a stimulus pattern that may be made up of parts but that one perceives as a whole. One

might use chunking by assigning an acronym or a summary slogan to a process so that the entire process can be encoded into memory. For example, children in the asthma self-management program learned a rap song with the words “Watch, discover, think, and act” for the stages of self-management (see Chapter Twelve at the book’s instructor Website) (Bartholomew et al., 2000b, 2000c). Other slogans are “Stop, drop, and roll” for burn prevention; “Slip, slap, and slop” for use of hats and sunscreen; and “Stop, look, and listen” for traffic safety.

### Advance Organizers and Images

Theories of information processing also present some ideas about how knowledge is stored in long-term memory. Long-term memory comprises information or schemes about events, concepts, and procedures (how to do something) (Anderson, 1983; Kintsch & Van Dijk, 1978). Schemas have both passive and active qualities. In other words, schemas contain related information that people can activate passively by perceiving an object or actively by consciously thinking of a group of concepts in order to compare a new perception with an existing category (Rumelhart, 1980). The idea of schemas suggests that a health message will be better understood if it activates existing schemas, if the receiver has an existing place to store the information and some conscious ideas regarding where the information is stored. An important method related to schemas is the advance organizer, an overview of the material with familiar and concrete examples that enable a learner to activate relevant schemas so that new material can be associated (Cook, 2006; Derry, 1984; Mayer, 1984). Kools, van de Wiel, Ruiter et al. (2006) show that graphic organizers, a form of advance organizers using images, could improve the understandability of health education materials substantially.

Others have shown that the use of imagery, the encoding of pictures with concepts to be stored in long-term memory, improves storage (Glover, Ronning, & Bruning, 1990; Mayer, 1989; Steen, 2007). Hamilton and Ghatala (1994) relate the ancient Greek method of loci, in which orators mentally attached parts of long speeches to landmarks on well-known travel routes. One might imagine a patient educator helping a learner memorize a long self-care process by attaching the steps in the procedure to landmarks on a familiar daily route. Verbal images or analogies are also helpful for encoding information to long-term memory. If material is too foreign or discrepant, it will not be learned. Therefore, analogies to more common events, concepts, or processes may be a helpful method, especially if learners can be guided to create their own analogies.

Preexisting schemata that contradict an informational message certainly may interfere with the encoding of the message for long-term memory. For example, a child who knows ivy as a plant may activate an entirely wrong schema when told in

the hospital about an IV (intravenous administration of medication). In cultures in which the etiology of certain diseases is thought to be an imbalance in temperatures, an explanation of immunizations may not readily activate an appropriate schema, making it difficult for the individual to process the information.

### Elaboration

Promoting skills for information processing is a relevant issue in the Elaboration Likelihood Model (ELM), which provides methods for increasing these skills and also for increasing motivation to process information more carefully (Petty, Barden, & Wheeler, 2009). Learners must add to the meaning of the material presented. Elaboration is particularly effective if it helps tie the information together. Rehearsal of information may help make the information more salient for people (Smith, 2008). Rehearsal is even more effective in promoting remembering when the learner adds something to the information being learned. For example, a leader who is working on more effective group management and who wants to remember three new skills for the next meeting could simply rehearse the concepts of summarizing, gate keeping, and connecting. However, once he or she is in the meeting, these abstract concepts may be hard to retrieve. Elaborating the concepts with images may help. The leader might use the visual image of a gate for gate keeping, letting people and their ideas into the conversation. Adding to the image of the gate, the leader puts all the sheep (ideas) into the corral, summarizing and then pairing (or connecting) them up two by two. Elaboration could also be done with concepts. The group leader could take each concept and think of specific ways to implement it in the next meeting. Although it seems counterintuitive to have to learn more in order to remember, the method of elaboration does create stronger memories.

### Cues

Getting information into long-term memory is only the first part of learning. Usually, the learner must also get the information back out (retrieval). Retrieving information from memory is easier when the memory is a strong one. Strong memories are made when encoding requires effort as described above.

Providing cues is a method for getting information out of memory. For a cue to be effective, it should be present at the time of encoding and at the time of retrieval. Providing cues has many implications for health educators. For example, for teens who are learning to negotiate condom use, the cues present during learning and practice, such as what the partner says and the situation or setting, should be as similar as possible to what teens will actually encounter when they try to retrieve and apply the steps of negotiation (Evans, Getz, & Raines, 1991; Godden & Baddeley, 1975; Tulving & Thomson, 1973). Cues work best when people are allowed to select and provide their own cues.

## Summary: Theories of Information Processing in Problem Analysis and Intervention Methods

Preexisting schemas may function as facilitators or barriers to information processing. Methods derived from information processing theories include chunking, advance organizers, using imagery, elaboration, discussion, and providing cues.

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### Health Belief Model (HBM)

Historically, a number of theories have focused directly on health and risk-related behavior (Weinstein & Sandman, 2002). A model that has been used in a wide range of health-related contexts is the HBM (Abraham & Sheeran, 2005; Champion & Skinner, 2008). The basic components of the HBM are based on psychological expectancy-value models. These models hypothesize that human behavior depends mainly on the value that an individual places on a particular goal and on the individual's estimate of the likelihood that a given action will achieve that goal. With respect to health, the components are the desire to avoid illness or to get well and the belief that specific behavior will prevent or reduce illness.

The original HBM comprises the following four psychological variables (Janz & Becker, 1984):

- Perceived susceptibility: a person's subjective perception of the risk of contracting a particular condition or illness (perceived personal relevance)
- Perceived severity: a person's feelings concerning the seriousness of contracting an illness
- Perceived benefits: a person's beliefs regarding the effectiveness of various actions available to reduce the threat of a disease
- Perceived barriers: potential negative aspects of a particular health action

In other words, an individual's decision to engage in a health action is determined by his or her perceptions of personal susceptibility to, and the severity of, a particular condition or illness balanced against perceived benefits and barriers. According to the HBM, this decision-making process is triggered by a cue to action, which may be internal (for example, symptoms of a disease) or external (for example, a health education message or a friend with the disease).

Although an impressive body of research findings has linked HBM dimensions to health actions, recent research has demonstrated the importance of factors that were not originally examined in the context of the model (Abraham & Sheeran, 2005; Champion & Skinner, 2008). For example, many health-related behaviors are undertaken for ostensibly nonhealth reasons, suggesting that people's barrier-benefit analysis should include costs and benefits other than health

beliefs (Ajzen, 1988). Current general social psychological models suggest that an individual's behavior, including health-related behavior, is also determined by perceptions of social influences and self-efficacy (Ajzen, 1988; Bandura, 1986). In later descriptions of the HBM, researchers incorporated these variables, self-efficacy specifically and the role of social influences more generally. The HBM may be most helpful in understanding relatively simple health behaviors, such as mammography screening or immunization. However, HBM has been shown to have some predictive validity for other problems, such as diabetes self-care (Champion & Skinner, 2008).

### Health Belief Model and Behavior Change

The HBM is a descriptive model of determinants of behavior and can sometimes provide clear direction for what factors should be changed (Abraham & Sheeran, 2005; Champion & Skinner, 2008). It does not suggest specific methods for behavioral change, except for the cue to action, which, among the constructs in the theory, has demonstrated the weakest relation to health behaviors thus far. In its use in intervention studies, other methods, such as counseling, have been used to shift HBM determinants. For example, Champion, Ray, Heilman, and Springston (2000) increased uptake of mammography screening among low-income women by providing for counseling regarding susceptibility, benefits, and barriers.

### Summary: HBM in Problem Analysis and Intervention Methods

Groups may be identified according to their perceptions of susceptibility and seriousness. HBM was originally developed for health-protective behaviors but is currently applied to health-promoting behaviors as well. HBM recognizes perceived environmental barriers in relation to perceived benefits. Determinants include perceived susceptibility, perceived severity, perceived benefits, and perceived barriers. Methods from the HBM are consciousness raising (cues to action); and methods to increase self-efficacy.

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## Protection-Motivation Theory (PMT) and Extended Parallel Process Model (EPPM)

Protection Motivation Theory, PMT, has the same basic ingredients as the HBM (Norman, Boer, & Seydel, 2005; Rogers, 1983b; Ruiter & Kok, 2010). PMT suggests that threat messages instigate two mediating cognitive processes (threat appraisal and coping appraisal) that, together, constitute responses to the

threat (referred to as danger control responses) rather than to the evoked fear (referred to as fear control responses). Threat appraisal includes assessments of threat seriousness and personal susceptibility, whereas coping appraisal includes assessments of the effectiveness of potential responses (response efficacy) and one's ability to undertake these successfully (self-efficacy). Together these appraisals generate protection motivation that is measured as an intention to adopt the protective recommendations (Rogers, 1983b). PMT incorporates two additional constructs: rewards or reinforcement associated with maladaptive responses (for example, smoking and relaxation) and costs or punishment associated with adaptive responses (for example, nonsmoking and gaining weight).

In addition to understanding danger control processes that prepare for action to avert the threat, Kim Witte argued that fear control processes need to be understood as well. She proposed the Extended Parallel Process Model, EPPM, which proposes that threat perception initially instigates danger control processes (Ruiter & Kok, 2010; Witte, 1992; Witte, Meyer, & Martell, 2001). As in protection motivation theory, threat perceivers are assumed to evaluate recommended action on its effectiveness and feasibility, and their response to the threat depends on the outcome of this coping appraisal. If the recommended action is thought to be effective and feasible, then intentions are formulated to perform the recommended action. However, if the recommended action is thought to be ineffective or impossible, then continuing threat perception will result in emotional and, in particular, fear arousal. At this point fear control processes are used resulting in denial and avoidance coping to reduce the unpleasant feeling of fear.

PMT and EPPM have been extensively tested (De Hoog, Stroebe, & De Wit, 2007; Floyd & Prentice-Dunn, 2000; Milne, Orbell, & Sheeran, 2002; Ruiter, Abraham, & Kok, 2001; Witte & Allen, 2000). Although the support for the impact of response-efficacy and especially self-efficacy is strong, the support for the impact of susceptibility and especially severity is weak (Ruiter & Kok, 2010).

## Fear

Fear arousal—vividly showing people the negative health consequences of life-endangering behaviors—has been suggested as a method to raise awareness of risk behavior and to change the risk behavior into health-promoting behavior. Using fear may be intuitively appealing to the health educator, and research on fear-arousing communication has a long tradition in social psychology and public health education. Most relevant theories and the available empirical data suggest that fear, as a result of subjective appraisals of personal susceptibility and severity, motivates an individual to action. However, the type of action depends on both outcome expectations and self-efficacy expectations. For instance, smokers may become afraid of cancer when they recognize their own susceptibility to cancer

and the severity of the disease. Their fear may motivate them to stop smoking but only when they are convinced that quitting is really effective in preventing cancer (response efficacy or outcome expectation) and when they feel confident that they are able to quit (self-efficacy). In this particular example, low self-efficacy may be the most important barrier to quitting for most smokers.

What happens when people are afraid but are not convinced of the effectiveness of the alternative behavior or of their own self-efficacy? Most data suggest that, under those conditions, the resulting behavior may be defensive, more oriented toward avoidance than action (for example, avoidance of the antismoking message) (Albarracín, Durantini, & Earl, 2006; De Hoog et al., 2007; Floyd & Prentice-Dunn, 2000; Milne et al., 2002; Ruiter et al., 2001; Witte & Allen, 2000). Smokers may deny the risks of cancer, and messages that arouse extreme fear may result in more smoking.

What does this mean for the use of fear-arousing communication as a method? First, fear is a motivator to behavior change, that is, no fear, no action. Second, fear motivates health-promoting behavior but obviously only if the individual has high outcome expectations and high self-efficacy expectations. In cases in which people are not aware of their risk (as for some people in the precontemplation stage for a behavior), some confrontation with undeniable negative consequences of the risky behavior may be effective, but preferably not in an emotional form (De Hoog et al., 2007). In situations in which people are aware of their risk but lack self-efficacy for engaging in a health-promoting alternative behavior, messages should focus on improving self-efficacy (Ruiter & Kok, 2010).

Recently, self-affirmation theory has been applied to make people less defensive for threatening health messages (Harris, Mayle, Mabbott, & Napper, 2007; Jessop, Simmonds, & Sparks, 2009; Sherman, Nelson, & Steele, 2000; van Koningsbruggen & Das, 2008). Self-affirmation theory suggests that the defensive reaction from a fear appeal is caused by a threat to people's self-image and that affirming a person's self-image would increase the acceptance of the message and motivate people to engage in the healthy behavior. Examples of applications for self-affirmation include a writing exercise in which people write about their previously measured highest ranking values or record as many of their desirable characteristics as they can think of. Interestingly, self-affirmation can also be applied as a method for reducing stigmatization and discrimination; people will resist derogating others when their own self-worth is affirmed (Paluck & Green, 2009).

### Message Framing

Health messages may be framed in a positive or a negative way. In a gain-frame the positive effects of a healthy behavior are emphasized, whereas in a loss frame the disadvantages of not performing the health behavior are stressed.

For example, missing early detection of cancer by not getting a Pap test every year can cost you your life (loss frame). Getting a Pap test every year may enable you to live to see your grandchildren grow up (gain frame). A loss frame is not the same as a fear-arousing message; loss frames do not automatically lead to an emotional response (De Hoog et al., 2007). Verrij, Ruiters, Van 't Riet & De Vries (2010) summarize the evidence and recommend that messages be framed to fit each person's relevant characteristics, possibly by computer tailoring. If that is not possible, they advise using a gain frame because meta-analyses have revealed that loss framed messages never have a direct influence on behavior (O'Keefe & Jensen, 2006, 2007), that gain-framed messages are more likely to prevent potential maladaptive reactions, and that gain-framed information is more readily accepted by the message receiver.

### Summary: PMT and EPPM in Problem Analysis and Intervention Methods

Groups may be identified according to their risk perceptions. PMT and EPPM were originally developed for health-protective behaviors, but are currently also applied to health-promoting behaviors. PMT and EPPM recognize perceived environmental barriers in relation to perceived benefits. Determinants are perceived susceptibility, perceived severity, response-efficacy, self-efficacy, rewards, and costs. Methods from PMT and EPPM include tailoring (to determinants), framing, fear arousal (under appropriate conditions), and performing a self-affirmation task.

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## Theories of Reasoned Action, Planned Behavior (TPB) and the Integrated Behavioral Model (IBM)

Once there was a theory, the Theory of Reasoned Action, the original TRA (Fishbein & Ajzen, 1975). Then there was the Theory of Planned Behavior, Ajzen's TPB (Ajzen, 1988; Conner & Sparks, 2005) which was an extension of the TRA. Then there was the Integrated Behavioral Model, IBM (Montaño & Kasprzyk, 2008), an extension of the TPB, and finally there is the new and revitalized Theory of Reasoned Action, which we will abbreviate here as TRA<sup>2</sup> (Fishbein & Ajzen, 2010), which is also an extension of the TPB but is more parsimonious than the IBM. All these theories focus primarily on determinants of behavior and can be seen as expectancy-value theories. Although they do not give specific methods for behavior change, these theories help health educators understand the specific variables that need to be changed (Fishbein & Ajzen, 2010; Witte, 1995). Over the last 25 years, research with these theories has almost solely focused on the TPB, which is the reason we will first describe the TPB and its applications.

## Theory of Planned Behavior

TPB has successfully been applied to many types of health behavior but also to other kinds of behaviors, such as car use (Gardner & Abraham, 2008) and energy conservation (Kaiser, Hubner, & Bogner, 2005). These theories can be applied in situations in which people are aware of the negative consequences of their behavior, for instance, when they realize they are eating a high-fat diet (Brug, Hospers, & Kok, 1997) or not getting enough exercise (Ronda, Van Assema, & Brug, 2001). If people are not aware of their risk, they must become aware of the problem before determinants can be explored.

The TPB postulates that intention, the most important determinant of behavior, is in turn determined by three conceptually independent constructs: attitude, subjective norms, and perceived behavioral control. Perceived behavioral control is comparable to self-efficacy in Social Cognitive Theory (Bandura, 1986; Fishbein & Ajzen, 2010, p. 160).

The TPB describes an attitude as a disposition to respond favorably or unfavorably to an object, behavior, person, institution, or event. Health educators are concerned mostly about the attitude toward a behavior, “the individual’s positive or negative evaluation of performing the particular behavior of interest” (Ajzen, 1988, p. 117). To understand attitudes toward a behavior, there must be correspondence, meaning that attitudes may predict behavior when both concepts are assessed at identical levels of action, context, and time. The attitude toward the behavior is determined by salient beliefs about that behavior. Each behavioral belief links the behavior to a certain outcome or to an attribute (for example, “Going on a low-fat diet reduces my blood pressure”). Beliefs are weighted by the evaluations of those outcomes (“Reducing my blood pressure is very good for me”).

The construct of subjective norms (perceived social expectations) is a function of beliefs that specific, important individuals or groups (social referents) approve or disapprove of the focal person performing the behavior and how important that opinion is to the person. Beliefs about specific social referents, such as “my partner thinks . . .” or “my mother thinks . . .” are termed normative beliefs. Relative to normative beliefs, some authors distinguish between social expectations and social pressure, describing the latter as a much stronger influence (De Vries, Backbier, Kok, & Dijkstra, 1995). Not in the TPB but integrated in the TRA<sup>2</sup> is the construct of descriptive norms: the behavior of relevant others, which will return in the Social Cognitive Theory later in this chapter.

Perceived behavioral control (Ajzen, 1988) or self-efficacy (Bandura, 1986) refers to the subjective probability that a person is capable of executing a certain course of action (for example, “For me to go on a low-fat diet would be [easy versus difficult]”). Ajzen describes perceived behavioral control as influencing

behavior through intention and as influencing behavior directly (Montaño & Kasprzyk, 2008).

### Using TPB at Higher Ecological Levels

The TPB is most often applied at the individual level. However, it can be applied to other ecological levels as well. For example, TPB has been used to examine the voting intentions of state legislators in North Carolina, Vermont, and Texas (Flynn et al., 1998; Gottlieb et al., 2003). Legislators' general attitudes and norms concerning cigarette tax increases were predictive of their intentions to vote for a cigarette tax. Normative influences were perceived interests of the tobacco industry, constituents, the legislature, and the health sector. Legislators who intended to vote for enforcement of minors' access legislation held strong outcome beliefs and evaluations about the public health impact. The strongest normative beliefs were for health and medical lobbyists (for example, "Medical lobbyists expect me to . . ."), and motivation to comply was strongest for voters and medical lobbyists (for example, "I care about what voters and lobbyists expect me to do"). The perceived impact of the cigarette tax legislation on retail sales, public health, and loss of political support for the next election—along with perceived behavioral control for getting the bill out of committee, voting for it, and passing it—were each associated with the legislators' voting intention. These types of TPB findings can provide guidance to health educators who plan messages for advocacy efforts.

TPB has also been used to plan the implementation of health education program innovations (Paulussen, Kok, & Schaalma, 1994; Paulussen et al., 1995). Differences in beliefs, perceived social expectations, and self-efficacy were associated with teachers' different rates of diffusion, adoption, and implementation of an HIV-prevention program. Diffusion was associated with the social influence of colleagues through professional networks; adoption with outcome expectations such as expected student satisfaction; implementation with self-efficacy expectations about the proposed teaching strategies and with teachers' moral opinions on sexuality. Surprisingly, knowledge of the effectiveness of the program had no influence on teachers' implementation decisions.

### Additional Constructs

Some authors have suggested determinants in addition to the three that are currently in the TPB. One suggestion is the addition of personal moral norms: people's judgments as to whether they themselves think they should or should not perform a certain behavior (Godin, Savard, Kok, Fortin, & Boyer, 1996; Godin, Fortin, Michaud, Bradet, & Kok, 1997; Manstead & Parker, 1995). Another

suggestion is anticipated regret: having people imagine how they would feel after they behaved in a risky way contrary to their own intentions (Richard, van der Pligt, & de Vries, 1995). Personal moral norms related to condom use are measured, for example, as “I personally think I should always use a condom.” Anticipated regret would be measured as “How would you feel afterward if you had unprotected sex?” Note that anticipated regret can also be applied as a method for attitude change; having people imagine how they would feel after they behaved in a risky way helps them to refrain from that behavior.

These various ideas may be integrated using the concept of self-representation (Abraham & Michie, 1998). Self-representations are concerned with the principles of a person about a certain behavior. Such principles may be based on moral values, including personal feelings of responsibility, or they may be closely related to an individual’s self-identity, focusing on societal rather than personal values. For example, a person with HIV might see herself as someone who would never expose another individual to infection.

A more recent development concerns the relation between intention and behavior. The Prototype Willingness Model addresses nonintentional but volitional risk behavior, especially of adolescents (Gerrard, Gibbons, Houlihan, Stock, & Pomery, 2008), and suggests that together with the intention for risk-avoiding behavior, there is a willingness or openness to engaging in risky behavior. That willingness results from (1) positive social images or prototypes of the type of person who engages in the risk behavior and (2) a low perception of vulnerability or susceptibility resulting from an optimistic bias plus a strong focus on short-term gains. Another development is reflected by studies on implementation intention (Sheeran et al., 2005). Later in this chapter, under goal-directed behavior, we discuss implementation intentions in more detail.

## The Integrated Behavior Model

In the most recent overview of TPB, Montaño and Kasprzyk (2008) recommend an Integrated Behavioral Model (IBM). IBM states that behavior is determined by variables besides intention and that intention is determined by a number of variables including attitude, subjective norms, and perceived behavioral control (see also Jaccard, Dodge, & Dittus, 2002). The two-step idea, in which various variables determine intention and then various variables determine behavior, is also reflected in other theories, such as the Information-Motivation-Behavioral Skills model (IMB) (Fisher, Fisher, Bryan, & Misovich, 2002), Social Cognitive Theory (McAlister et al., 2008) (see later in this chapter) and in the critical reviews of the Transtheoretical Model (TTM) (Brug et al., 2005) (see later in this

chapter), as well as in a recent meta-analysis of the intention-behavior relation (Webb & Sheeran, 2006).

## Theory of Reasoned Action<sup>2</sup>

Recently, the Theory of Reasoned Action, TRA<sup>2</sup>, was reintroduced (Fishbein & Ajzen, 2010). In their book Fishbein and Ajzen explain that after their early cooperation on the TRA, both authors independently developed theoretical ideas and, when starting a new collaboration recently, discovered that those ideas were comparable: the new TRA<sup>2</sup>. TRA<sup>2</sup> is supposed to be parsimonious and constructs in the model have been selected very carefully. Behavior is determined by intention, as far as people have actual control over their behavior. Actual control is determined by environmental factors and skills to deal with these factors. Intention is determined by attitude, perceived norm, and perceived behavioral control, which in turn are all determined by salient beliefs: behavioral beliefs, normative beliefs and control beliefs. Compared with TPB, TRA<sup>2</sup> has more attention for affective compared to cognitive attitudes, descriptive compared to subjective norms, and self-efficacy compared to perceived behavioral control.

## Measuring TPB and TRA<sup>2</sup> Determinants

The TPB and TRA<sup>2</sup> give very clear guidelines for measuring the determinants of behavior. The theories suggest starting with open, qualitative methods such as interviews and focus groups to find all the salient factors, the prevalence and strength of which are then summarized through quantitative methods (De Vries et al., 1992). Based on this eliciting procedure, structured questionnaires are developed to measure the TPB concepts (Ajzen, 2006; Francis et al., 2004). Fishbein and Ajzen (2010) provide an extensive appendix on measurement of TRA<sup>2</sup> constructs (pp. 449–464).

## Changing Intentions and Behavior

In the TRA<sup>2</sup> there is a distinction between goals (for example, avoiding HIV infection), behaviors (for example, condom use), intentions, and beliefs (Fishbein & Ajzen, 2010). Change is seen as a planned process in three phases: elicitation of the relevant beliefs, changing intentions by changing salient beliefs, and changing behavior by changing intentions and increasing skills or decreasing environmental constraints. The basic idea behind selecting any potential change method is that the relevant beliefs are to be changed. For example, in designing an intervention to get people who are about to turn 50 to obtain a colonoscopy, pilot

work identified the following four primary beliefs as targets for the intervention (Fishbein & Ajzen, 2010, p. 345):

- My getting a colonoscopy in the next two months would be embarrassing (attitude)
- My getting a colonoscopy in the next two months would be painful (attitude)
- My doctor thinks I should get a colonoscopy in the next two months (perceived norm)
- My health insurance won't cover my getting a colonoscopy in the next two months (perceived control).

Fishbein & Ajzen (2010) suggest that, whatever intervention method one chooses, the essential message should be: “Your getting a colonoscopy in the next two months will be neither embarrassing nor painful; it is recommended by your doctor, and there are ways to have the cost of a colonoscopy paid for even if you don't have health insurance.” Note that the message should be formulated at the personal level and that it should be truthful. Of course this message will need supporting information and strong arguments that are directly tied to the behavior of interest. Fishbein & Ajzen (2010) recognize methods such as persuasive communication, use of arguments, framing, active participation, modeling, and group discussion but indicate that these methods will only have an effect when salient behavioral, normative, or control beliefs are changed (Fishbein & Ajzen, 2010, pp. 321–368). Obviously, it is important that the salient beliefs are identified and measured correctly.

Witte (1995) organizes the results of the determinants analysis in a list of relevant categories (for example, beliefs, social influences, self-efficacy, values) and then decides which determinants need to be changed, which need to be reinforced, and which need to be introduced. For example, in a program for HIV prevention for Hispanic men, the men's belief that condoms were unclean needed to be *changed*; the importance of family values needed to be *reinforced*; and the belief that condoms could prevent HIV infection needed to be *introduced*.

### Shifting Perceived Norms

Thinking about how to shift subjective norms may require more information about the nature of the construct. The perceived norm is a special case of social influence: the impact of others on people's perceptions and behaviors (Forsyth, 2006). TPB focuses on the perceived expectations of others, whereas Social Cognitive Theory focuses on vicarious learning or modeling, the observation of the behavior of others. The perception of others' expectations may be incorrect; for example, children may incorrectly assume that most peers expect them to smoke.

Two explanatory processes provide insight into social influence: conformity processes and social comparison (Forsyth, 2006). Conformity refers to the social influence of a majority on a minority, an influence that has been shown to be very strong, especially in the situation of a group against a minority of one person. Conformity can lead to public compliance but also to internalized change as the individual accepts the group's ideas as correct. Social comparison theory (Suls & Wheeler, 2000) explains why social influences are effective:

1. People like to be right, so when direct information or experience is lacking, people turn to others to decide about the right course of action.
2. People like to feel good, and they think they will feel good if they become more accepted by relevant others by agreeing with them or joining in their behavior.

Upward and downward social comparison of patients with other patients have been described in the area of patient education (Suls & Wheeler, 2000). Upward comparison with patients who are perceived to do better than oneself will provide information on how to cope with the disease; downward comparison with patients who do worse will make you feel better about your own situation. Use of a patients' self-help group may serve both purposes in addition to providing social support (see Chapter Three).

There are three ways to influence the perceived norms in TPB and TRA<sup>2</sup>:

1. Influence normative beliefs by making peer expectations or peer behaviors visible (only if those expectations or behaviors are supportive of the health-promoting behavior)
2. Influence motivation to comply by building resistance to social pressure to engage in risk behavior

Finally, if we are unable to shift either the perceived norm or the motivation to comply, we can do the following:

3. Hide the behavior or shift attention from the behavior

For example, assume that young women do not want to ask their partners to use a condom for HIV prevention because they expect the partners to react negatively to the idea that the women suspect them of having HIV. An approach of the first type would be to mobilize peers to talk about safe sex to make the norms for using condoms more visible. This approach assumes that positive peer experiences are available for discussion in the environment—both that young men are willing to wear condoms and that young women agree to ask the boys to

wear them. The second approach might be to build resistance to social pressure, which in this case might mean that women learn effective refusal skills when the partner does not want to use a condom. The third approach might be translated into methods and applications in which women learn to shift attention from using a condom to prevent HIV infection by telling the partner that they want to use a condom to prevent pregnancy.

Adverse effects of health promotion messages may occur when in the message data are presented showing that a majority of people behaves in an unhealthy manner: “70% of the Dutch population do not follow the guidelines for exercising!” Unintentionally, this message communicates that not exercising is the norm in the Dutch population (Cialdini & Goldstein, 2004). As mentioned above, social norms should only be mobilized when they are supportive of the health-promoting behavior. In this case, a better alternative message, used by the Dutch Institute for Sport and Exercise, is “More and more people start to exercise!”

Methods for changing social influences and for improving self-efficacy are sometimes the same, relating both to self-efficacy and skills. Resistance to social pressure, for instance, can be seen as a skill. How can we teach people to resist social pressure? A summary of the literature (McGuire, 1985) suggests five methods:

- Training refusal skills
- Modeling resistance
- Committing to earlier intention and behavior
- Relating intended behavior to values
- Performing a psychological inoculation against pressure

### Summary: TPB and TRA<sup>2</sup> in Problem Analysis and Intervention Methods

Groups can be identified according to their beliefs and intentions. TPB and TRA<sup>2</sup> are useful for understanding health risk behaviors when people are aware of the negative outcomes associated with continuing the behavior. TRA<sup>2</sup> recognizes environmental constraints in relation to perceived behavioral control; all constructs can be used to explain behavior of agents at every ecological level. Determinants of intention are salient beliefs, instrumental attitudes, experiential attitudes, perceived social expectations, descriptive norms, perceived behavioral control, and self-efficacy. Determinants of behavior are intentions, skills, and environmental constraints. TPB and TRA<sup>2</sup> do not directly suggest methods but refer to methods from other theories. Essential is the change in salient beliefs based on belief selection. Other theories suggest anticipated regret, information

about others' approval, mobilizing social support, resistance to social pressure, and shifting focus.

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## Goal-Setting Theory

Goal setting leads to better performance because people with goals exert themselves to a greater extent, persevere in their tasks, concentrate more, and if necessary, develop strategies for carrying out the behavior (Latham & Locke, 2007; Locke & Latham, 1990, 2002, 2005). Goal-setting theory is clearly a theory of action and describes a particular method for behavior change. In HIV prevention, for example, the health educator may attempt to get students to associate safe sex with life goals, such as careers that might be threatened by the consequences of unsafe sex. In this way safe sex becomes part of the strategy to attain long-term goals.

Goal setting in health education also may be directly related to the health behavior. In the Cystic Fibrosis Family Education Program, for example, parents and children work with health care providers to set goals regarding self-care, such as increasing calories a certain amount or keeping a record of symptom change to provide the context for the self-care goals. Health care providers also work with the families to clarify goals that may indirectly relate to cystic fibrosis care (Bartholomew et al., 1991). For example, a child may set a goal to try out for the school tennis team. She may need to gain weight and improve her fitness to do so; therefore, she sets specific eating and exercise goals.

### Characteristics of Goals

A goal should be behaviorally specific and measurable or observable. Strecher, Seijts, Kok et al. (1995) advise that goals should be stated in terms of behavior (for example, exercise behavior and food intake) instead of health outcomes (for example, weight loss). Setting a challenging goal, a goal that is feasible though somewhat difficult, leads to a better performance than does setting an easy goal or no goal at all (Locke & Latham, 1990, 2002). This positive effect of difficult goals occurs only if a person accepts the challenge and has sufficient experience, self-efficacy, and feedback to be able to perform adequately. The rewards for reaching the goal are not only the expected outcomes but also a sense of self-satisfaction. Goal setting probably will not be effective when the task is too complex. In that case, the educator can help the client set subgoals and suggest strategies (for example, not to quit smoking permanently but first to abstain for one week and then set a new goal) (see Brown & Latham, 2002; Seijts, Latham, Tasa, & Latham, 2004).

### Summary: Goal-Setting Theory in Problem Analysis and Intervention Methods

Goal-setting theory suggests different goals for people who are high or low in self-efficacy and skills and may be applied to all behaviors in which feedback is feasible. Determinants are self-efficacy and skills; methods include goal setting, selecting a somewhat difficult goal, acceptance of goal, match of goal complexity and difficulty with skills, and feedback.

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## Theories of Goal-Directed Behavior

A central tenet of theories on goal-directed behavior is that people hold personal goals, which represent desired states or outcomes to be achieved or avoided (Gollwitzer, 1999). Goals are reference points against which current states or outcomes are compared. Two aspects of goals are distinguished, goal content and goal process. Goal content refers to people having simultaneous goals that can differ in their importance and compatibility. It is therefore essential to ensure that important health goals are salient and are shielded from other potentially conflicting goals. For instance, Stroebe, Mensink, Aarts et al. (2008) show that the food intake of dieters is characterized by two conflicting and incompatible goals, eating enjoyment and weight control. It will take a major effort for dieters to shield their weight control goal against the chronic stimulation of the eating enjoyment goal. Goal processes relate to mental processes and behaviors of goal striving. These follow a sequence: (1) goal establishment, (2) goal planning, (3) goal striving and monitoring, and (4) attainment, revision, and persistence (Austin & Vancouver, 1996). Gollwitzer (1993) describes the sequence as: wishing, planning, acting, and evaluating. Theories of goal-directed behavior suggest that successful behavioral changes are the result of these goal striving processes, however not necessarily in a fixed order. Moreover, they suggest that people have to engage in a series of subgoals in order to attain the overall health goal (see the introduction of performance objectives in Chapter Five).

### Implementation Intentions

Gollwitzer (1999) distinguishes between goal intentions and implementation intentions. Goal intentions (“I intend to pursue X,” as in TPB) result in a commitment to realize a wish or desire. Implementation intentions (“I intend to initiate behavior X when conditions Y are met”) connect a certain goal-directed behavior with an anticipated situation (Sheeran, Milne, Webb, & Gollwitzer, 2005). The purpose of an implementation intention is to lay down a specific

plan to promote the initiation and efficient execution of goal-directed activity. By forming implementation intentions, people pass the control of the behavior over to the environment (Gollwitzer, 1999). Situations and means are turned into cues to action that are hard to forget, ignore, or miss. It appears that forming an implementation intention is a conscious cognitive act that has automatic consequences.

Based on a meta-analysis of 94 studies, Gollwitzer and Sheeran (2006) conclude that forming an implementation intention makes an important difference to whether or not people achieve their goals. This finding was robust across variations in study design, outcome measurements, and in the domain of goal attainment. If-then planning facilitated goal striving no matter what self-regulatory problem was at hand. Medium to large effects were obtained in relation to initiating goal striving, shielding goals from unwanted influences, disengaging from failing goals, and preserving self-regulatory capacity for future goal striving. There was also strong support for the if-then process: people who form implementation intentions are in a good position to recognize and respond to opportunities to act. Recently, in a study of the effects of text messages, Prestwich, Perugini, and Hurling (2009) showed that the effect of forming implementation intentions may be enhanced via reminders about the plan.

Forming implementation intentions may also help in goal shielding, in that people can identify cues that may result in relapse and describe adequate responses in advance of exposure (Achtziger, Gollwitzer, & Sheeran, 2008). Whereas earlier studies of implementation intentions have been directed at specific situations, recent studies have examined their effectiveness in relation to motivational cues (such as feeling bored) and have shown promising effects on behavioral maintenance, including dietary behaviors (Adriaanse, de Ridder, & de Wit, 2009).

In a critical empirical and theoretical review Sniehotta (2009) argues that implementation intentions are effective only when striving for a behavior in a specific situation. However, changes in health behaviors are often more complex, with the desired behavior occurring in all kinds of possible situations. Thus implementation intentions are most effective in changing behavior if the situational cue is frequent and the behavior appears exclusively in this situation. For many (health promotion) behaviors however, the behavior appears in various kinds of situations and not always frequently. Sniehotta (2009) also distinguishes between action plans, such as when, where, and how to act in line with the goal intention, and coping plans, such as helping a person to overcome obstacles and to cope with difficulties by anticipating personal risk situations and planning coping responses in detail (see Sniehotta, Schwarzer, Scholz, & Schuz, 2005). Sniehotta (2009) suggests that action planning and coping planning need to go beyond implementation intentions. Planning involves contingent reinforcement through

mastery experiences, feedback (see Social Cognitive Theory), and self-regulatory strategies (see theories of self-regulation). Sniehotta reports that interventions that involve coping planning or both action and coping planning show substantial effects on health behaviors.

### Summary: Theories of Goal-Directed Behavior in Problem Analysis and Intervention Methods

Goal-directed behavior theories focus on people who are motivated for change but also on habitual behaviors and behavior influenced by environmental stimuli. Determinants from these theories are habits and environmental influences. Methods include implementation intentions, cue altering, mastery experiences, planning coping responses, and feedback.

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## Theories of Automatic Behavior, Impulsive Behavior, and Habits

Much of health promotion research and theory is based on the assumption that people are consciously and systematically processing information in order to construe and interpret their world and to plan and engage in courses of action. Chartrand and Bargh argue, however, that most of our moment-to-moment psychological life occurs through nonconscious means (Chartrand & Bargh, 1999; Hassin, Uleman, & Bargh, 2005). They present evidence that goal-directed behavior may start consciously but may become automatic over time. An example is driving style: During the first lessons, the aspiring driver is fully aware of the actions required to perform the most basic driving activities, for example, starting a car. For the experienced driver, however, driving a car is largely automatic and drivers are able to do other activities at the same time.

Environmental cues may also guide behavior outside of awareness. An example can be found in the effects of priming, in which people are exposed to a stimulus and later their actions are congruent with the stimulus. In one study of this process, elderly participants were exposed either to words related to the stereotype of the elderly or to words unrelated to that stereotype. Participants exposed to stereotyped words such as *old* and *gray* behaved more in line with that stereotype; for instance, they walked more slowly (Dijksterhuis et al., 1998). In social interaction, people tend to change their behavior as a function of other people's behavior. For instance, participants in a study liked other participants better (who were in fact confederates of the experimenter) who deliberately mimicked the participants' mannerisms and body postures. In all these cases, the participants were not aware of these behaviors and behavior changes.

Automatic behavior, as Chartrand and Bargh (1999) point out, is a necessity for living; without it we could not function. If all life's simple decisions and actions involved deliberate and careful thought, people would simply not have enough time and resources for the demands of living. Because a large part of behavior is conducted on automatic pilot, people are, for instance, able to do two things at the same time.

Attitudes can also be activated automatically (Fazio, 2001). Exposure to stimuli with a subjective negative evaluation activates negative attitudes; exposure to stimuli with a positive evaluation activates positive attitudes. The activated attitude determines a first reaction, whether negative or positive, to the next stimulus, without a person's being completely aware of that reaction. The negative or positive automatic reaction may make a person more likely to visually notice something, more likely to categorize objects or people in categories that match with the attitude, and more likely to behave in negative or positive ways toward categories of objects or people. The last case may lead to prejudice and discrimination. Automatically activated attitudes impose selectivity in the perception of behavioral choices. For example, people who habitually drive to work and who readily access representations of car use in memory will, when asked about a way to travel to a holiday destination, automatically activate a positive car-use attitude and may have difficulty even considering alternative ways of transportation (Danner, Aarts, & de Vries, 2008).

### Impulsive Behavior: Dual-Systems Models

Dual-systems models explain social cognitions and behavior as a joint function of two interconnected mental faculties, each operating according to different principles. We present the Reflective-Impulsive Model (RIM) as an example of dual-systems models (Deutsch & Strack, 2006; Strack & Deutsch, 2004). The RIM distinguishes between a reflective system and an impulsive system. The impulsive system directs behavior by linking perceptual stimuli to behavioral schemata based on previously learned associations that focus on seeking pleasure and avoiding pain. The reflective system features are complementary to the impulsive system, generating judgments, decisions, and intentions. Together, they result in behavior. The impulsive system is always active, while the reflective system acts on intentions. Often, health-promoting behavior entails a conflict between feeling and knowing; for example an urge to smoke versus awareness of the negative consequences of smoking. People with strong preferences for snack foods and low inhibitory capacity are more susceptible to the temptations of palatable foods, eat more, and are more often overweight and obese (Nederkoorn, Houben, Hofmann, Roefs, & Jansen., 2010). In that case interventions are

required that help people suppress impulses or to seek distractions. The reflective system has less power to suppress the impulsive system when available cognitive resources are reduced under the following circumstances (Hofmann, Friese, & Strack, 2009):

- High cognitive load, ego-depletion (see self-regulatory theories), alcohol consumption
- A dispositional low capacity for self-control
- Low working memory capacity
- When the behavior is habitual
- A positive mood
- A focus on affective reactions

RIM suggests that interventions directed at changing health behaviors should simultaneously attempt to change people's reflective reactions (which health promoters often do) and their impulsive reactions (which is difficult). Interventions should also create the situational and dispositional circumstances that are conducive for effective self-regulation, including improving self-regulation, self-efficacy, coping skills, and control motivation (Hofmann et al., 2008). One other method to inhibit impulsive unhealthy behavior is public commitment in which a person pledges in front of others to perform the healthful behavior (Ajzen et al., 2009; Conn, Valentine, & Cooper, 2002).

A dual-systems approach may also explain why adolescents and young adults take more risk than younger or older individuals. Research in developmental neuroscience suggests a temporal gap between puberty, which impels adolescents toward thrill seeking, and the slow maturation of the cognitive-control system that regulates these impulses (Steinberg, 2007). This temporal gap makes adolescence a time of heightened vulnerability for risky behavior. Interventions may be based on this view to reduce crash rates of novice teen drivers (Keating, 2007), especially preventing teens from driving a car in the presence of other teens (Gardner & Steinberg, 2005).

## Habits

Habits are defined as a special case of automatic behavior: "Habits are learned sequences of acts that have become automatic responses to specific cues and are functional in obtaining certain goals or end-states" (Verplanken & Aarts, 1999, p. 104). The most prominent characteristics of habits are that they are efficient and occur without much awareness. Habits are significant predictors of future behaviors in addition to intentions, especially when individuals repeatedly perform the behaviors and when the habit is strong (which it is likely to be after

enough repetition). When people have an intention to eat healthy foods but a habit of eating fatty foods, their eating pattern will often be unhealthy. Intentions only predict behavior if habits are weak, meaning they have a low frequency or the context is unstable. Habits overrule intentions when the representation of the habitual behavior can be easily accessed from memory (Danner et al., 2008).

Habits are difficult to change, and they are not particularly influenced by information for two reasons (Verplanken & Aarts, 1999). First, information influences attitude and intentions, but these do not change behavior when they have to compete with a strong habit. Second, people with strong habits are usually not very interested in new information. Forming new habits may be the best method to change old habits. Forming implementation intentions (see the discussion of goal-directed behavior earlier in this chapter) may be a useful start to creating new habits that may replace old ones. New cue-response links can be formed, and after some time these new behaviors may turn into new habits. However, the new cue-response links may not be as rewarding as the earlier ones. Thus, applying implementation intentions as a method for changing habits needs to be paralleled by applying other methods, such as relapse prevention (see the discussion of attribution theory and relapse prevention later in this chapter).

Wood and Neal (2007) list possible interventions for habit change. First, people can break habits after exposure to relevant context cues by actively inhibiting the cued response. Such inhibition appears to be effortful, to draw on limited regulatory resources, and unlikely to be sufficient to bring about long-term change in habits. Avoidance may help, as well as counter conditioning. Most promising is to combine inhibition with learning and performing a new desired response. Second, people can try to alter or disrupt the exposure to relevant context cues. Avoidance is one strategy, cue altering another. An example of cue altering is to use smaller sizes of plates, spoons, and glasses to reduce the amounts of food and drink that people serve and consume (Sobal & Wansink, 2007). However, individuals' efforts to control habit cueing are only as strong as their self-control resources. Wood and Neal (2007) expect the most success when changes in context occur naturally as a function of life events, such as changing jobs, moving to a new home, or transferring to a new university. If people are best able to act on their intentions when related habits are disrupted, then it is during these times that people's overt reactions are most likely to change through behavior change interventions. Wood and Neal (2007) suggest that interventions to break habits should be directed to people when they are best able to respond, for instance, as new residents in a neighborhood.

People react to prompts without requiring substantial levels of attention. In an intervention to promote stair use instead of elevator use, cues or prompts were introduced, and a series of 12 orange footsteps was placed leading to the stairs

from both sides of the hall. The intervention was successful in increasing stair use (van Nieuw-Amerongen, Kremers, de Vries, & Kok, 2009).

### Summary: Theories of Automatic Behavior and Habits in Problem Analysis and Intervention Methods

Behaviors explained by these theories are automatic, unconscious, impulsive behaviors, those behaviors that could become habitual. Automatic behaviors are often guided by external stimuli or context cues with reduced cognitive resources. Determinants are habits, environmental influences, and automatic activation of attitudes. Methods include implementation intentions, cue altering, counter conditioning, stimulus control, public commitment, and other methods for improving self-efficacy and skills.

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## Transtheoretical Model (TTM) of Behavior Change

The TTM has two major sets of constructs: stages of change and processes of change (Prochaska, Redding, & Evers, 2008; Prochaska & DiClemente, 1984; Sutton, 2005). This model was first used to describe cessation of addictive behaviors and later to predict uptake of health-promoting behaviors (Prochaska et al., 2008; Prochaska & DiClemente, 1984). Further, both the stages and the processes are suggestive of intervention methods to stimulate change. An important contribution of the model is the specific tailoring of educational efforts to include different methods for individuals in different stages.

### Stages of Change

In the model, people are thought to move from having no motivation to change to internalizing the new behavior. The early stages are defined by the level of intention to change a problem behavior, whereas the later stages are defined by the length of time a person has engaged in the new behavior. The stages are as follows:

- Precontemplation, in which people have no intention of changing their behavior within the next six months
- Contemplation, in which people are thinking about changing the problem behavior in the next six months
- Preparation, in which people are planning to change this behavior in the short term (one month) and are taking steps to get ready for the change
- Action, in which people have recently (less than six months) changed the behavior

- Maintenance, in which people have performed the new behavior for more than six months
- Termination, in which there is no temptation to relapse and people have 100% confidence

People in the action or maintenance stages may lapse and then recycle to action or relapse to contemplation or even precontemplation. There is still considerable debate on the validation of the stages of change (Adams & White, 2005; Bridle et al., 2005; Brug et al., 2005; Hutchison, Breckon, & Johnston, 2009; Salmela et al., 2009; Spencer, Wharton, Moyle, & Adams, 2007; Sutton, 2005). Brug and colleagues (2005) suggest that only the distinction between two larger stages of motivation (precontemplation, contemplation, preparation) on the one hand and action (action, maintenance, termination) on the other is well supported. Armitage (2009) concludes that critical evaluations of TTM are focusing too much on the stages and ignoring other aspects of the theory such as the processes of change which, in his view, are excellent methods for improving health behavior independent of the stages (see Velicer, DiClemente, Prochaska, & Brandenburg, 2006). Brug and colleagues (2005) add that longer-term behavioral changes need interventions beyond health messages, incorporating methods for changing environmental conditions. These environmental change methods are mentioned in their processes of change (such as social liberation). However, these have seldom been incorporated in intervention studies.

## Processes of Change

In the TTM processes of change are described that may be stimulated by different methods (Table 2.3). Processes sometimes are clearly determinants of moving to the next stage; at other times they are very close to methods for promoting change. Table 2.3 defines the processes suggested by the authors of TTM (Prochaska et al., 2008, pp. 101–102).

These processes can be applied at higher environmental levels. For instance, the strategy of gaps analysis, in which the desired future state is compared to current conditions, applies reevaluation in the context of organizational development. This provides the motivation and direction for an organizational intervention (Allen & Bellingham, 1994; Cummings & Worley, 2009).

**Tailoring, Relevance, and Individualization.** Relevance, tailoring, and individualization have all been shown to be effective basic methods in health education interventions, and they can be traced to a number of theories, such as Social Cognitive Theory and TTM. We will discuss these methods here because they fit

Table 2.3 Change Processes in the Transtheoretical Model

Process	Definition
<i>From Precontemplation to Contemplation</i>	
Consciousness raising	Involves increased awareness about the causes, consequences, and cures for a particular problem behavior. Methods that can increase awareness include feedback, confrontations, interpretations, bibliotherapy, and media campaigns.
Dramatic relief	Initially produces emotional experiences, followed by reduced affect or anticipated relief if appropriate action is taken. Role playing, grieving, personal testimonies, health risk feedback, and media campaigns are examples of methods that can move people emotionally.
Environmental reevaluation	Combines both affective and cognitive assessments of how the presence or absence of a personal behavior affects one's social environment. It can also include the awareness that one can serve as a positive or negative role model for others. Methods such as empathy training, viewing of documentaries or testimonials, and family interventions may lead to such assessments.
<i>From Contemplation to Preparation and Action</i>	
Self-reevaluation	Combines both cognitive and affective assessments of one's self-image with and without an unhealthy behavior. For example, a person can compare his or her image as a sedentary person to a possible image as an active person. Clarifying values, healthy role models, and mental imagery are methods that can move people evaluatively.
<i>From Preparation to Action</i>	
Self-liberation	Is both the belief that one can change and the commitment and recommitment to act on that belief. New Year's resolutions, public testimonies, and multiple rather than single choices can enhance what the public calls willpower.
<i>From Action to Maintenance</i>	
Helping relationships	Combine caring, trust, openness, and acceptance as well as support for the healthy behavioral change. Rapport building, therapeutic alliances, counselor calls, and buddy systems can be sources of social support.

**Table 2.3 (Continued)**

Process	Definition
Counterconditioning	Requires learning healthier behaviors that can substitute for problem behaviors. Relaxation, assertion, desensitization, nicotine replacement, and positive self-statements are methods for safer substitutes.
Contingency/Reinforcement management	Provides consequences (mostly rewards) for taking steps in a particular direction. Contingency contracts, overt and covert reinforcements, incentives, and group recognition are methods for reinforcement when the person meets contingencies.
Stimulus control	Removes cues for unhealthy habits and adds prompts for healthier alternatives. Avoidance, environmental reengineering, and self-help groups can provide stimuli that support change and reduce risk for relapse.
Social liberation	Realizing that the social norms are changing supporting the health-promoting behavior.

Permission to use a close paraphrase of the list of Processes of Change from J. O. Prochaska, C. A. Redding, & K. E. Evers (2008) "The Transtheoretical Model and stages of change" in K. Glanz, B. K. Rimer, & K. Viswanath (Eds.), *Health behavior and health education: Theory, research, and practice* (4th ed., pp. 97–121). San Francisco: Jossey-Bass, pp 101–102, granted from Jossey-Bass Publishers.

with TTM's stages approach. Adapting the program to the knowledge, beliefs, circumstances, and prior experience of the learner, as assessed by pretesting or other means, can create relevance (Mullen & DiClemente, 1992). Computer programs enable one to tailor interventions to measured characteristics of the individual, such as stage of change, beliefs, attitude, and self-efficacy (Kreuter, Farrell, Olevitch, & Brennan, 2000; Lustria, Cortese, Noar, & Glueckauf, 2009).

Tailoring will be effective only when there is a clear link between characteristics of the person and the messages that are supposed to address those characteristics. Tailoring the message to salient beliefs of the intervention group increases people's motivation and ability to process the message carefully, thereby increasing the chance of persistent changes in attitudes and behavior (Witte, 1995). Moreover, it is important to tailor interventions to lay people's beliefs about illness, such as causes, consequences, duration, and cure (Salovey, Rothman, & Rodin, 1998).

Individualization is the provision of opportunities for learners to have personal questions answered or instructions paced according to their individual

progress (Mullen et al., 1985; Mullen & DiClemente, 1992). It may also include the ability to offer instruction that is geared to specific needs and disease characteristics. The Watch, Discover, Think, and Act asthma computer application individualizes instruction to each child's asthma triggers and symptoms based on information the child types in (Bartholomew et al., 2000b, 2000c).

Both individualization and tailoring are related to the concept of cultural competence, which we discussed earlier. Both program methods and applications not only must be acceptable to the intervention groups but must fit the culture in order to foster empowerment and program effectiveness (Pasick, D'Onofrio, & Otero-Sabogal, 1996).

### **Summary: TTM of Behavior Change in Problem Analysis and Intervention Methods**

Based on TTM, different groups can be identified: people in precontemplation, contemplation, preparation, action, and maintenance. Originally the TTM was helpful for addictive behaviors; currently it is applied in a variety of behaviors. TTM suggests environmental barriers for change and is also relevant for considering behavior change of agents at the various environmental levels. Behaviors have different determinants for each stage. Methods derived from TTM include tailoring (to stages), individualization, and methods guided by processes of change: consciousness raising, dramatic relief, environmental reevaluation, self-reevaluation, self-liberation, helping relationships, counterconditioning, contingency management, and stimulus control.

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### **Precaution-Adoption Process Model (PAPM) and Risk Communication**

Another stage theory, the PAPM, integrates almost all theoretical constructs that we have discussed in the PMT and the TTM sections (Weinstein, 1988; Weinstein, Sandman, & Blalock, 2008). PAPM pays more attention to the issue of awareness of the risk compared to TTM and to the difficulty of reaching resistant groups. Compared to the TTM, PAPM incorporates determinants and methods for change that are supported by popular health-promotion theories, especially SCT (Bandura, 1997). Table 2.4 presents the seven stages and factors and issues that are likely to determine progress between the stages (Weinstein et al., 2008).

As in other stage theories, Weinstein (1988) suggests that people in different stages need different methods to help them change and to help them move through the stages. People who have decided not to act are a particularly difficult

**Table 2.4 The Precaution-Adoption Process Model**

Stage Transitions	Factors or Issues
Stage 1: Unaware of the problem to Stage 2: Aware but not thinking about changing	Media messages about the hazards and precautions
Stage 2 to Stage 3: Thinking about changing	Communications from significant others Personal experience with the hazard
Stage 3 to Stage 4: Decided not to act or Stage 5: Decided to act	Beliefs about hazard likelihood and severity Beliefs about personal susceptibility Beliefs about precaution effectiveness and difficulty Behaviors and recommendations of others Perceived social norms Fear and worry
Stage 5 to Stage 6: Action Stage 7: Maintenance	Time, effort, and resources needed to act Detailed “how-to” information Reminders and other cues to action Assistance in carrying out action

group because they may be quite well informed but tend to dispute or ignore information that challenges their decision. One relevant factor in deciding not to act may be that people systematically underestimate their own risk (see the following discussion of unrealistic optimism).

### Unrealistic Optimism

People often underestimate their risk, a condition that risk-perception theorists call unrealistic optimism: people think they are less at risk than comparable others (Brug, Van Assema, Kok, Lenderink, & Glanz, 1994; Van der Pligt, Otten, Richard, & Van der Velde, 1993). The main reasons for unrealistic optimism are that people underestimate what techniques others undertake to protect themselves and that they have stereotypes of people who run high risks (Salovey et al., 1998). To illustrate, adolescents may refrain from condom use because they think that other adolescents have multiple partners whereas they have regular partners and that only adolescents who often change partners are at risk for contracting HIV. Health educators should assist in making each person’s risks clear by making comparisons with an absolute and a normative standard (the risks of others), preferably using undeniable feedback. They should also indicate that risk is a matter of risk behavior rather than of which risk groups the

person belongs to. The following methods for changing risk-perception variables are suggested (Champion & Skinner, 2008):

- Define the risk levels of the population at risk
- Personalize risk based on a person's behavior
- Make perceived susceptibility more consistent with the individual's actual risk
- Specify consequences of the risk

### Risk Communication

Holtgrave and colleagues (1995) suggest various methods to effectively communicate risks. Health educators can, for example, compare risks on the same dimensions (dread, control, catastrophic potential, equity, and novelty) or compare risks with similar dimensional profiles. However, sometimes people become angry when a risk over which they have no control, such as air pollution, is compared to a risk over which they do have control, such as smoking (Visschers, Meertens, Passchier, & De Vries, 2007). The empirical evidence on the effects of risk communication, especially probability information, is summarized by Visschers, Meertens, Passchier, and De Vries (2009). They formulated recommendations, including:

1. Use the same denominator in probability information throughout the risk message.
2. Use step-by-step probability descriptions that are easy to understand and are likely to result in adequate risk estimates.
3. Be careful about presenting relative risk reduction, as this may be mistaken for absolute risk reduction.
4. Take the context of the risk communication into account (setting, frame, severity).
5. Present both numerical and verbal probability information in a risk message.
6. Use graphs to present probability of harm.

In a recent project, scenario-based risk information was the most effective in increasing perceived susceptibility for STIs, especially when people generated their own scenarios and when multiple risk scenarios were provided. When people find it very difficult to imagine the risk situation, scenario information is ignored (Mevisen, Meertens, Ruiters, Feenstra, & Schaalma, 2009; Mevisen, Meertens, Ruiters, Feenstra, & Schaalma, in press). Communicating risk seems to induce defensive reactions. It is therefore advisable to pilot test messages carefully before using them on a large scale. Personalized probability-based risk information is promising, especially in combination with behavioral recommendations and information tailored to motivation and skills.

## Raising Awareness

Awareness is often described as the first step in the change process. In the theories of self-regulation and coping, the first step in an intervention is some form of need recognition or problem appraisal. However, these theories do not provide clear methods for stimulating need recognition. Often, self-regulatory and coping theories are applied in situations in which people have a disease, such as asthma, cystic fibrosis, or AIDS (Wenzel, Glanz, & Lerman, 2002). For example, individuals are taught appraisal skills to detect a problem related to disease or self-management and other skills with which to solve the problem (Bartholomew et al., 1993). Without these additional problem-solving skills to raise self-efficacy and outcome expectations, avoidance of thinking about the risk may ensue. For people who are not motivated to perform appraisal, methods for awareness may be applied, such as risk information, confrontation, and fear arousal.

Messages to promote awareness should focus on self-evaluation related to risk and reevaluation of outcome expectations, rather than on action (Maibach & Cotton, 1995). Messages could include personalization by reminding someone of recent episodes of the risk behavior and the potential consequences of the person's risk behavior on significant others. At a higher ecological level, mass media gatekeepers must also become aware of an issue as a necessary condition for featuring health-promoting issues (McGrath, 1995).

## Summary: PAPM in Problem Analysis and Intervention Methods

PAPM identifies people in different stages of precaution adoption and may be applied to all health behaviors, but especially to risk behaviors of which people are unaware. PAPM describes lack of environmental resources as barriers for change. Determinants are different in different stages. Methods from PAPM are tailoring to stages, consciousness raising, personalizing risk, specifying consequences of the risk, comparing risks on the same dimension, using step-by-step probability descriptions, presenting both numerical and verbal probability information, and providing scenario-based risk information.

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## Attribution Theory and Relapse Prevention

An important variable in many models that try to explain determinants of behavior is self-efficacy, the self-confidence for performing a particular behavior. But what are the determinants of self-efficacy? Weiner (1986) suggests that self-efficacy, or expectancy of success as he calls it, is determined by the perceived

stability of the attributions for success and failure. Attribution theory describes the impact of the way people attribute the outcomes of behavior on their future cognition and behavior across the three dimensions of stability, locus, and controllability (Weiner, 1986).

Stability is the relevant dimension for the understanding of success expectations for health behavior change. A person attributing a failure to a stable cause (for example, ability) will have a lower expectancy of success for performing the same task again, as compared with somebody who attributes a failure on the same task to an unstable cause (for example, bad luck). In the case of success, this effect is reversed. If a person succeeds, attributing the success to a stable cause (for example, talent) will be associated with a higher expectation of success than if the success is attributed to an unstable cause (for example, fortunate circumstances). Furthermore, attribution theory suggests that lower success expectancy leads to less adaptive task behavior; people will invest less energy in the task at hand. Hospers, Kok, and Strecher (1990) found that success of participants in a weight-reduction program was positively related to the participants' self-efficacy at the start of the program. Self-efficacy was inversely related to stability of attributions for earlier failures, and both relationships were independent of the number of failures.

### Attributional Retraining and Relapse Prevention

One method for changing attributions to improve self-efficacy is called attributional retraining, or reattribution (Kok et al., 1992). The health educator or counselor tries to help people reinterpret previous failures in terms of unstable attributions (“You were in a very difficult situation there”) and previous successes in terms of stable attributions (“You are the type of person who has been able to stay off cigarettes during your whole pregnancy”).

Attributional retraining is often used in attempts to prevent relapse (Marlatt & Donovan, 2005). Relapses are caused when a person lapses in a high-risk situation due to a lack of coping response. Self-efficacy expectations and perceived skills are relevant not only for new behavior but also for the maintenance of behavior changes. Relapse-prevention theory describes the process of lapses, attributions, self-efficacy estimations, coping, craving, emotional states, and successes and failures in maintaining the behavior change. The major distinction between success and failure is the presence or absence of a coping response for high-risk situations (Marlatt & Donovan, 2005). High-risk situations are those situations that invite or pressure people to take up their risk behavior again. For instance, a worker who has quit smoking goes to the coffee shop where colleagues are

smoking. If the worker has an adequate coping response, she will be more likely to maintain her health-promoting behavior and may develop an even higher estimation of self-efficacy. However, if she does not have an adequate coping response to the high-risk situation at the coffee shop, she may lapse into her earlier risk behavior and experience a sense of failure. She may attribute this failure to stable and uncontrollable causes and develop lower self-efficacy and a higher chance of complete relapse as a result. Marlatt and Donovan (2005) stress that their relapse prevention model is not linear but dynamic. Relapses are a complex phenomenon and seemingly insignificant changes in one risk factor may kindle a downward spiral resulting in a major relapse.

How can health promotion programs help people prevent relapse? The theory suggests a series of primarily face-to-face or group methods that involve helping the person at risk identify high-risk situations, plan coping responses, and practice the responses until they become automatic (Marlatt & Donovan, 2005). It also suggests reattribution training for incidental lapses so that the at-risk person attributes failure to an unstable cause.

### **Summary: Attribution Theory and Relapse Prevention in Problem Analysis and Intervention Methods**

People may be differentiated as those who make stable versus unstable attributions for failure for all behaviors with success or failure characteristics. There may exist real barriers in the environment that may make maintenance of behavior change too difficult even with high self-efficacy. Determinants are stable versus unstable attributions for failure. Methods include reattribution training, relapse-prevention, planning coping responses, and methods to train skills and self-efficacy.

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### **Communication-Persuasion Matrix (CPM)**

One general theory for behavior change is McGuire's CPM (1985, 2001). Health educators use this model somewhat differently from the way McGuire originally intended by including variables from Social Cognitive Theories (attitude, social influences, and self-efficacy) and stage theories (maintenance) (Kok et al., 1996). The model combines seven steps describing the effects of persuasive communication with four communication variables in a matrix. The first steps posit that successful communication should result in the receiver's attention and comprehension. The subsequent steps refer to the receiver's changes in attitudes, social

influences, self-efficacy, and behavior; the last step refers to the maintenance of that behavior change. McGuire (1985) argues that educational interventions should match each step. Choices related to the communication variables, message content, program audience, communication channels, and message source depend on the step that is addressed. For instance, certain mass media messages, such as statements by famous sports heroes, may attract a lot of attention but may have negative effects on self-efficacy. An important contribution of CPM is that every method that uses communication will have to go through the steps for successful communication in order to have any effect at all. Protocols for pretesting of educational materials should apply these steps, and in practice most of them do (U.S. Department of Health and Human Services, Office of Cancer Communications, National Cancer Institute, 2002). Applying the CPM to all program communications is a basic method for change.

CPM can accommodate a host of social psychological variables that have been found to influence attitude and behavior (McGuire, 1985, 2001). However, for many of these variables, the relationship to attitude and behavior change is ambiguous. McGuire explains this ambiguity by distinguishing differential effects on reception of the message (that is, successful communication) and yielding to the message (that is, attitude and behavior change). For instance, as mentioned before, the use of celebrities in persuasive messages can have a positive effect on reception but may have a negative effect on yielding. Almost no variables have a universal, unidirectional effect on attitude and behavior change.

### Cultural Similarity

The Communication-Persuasion Matrix may be applied to analyze the role of culture as a factor in enhancing the effects of health communication, as was done by Kreuter and McClure (2004). They focus on message source, message context, and communication channel because these three aspects are modifiable by communication. Cultural similarity between source and receivers leads to greater message recall and favorable attitudes, especially among receivers who identify strongly with their cultural group. With respect to message content, using surface characteristics of the target group (such as preferred language) enhances receptivity. Using social-cultural characteristics (deep structure) leads to a more positive processing of the message. With respect to message channel, at the most basic level a target group must have access. Different cultural groups use different media, because they have different needs: sense of community, cohesiveness, culturally relevant information. Exposure to minority newspapers, for instance, gives people a different agenda (see agenda-setting theory in Chapter Three). Larkey and colleagues (2008) give examples of culturally relevant messages directed at Latinos for cancer prevention and screening trials.

### Summary: CPM in Problem Analysis and Intervention Methods

Intended program recipients will be at different stages of awareness, comprehension, attitude change, social support, sufficient self-efficacy, behavior change, or behavior maintenance. CPM is applicable to any behavior that can be influenced by communication. Information processing may be disturbed by information complexity and external factors. Determinants will be different by stage. Methods from CPM include persuasive communication, active processing of information (active learning), tailoring (to stage), arguments, and cultural similarity.

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### Elaboration Likelihood Model (ELM)

Petty and Cacioppo (Petty, Barden, & Wheeler, 2002; Petty, Brinol, & Priester, 2008; Petty & Cacioppo, 1986a, 1986b) have created a new perspective on persuasion effects with the ELM. The basic idea of the ELM is that people differ in the ability and motivation for thoughtful information processing. These authors explain two ways of processing information: central and peripheral. Central processing occurs when a message is carefully considered and compared against other messages and beliefs. Peripheral processing occurs when a message is processed without thoughtful consideration or comparison. For example, a student learning about self-efficacy for the first time can process the information centrally by comparing his or her own self-efficacy in terms of several different behaviors. The student can continue the central processing by trying to find situations wherein self-efficacy seems to be important in choosing to attempt a behavior or to maintain effort.

Pollay, Siddarth, Siegel et al. (1996) suggest that peripheral cues are systematically used in tobacco advertisements for youth because these cues tend to bypass logical analysis. A variable—for instance, the source credibility of a sports hero as a role model—may have a positive effect when receivers process the message through the peripheral route but a negative effect when they follow the central route. In the sports hero example, people realize that their behavioral capabilities are different from those of the sports hero. For example, a well-known cyclist might be used in a mass media campaign to promote physical activity among youth. With peripheral processing, an overweight, sedentary teen might admire the athlete and react favorably to the ad for a brief time. However, with central processing, the same teen might compare the attributes of the athlete to her own fitness and end up with lower self-efficacy for physical activity than before the campaign. The same variable, source credibility, may also influence the motivation and ability to think, thus shifting people from the peripheral route to the central route or vice versa (Petty & Wegener, 1998).

Research findings suggest that thoughtful information processing is related to a higher persistence of attitude change, a higher resistance to counter persuasion, and a stronger consistency between attitude and behavior (Petty & Cacioppo, 1986b). Health educators would thus like to promote thoughtful information processing as much as possible. The ELM suggests three ways to stimulate motivation to think about the message: make the message personally relevant, make it unexpected, and repeat it.

### Successful Communication

Successful communication is a prerequisite for any other change method (McGuire, 1985). A program cannot have any effect if the population is not exposed, does not pay attention to the program, or does not understand the message. Any program that includes methods for changing determinants and behavior should also include methods to achieve successful communication.

The ELM suggests that people only process the message seriously, through the central route, when they are motivated and able to do so (Petty et al., 2008; Petty & Cacioppo, 1986a, 1986b). An illustration is the program *Sex, Games, and Videotapes*, an HIV-prevention program for homeless mentally ill men in a New York shelter, that made messages personally relevant, surprising, and repeated by embedding them in playing competitive games, storytelling, and watching videos, activities that were salient pastimes in the shelter (Susser, Valencia, & Torres, 1994). Petty and colleagues (2002) mention additional motivational methods for stimulating central processing: making the message personally relevant through tailoring, making people feel responsible or accountable, and making them believe that they are part of a minority that practices the behavior. Additional methods that improve skills for information processing are using media that allow self-pacing by the target participants, environments without distractions, and the use of language that people easily understand. Anticipation of interaction over the message and direct instructions to process the message carefully can help centralize the processing (Petty & Wegener, 1998). When the intervention group has the time and the behavioral capability, active learning can be used to promote central information processing based on the evidence that getting individuals to search for answers to questions they pose as a result of some stimulus leads to better information processing and learning, followed by more change in determinants and behavior.

### Persuasive Arguments

One of the most widely used intervention methods for attitude change is the presentation of arguments in a persuasive message. The ELM predicts that

high-quality arguments are effective only when the receivers process the message through the central route, not when they use the peripheral route. Because attitude change through the central route is more persistent, more resistant to change, and more related to behavior, health promoters should promote central information processing. A higher number of arguments does not ensure quality and, in fact, may negatively affect attitude change (Petty & Wegener, 1998). A greater number of arguments may be convincing for people who process the information through the peripheral route, but they will be less convincing for people who process through the central route. Petty and Wegener (1998) suggest that the following characteristics determine the quality of arguments, that is, their effectiveness after careful processing:

- Expectancy value: people like outcomes that are likely and desirable and avoid outcomes that are likely and undesirable.
- Causal explanations: a causal explanation will convince receivers of the likelihood of the outcome.
- Functionality: arguments that match the way people look at the world are more convincing.
- Importance: the relevance of outcomes determines the argument's effectiveness.
- Novelty: an unfamiliar or unique argument has more impact than does a familiar argument.

Persuasive arguments may be used at the individual level to encourage people to adopt healthful behaviors and may also be used for agents at higher ecological levels. For example, viewing a television broadcast on the health consequences to children from environmental tobacco smoke and the benefits of protecting children from smoke may influence a mother to declare her home smoke free. Seeing other legislators receive media attention for promoting healthy policy may lead legislators to vote for health legislation. Both outcome expectations and expectancies must be high. For example, a city council must be persuaded both that fluoridation prevents dental caries and that the prevention of dental caries is something to value because of its effect on children's health. A persuasive argument about the extent of dental disease in children in the community and the outcome to their overall health that uses facts and personalized models might influence the council to accept both beliefs and to change the way it votes.

### Summary: The ELM in Problem Analysis and Intervention Methods

Communication receivers are at different stages and have different tendencies to process the messages with either high or low elaboration likelihood. ELM targets

any behavior that can be influenced by communication. Information processing may be disturbed by information complexity and external factors. Determinants will be different by stage. Methods derived from ELM are persuasive communication, elaboration, active processing of information, tailoring to the individual's stage, and new arguments.

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## Theories of Self-Regulation

Self-regulatory conceptualizations have to do with how individuals function to self-correct behavior (Baumeister & Vohs, 2004; Boekaerts, Pintrich, & Zeidner, 2000). Creer (2000b) argues that self-management, the term that has often been used in the health domain, and self-regulation, the term used in psychology (Cleary & Zimmerman, 2000; Zimmerman, 2000a) and in education (Schunk & Ertmer, 2000), refer to the same phenomenon. Self-management is an active, iterative process of observing oneself, making judgments based on observation (as opposed to judgments based on habit, fear, or tradition), setting a goal, choosing strategies, reacting appropriately in the light of one's goal, and revising one's strategy accordingly (Clark, 2003). The process is iterative, because feedback loops, through which one sees discrepancies between goals and outcomes and feels dissatisfaction, play an essential part in self-regulation (Scheier & Carver, 2003). Various authors' descriptions of self-regulation processes make a distinction between awareness and action. In the awareness phase people monitor themselves and, after an evaluation of the outcomes, decide they want to change. In the action phase people make plans, implement plans, and revise plans if necessary. After implementation people again self-monitor their behavior and decide whether their goals have been reached and, in case they have not, what other plans may be helpful.

Rothman, Baldwin, and Hertel (2004) have extended the self-management stages to include continuation, maintenance, and habit formation. They also point out that the determinants for change and the methods to promote change vary over these stages, comparable to the other stage models that we described earlier. "Rosenbaum (2000) states that peoples' general repertoire of self-regulatory skills is essential for goal accomplishments. He uses the term 'learned resourcefulness' to indicate the acquired regulatory skills that help people to control their behavior. By repetition, the employment of self-control strategies may become internalized and automatic, thereby contributing to overall improved self-control abilities" (Alberts, 2007, p. 106).

Muraven and Baumeister (2000) suggest a “strength model” of self-management in which a person’s capacity to exert self-control is defined by personal restrictions (Muraven & Baumeister, 2000). The restrictions exist because people have limited resources on which self-control can be drawn in the same way they have limited energy or strength. After an act of self-control, a person’s resources decrease and performance on a subsequent self-control act can be impaired (Schmeichel & Baumeister, 2004; Alberts, 2007). For instance, Muraven, Collins, and Nienhaus (2002) showed that individuals whose self-control was depleted through the prior exertion of self-control consumed more alcohol than individuals whose self-control was not depleted. Self-control becomes tired after use and, like a muscle, needs rest to recover and can become stronger with repeated practice. Strengthening through repeated practice may offer a strategy to counter regulatory failure (Muraven et al., 2002; Oaten & Cheng, 2006; Alberts, 2007). Activation of persistence has been shown to help people overcome the effects of ego depletion and to lead to stable self-control performance (Alberts, Martijn, Greb, Merckelbach, & de Vries, 2007).

### Interventions Based on Self-Regulation

Self-regulatory theory is useful for designating health-promoting behaviors for the self-management of chronic disease. For example, in a family-oriented pediatric asthma self-management program, Bartholomew, Gold, and colleagues (2000b) conceptualized both asthma-specific skills (for example, taking control medications) and self-regulatory skills (for example, monitoring for symptoms of asthma) (see Chapter Twelve on the book’s instructor Website). Another excellent example of an intervention based on self-management is a program to promote therapy adherence with HIV+ patients by De Bruin and colleagues (2010a). In a review of thirteen successful theory-based interventions for disease management, Clark (2003) notes that eight of the programs used self-regulatory approaches, which encourage the executive cognitive processes of setting goals, observing behavior, and revising goals. Other reviews show positive effects of self-management on pain reduction (Reid et al., 2008), health of patients with osteoarthritis (Devos-Comby, Cronan, & Roesch, 2006), and diabetes adherence and dietary behavior (Hill-Briggs & Gemmel, 2007). Self-management through the Internet has been shown to improve the health condition of children with a chronic illness (Stinson, Wilson, Gill, Yamada, & Holt, 2009). However many other reviews and meta-analyses suffer from a lack of clarity about the criteria for including self-management interventions and do not provide clear descriptions of the included interventions

in terms of the earlier mentioned self-management steps: monitoring, evaluation, planning, and implementation (see for instance Warsi et al., 2009).

### Summary: Theories of Self-Regulation in Problem Analysis and Intervention Methods

Theories of self-regulation may be used with people who are trying to incorporate complex behaviors into their lifestyles. These theories identify performance objectives for self-regulatory behaviors, that is, monitoring, evaluation, and action. The learner is helped to explicitly consider the role of the environment in the performance of certain behaviors, for example, to appraise the environment in the monitoring phase. Self-regulation can be seen as a determinant of behavioral capability. Methods from self-regulation theories include self-monitoring, feedback, and methods to change self-efficacy and skills.

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## Social Cognitive Theory (SCT)

Bandura's Social Cognitive Theory (1986) is an interpersonal theory that covers both determinants of behavior and the process of behavior change (Bandura, 1997; Luszczynska & Schwarzer, 2005; McAlister et al., 2008). SCT explains human behavior "in terms of a model of reciprocal determinism in which behavior, cognitive and other personal factors, and environmental events all operate as interacting determinants of each other" (Bandura, 1986, p. 18). Major determinants of behavior described by SCT are outcome expectations, outcome expectancies, self-efficacy, behavioral capability, perceived behavior of others, and environment.

### Outcome Expectations, Self-Efficacy, and Behavioral Capability

An outcome expectation is a judgment of the likely consequence that a certain behavior will produce ("When I use a condom consistently, I will prevent sexually transmitted infections"). Outcome expectancies, on the other hand, are the values that individuals place on a certain outcome (McAlister et al., 2008). Outcome expectations are comparable to behavioral beliefs in the TPB, and outcome expectancies are comparable to evaluations.

Self-efficacy is a judgment of a person's capability to accomplish a certain level of performance ("I am confident that I can use a condom consistently"). Bandura (Bandura, 1986, p. 392) is very explicit about the interrelation between outcome expectations and self-efficacy: "The types of outcomes people anticipate depend largely on their judgments of how well they will be able to perform in

given situations.” When people are not confident that they can use a condom consistently, they may also not expect to prevent STIs. Some studies have found an interaction effect between self-efficacy and outcome expectations. When a person is in a situation in which outcome expectations are positive and strong but self-efficacy for that behavior is low, a situation of avoidance or denial may occur, and the person is unlikely to attempt the behavior (Bandura, 1986). In addition to personal self-efficacy, Bandura (1997) describes perceived collective efficacy, belief in the performance capability of a social system as a whole (Chapter Three).

The concept of behavioral capability is that if people are to perform a particular type of behavior, they must know what the behavior is (knowledge of the behavior) and how to perform the behavior (skill). Self-efficacy is a person’s perception; capability is the real thing. Health promotion programs should go beyond providing knowledge to providing behavioral capability, which is closer to actual performance. The development of behavioral capability is the result of the individual’s training, intellectual capacity, and learning style. Enactive mastery experiences provide procedural knowledge of the activities to perform, practice in performing those activities, and feedback about successful performance.

## Observational Learning and Environment

Most human behavior is learned through observation of models (vicarious learning). By observing others, a person can form rules for behavior; and on future occasions this coded information can serve as a guide for action. Four constituent processes govern modeling:

- Attention to and perception of the relevant aspects of modeled activities (including characteristics of the observer and the model)
- Retention and representation of learned knowledge and remembering
- Production of appropriate action
- Motivation as a result of observed positive incentives and reinforcement

When providing models to encourage the learning of certain behaviors, the health educator should find a role model from the community or at-risk group that will encourage identification. The model should present a coping model (for example, “I tried to quit smoking several times and was not successful, then I tried . . . . Now I have been off cigarettes for . . .”) rather than a mastery model (for example, “I just threw my pack away, and that was it”). Learners should be able to observe models being reinforced for their behavior (for example, being congratulated by friends for staying off cigarettes or having a partner say how fresh the ex-smoker smells).

Perceived behavior of others is distinguishable from perceived social expectations: smoking parents (behavior of the parents) may be contributing to their child's taking up smoking while they expect their child not to smoke (perceived social expectation).

The term environment refers to an objective notion of all the factors that can affect a person's behavior but that are physically external to that person. The social environment includes family members, peers, and neighbors. The physical environment includes availability of certain foods, indoor and outdoor air quality, restrictions for smoking, and so on. Individuals may or may not be aware of the strong influence that the environment has on their behavior. Likewise, health promoters may underuse the role of environment in their program planning. Keeping the concept of reciprocal determinism in mind will help planners avoid this pitfall. Planners should always try to create a facilitating environment for health-promoting change.

### SCT and Behavior Change

SCT integrates determinants of behavior with methods for behavior change. All SCT interventions are based on active learning that promotes performance during the learning process. Perceived behavior of others is not only a determinant of behavior; it is also a very effective method for behavior change through modeling. Reinforcement is a general method of SCT. Modeling, in which a person experiences vicarious reinforcement, is a special case of reinforcement. A person may experience vicarious reinforcement by observing a model receiving reinforcement. Reinforcements may be external (such as receiving money) or internal (such as doing something that one perceives as right). Self-efficacy and behavioral capability may be improved through the following (Bandura, 1997):

- Enactive mastery experiences: enabling the person to succeed in attainable but increasingly challenging performances of desired behaviors
- Vicarious experiences (modeling): showing the person that others like themselves can do it, including detailed demonstrations of the small steps taken in the attainment of a complex objective
- Verbal persuasion: telling the person that he or she can do it; strong encouragement can boost confidence enough to induce the first efforts toward behavior change
- Improving physical and emotional states: making sure people are well rested and relaxed before attempting a new behavior; including efforts to reduce stress and depression while building positive emotions, such as when fear is relabeled as excitement

## Facilitation

All learning has to be complemented by facilitation, the provision of means for the learner to take action or means to reduce barriers to action (Bandura, 1986; Mullen et al., 1985; Mullen & DiClemente, 1992). Facilitation often means creating a change in the environment. For instance, a program that targets improvement in drug users' self-efficacy for using clean needles must also facilitate clean needles being easily accessible. People with higher self-efficacy will exert more effort, although actual barriers ultimately mediate what the effect will be.

## Summary: Social Cognitive Theory in Problem Analysis and Intervention Methods

SCT may be applied to any behavior but is usually applied to behaviors that are complex and require considerable behavioral capability. Actual barriers are recognized as difficult even with high self-efficacy, and there is a strong impact of the social and the physical environment. Determinants include outcome expectations, self-efficacy expectations, behavioral capability, perceived behavior of others, and social and physical environment. Methods derived from SCT are active learning, reinforcement, enactive mastery experiences, modeling, guided practice, verbal persuasion, improving physical and emotional states, and facilitation.

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## Theories of Stigma and Discrimination

A stigma is defined as an “attribute that is deeply discrediting” and that reduces the bearer “from a whole and usual person to a tainted, discounted one” (Goffman, 1963, p. 3). The immediate reaction to a stigma seems to be avoidance as if physical contact or even proximity to the stigmatized person can result in some form of contamination (Pryor, Reeder, Yeadon, & Hesson-McInnis, 2004). The origin of stigmatization lies in the perception and cognitive representation of people with a deviant condition. These conditions may subsequently trigger perceivers' emotional and behavioral reactions (Dijker & Koomen, 2003, 2007). Deviant conditions may relate to many circumstances, such as ethnicity and sexual preference, but also to illness including AIDS, mental illness, and physical conditions or handicaps.

## Social-Psychological and Sociological Views on Stigma

Dijker and Koomen (2003, 2007) extend attribution theory's explanation of people's tendency to stigmatize ill and handicapped persons. They distinguish

four determinants of stigmatization and three resulting emotional reactions to stigmatization. Bos, Schaalma, and Pryor (2008) apply these to AIDS-related stigma. The four determinants are the perception of contagiousness of the disease, seriousness of the disease, personal responsibility of the patient, and norm-violating behavior of the patient in terms of having the disease. The three emotional reactions are fear, leading to more stigmatization and avoidance; pity, leading to less stigmatization and avoidance; and anger, leading to more stigmatization and avoidance. Perceived contagiousness leads to fear and to avoidance behavior. Perceived seriousness leads to fear but also to pity, which in turn leads to less avoidance. High perceived responsibility leads to anger, but low perceived responsibility to pity. If the disease is associated with perceived norm-violating behavior (drug use, homosexuality), anger increases; if it is not, pity increases. Most reactions to AIDS patients are negative, but some determinants lead to increased pity, resulting in less stigmatization.

Reactions to the stigmatized are not always negative, as Pryor et al. (2004) explain by applying a dual-systems approach (see earlier in this chapter). A stigma may evoke reflexive and reflective reactions. Reflexive reactions are immediate, emotional, and negative; reflective reactions are rule-based, thoughtful, and often more positive. Pryor and colleagues show that initial reactions to stigma are governed by the reflexive system, whereas subsequent reactions are governed by the reflective system. People show more positive reactions, for instance, to a person with an uncontrollable stigma (low responsibility) when they are given time to consider their responses than when they are asked for an immediate response. An emotion such as pity may be derived from a reflective process and may be slower to emerge than an emotion such as fear or anger.

Being stigmatized has a detrimental impact on self-esteem. Persons with a concealable stigma, such as mental illness, are confronted with the dilemma of disclosure. Bos, Kanner, Muris, et al. (2009) show that people with a mental disorder selectively disclose their mental illness. They are open toward their partner and close family members but more closed toward less intimate interaction partners such as acquaintances and colleagues. When people disclosed, the reactions of family were more supportive and less stigmatizing, but the reactions of acquaintances and colleagues were less supportive and more stigmatizing. Selective disclosure seems to optimize social support, but concealing one's stigma may also induce stress. Being stigmatized was negatively related to self-esteem, especially for those who were relatively open about their mental illness. With regard to a different stigma, Meyer (2003) shows that lesbians, gay men, and bisexuals have a higher prevalence of mental disorders than heterosexuals. Meyer offers an explanation in terms of minority stress: stigma, prejudice, and discrimination create a hostile and stressful social environment that causes mental health

problems. The stressors include the experience of prejudice events, expectations of rejection, hiding and concealing, internalized homophobia, and ameliorative coping processes. In a group of people living with HIV/AIDS, Stutterheim, Pryor, Bos et al. (2009) examined specific stigma experiences across a number of social settings. Three manifestations in family settings, namely receiving advice to conceal one's status, being avoided, and being treated with exaggerated kindness, and one manifestation in health care settings, namely awkward social interaction, were most strongly related to psychological distress.

Sociologists point to stereotypes that label human differences with undesirable characteristics that separate "us" from "them" (Link & Phelan, 2001). These labels and stereotypes create status hierarchies and inequalities based on power. Often these inequalities result from institutional discrimination, accumulated institutional practices that work to the disadvantage of stigmatized groups even in the absence of individual discrimination. Stereotypes, status hierarchies, and inequalities reduce a person's life chances. Thus members of a potentially stigmatized group may engage in "label avoidance" so they are not identified with the group and thus escape the negative effects of public stigma (Corrigan & Wassel, 2009).

### How to Reduce Stigmatization

Possible methods for stigma reduction are suggested by Bos and colleagues (2008). Conscious repression of stereotypes may be effective in changing stereotypes but only when people are highly motivated and when they have some experience with suppressing stereotypic thoughts (Monteith, Ashburn-Nardo, Voils, & Czopp, 2002). Otherwise, it may easily lead to rebound effects (Macrae, Bodenhausen, Milne, & Jetten, 1994; Paluck & Green, 2009). Stereotype-inconsistent information is often ineffective as well; stereotype-inconsistent individuals are seen as exceptions that confirm the rule. It may have positive effects when stereotype-disconfirming attributes are present among a large number of group members and when these stereotype-disconfirming attributes do not differ too extremely from people's pre-existing stereotypes (Kunda & Oleson, 1995, 1997). Interpersonal contact with members of a stigmatized group may change stereotypes when the contact is sustained and intimate between members of equal status who share important goals, and supported by the institution within which it occurs (Paluck & Green, 2009; Pettigrew & Tropp, 2006). For instance, HIV-positive speakers in AIDS education decrease fear and stigmatization among the audience (Markham et al., 2000; Paxton, 2002a). Instructions to be empathic, shifting perspective by imagining oneself in the situation of the stigmatized person, have been shown to be effective in reducing stigmatizing reactions (Batson et al., 1997a, 1997b;

Batson, Chang, & Ryan, 2002; Paluck & Green, 2009). In classroom settings, cooperative learning lessons can be engineered so that students must learn from one another to reduce stigmatization (Paluck & Green, 2009). Teachers in the Jigsaw classroom, a cooperative learning technique that reduces racial conflict among school children, give each student one piece of the lesson plan, so that good comprehension requires students to collaborate (Aronson, 2008, 2010).

AIDS-related stigma has many causes and outcomes and thus has to be tackled at different levels: social, political, and economic (Bos et al., 2008; Parker & Aggleton, 2003). Unfortunately, stigma intervention developers often have limited possibilities to establish macro-social changes. Link and Phelan (2001) recognize that stigmatized groups actively use available resources to resist the stigmatizing tendencies. However, if one mechanism is changed, it will be easily replaced by another. An approach to change must, in their view, address the fundamental cause of stigma. It must either change the deeply held attitudes and beliefs of powerful groups that have led to labeling, stereotyping, setting apart, devaluing, and discriminating, or it must change circumstances so as to limit the power of such groups to make their cognitions the dominant ones (see Mahajan et al., 2008).

### **Summary: Theories of Stigma and Discrimination in Problem Analysis and Intervention Methods**

These theories focus on stigmatized groups and people who stigmatize. People who are stigmatized may learn to cope with stigma or resist stigma. People who stigmatize may learn to reduce stigmatizing. Relevant elements in the environment are power differences and institutionalized stigma. Determinants of stigma include perceived contagiousness, severity, responsibility, norm-violation, reflexive and reflective reactions, and power. The main determinant of coping with stigma is self-efficacy. These theories suggest methods for stigma reduction: stereotype-inconsistent information, interpersonal contact, empathy training, cooperative learning, conscious regulation of impulsive stereotyping and prejudice; methods for reducing power differences.

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### **Diffusion of Innovations Theory (DIT)**

An innovation is an idea, practice, or product that is new to the adopter, which may be an individual or an organization (Oldenburg & Glanz, 2008). Healthy behavior, for example, physical activity, cessation of smoking, and use of contraceptives, may be innovations for individuals. Health promotion programs to encourage these behaviors may be innovations in an organization. For example, patient self-management programs may be an innovation in an

organization because they change the power relationship between patients and providers (Mullen & Mullen, 1983). For many years Rogers (2003) has studied the process of diffusion, beginning with a focus on individual adopters of new technology. Rogers's individual model is useful for health education because it describes the decision-making process not only of individuals but also of change agents and program implementers.

Diffusion is seen as happening in phases. The most often used distinction in health promotion is between dissemination, adoption, implementation, and maintenance (Wiecha et al., 2004):

- **Dissemination:** the planned systematic efforts designed to make a program or innovation more widely available, with diffusion as the result
- **Adoption:** uptake and commitment to initiate the program or innovation by the target audience
- **Implementation:** the active planned efforts to implement an innovation within a defined setting
- **Maintenance, sustainability, and institutionalization:** the ongoing use of an intervention after initial resources are expended; incorporation of the program into the routines of an organization.

### Characteristics of Adopters and Innovations

Of course, potential adopters can decide not to adopt an innovation. This decision can be either an active process or simply a passive failure to become familiar with the innovation and to decide. Classic diffusion theory has dealt with characteristics of both adopters and innovations. Adopters adopt at different times following the introduction of the innovation into their social system; and the population can be segmented into innovators, early adopters, early majority, late majority, and laggards, based on the point at which they adopt the innovation. Rogers (2003) has described the process of adoption as a normal, bell-shaped distribution that places majority adopters within one standard deviation on either side of the mean of the curve, early adopters and laggards two standard deviations away, and innovators three standard deviations away. These categories of adopters have been shown to have different characteristics: innovators are venturesome; early adopters are opinion leaders; early majority are deliberators; late majority are skeptical; and the laggards are traditional.

Innovations are often communicated through two different channels: media and interpersonal communication. Initially, media increase awareness of the innovation. As people hear about the innovation and begin to adopt it, they talk with others about their interest and experience. The interpersonal channel thus becomes more important as more members of the population adopt the innovation. More potent outreach and incentives are needed for late adopters

and laggards, who have not adopted even though the innovation has been communicated through the media and the majority of members of the population have adopted the innovation. Thus, for intervention planning, it is important to know the adopter category (Green, Gottlieb, & Parcel, 1991; Rogers, 2003).

SCT provides explanations of the psychological mechanisms by which diffusion occurs (Bandura, 1997). For people to adopt, implement, and maintain a new behavior, they must be aware of the innovation, hold positive outcome expectations and expectancies for it, and have sufficient self-efficacy and behavioral capability for both adoption and implementation. Adolescents adopting condom use, for example, must know that condoms are available, expect that condoms help prevent HIV and STIs, and have positive self-efficacy expectations about talking to their partner about condoms and about using condoms adequately. In Chapter Three we discuss adoption, implementation, and sustainability at the organizational and community levels, and in Chapter Eight we focus on diffusion of health promotion programs.

Also important in the consideration of interventions to promote diffusion of behavior change are the characteristics of innovations (Oldenburg & Glanz, 2008; Rogers, 2003). These characteristics are the potential adopters' perceptions of what the innovation is like. They include the following:

- Relative advantage of the innovation compared with what is being used
- Compatibility with the intended adopters' current behavior
- Complexity
- Observability of the results
- Impact on social relations
- Reversibility or ease of discontinuation
- Communicability
- Required time
- Risk and uncertainty
- Required commitment
- Ability to be modified

Each of these characteristics of an innovation must be considered as either a predictor of or a barrier to adoption and implementation, both in innovation design and in the creation of an intervention to aid diffusion.

Diffusion of Innovations Theory suggests methods and applications to influence the determinants and accomplish the performance objectives for adoption, implementation, and sustainability of new behavior (Rogers, 2003). Communication within the community about the innovation is essential for the diffusion process; the health promoter will want to stimulate communication and mobilize social support for the innovation. One effective method is to speed this

process by using the mass media to communicate the stories of people who have been successful in adopting the new behavior. These early adopters then serve as role models for the early majority in the target community, and the early majority serves as models for the late majority. One way to do this is through behavioral journalism (McAlister, 1995; van Empelen et al., 2003). Combining DIT with SCT, behavioral journalism includes the use of appropriate role-model stories (for example, those of early adopters) based on authentic interviews with the target group and the use of mass media and networks within the community to distribute those role-model stories to the target population (for example, the early majority).

### Summary: Diffusion of Innovations Theory in Problem Analysis and Intervention Methods

Intervention groups can be distinguished by adopter category, such as innovators, early adopters, early majority, late majority, and laggards. Relevant performance objectives are adoption, implementation, and sustainability of the new behavior. DIT may be applied to any behavior that is new to the person: at-risk individuals, environmental agents, or program adopters. Determinants include the characteristics of adopters, such as being venturesome individuals, opinion leaders, deliberators, skeptical, and traditional, and the characteristics of the innovation, such as relative advantage, compatibility, complexity, observability, impact on social relations, reversibility, communicability, time, risk and uncertainty, commitment, and ability to be modified. Methods are increasing the rate of diffusion by linkage (participation), persuasive communication about the innovation, mobilizing social support, and modeling.

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## Summary

Chapter Two describes an ecological way of analyzing health problems and their solutions and presents theories that are applicable to health education and promotion problems and solutions at the individual behavior level. Chapter Two reviews behavior-oriented theories: theories in which understanding and changing human behavior are the major processes of interest.

The health educator can look to theory for help with describing the at-risk groups and environmental agents, understanding the health-promoting behaviors, describing possible determinants of both risky and healthful behavior, and finding methods to promote change. In this chapter the authors encourage planners to break away from their habitual approaches of using single theories, and rather use a variety of theories.

In this chapter, we present brief reviews of selected theories that are often applied in health promotion, including learning theories, theories of information processing, Health Belief Model; Protection Motivation Theory and Extended Parallel Process Model; Theories of Reasoned Action, Planned Behavior, and the Integrated Behavioral Model; Goal-Setting Theory; theories of goal-directed behavior; theories of automatic behavior, impulsive behavior, and habits; Transtheoretical Model of Behavior Change, Precaution Adoption Process Model and risk communication; Attribution Theory and relapse prevention; Persuasive Communication Matrix; Elaboration Likelihood Model; theories of self-regulation; and Social Cognitive Theory.

A description of each theory is followed by a summary of the theory's contribution to our understanding of intervention groups, behaviors, environments, determinants, and methods.

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## Discussion Questions and Learning Activities

1. List five Intervention Mapping tasks that can make use of theory for program planning.
2. Describe what is meant by an eclectic, or problem-focused, approach to theory and explain why this approach is useful in planning health promotion programs.
3. Select a theory that explains behavior at the individual level and describe how the theory could be used to understand or predict behavior at the organizational, community, or societal levels.
4. Describe eight variables that are considered important determinants of behavior across five different theories. Which variables are considered necessary and sufficient to explain behavior?
5. Describe a method from Social Cognitive Theory that can be used to improve self-efficacy for changing a behavior.
6. Sometimes health promotion campaigns use sport heroes as role models to influence people to practice a health behavior (such as eating fruits and vegetables) or to not do a health risk behavior (such as not using drugs). Use Social Cognitive Theory to explain why sport heroes may not be the best role models to influence a change in health-related behavior for most community members.
7. When considering the Elaboration Likelihood Model, give examples of what that theory says about effective ways to stimulate central processing of information.
8. List ways to reduce stigma. How much evidence is there for each of these methods?

# ENVIRONMENT-ORIENTED THEORIES

## LEARNING OBJECTIVES

- Identify theories to describe environmental conditions that influence behavior and health
- Identify potential environmental agents whose role behavior influences the environmental conditions
- Describe determinants of the behavior of the environmental agents and theoretical methods to change these behaviors
- Explain the differences in intervention methods due to role and power at higher ecological levels of the environment

The purpose of this chapter is to identify environment-oriented theories and models that are useful for planning health promotion interventions. We first discuss how to describe and select environmental conditions to be changed, and then we suggest how to change these conditions. The theories and models are organized by environmental level: interpersonal, organizational, community, and societal.

As we discussed in the previous chapters, the individual is embedded within social networks, organizations, community, and society; and each lower level is embedded within higher levels. A facilitating environment that makes the health-promoting behavior the easiest behavior to perform (Milio, 1981) is key to a change in the behavior of the at-risk population, as well as to a change of environmental conditions. Examples of environmental conditions include social influences (such as norms, social support, and reinforcement) and structural influences (such as access to resources, organizational climate, and policies). Barriers to performing a health behavior are often structural, such as lack of health

insurance, inconvenient clinic hours, lack of transportation, high-fat cafeteria foods, high cost of healthy foods, intense advertising of cigarettes and alcohol, and unsafe neighborhoods for jogging or walking.

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## Perspectives

In this section, we discuss our logic model for the relations among theoretical methods, determinants, agents, environmental conditions, and health as they relate to environmental change and the role of power in influencing environmental change.

### Model for Change of Environmental Conditions

Figure 2.1, the logic model for the relationships among methods, determinants, behaviors, environmental conditions, and health that we introduced in Chapter Two, shows the environmental path through the environmental agent. The environmental condition is a state of a given environment that influences health either directly or through behavior. The accessibility of hiking and bicycling trails, for example, is an environmental condition that may facilitate physical activity. The presence of toxic agents in the air acts directly on health. For each environmental condition, human agents behave in ways that influence the existence or intensity of the environmental condition. A city council allocates money to build hiking and bicycling trails, and Congress may authorize money for use by cities to build such trails. Members of city councils and federal legislators are environmental agents in this case, and their respective behaviors are proposing and voting to allocate funds. Note that agents and actions at different levels are directed at the same environmental condition in this example. Working to influence change at multiple ecological levels is synergistic in producing and sustaining changes in environmental conditions.

Once the agents and their behaviors have been identified, the planner can select determinants and methods to change them. In Chapter Two, we presented theoretical constructs that described determinants for behavior and theoretical methods to change specific determinants. These constructs and methods apply to behavior of both the at-risk population and the environmental agent. Positive outcome expectations may influence a legislator to vote to allocate funds (for example, “If I vote to allocate funds for trails, people in my district will have more opportunities to exercise”), as well as to influence the at-risk population to jog (for example, “If I jog, I will reduce my level of stress”). Similarly, persuasive communication is a method to influence the outcome expectations of both the

population at risk and the environmental agents, the joggers and the legislators. Thus, theories from both Chapters Two and Three are needed as the health promoter plans for change in environmental conditions.

However, we realize that this perspective does not fully capture the process of collective action. In this initial presentation of the behavior of environmental agents, we have not yet emphasized how these behaviors occur as part of a collective (such as a legislative body, work site, or social network) or how these collectives are systems in their own right with their own regulatory processes. In a collective, the whole is greater than the sum of its parts. Clearly, a single legislator's vote does not lead to passage of a law. Law making is a complex process, and much goes on behind the scenes. For example, in the United States, a powerful Speaker of the House sometimes assigns the bills to committees in which they will die; key committee chairs schedule hostile hearings; senators make compromise deals in the construction of bills; opposition party members add fatal amendments; and political party leaders bring their legislators' votes in line.

In this chapter we describe organizational, community, and social change methods that rely on the power and authority vested in organizations, associations of citizens, and government. We examine the methods and practical applications to address collective action at these higher ecological levels. For example, a health promotion intervention might influence the legislature to pass a law limiting minors' access to cigarettes; or influence a company to go tobacco free; or a social network to support a first-time mother in quitting cigarettes. These intervention examples have a direct influence on at-risk populations. Interventions may influence the at-risk population indirectly as well (Kok, Gottlieb, Commers, & Smerecnik, 2008). For example, a legislature might pass a law that companies must reduce emissions of pollutants, which, in turn, influences the environment of the at-risk population.

When health educators seek to address these upper ecological levels, they often find general methods for community organization and organizational development, but they provide little guidance on ways to engage in the process. However, through an analysis of interviews with health promotion researchers and professionals in the United States and the Netherlands, we discovered that these higher level methods are frequently bundles of lower level methods (Environments & Health, n.d.a; Gottlieb, Kok, & Smerecnik, 2010). For example, advocacy includes the methods of persuasion, raising awareness, informing, social comparison, networking, participation and media exposure. In this chapter, we undertake a careful review of methods and practical applications that builds on our earlier discussion of the use of individual-level determinants applied to persons in specific roles within social systems, for example, a legislator, school principal, or union official.

**FIGURE 3.1** Logic Model for Relationships Between Methods, Determinants, Behaviors, Environmental Conditions, and Health

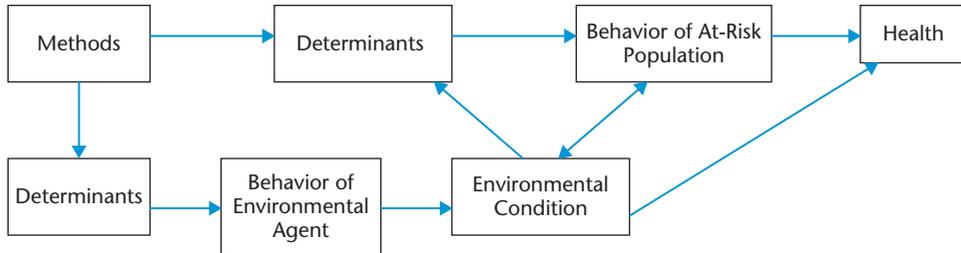


Figure 3.1 provides an overview of the process by which methods and practical applications influence agents to produce the environmental outcomes that influence individual behavior. The environmental outcomes can also be considered as ends in themselves; that is, the particular system (for example, a worksite) has healthy characteristics, in which case the end goal of the population's health may not be considered. However, in general, planners assume, either explicitly or implicitly, that the end result is population health.

### Looking at Healthy Environments as Outcomes

Figure 3.1 considers environmental conditions as they relate to health directly or through the path of behavior. Others have looked at the environment as a desired outcome, irrespective of individual health outcomes. Since the 1986 Ottawa Charter, the World Health Organization has focused on healthy settings where people “learn, work, play and love” (World Health Organization, 1986). Healthy settings include nations, cities, communities, workplaces, hospitals, prisons, schools, and universities (Whitelaw et al., 2001). The settings approach is rooted in social ecology and systems thinking (Dooris, 2006; Dooris, 2009; Green, Kreuter, Deeds, & Partridge, 1980; Green, Poland, & Rootman, 2000; Nutbeam, 1998; Nutbeam & Harris, 1995; Paton, Sengupta, & Hassan, 2005; Whitelaw et al., 2001; World Health Organization, 1986). For example, a healthy city could be characterized as one that has health-promoting policies and characteristics across all sectors (such as a large greenbelt, low population density, recreation facilities, and low unemployment). In addition, a healthy city has explicit political commitment to promote health at the highest levels, and investment in formal and informal networking and cooperation, focusing on equity and building personal and social competence to deal with issues of importance to the community (Awofeso, 2003; Duhl, 1990; Duhl, 2004; Haglund, Finer, Tillgren, & Pettersson, 1996; Nutbeam & Harris, 1995).

A healthy worksite would have healthy policies, a health-promoting culture, commitments to self-knowledge and development, respect for individual differences, jobs that foster responsibility and autonomy, safe and healthy working environments, and equitable salaries and promotion opportunities. Health-promoting workplaces balance a focus on customer expectations and organizational targets with a focus on employees' skills and health. This focus extends beyond wellness programs to include broader organizational and environmental issues (Chu et al., 2000; Paton et al., 2005; Rosen, 1992).

A healthy school would have a coherent, sequential health and physical education curriculum, teacher training, and an ethos that supports student and staff well-being. It would also have health-promoting policies and practices including those of nutrition and food services, comprehensive health services, counseling, social services, and school-community partnerships, all established with the principles of democracy and equity (Allensworth, 1997; Burgher, Rasmussen, & Rivett, 1999; Mukoma & Flisher, 2004; Rowling, 1996).

If one starts with the endpoint of environment as an outcome, one uses the same steps of identifying the environmental agents and their behavior and actions, the determinants of the agents' behavior, and methods to change those behaviors. In health promotion situations in which the environmental condition is the outcome of interest, we suggest that the links through behavior to health and to health directly as well as the impact on quality of life be considered in the needs assessment (Step 1) and also in the evaluation (Step 6). This will ensure program justification at both the outset and in the summative evaluation.

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## General Environment-Oriented Theories

### Systems Theory

We begin our discussion of environment-oriented theories with a description of systems theory. There are many branches of systems theory, including general systems theory, complexity science, nonlinear dynamics, cybernetics, computational simulation, game theory, and ecology. All share the commonality of systems thinking, a perspective for understanding how things work, "a worldview that balances part and whole and focuses on complex interrelationships and patterns from multiple perspectives" (National Cancer Institute, 2007, p. 41). Systems thinking bridges theory and practice and provides an analytic strategy to understand complex systems and to intervene on them (National Cancer Institute, 2007). In this regard it is both a theory of the problem and a theory of action.

Through the lens of systems theory, humans are complex adaptive systems made up of other complex adaptive systems (such as organs, cells and so on) and are embedded within other complex adaptive systems (such as dyads, groups, organizations, communities, societies). Complex adaptive systems (CASs) demonstrate a number of key characteristics listed below (see Anderson, 1983; Anderson, Crabtree, Steele, & McDaniel, 2005; Goodson, 2009; Goodson, Gottlieb, & Smith, 1999; McDaniel, 1997; McDaniel, Jordan, & Fleeman, 2003; National Cancer Institute, 2007; Zimmerman, Lindberg, & Plsek, 1998).

- Agents, including people and human processes, have the capacity to exchange information with their environment and adjust their behavior accordingly. Diversity of agents increases the likelihood of novel behavior and is necessary for the sustainability of CASs.
- Agents interact and exchange information, creating connections among all agents in the system. Although agents interact locally and no single agent knows the pattern as a whole, global patterns and complexity result as information is spread through the system.
- Interactions are nonlinear; small “causes” can have large effects, and vice versa, large “causes” can have small effects.
- Because of sensitivity to initial conditions, small differences in initial conditions can lead to exponential differences in future conditions.
- CASs are self-organizing as people mutually adjust their behaviors to meet changing internal and external environmental demands. They adapt and evolve over time as spontaneous patterns emerge at the macro level from collective interactions of independent agents at the micro level.
- CASs are open systems, and agents interact with the environment beyond the system’s boundaries, so that the CAS and systems around it or in which it is embedded coevolve.

Naaldenberg and colleagues (2009) have pointed to the importance of structure, meaning, resources, and power relations as being key to understanding social systems (be they groups, organizations, communities, or societies). Structure includes the agents, their activities, and their relationships. Individuals act on the basis of the meanings that actions or issues have for them and create meaning through interactions with others via an interpretive process that is highly dependent on context. Agents bring resources to the system, and whether they possess or need resources influences power relationships within the system. In the next section we will discuss power as an emergent quality of human interactions.

As we will see throughout this chapter, the health promoter addresses structure, meaning, resources, and power in designing system change efforts.

Foster-Fishman and colleagues (2007) distinguish deep and apparent, that is, visible, elements of a system. Norms, including attitudes, values, and beliefs, are deep elements of a system and are often found to be root causes of system problems. Regulatory processes—such as policies and procedures; available resources; and dominant operations, especially power and decision-making processes and structures—are apparent elements and are also key to change. These elements are interdependent, emerging from interaction and sense-making among system members.

The systems change process has been described using the following principles: (1) planning a collective vision, (2) purposeful organizing and participatory self-organizing, (3) facilitating mission leadership, and (4) evaluating and systems learning. Some techniques, for example, brainstorming, nominal group technique, focus groups, concept-mapping, structured conceptualization, and future-search conferences, are useful for all principles. Others, such as community-based participatory research, participatory action research, empowerment evaluation, appreciative inquiry, total quality management, and the CDC evaluation framework, are appropriate primarily for evaluating and systems learning (National Cancer Institute, 2007).

As noted above, successful systems changes influence multiple elements and relationships within a system, often at several levels. For example, programs to influence healthier diets for children in school focus on the beliefs and behaviors of children and their parents; the purchase of healthful food by the school food service; the cafeteria workers' food preparation methods; and district, city, and perhaps other jurisdictional policy regarding school lunch and vending machines at school. An intervention to change a policy influencing health may not work by itself, depending on whether other elements that influence the policy are aligned with the policy intervention, and whether the policy's influence on the health outcome is facilitated by other elements that act concurrently on that outcome.

Systems thinking is useful for the dissemination of health promotion programs in addition to their development. The efficacy testing of health promotion is done in highly controlled environments. When these evidence-based programs are disseminated to community settings with a unique context, that is, placed into a complex adaptive system, it is unlikely that implementation will look the same and that the same results will be obtained. Systems thinking offers a framework to understand these issues and to change the system as needed to ensure adoption and implementation that maintain core elements and to ensure sustainability (Green et al., 1980; Green & Glasgow, 2006).

**Summary: Systems Theory in Problem Analysis and Intervention.** Systems theory is used to define and address all levels of the environment as interrelated

social systems. There are environmental agents at each level who can engage in activities to change the system to facilitate health. The environmental influences of these agents' behavior can include norms, regulatory processes and resources, whereas methods address social change broadly and include dialogue, planning, organizing, evaluation, and feedback.

## Theories of Power

Power has been defined as the probability that an individual or group will determine what another individual or group will do even if it is contrary to the latter's interests (Orum, 1988). The seminal work of sociologist Max Weber (1947) defined three sources of power: authority, charisma, and legitimacy. Social psychologists have studied power as an emergent property of relationships.

Each of the ecological levels has different power structures and methods for the change of social influence. In small groups, social influence occurs through interaction and through leadership. The leadership might be shared by members of the group, given over voluntarily to an individual leader by the group, or vested in an individual from a higher authority. At the organization level, the power of authority comes through the organizational hierarchical structure, that is, who is above whom in the organizational chart. Informal power arises from an individual's charisma, from others' satisfaction with a person's previous leadership activities, or from legitimacy, such as being elected as a chairperson or born into a family business. At the community and societal levels, power is "the social capacity to make binding decisions that have major consequences over the directions in which a society moves" (Orum, 1988, p. 402).

Turner (2005) has developed the three process theory of power that views power as an emergent quality of human social relationships. In this theory, power is the capacity to exert one's will through other people—that is, using either persuasion or control, getting people to do something they are not interested in doing. Control in turn is subdivided into authority, in which group norms have given someone the right to control, or coercion, the attempt to control others against their will.

Group identity can unify people so that they influence each other, act as a coordinated body, and thus gain the power of collective action. Social change occurs when a subordinate group develops a distinct identity and its own goals and beliefs and can challenge the power of the dominant group. Persuasion, social influence, and coercion, methods discussed in Chapter Two, are the chief mechanisms for obtaining power, both individually and as a group.

The role of power differs in the three types of social change defined by J. Rothman (2004) and discussed in the section on community. In locality development the democratic town hall process distributes power equally; in

social planning the power rests with experts; and in social action, disenfranchised people wrest power from the official power structure. Formal leadership in a community rests with elected and appointed officials to whom community members have given governing authority. This authority is distributed to the government agencies that carry out local, state, or provincial and national programs. Private organizations, because of their economic power (providing jobs and products), may have even more influence over a community.

Minkler, Wallerstein, and colleagues (2004, 2008) have distinguished between the concepts of *power with* and *power over*, using a feminist perspective that views power as a limitless resource. They suggest that community building and capacity building are models of *power with*, whereas empowerment-oriented social action is a model of challenging *power over*. These two types of community organization are argued to lead to community competence, leadership development, and critical awareness.

McCullum, Pelletier, Barr, Wilkins, and Habicht (2004) used a three-dimensional framework of power that built on core sociological perspectives. The first dimension, participation in decision making, is at first glance simply a determination of whether community members are at the table. However, the other two dimensions show processes that limit true participation in decision making. In the second dimension, agenda setting, the choice of what issues and decisions are considered has a bias such that values and beliefs of vested interests determine what is discussed. The third dimension, the shaping of perceived needs, is more insidious. Dominant groups in society frame issues by defining the causes of and solutions for identified problems. Powerless groups have been socialized to accept the frames of reference of the dominant groups and institutions, and they may lack awareness of how their ways of looking at the world have been conditioned. Thus, they may adopt values and interests that are not their own but rather those of the dominant group.

Power is the key to creating change at the higher environmental levels. In planning interventions at higher ecological levels, health educators can bring power to play in several ways. They can identify the agent who has the power to carry out the desired change, choose the change method that is most effective given the position of the agent and the form of power the person holds, and use the form of power that will most effectively influence a change agent. In addition, the health promoter must be conscious of the unintended negative effects of power in his or her work with communities, which can reinforce the status quo and lead to oppression of some groups by others (Hawe & Shiell, 2000).

**Summary: Power Theories in Problem Analysis and Intervention.** Power theories are applicable to all environmental levels, and agents at each level with power are able to exert their influence to make environmental changes.

The determinants of an agent's power include authority, charisma, legitimacy, group norms, and group identity. Methods for changing the behavior of others and environmental conditions include persuasion, social influence, coercion, community organizing, and agenda setting.

### Empowerment Theories

Within public health, empowerment has been defined as a “social action process for people to gain mastery over their lives and the lives of their communities” (Minkler, Wallerstein, & Wilson, 2008, p. 294). Empowerment is a multilevel process, focusing on the individual, organizational, and community levels. Empowerment can be viewed as an outcome as well as a process. Empowerment as a process focuses on how to enable people to take power; empowerment as an outcome refers to the consequences of this process. An empowering process may result in empowerment as an outcome, but may also result in other desired outcomes, such as improvement of health, relocation of resources, or policy change (Zimmerman, 1995). Zimmerman (2000b) has compared empowering processes and empowered outcomes at the individual, organizational, and community levels (Table 3.1.). Each level influences and is influenced by empowerment at the other levels.

At the individual level, the results of empowerment are psychological, including increased perception of control over one's destiny, a sense of political efficacy, and motivation to act (Syme, 1988; Zimmerman, 1990). This type of

**Table 3.1 A Comparison of Empowering Processes and Empowered Outcomes across Levels of Analysis**

Level of Analysis	Process (Empowering)	Outcome (Empowered)
Individual	Learning decision making skills Managing resources Working with others	Sense of control Critical awareness Participatory behaviour
Organizational	Opportunities to participate in decision making Shared responsibilities Shared leadership	Effective competition for resources Networking with other organizations Policy influence
Community	Access to resources Open government structure Tolerance for diversity	Coalitions of organizations Pluralistic leadership Social capital

Source: Adapted from “Empowerment Theory: Psychological, Organizational and Community Levels of Analysis” by Zimmerman, M. A. (2000b) in *Handbook of Community Psychology* edited by J. Rappaport & E. Seidman (pp. 43–62). New York: Kluwer Academic/Plenum, p. 47.

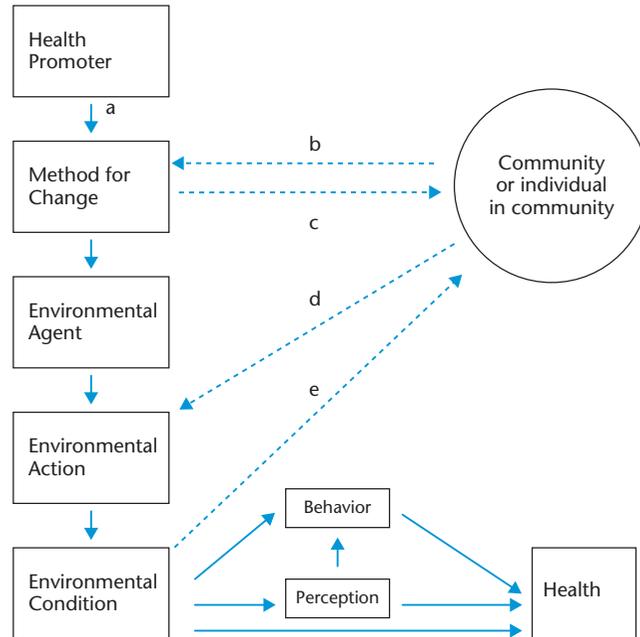
empowerment occurs when people take action to understand their environment critically and to gain power and control through organizational and community involvement (see this chapter's discussion of conscientization and social movements). At the organizational and community levels, empowerment involves collective problem solving, shared leadership and decision making, and accessible government, media, and resources (Zimmerman, 1995, 2000b).

Empowerment at the higher ecological levels is a similar concept to collective efficacy. Defined as "a group's shared belief in its conjoint capabilities to organize and execute the courses of action required to produce given levels of attainments" (Bandura, 1997, p. 477), collective efficacy may be applied to the levels of family, organizations, community, and nation. For example, perceived organizational efficacy could be employees' beliefs that their organization can accomplish its goals. Although related to personal self-efficacy, it is an emergent group-level attribute that is more than the sum of members' perceived personal efficacies. Change in collective efficacy comes through the same mechanisms as change in personal efficacy. The most effective way to enhance a community's collective efficacy is through success at accomplishing a particular goal. A community could experience enhanced efficacy by mounting a successful campaign of lobbying the city council to pass a clean indoor air act. Models of how other communities accomplished similar goals could also enhance efficacy, as might community leaders persuading the community members to take action.

Figure 3.2 extends Figure 3.1 to include the paths by which the health promoter uses methods of change (path a) either to act directly on the environmental agent to influence the environmental condition or to facilitate community empowerment (path b). It also includes the methods by which an empowered community or individuals in a community influence environmental agents to take actions that change environmental conditions (path c) and the paths by which the empowered community may take an environmental action directly (path d). When a community is effective at influencing an agent to take an environmental action or when the community takes that action directly and the environmental condition is changed, we hypothesize that a feedback loop (path e) occurs and results in increased collective empowerment.

In the remainder of this chapter, we discuss theories and provide examples that illuminate environmental change at each ecological level: interpersonal, organizational, community, and society. We present methods by which health promoters facilitate empowerment of social networks, organizations, and communities. These individuals and communities in turn influence the actions that environmental agents take at various levels to create environmental outcomes conducive to health.

**FIGURE 3.2 Model of Environmental Health Etiology and Empowerment**



Source: Adapted with permission from unpublished manuscript *How to change environments for health* by M. Commers, N. H. Gottlieb, & G. Kok, 2005.

**Summary: Empowerment Theories in Problem Analysis and Intervention.**

Empowerment theories address the process by which community members become involved in their communities and take action to gain power and control. Environmental conditions that enable and demonstrate empowerment include collective problem solving, shared leadership and decision making, accessible government, media and resources, collective efficacy. Methods by which community members become empowered include participation in decision making, enactive mastery experiences and feedback, and modeling.

## Interpersonal-Level Theories

Social relationships are the foundation for human existence, and interpersonal-level theories are key to understanding and intervening on relationships. Relationships at the interpersonal level typically include family members, friends, peers, neighbors, associates, and service providers.

## Social Networks and Social Support

A social network is an analytic framework for understanding relationships among members of social systems. Networks are classified as personal, based on the ties an individual has with other persons, or whole network, based on the relationships among a defined group of people. Personal networks are particularly useful for the study of social support. The whole-network approach shows the network in which the personal network is embedded as a larger system, with a view of cliques of individuals and those persons who span the boundaries across networks. Networks can be horizontal (peers) or vertical (hierarchical) and can provide a way to understand bonding, bridging, and linking social capital (to be discussed later) as well as power relationships in organizations (Gottlieb, 1985; Hall & Wellman, 1985; McLeroy, Gottlieb, & Heaney, 2001).

Social networks consist of nodes (individuals, groups, or organizations) that are joined by ties (the relationships among nodes). Community can be understood as networks of networks in which the nodes of the larger network comprise smaller-scale networks. Networks can be defined by their content—whether they are primarily friendship, kinship, sexual, communication, or task-oriented. The network also has a structure, including the number of members, the degree of members' similarity to each other, the way they are connected, and their links to other networks (Heaney & Israel, 2008). An individual can play several roles in a network: a group member, a linking agent, or an isolate with few ties to other network members (Fulk & Boyd, 1991). Linking agents are especially important because, as members of multiple networks, they bring information across network boundaries.

The personal social network provides the structure for a variety of social functions, including social influence, control, undermining, comparison, and support and companionship (Heaney & Israel, 2008). We focus here on social support—the help provided through social relationships and interactions (Heaney & Israel, 2008). The four main types of social support are emotional (provision of empathy, love, trust, and caring), instrumental (provision of tangible aid and services), informational (provision of advice, suggestions, and information), and appraisal (provision of feedback useful for self-reevaluation and affirmation). Social support is a positive social interaction. However, negative interactions and modeling for unhealthy or deviant behaviors also occur in relationships. Health educators will need a comprehensive view of relevant social networks, including both support and undermining, with regard to both development of interventions and design of health outcomes studies (Heaney & Israel, 2008; Uchino, Cacioppo, & Kiecolt-Glaser, 1996; Uchino, 2006).

Interventions can be directed toward different types of social networks and the specific types of social support they provide. Small, dense, geographically

close, intense networks provide emotional and appraisal support. These networks typically do not have access to the larger society or to information outside the network's domain. On the other hand, large, diffuse, and less intense networks provide more informational support and social outreach (McLeroy et al., 2001). Different types of social support are important at different times in the experience of stressors. For example, with the loss of a job, emotional support that the individual is still loved and his or her self is intact is most important at first. Later, the individual needs informational support regarding other job opportunities or possible career changes. Tangible support such as loans, transportation, or child care may also help people when they are job hunting.

The extent and nature of social relationships has been linked to health status in a number of studies and physiological processes related to disease outcomes. We refer the reader to comprehensive reviews on social support and health (Berkman, 1984; Berkman & Glass, 2000; Heaney & Israel, 2008; Hogan, Linden, & Najarian, 2002; Smith & Christakis, 2008; Uchino, 2004, 2006; Uchino et al., 1996). The mechanisms underlying this epidemiological finding have been hypothesized to include modeling and reinforcement of positive health-related behaviors, buffering of the effects of stress on health, and provision of access to resources to cope with stress. Social-structural conditions such as culture, socioeconomic factors, politics, and social change shape social networks. Social networks in turn provide opportunities for social support, norms and social control, social involvement, person-to-person contagion, and access to resources and material goods. For example, distributions of obesity, smoking, eating, exercise, sexually transmitted disease, tuberculosis, suicide, and healthcare seeking have been shown to vary by networks. Health care interventions, such as treatment of a depressed mother, can also influence others in the treated patient's network; in this case, the child (Berkman, 1984; Berkman & Glass, 2000; Smith & Christakis, 2008).

**Social Support Interventions.** Hogan, Linden, and Najarian (2002) conducted a comprehensive review of social support interventions for a variety of issues, including cancer, loneliness, weight loss, substance abuse, surgery, and birth preparation. Studies represented three types of comparisons: group interventions compared to individual interventions; professionally delivered interventions compared to peer-delivered interventions; and interventions targeting network size or perceived support compared to those building social skills to facilitate support. Of the 92 studies with control groups, 83% reported at least some intervention benefits. They found support provided by friends, family members, or peers to be beneficial, especially when the support was reciprocal. Training in social

support skills was particularly useful. These findings held across individual and group interventions, whether they were led by professionals or peers.

Heaney and Israel (2008) identify four types of interventions to increase social support: enhancing existing social network linkages, developing new social network linkages, enhancing networks through the use of indigenous natural helpers and community health workers, and enhancing networks at the community level through participatory problem solving. Interventions may also combine these types of interventions.

The enhancement of existing network linkages can be accomplished by training network members in skills for providing support and by training members of the target group to mobilize and maintain their networks. For example, family members or significant others may be trained to provide support to individuals who are in programs to stop smoking (Cohen & Lichtenstein, 1990; Palmer, Baucom, & McBride, 2000). At the government and society level, legislation can be enacted to support social networks. Examples of such legislation are family leave acts, policies to promote volunteerism, and funding for child and elder care programs (McLeroy et al., 2001). We describe methods for policy change later in this chapter.

The second type of intervention develops new social network linkages through mentor programs, buddy systems, and self-help groups. For example, youth mentoring programs in which at-risk youth are matched with nonfamilial adults have been found to be effective, although the benefits are modest and results mixed (DuBois, Holloway, Valentine, & Cooper, 2002). Buddies have been used in diverse settings, for example, in smoking cessation programs (Park, Tudiver, Schultz, & Campbell, 2004b), for mothers of very preterm infants (Preyde & Ardal, 2003), and in worksite programs (Tessaro et al., 2000). Groups such as Alcoholics Anonymous provide access to new social networks designed to provide cognitive, instrumental, and emotional support for behavioral and life change. Interventions can encourage such networks to reach out to incorporate new members and new information from persons who hold membership in other networks.

Third, indigenous or natural helpers have been employed to enhance networks, particularly around health issues. Natural helpers are community members to whom other persons turn for advice, emotional support, and tangible aid. Often they agree to become a link between the community and the formal service-delivery system. They may include persons who come into contact with many people in their role, such as hairstylists, shopkeepers, and clergy. They may also be community volunteers and people with similar problems (Eng, Rhodes, & Parker, 2009). Recent comprehensive reviews of lay or community health worker

interventions have been conducted by the Cochrane Collaboration (Lewin et al., 2005) and the Agency for Healthcare Research and Quality (Viswanathan et al., 2009). Evidence for the effectiveness of these interventions was found for immunizations, appropriate health care utilization, asthma management, cervical cancer screening, mammography, and improving outcomes for acute respiratory infections and malaria. In addition, Rhodes and colleagues (2007) did a qualitative systematic review of lay health advisor interventions focused on the Hispanic population that included smoking cessation, cardiovascular health behaviors, condom use, and use of protective eyewear among farmworkers. They concluded that the lay health advisor approach is effective with this population. In Chapter Eleven (on the book's instructor Website), Fernández and colleagues describe the work of lay health workers, called *promotoras*, in the promotion of breast and cervical cancer screening among migrant farmworkers.

Rhodes and colleagues (2007) found six roles in their review of lay health advisor interventions in Hispanic communities. The advisors supported participant recruitment and data collection, served as health advisors and referral sources, distributed materials, served as role models, advocated on behalf of community members and served as co-researchers in participatory research models. Lay health advisors work at the individual, organizational, and community levels to facilitate improved health practices, improved coordination of agency services, and improved community competence (Eng et al., 2009).

Finally, networks can be enhanced at the community level through participatory problem-solving processes. In the Health, Opportunities, Problem-Solving and Empowerment (HOPE) Project, young Cambodian girls and women living in Long Beach, California, participated in training sessions, team building, and dialogue (Cheatham-Rojas & Shen, 2008) based on the work of Paulo Freire (1973a, 1973b). They developed a program called Community Forum on School Safety that led to establishment of a community advisory board to work on issues of sexual harassment in the Long Beach schools (Cheatham-Rojas & Shen, 2008). Another example is the Healthy Native Communities Fellowship, a technologically innovative and culturally grounded health promotion project that brings together community teams to build an “intentional family” and facilitate change at both the individual and community levels (Jones et al., 2008).

**Summary: Social Networks and Social Support Theories in Problem Analysis and Intervention Methods.** Social network and social support theories address the environmental condition of social networks that provide emotional, instrumental, informational, and appraisal support as appropriate for the context. Environmental agents providing this support or mobilizing support from individuals in their own networks are the network members, including lay

health advisors. Determinants of the agents' support provision and mobilization behaviors include knowledge, beliefs and attitudes, self-efficacy and skills, facilitation of policies and culture, availability of self-help groups, and network characteristics of reciprocity, intensity, complexity, density, and homogeneity. Methods for change of these behaviors include enhancement of existing networks by skills training for providing and mobilizing support, use of lay health workers, teaching of participatory problem solving (see methods for community organization later in this chapter), and linking of members to new networks (for example, mentor programs, buddy systems, and self-help groups).

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## Organizational-Level Theories

Health promotion practitioners sometimes work in organizations with the opportunity to serve as internal change agents. They also work as external change agents with community groups seeking to make change in organizations. In this section we introduce several theories explaining organizational change and present methods to stimulate changes in policy, culture, and other environmental conditions at the organizational level. These theories can also be used to enable the adoption, implementation, and sustainability of health promotion interventions in organizations. Understanding key aspects of organizations and of organizational change is critical to the health promoter's ability to influence change at the organizational level.

### Organizational Change Theories

An organization is a tool used by people to coordinate their actions to accomplish an overriding goal. Organizations take inputs from the environment, such as human input, raw materials, information, financial and social capital, and transform them to produce goods, services, and value for customers, shareholders, and other stakeholders in the environment. They can be for-profit, not-for-profit, governmental or non-governmental, publicly held or privately held. All organizations, however, attempt to manage their increasingly complex environments to obtain needed resources and to release valued outputs into the environment. The environment, including economic, competitive, technological, political, environmental, demographic, cultural and social forces, is constantly changing, and organizations must change in response to maintain their effectiveness and survive. Managers design a structure and culture to match the environment, choose technology to convert inputs to outputs, and develop strategy to guide the organization to create value. This planned organizational change can be incremental, using methods such as quality improvement and

flexible workgroups, or revolutionary, involving methods such as restructuring, reengineering, and innovation (Boonstra, 2004; Jones, Baggott, & Allsop, 2004).

Planned change efforts build on Lewin's (1947) seminal work on Force Field Analysis. He proposed that organizations were in a state of quasi-stationary equilibrium in which two sets of forces—those driving for change and those striving for the status quo—were approximately equal. For change to occur, the forces driving for change could increase, or the forces maintaining the status quo could decrease, or both could occur. Lewin advised that decreasing the status quo forces was less disruptive and more effective than was increasing forces for change. He described the change process as having three phases: unfreezing-moving-refreezing. Unfreezing reduces the forces that maintain the organization's current behavior, often by showing that the behaviors or conditions that organizational members desire are different from those they currently exhibit. During the moving phase, changes in organizational structures and processes lead to new behaviors, values, and attitudes. In refreezing, the organization puts in place norms, policies, and structures that support the new state of equilibrium (Cummings & Worley, 2009; Lewin, 1947). As a caveat, it should be noted that although planned change is described as a rationally controlled and orderly process, in practice it can be messy and unpredictable!

Weick and Quinn (1999) make an important distinction between episodic and continuous change. Episodic change is planned, infrequent, and intentional. Continuous change, on the other hand, views the organization as unstable, with constant modifications in work processes and social practice to meet daily contingencies.

From an intervention standpoint, the change sequence in a continuous change organization is freezing-rebalancing-unfreezing. Freezing is making the processes within the organization visible and describing the patterns. Rebalancing involves the reinterpretation, relabeling, and resequencing of patterns, so that there are fewer blockages and barriers to them. Leaders do this by modeling the change and inspiring others with their ideas. The next step in the cycle is unfreezing, the resumption of improvisation and learning as the organization continues to meet daily contingencies. The change agent in continuous change is a sense maker who redirects change as opposed to the episodic model's prime mover who creates change (Weick & Quinn, 1999). Learning replaces control in this model. This view is consonant with a view of the organization as a complex adaptive system that is self-organizing and in a mutual adjustment process with its environment. Effective managers deal with this unexpectedness by observing, learning in the moment, creating meaning through dialogue, reflecting on experiences, and constructing explanations (McDaniel, 1997). Planned change is more effective in stable than unstable environments.

**Changing Organizational Culture.** Changing organizational culture is an example of the continuous change model. Schein (2004) defines culture as a pattern of basic assumptions invented, discovered, or developed by a given group as it learns to cope with its problems of external adaptation and internal integration. For the pattern to be “culture,” it must have worked well enough to be considered valid and therefore taught to new members as the way to perceive, think, and feel. Organizational interventions are most effective when they are compatible with the culture, so it is important to understand the culture of the organization in which a health promotion program is being developed and implemented.

It is possible to facilitate changes in organizational culture, although this process is slow and evolutionary. Culture changes with the group’s learning and experience over time, as organizational members react to environmental shifts and crises within the organization. Schein (2004) describes the importance of leaders’ behavior in shaping organizational culture: what leaders pay attention to; how they react to critical incidents; how they model for and coach others; and what criteria they set for allocating rewards and recruiting and promoting personnel. As seen in Table 3.2, Schein refers to leader behaviors as primary culture-embedding mechanisms. The culture is reinforced by organizational design, structure, and formal statements. In a young organization, leaders create the culture, and the organizational systems reinforce it. In mature organizations, the organizational systems become primary and constrain future leaders’ behavior.

**Table 3.2 Culture-Embedding Mechanisms**

Primary Embedding Mechanisms	Secondary Articulation and Reinforcement Mechanisms
<ul style="list-style-type: none"> <li>• What leaders pay attention to, measure, and control on a regular basis</li> <li>• How leaders react to critical incidents and organizational crises</li> <li>• Observed criteria by which leaders allocate scarce resources</li> <li>• Deliberate role modeling, teaching, and coaching</li> <li>• Observed criteria by which leaders allocate rewards and status</li> <li>• Observed criteria by which leaders recruit, select, promote, retire, and excommunicate organizational members</li> </ul>	<ul style="list-style-type: none"> <li>• Organization design and structure</li> <li>• Organizational systems and procedures</li> <li>• Design of physical space, facades, and buildings</li> <li>• Stories, legends, and myths about people and events</li> <li>• Formal statements of organizational philosophy, values, and creed</li> </ul>

Source: Reprinted with permission from Schein, E. H. (2004). *Organizational culture and leadership* (3rd. ed.). San Francisco: Jossey-Bass, p. 246.

**Organizational Development.** Organizational development, an important method of organizational change, has been defined as “a system-wide application and transfer of behavioral science knowledge to the planned development, improvement and reinforcement of the strategies, structures, and processes that lead to organizational effectiveness” (Cummings & Worley, 2009, pp. 1–2). Growing out of human relations research, it supports the values of human potential, participation, and development.

Steps from contemporary organizational development models can be placed within the planned change framework (Brager & Holloway, 1978; Butterfoss, Kegler, & Francisco, 2008; Schein, 2004). Diagnosis, often conducted using surveys, is equated with Lewin’s unfreezing (1947). It includes evaluation of an organization’s mission, goals, policies, procedures, structures, technologies, and physical setting; social and psychological factors; desired outcomes; and readiness to take action. Action planning is the selection of change strategies. Criteria for selection include the organization’s readiness to adopt a particular strategy, the availability of leverage points on which to intervene, and the organizational development consultant’s skill in conducting the intervention. Similar to the process that Lewin (1947) called moving, intervention includes the facilitation of problem identification and solving with members of the organization. Group development activities, management building, and structural redesign are among the other intervention elements that can be carried out. Evaluation assesses the planned change effort and the determination of whether additional efforts are needed. Institutionalization, the final step, refreezes the supports for the changes through written plans, goals, job descriptions, and budgets.

Methods used in organizational development to deal with resistance to change include communication, participation and empowerment, facilitation, bargaining and negotiation. In cases where these methods have not worked, organizations may resort to manipulation and coercion. Organizational development to promote change has included counseling, sensitivity training, and process consultation at the individual level; team building and intergroup training at the group level; and organizational confrontation meetings at the level of the whole organization (Jones et al., 2004).

**Stage Theory of Organizational Change/Diffusion of Innovation.** Stage theory refers to the idea that organizations move through a series of stages as they change and that strategies to promote change must be matched to the stage. Lewin’s model discussed earlier provided the foundation to this theory, and later theorists, such as Everett Rogers (see diffusion theory) and others have worked in this tradition. In their work on the establishment of alcohol policy

and programs in U.S. government agencies, Beyer and Trice (1978) developed a stage theory of organization change that has been used in health education practice, particularly in the adoption of organizational innovations such as health promotion interventions (Butterfoss et al., 2008). The process of adoption of innovations at the organizational level is more complex than the process at the individual level. Organizational-level factors, such as goals, authority structure, roles, rules and regulations, and informal norms and relationships, must be taken into account (Rogers, 1983a). However, there are similarities to Diffusion of Innovations theory applied to individuals (discussed in Chapter Two). For example, both media and interpersonal channels are used for communicating the innovation to organizational members; organizations can be categorized according to their readiness to adopt; and characteristics of the innovation, such as relative advantage, are important.

In stage theory, an organization is theorized to move sequentially and linearly through seven stages as it adopts and institutionalizes a health promotion innovation. Outside consultants may provide technical assistance to this process. These stages, which are listed below, are similar to those described by Rogers: agenda setting, matching, redefining and restructuring, clarifying and routinizing (1983a).

1. Sensing unsatisfied demands on the system, noting a problem and bringing it to the surface
2. Searching for possible responses, seeking solutions to the problem
3. Evaluating alternatives, judging potential solutions
4. Deciding to adopt a course of action, selecting one of a number of alternative responses
5. Initiating action within the system, which requires policy changes and resources necessary for implementation
6. Implementing the change, which includes putting the innovation into practice and usually requires some organization members to change their work behaviors and relationships
7. Institutionalizing the change by including the change in strategic plans, job descriptions, and budgets so that it is a routine part of organizational operations (Butterfoss et al., 2008)

The key agents involved in change have been found to differ from stage to stage (Huberman & Miles, 1984). Senior-level administrators with political skills are important in the early stages, when a problem is recognized and made public, alternative solutions are discussed, and a choice is made and initiated within the organization. These administrators are also important at the institutionalization

stage because they have the power to incorporate the changes into organizational structure and routines. Midlevel administrators are active during the adoption and early implementation stages, when administrative skills are critical in order to introduce procedures and provide training on the innovation. The people who need to make changes in their practice are the focus of the implementation process. Examples are teachers involved in curriculum innovation or food service workers involved in an innovation in preparing cafeteria food. The focus here is on people's professional and technical skills. Of course, because the agents and behaviors are different at different stages, the determinants change as well. For example, at the decision stage, organizational leaders might be persuaded by an intervention's characteristics, whereas implementation might be determined to a great extent by the skills of the implementers and by feedback and reinforcement to the implementers.

Institutionalization focuses on the integration of the innovation into organization functions and routines so that it survives beyond the presence of the original program funding, adopters, or program champions (Goodman, Steckler, & Kegler, 1997; Goodman & Steckler, 1987, 1989; Pluye, Potvin, Denis, & Pelletier, 2004; Shediach-Rizkallah & Bone, 1998). Institutionalization of an intervention requires mechanisms for becoming embedded in the organization's routines, for example, in the continuing allocation of resources (funding, personnel, materials, facilities, time), and in written objectives, job descriptions, plans, and budgets. In other cases, interventions may be institutionalized outside an organization's boundaries or the goals of the intervention may be subsumed in other programs. For example, program components may be taken over by community organizations, once the demonstration program is over, as in the case of the Stanford Heart Disease Prevention Program (Jackson et al., 1994) and the Minnesota Heart Health Program (Bracht et al., 1994; Bracht & Kingsbury, 1990). Finally, the program continuation goal may be sustainability—to continue the program's effects whether or not the program itself continues intact. For example, in the World Health Organization efforts to eradicate smallpox, the initial program of mass vaccination was followed by surveillance and aggressive follow-up of suspected cases (Fenner, Henderson, Arita, Jezek, & Ladnyi, 1988).

Flaspohler and colleagues (2008) examined the capacity needed by staff and organizations to adopt and implement prevention programs. These elements are also important to consider in general organizational consultation and technical assistance. General staff capacity includes intellectual ability, motivation, and tolerance for ambiguity. Innovation-specific capacities include understanding of the innovation, perceived capacity to implement the intervention, and attitude or buy-in toward the innovation. At the organization level, general capacity relates to effectiveness of leadership and management style, organizational structure

and climate, availability of resources, and community linkages and support. Innovation-specific capacities include ability to select and adapt innovations to suit the organization's needs; organizational support, resources, and buy-in; technical assistance and training; and evaluation systems and skills to evaluate innovation implementation and use.

**Summary: Organizational/Diffusion Theories in Problem Analysis and Intervention.** In health promotion, organizational theories focus on the development of health-promoting organizational structures and culture. The environmental agents include upper and middle management, internal change consultants, and other organizational members. Their behaviors are adoption, implementation, and institutionalization of new policies, practices, structures, cultural beliefs, and norms. The determinants of agent behaviors include outcome expectations, attitudes and beliefs, skills, and resources. Methods are at the organizational level, such as sense making, participatory problem solving through organizational diagnosis and feedback, modeling, team building or human relations training, technical assistance, and structural redesign.

## Stakeholder Theory

We include stakeholder theory with organizational theory, although stakeholders are key agents at the community and societal levels as well. Environmental change processes at all levels bring together stakeholders who may differ from each other in their social, political, and ethical paradigms; engagement goals and interests; and types and amounts of power (Brown, Bammer, Batliwala, & Kunreuthe, 2003; Glasgow, McCaul, & Schafer, 1986; Glasgow et al., 1992). Such diversity is critical to the understanding of an issue from multiple perspectives and to the creation of new meanings and intervention opportunities (McDaniel, 1997). The relationships among stakeholders who cross levels and networks are particularly important change levers as these stakeholder relationships have the potential to produce change in multiple system sectors (Foster-Fishman, Nowell, & Yang, 2007).

Health promoters, their organizations, and the communities with which they work are frequently external stakeholders of organizations, that is, they exist outside a focal organization but have a direct interest in what the organization does. Stakeholder theory (see, for example, Freeman, 1984) has examined how managers can strategically approach relationships with multiple external stakeholders, but more recently theoretical work has focused on strategies of stakeholder influence on organizations (Berry, 2003; de Bakker & den Hond, 2008; den Hond & de Bakker, 2007; Logsdon & Van Buren, 2009). Stakeholder analysis identifies stakeholders and their interests and prioritizes them based on

their characteristics and location in social networks outside of the organization (Bourne & Walker, 2005; Frooman, 1999; Hoeijmakers, De Leeuw, Kenis, & de Vries, 2007; Prell, Hubacek, & Reed, 2009; Rowley, 1997). The salience of stakeholder participation depends on three attributes: their power (ability to impose their will), legitimacy (perception that their actions are appropriate), and urgency (requiring immediate attention) (Mitchell, Agle, & Wood, 1997).

Change-focused stakeholder groups, such as community groups seeking to change organizational policies related to environmental conditions, seek to maximize their power, legitimacy, and urgency. They may forge alliances with other stakeholders, and they may use either community development or social action, a more radical approach to change (see Community-Level Theories). Community development focuses on use of persuasion, constructive dialogue, and cooperation. In social action, when mass participation is possible, boycotts, buycotts (buying from preferred companies), writing letters or e-mails, petitions, marches, and rallies are possible tactics. When there is less dependence on participatory action, blocking of gates, sabotage, Internet activism, lawsuits, shareholder activism, and negative publicity are suggested tactics (den Hond & de Bakker, 2007). Social movement theory (discussed later in this chapter) provides insight into legitimacy, framing, and other aspects of stakeholder activism. Berry (2003) provides a case study of an activist community derailing the plans of a multinational chemical company within the context of stakeholder theory, environmental justice, and community activism.

**Summary: Stakeholder Theory in Problem Analysis and Intervention.** Stakeholder theory provides guidance to health promoters, working through their own organizations or through the community to change an organization's policies and practices. The determinants of agent behaviors, that is, those of the focal organization's decision makers, include outcome expectations, attitudes, and beliefs. Methods include social influence, alliances, community development, and social action.

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## Community-Level Theories

Communities may be based on geography; on gender, ethnic, or cultural identity; or on an issue such as the environment, animal rights, or public health. A shared reality or identity is key to the construct (Labonte, 2004). We first review community coalition theory, which could also be considered an interorganization network theory. Then we discuss theories of social capital and community capacity. Although social capital can be considered as an emergent property of

social networks, we have included it as a community-level construct because it is so closely intertwined with development of community capacity, which should be a goal of every community change effort. The remainder of this section focuses on social norms, Conscientization, and community organization. We review models of community organization from the United States, beginning with a description of Rothman's classic models of community organization (Rothman, 2004) and then discuss the approach of Minkler and Wallerstein (2004, 2008), who extend earlier models to include an explicit focus on community strengths and capacity.

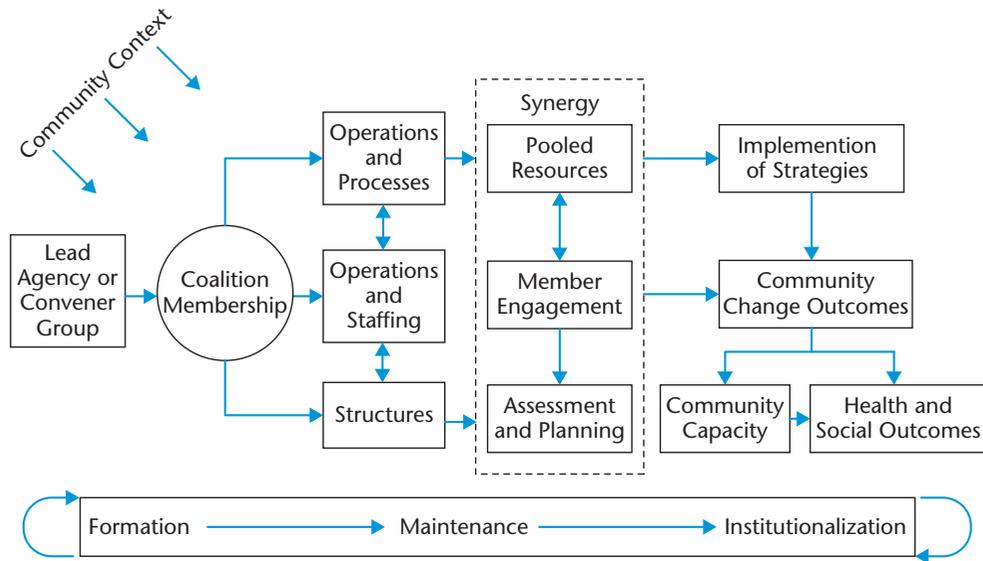
### Coalition Theory

Organizations form partnerships to manage their environments. These interactions may be informal and transient or highly structured, with shared decision making and leadership. Coalitions have been defined as “an organization of individuals representing diverse organizations, factions or constituencies who agree to work together in order to achieve common goals” (Feighery & Rogers, 1990, p. 1). Community coalitions include a structured arrangement for organizations to work together to achieve a common goal, usually preventing or ameliorating a community problem (Butterfoss, 2007; Butterfoss & Kegler, 2009). Thus, coalitions are an important method for facilitating community empowerment, particularly through four processes: enhancing experience and competence, improving group structure and capacity, removing social and environmental barriers, and increasing environmental support and resources (Fawcett, 1991; Fawcett et al., 1995).

Over the past two decades, community coalitions, funded by governments and foundations, have become a key approach to community problem solving. This has led to some concern that community coalitions have been co-opted by human service organizations and funders, to the detriment of disenfranchised communities (Chavis, 2001). Butterfoss and Kegler (2009) have proposed a theory of action for community coalitions (Figure 3.3) that draws on a large body of empirical research. Coalitions develop through three specific stages represented at the base of Figure 3.3: formation, maintenance, and institutionalization (Butterfoss, 2007; Butterfoss & Kegler, 2009). Coalitions recycle through these stages with the recruitment of members, renewal of plans, and addition of new issues. Each stage requires a different set of skills and resources and thus different strategies for training and technical assistance by staff and consultants.

The formation stage is most successful when a convener or lead agency with linkages to the community provides the resources of technical assistance, material support, credibility, and valuable contacts. The coalition must also include

FIGURE 3.3 Community Coalition Action Theory



Source: Reprinted with permission from F.D. Butterfoss & M. C. Kegler (2002). Toward a comprehensive understanding of community coalitions: Moving from practice to theory. In R. J. DiClemente, R. A. Crosby, & M. C. Kegler (Eds.), *Emerging theories in health promotion practice and research: Strategies for improving public health* (pp. 157–193). San Francisco: Jossey-Bass, p. 163.

a deeply committed core group that expands to include community gatekeepers and a broad constituency of participants. The coalition should identify strong staff and member leaders who then develop structures, such as formalized rules, roles, and procedures. During this stage, open and frequent communication, shared and formalized decision-making processes, conflict management, benefits of participation that outweigh the costs, and positive relationships among members will provide for a high level of member engagement, pooling of resources, and effective assessment and planning.

The key tasks of the maintenance stage are sustaining member involvement; pooling member and external resources; and engaging in assessment, planning, and action to achieve coalition goals. As Figure 3.3 indicates, there is a synergy in these tasks to promote successful implementation of strategies and community-change outcomes. Coalitions are more likely to create community change when they direct interventions at multiple levels. At the institutionalization stage, successful coalitions show impact on health and social outcomes, as well as increases in capacity that they can apply to other issues.

Foster-Fishman and colleagues (2001) have developed a framework of core competencies and processes needed within coalitions for members, relationships, organizational structures, and the programs they sponsor. Member capacity includes core skills and knowledge about working collaboratively, building effective programs, and developing coalition infrastructure; positive attitudes about collaboration, target issues, other stakeholders, and self as a legitimate member; and access to capacity building and coalition support for member involvement. Relational capacity includes developing a positive working climate, creating a shared vision, promoting power sharing, valuing diversity, and developing positive external relationships with community stakeholders, other communities, and coalitions targeting similar problems. Organizational capacity includes effective leadership, a task-oriented work environment, formalized procedures, effective communication, sufficient resources, and an orientation to continuous improvement. Programmatic capacity includes clear, focused program objectives and realistic goals that are unique, innovative, and ecologically valid.

***Summary: Coalition Theory in Problem Analysis and Intervention Methods.***

A coalition is a method for influencing community and policy environmental conditions. Coalition leaders seek to establish and maintain high-functioning health promotion coalitions. Determinants of these coalition leaders' behaviors include motivation to collaborate, organizational capacity, barriers to collaboration, community capacity, and community resources. Methods to change these determinants include participatory problem solving, technical assistance, skills training for leadership and conflict management, and interlinking organizations and networks.

## **Social Capital and Community Capacity**

Social capital has been defined variously, for example, as “the ability of actors to secure benefits by virtue of membership in social networks or other social structures” (Portes, 1998, p. 6), as “the processes and conditions among people and organizations that lead to accomplishing a goal of mutual social benefit” (Green & Kreuter, 2005, p. 52), and as “features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit” (Putnam, 1995, pp. 35–36). The first definition is from the individual perspective and is similar to social support, which we discussed earlier in this chapter. The latter definitions are from the perspective of the whole network and the collective. High social capital is manifested in high levels of four interrelated constructs: trust, cooperation, civic engagement, and reciprocity (Green & Kreuter, 2005).

Three types of social capital have been described: bonding, bridging, and linking. Bonding social capital refers to trust and cooperation between network members with a shared social identity (Szreter & Woolcock, 2004). Bridging social capital occurs between people who are not alike in a sociodemographic or social identity sense, and yet have relations of respect and mutuality (Szreter & Woolcock, 2004). Linking social capital, a subset of bridging social capital, comprises norms of respect and trusting relationships between people who are interacting across explicit differences in power (Szreter & Woolcock, 2004).

In a seminal review, Kawachi and Berkman (2000) found that social capital, operationalized as interpersonal trust, norms of reciprocity, and per capita membership in voluntary association aggregated to the state level is directly associated with age-adjusted mortality. Also, when adjusted for individual-level characteristics, social capital is associated with the likelihood of an individual's reporting fair and poor health (Kawachi & Berkman, 2000). Although some evidence calls into question the role of social capital in the promotion of health in a cross-national examination (Kennelly, O'Shea, & Garvey, 2003), many researchers agree that it has some role, with the relationship being stronger for countries with high social inequality (Islam, Merlo, Kawachi, Lindstrom, & Gerdtham, 2006; Kawachi, Kennedy, Lochner, & Prothrow-Stith, 1997; Kawachi, Kim, Coutts, & Subramanian, 2004; Kawachi, 2006). Social capital has also been linked to homicide rates (Lochner, Kawachi, Brennan, & Buka, 2003) and binge drinking (Weitzman & Kawachi, 2000; Weitzman, Gortmaker, & Sobol, 1990). Stronger bonding ties within deprived communities have been found to be associated with poorer health of residents as there may be higher expectations to help neighbors, which increases financial and mental strain (Caughy, O'Campo, & Muntaner, 2003; Mitchell & LaGory, 2002). Usher's explanation, from work in the rural south, is that social capital may be more important as a community than an individual resource and that bridging social ties within poor minority communities is key to breaking the social and economic isolation resulting from segregation (Usher, 2006).

Community capacity is closely related to and inclusive of social capital. It has been defined as "a set of dynamic community traits, resources, and associational patterns that can be brought to bear for community building and community health improvement" (Wendel et al., 2009, p. 285). Dimensions of community capacity include skills and resources, the nature of social relations, structures and mechanisms for community dialogue, leadership, civic participation, the value system, and learning culture (Wendel et al., 2009). Central to community capacity are the community's ability to engender leadership and participation; analyze its own thinking processes and change efforts; mobilize resources; experience a sense of connection among people; participate in meaningful rituals;

maintain an awareness of previous change efforts and current conditions; and employ power to create change (Flaspohler et al., 2008; Goodman et al., 1998; Goodman & Steckler, 1987).

Community capacity, including social capital, is both a means to achieve community health goals and an end in itself (Wendel et al., 2009). Interventions to increase community capacity include community development and participatory problem solving, which we discuss in the following section. Methods include participatory action research, organizational learning, dynamic systems analysis, consensus building through dialogue, stakeholder consultation and deliberation, and interpersonal and group process. Personal values such as openness, authenticity, comfort with process and uncertainty, and caring attitudes are important (Wilson, 1997). Two major health promotion programs provide examples of how these methods can be applied. The South African Intervention with Microfinance for AIDS and Gender Equity (IMAGE), which combined a microfinance program with a 12-month Sisters for Life gender and HIV-training curriculum, was found to produce higher levels of social capital, as well as a reduction in violence and HIV risk behavior, in the intervention communities compared to nonintervention communities. The curriculum focused on gender roles, communication, relationships, critical thinking, leadership, and community organization, intimate partner violence, and HIV prevention (Pronyk et al., 2008). In another example, in the United States, Poder es Salud/Power for Health, a community-based prevention research project explicitly designed to enhance community-level social capital, used community health workers (CHW) and popular education to expand ties between African American and Latino communities in rural Oregon. The CHWs were trained in leadership, local politics and governance, advocacy, community organization, and population education. They engaged the communities through churches and apartment complexes to identify health issues and solutions and implement interventions, which included an anti-violence campaign and a cooperative to assist self-employment (Farquhar, Michael, & Wiggins, 2005).

From the perspective of social networks, we emphasize the importance of linking persons to community organizations, such as churches, social clubs, schools, political groups, and work settings, in which individuals can voluntarily associate with others to address issues of community concern. It is also important for residents to have loose ties outside their primary networks to bring in new information and resources, and interorganizational meetings and coalitions can foster such ties (Steckler, Goodman, McLeroy, Davis, & Koch, 1992a; Steckler, Goodman, & Kegler, 2002). For example, statewide meetings of church associations, nonprofit health agency volunteers, political conventions, and joint neighborhood association meetings allow the opportunity for residents to connect

with others with similar concerns and interests, to learn about their activities, and to team up to work together.

Democratic management, in which “members share information and power, utilize cooperative decision-making processes, and are involved in the design, implementation, and control of efforts toward mutually defined goals” (Israel, Checkoway, Schulz, & Zimmerman, 1994, p. 152), is essential to the development of community capacity. Deep democracy with roots in action learning, community participation, whole systems theory, social capital, appreciative inquiry, and communitarian thought has been the focus of community interventions in both the United States and the developing world (Wilson & Lowery, 2003).

**Summary: Social Capital Theory in Problem Analysis and Intervention Methods.** Members and leaders of social and community networks participate in civic affairs, resulting in increased social capital and community competence. The determinants of participation include knowledge, beliefs, attitudes, self-efficacy, and skills; availability of structures and mechanisms for community dialogue; and supportive culture. Methods directed to these determinants include community development and participatory problem solving (see Community Organizing Methods later in this chapter); linking members to community organizations, interorganizational meetings, and coalitions; skills training for community participation and technical assistance.

## Social Norms Theories

Social norms, expectations of behavior by members of a social group, are a property of a community. They are the social rules that specify what is appropriate or inappropriate in a particular situation. Norms are the environmental condition that is the basis for perceived social influence, the individual-level variable we discussed earlier. They are transmitted to individuals through the process of socialization that occurs primarily in childhood through the family and then is continued through institutions such as churches, voluntary associations, and schools (Smelser, 1998).

Mass media portrayals of role models and reinforcement have been used to shift social norms. A combination of education and entertainment has been used to transmit social norms and culture, using narrative storylines and characters (Bouman, Maas, & Kok, 1998; Moyer-Guse, 2008; Petraglia, 2007; Wilkin et al., 2007). In various formats, including soap operas, popular music, films, and comic books, popular characters have modeled health behaviors. Entertainment-education (E-E) programs have been used extensively internationally where nonprofit and governmental agencies can produce and air programs, as well as

in the U.S. for-profit television system, where the focus has been on including accurate health information in popular television shows (Wilkin et al., 2007). For example, a fast-paced prime time crime drama *Jasoos (Detective) Vijay*, produced by the BBC World Service Trust in India, targeted prevention of HIV-AIDS among sexually active men aged 18–34. Those who watched the program had higher awareness and knowledge of HIV/AIDS-related issues, were more likely to discuss condoms, STIs, and AIDS with others, and more likely to use condoms with sex workers (Chatterjee, Bhanot, Frank, Murphy, & Power, 2009). In the United States, addition of a breast cancer storyline in a Spanish-language telenovela resulted in more calls to a cancer information number, increased knowledge about cancer treatment, and, among men, increased intention to encourage women to have mammograms (Wilkin et al., 2007). Digital games and decision aids are newer modalities using entertainment education (Jibaja-Weiss & Volk, 2007; Wang & Burris, 1994; Wang & Singhal, 2009).

Behavioral journalism uses mass media role-model stories of community members and advice from experts to increase adoption of behaviors (McAlister et al., 2000; McAlister, 1991; Ramirez et al., 1995; Ramirez et al., 1999; Reininger et al., 2009). Depending on the nature of the behavior to be changed and the community context, news stories, talk shows, feature stories in newspapers, and cartoon-style newsletters have been used as media vehicles. In behavioral journalism, the health educator interviews potential models for descriptions of reasons for their behavior change, skills used, and ways in which the change has been reinforced. The media materials then use models who are perceived as attractive and similar to members of the at-risk population. Behavioral journalism has also been combined with use of a community network of volunteers who cue people to watch the television documentary stories. Community volunteers, who in some cases are lay health workers, also model behaviors for their contacts and reinforce stated intentions and behaviors. These methods increase the visibility of behaviors of opinion leaders and early adopters, increasing the speed of adoption of the behaviors within the population (McAlister, 1991; McAlister et al., 2000; Ramirez et al., 1995, 1999; Reininger et al., 2009).

Mobilizing social networks is another method used to influence social norms. For example, in a natural-helper model intervention Kelly (1992, 2004), Jones (2008) and colleagues trained respected and popular patrons of gay bars to adopt protective sexual practices and persuade acquaintances to follow their examples. The researchers considered training 15% of the priority population as opinion leaders to be a critical mass to establish new norms among the bar patrons (Kelly, 2004). This intervention led not only to a change in individual behavior but to increased norms supportive of protective behavior.

**Summary: Social Norm Theories in Problem Analysis and Intervention Methods.** Community members and opinion leaders at various levels demonstrate and support health-promoting behavior, resulting in health-promoting social norms. Determinants of their behavior include all the determinants at the individual level and the availability of models and of appropriate social norms. Methods include mass media role modeling, entertainment-education, behavioral journalism, and mobilization of social networks

## Conscientization

Paulo Freire's work (1973a, 1973b) in liberation education has formed the basis for empowerment models (Wallerstein, Sanchez, & Velarde, 2004). In conscientization, facilitators lead individuals in small groups to consider their own realities and constraints. The process moves group members to an understanding of the social forces underlying a problem and an understanding of their responsibility to act.

Critical consciousness, or conscientization, links individual-level and community-level empowerment and is a key method for strengths-based community organization. Using the context of developing literacy in his country, Freire described the method by which critical consciousness emerges. Educators began the process by being with the people in a local community; discovering the words and phrases they used to describe daily life; and observing the way they lived. Educators then selected generative words and integrated them to form codes that represented the life of the people. Program participants discussed these codes, which might be pictures, songs, or words, in cultural circles or in learning groups. They framed the discussion in terms of the participants' lives and the root causes of the conditions of their lives. This reflection on root causes gave rise to a political and social understanding that was accompanied by action to transform this reality. The final step of conscientization was the understanding that oppressive reality is a process that can be overcome. This understanding results in praxis, the unity between a person's understanding and actions (Freire, 1973b; Gadotti, 1994).

The Freirian method has been applied in health education to such areas as women's health; smoking, drug, and alcohol prevention; sexuality and sexual harassment; homelessness; environmental health; youth empowerment; occupational health; and health of the elderly (Cheatham & Shen, 2003; Goodman, 1998; Goodman & Steckler, 1987; McDonald, Sarche, & Wang, 2004; McFarlane & Fehir, 1994; Minkler, 2004a; Roter, Rudd, Keogh, & Robinson, 2008; Rudd & Comings, 1994; Wallerstein et al., 2004; Wang, Yi, Tao, &

Carovano, 1998; Wang, 2003; Wang & Burris, 1994). These projects all rely on participatory analysis using critical reflection and dialogue. Questions to encourage a critical stance, described by Shaffer (1993) and used by Wang (2003), include the following: “What do you see here? What’s really happening here? How does this relate to our lives? Why does this problem, concern or strength exist? What can we do about it?” (Wang, 2003, p. 196). Issues, themes, and theories emerge that inform action.

The cycle of reflection-action-reflection continues into the policy realm. For example, the rural Chinese women with whom Wang and colleagues worked (1998) presented their concerns to provincial policymakers (Wang et al., 1998); adolescents have been involved in peer education, participating in a statewide youth leadership group for policy development and carrying out service projects (Wallerstein et al., 2004); and low-income elderly residents of hotels have formed building tenants’ associations, achieved better living conditions, and received compensation for lack of services (Minkler, 2004a). However, a sustained effort is required for action and advocacy to result in outcomes.

From their work with the Adolescent Social Action Program, which focused on alcohol and substance abuse prevention, Wallerstein and colleagues (Wallerstein & Sanchez-Merki, 1994; Wallerstein, Sanchez-Merki, & Dow, 1997) identified three stages through which an individual passes from apathy to a social responsibility to act. The first stage involves individuals beginning to care about the problem, each other, and their ability to act in the world. This stage is accomplished through dialogue and self-disclosure in small groups and through the use of questioning. At the next stage, individual responsibility to act, as well as individuals’ self-efficacy to talk and help others, increases as a result of engaging in participatory and caring dialogue with community members who have experienced problems with alcohol or drugs. The final stage, social responsibility to act, involves critical thinking about the social forces that underlie the problem and a commitment to change both self and community. This three-stage transformation results in individual and community empowerment.

**Summary: Conscientization Theory in Problem Analysis and Intervention Methods.** Community members in groups, especially marginalized populations, become politically and socially active, resulting in the environmental condition of a community empowered to confront larger social and political environments. Determinants of their behavior include understanding of the root causes of social problems and collective self-efficacy. The method of problem-posing education includes reflection-action-reflection, nonjudgmental small-group discussion of learning materials, question posing, and self-disclosure.

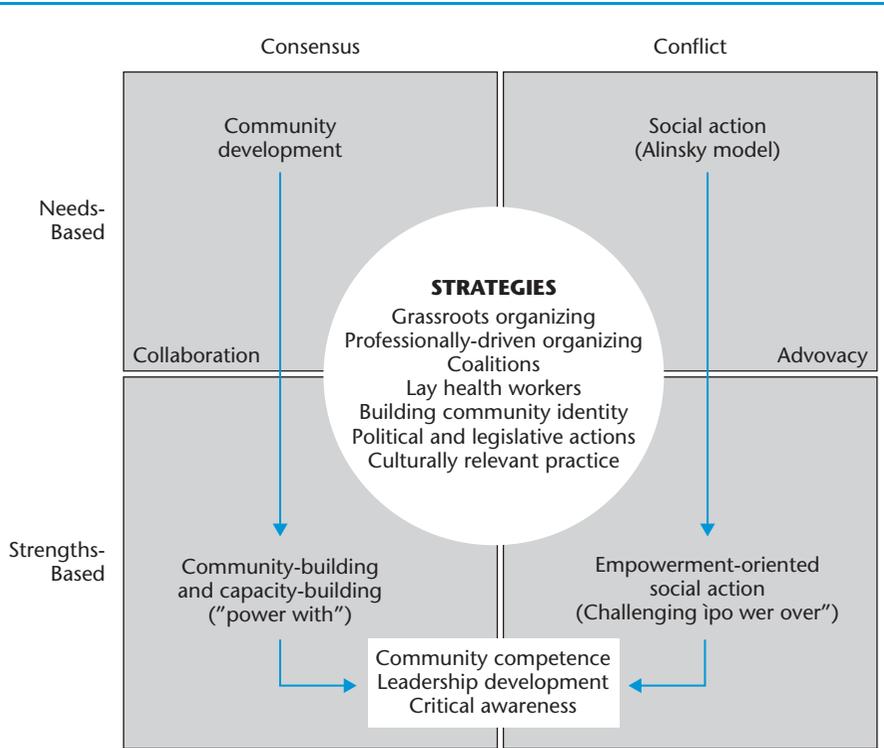
## Community Organization

Building on the three types of social change identified by Bennis, Benne, and Chin (1969), Rothman (2004) developed three models of community organization: locality development, social planning, and social action. Locality development raises consciousness about the underlying causes of problems and identifies strategies for action. It is heavily process oriented, with an emphasis on consensus, cooperation, and development of a sense of community. This model is most akin to the community development tradition in health education. Social planning uses information derived from empirical research. It is heavily task oriented, with an emphasis on expert assistance as a means to solve problems. Social action is based on coercive change and seeks to redress imbalances of power. It relies on conflict methods of change such as demonstrations and boycotts, and the change agent is both an activist and a partisan. The skillful organizer assesses the context of the community and of the problem at hand and mixes and matches the change models (Rothman, 2004).

Minkler and Wallerstein (2004, 2008) extend Rothman's work (2004), presenting a typology of community organization based on change method (consensus versus conflict) and view of the community (needs-based versus strengths-based). In their typology, diagrammed in Figure 3.4, earlier models of community organization—both community development and social action—are viewed as needs-based, centering on the organizer's helping the community. Current community organization practice is seen as centered on the community, building on community strengths and assets. The form of practice differs depending on whether consensus or conflict is the change strategy. Community-building approaches use consensus and inclusiveness, a concept of power as *power with*, whereas empowerment-oriented social action uses conflict and challenges *power over*. Both types of community change are directed toward increased community competence, leadership development, and critical awareness within the community. Methods and strategies in their typology include participatory problem solving, grassroots organizing, professionally driven organizing, coalitions, lay health workers, critical awareness and reflection, development of community identity, leadership development, political and legislative actions, and culturally relevant practice.

**Community Participation.** Community participation is a core method of community work and is one of the bases of the Healthy Cities movement (World Health Organization Regional Office for Europe, 2002). It has been defined as “a process by which people are enabled to become actively and genuinely involved in defining the issues of concern to them, in making decisions about

**FIGURE 3.4 Community-Organizing and Community-Building Typology**



Source: Reprinted with permission from M. Minkler and N. Wallerstein, (1997), in K. Glanz, F. M. Lewis, and B. K. Rimer (Eds.). *Health behavior and health education: Theory, research, and practice* (2nd ed.), San Francisco: Jossey-Bass, p. 248.

factors that affect their lives, in formulating and implementing policies, in planning, developing and delivering services and in taking action to achieve change” (World Health Organization Regional Office for Europe, 2002, p. 10). Community participation achieves a number of objectives, including increasing democracy, combating exclusion of marginalized and disadvantaged populations, empowering people, mobilizing resources and energy, developing holistic and integrated approaches to problems, achieving better decisions and more effective services, and ensuring the ownership and sustainability of programs. Theorists see community participation as falling along a continuum from no community control to high community control (World Health Organization Regional Office for Europe, 2002). Health promoters using community organization methods

must decide whether the issue and context make aiming for the highest levels of community participation appropriate. Community organizers may have a greater challenge in engaging people at the higher levels, but they should not settle for a lower level simply because using the more passive processes of providing information and consultation is easier (World Health Organization Regional Office for Europe, 2002).

Yoo and colleagues (2004, 2009), working primarily within a locality development framework, incorporated a social ecological framework developed by Goodman (2000) in a stepwise process of community empowerment. The facilitation process, which could also be defined as participatory problem solving, involved six steps: entrée into the community, issue identification, prioritization of issues, strategy development, implementation with action plans and feedback, and transition. In the last step responsibility was transferred from the facilitators to community leaders and an iterative process of action planning using the model continued. This process was first used in African American communities within New Orleans, Louisiana in 2001 (Yoo et al., 2004) and then was carried out from 2004 to 2006 with primarily Caucasian residents of 12 high-rise buildings for senior citizens in Allegheny County, Pennsylvania (Yoo, Butler, Elias, & Goodman, 2009). Factors related to success of these projects were a clearly understood and applied sound conceptual framework, consistently well-attended community meetings, available community organization support staff, open communication, focused community leaders, a community network, and regular debriefing among facilitators. Challenges included limited space, time, money, and data; slow process on action steps; difficulty attracting community participation; lack of promotion of the project in the community; and unexpected situations that required a response.

In another example, the Contra Costa County Health Services Department in California, through its Healthy Neighborhoods Project, worked with the El Pueblo neighborhood, a public housing development, to identify and train neighborhood health advocates in health, tobacco use prevention, and nutrition using Freirian popular education methods. The advocates were also trained in aspects of community organization, including door-to-door interviewing, community asset mapping, cross-cultural communication, and media and policy advocacy. The health department coordinator served as a facilitator and broker for resources. The neighborhood health advocates assessed the capacities of residents and residents' perceptions of their community and organized a community mapping day. Trained adult and youth volunteers mapped the neighborhood's positive and negative physical and institutional features. The group presented its findings at a community forum, and residents who attended developed an

action plan and organized the painting of a mural by local children to show the residents' vision for the community (El-Askari et al., 1998; El-Askari & Walton, 2008). To achieve the top priority of installation of speed bumps to slow traffic and reduce drug dealing, an El Pueblo residential council talked with the police chief, lobbied the city council, spoke at public meetings, organized demonstrations, and involved the media. These actions resulted in a consensus decision by the housing advisory commission to approve the speed bumps. Better street lighting and increased police patrol, two other priorities, were also accomplished. Residents also organized to remove a billboard that advertised cigarettes from the neighborhood and to get a community-based organization to offer healthy cooking classes (El-Askari et al., 1998; El-Askari & Walton, 2008).

Following its initial successes, the El Pueblo residents' council became larger, better organized, and more representative of the residents. Members began to visit other San Francisco Bay Area public housing residents' councils to share their experiences. The council then wrote and received funding for three grants: a tenant opportunities grant to establish computer classes, job training classes, and job search workshops; a drug elimination effort; and a youth sports grant. Over the course of the project, success motivated residents to take leadership roles in addressing other issues, resulting in a strong sense of control. Residents reported increased energy and life satisfaction, and strong social ties developed. Residents also began involvement in broader policymaking initiatives, such as the county's public and environmental health advisory board. Since that time, the model has been replicated in the South and West Berkeley communities with a focus on the reduction of health disparities (El-Askari et al., 1998; El-Askari & Walton, 2008).

These two examples clearly show both the health promoter's methods in working to facilitate empowerment in the communities and the communities' methods to achieve the environmental conditions they wanted. As residents achieve success, they increase their collective self-efficacy and empowerment. The latter, however, is contingent on reflection of the action taken and awareness that the action is legitimate and that one's social identity is active and powerful (Drury & Reicher, 2005).

**Social Action.** Social action organizing, according to Rothman (2004), has as its goal the shifting of power relationships and resources from the haves to the have-nots. Social action as a method achieves change by crystallizing issues and organizing people to take action. Historical examples of this type of community organization practice have included method organizing; the civil rights movement; the United Farm Workers movement; community action programs; and the work of the Students for a Democratic Society (SDS), the Student

Nonviolent Coordinating Committee (SNCC), the Black Panthers, the Brown Berets, and La Raza Unida (Alinsky, 1969; Alinsky, 1972; Fisher, 2008; Fisher & Ury, 1991). Methods include boycotts, demonstrations, and strikes.

**Social Movements.** The study of social movements overlaps considerably with community organization and advocacy that challenges *power over*. It offers insights for understanding the processes of change at the community level. Social movements have been defined “as collectivities acting with some degree of organization and continuity outside of institutional or organizational channels for the purpose of challenging or defending extant authority, whether it is institutionally or culturally based, in the group, organization, society, culture or world order of which they are a part” (Snow, Soule, & Kriesi, 2004b, p. 11). We briefly discuss key insights from studies and theories of social movements particularly relevant to health education practice and refer the reader to other sources (Snow, Soule, & Kriesi, 2004a) for further elaboration.

Framing is the process of assigning meaning and interpretation to relevant events and conditions in order to mobilize potential constituents, gain bystander support, and demobilize antagonists. Frames focus attention on what is relevant in a situation, create a set of meanings or narratives as to what is going on there, and serve a transformative function for both individuals and groups. Transformation can include altering the meaning of objects and one’s relationship to them, including reconfiguring one’s biography, and transforming routine grievances into injustices in the context of collective action (Snow, 2004). This construction of meaning can be viewed as a “politics of signification” (Snow, 2004, p. 384), in which social movements, governments at all levels, other authority structures, the media, and interested stakeholder groups seek to establish, among contested frames, the dominant meaning ascribed to persons, experiences, objects, and events. The mass media arena is especially important as it serves as a public forum, is assumed by all players to have persuasive influence, and signals and diffuses changes in cultural codes, such as language used for framing an issue (Gamson, 2004).

These collective (as opposed to individual) frames are formed within a cultural context, using deeply held cultural values, such as justice, self-reliance, and rights. The culture shapes the framing process; the framing process in turn can shift culture. Movements focused on moderate change act on commonly shared meanings with the available culture, whereas attempts at radical social change require a critique of the current cultural understandings. Thus, the appeals must be different and, for radical change, go beyond cognitive persuasion to embodiment and action. For example, during the civil rights movement, African Americans took action to use facilities that had been designated for “whites

only” (Williams, 1970, 2004). Social movements use tactics such as persuasion, facilitation, bargaining, and coercion. These have been characterized as either nonconfrontational or insider tactics (such as leafleting, letter-writing campaigns, lobbying, boycotts, lawsuits, and press conferences), and confrontational or outsider tactics (such as sit-ins, demonstrations, vigils, marches, and blockades). Protest tactics may be characterized as conventional (such as lobbying), disruptive (such as boycotts or demonstrations), or violent (such as bombings) (Taylor & Van Dyke, 2004).

**Advocacy.** Advocacy is a primary method used in community organizing and for change at environmental levels, whether sharing *power with* or challenging *power over* (see Chapter Six, Table 6.11). This method addresses many of the processes that social movement theorists have discussed.

Health advocacy has been defined as “the processes by which the actions of individuals or groups attempt to bring about social and/or organizational change on behalf of a particular health goal, program, interest or population” by the 2000 Joint Committee on Health Education and Promotion Terminology (cited in Galer-Unti, Tappe, & Lachenmayr, 2004). Another definition focuses on using a set of skills to shift public opinion and garner resources to support an issue (Wallack, Dorfman, Jernigan, & Themba, 1993). Some view advocacy as directed primarily to legislative policy, using the strategies of voting, electioneering, direct lobbying, and grassroots lobbying (Christoffel, 2000; Galer-Unti et al., 2004). Others, however, view advocacy as a key component of community organization, with goals other than legislation. An example is forcing New York City to include lead treatment services and its school system to address the hazards of peeling paint in kindergarten classrooms (Klitzman, Kass, & Freudenberg, 2008).

Advocacy seeks to ensure that the rights of disenfranchised individuals are protected, that institutions work the way they should, and that legislation and policy reflect the interests of the people. It addresses attitudes and policies at all levels from organizational, through community and state, to the national arena. In public health advocacy, efforts are made to change community conditions, often pitting consumers against large industry and pitting citizens against city hall. Community activism is rooted in democratic principles and practices and, though often viewed as synonymous with social action, it includes cooperation as well as confrontation. Examples of advocacy groups include local and national groups participating in social movements—such as those for the environment, environmental justice, and tobacco control—and citizen groups that have come together to support issues of importance in their communities. Advocacy groups have different tactics. For example, some are confrontational, such as ACT UP (an AIDS-awareness activist group); others are research based, such as the

League of Women Voters (Altman, Balcazar, Fawcett, Seekins, & Young, 1994; Wallack et al., 1993).

It is important that health promoters choose tactics and activities that fit the type of community organizing they are using, the issue, and the community. Groups must decide the ways in which they intend to accomplish goals, and those activities will likely change over time in response to reactions to actions taken and to shifting external forces. Altman and colleagues (1994) list the following approaches to advocacy: coalition building, community development, coordination, education, networking, public awareness, and policy or legislative change. They suggest the principles of presence—generosity, shaping, escalation, accuracy, and honesty—to enhance tactical efforts (Table 3.3.). These principles should underlie action, regardless of whether the action flows from a social action, community development, or social planning perspective.

The advocacy process and products have been divided into three stages: research and investigation; strategy, including stakeholder education and mobilization; and direct action (Altman et al., 1994; Christoffel, 2000). In research and investigation, the advocacy group conducts studies of the issue in order to understand it as fully as possible by gathering data on public opinion, obtaining information about the opposition and its strategies and tactics, and acting as a watchdog of target organizations. The advocacy group can also request accountability by formally asking responsible parties for the reasons behind a decision

**Table 3.3 Principles Underlying Effective Tactics**

Principle	What to Do
Presence	Remind people of the issue by doing something about it frequently
Generosity	Praise others for their strengths and actions to gain goodwill and to reinforce their actions
Shaping	Reward small steps of those who change toward your goals
Escalation	Continue to mobilize more people and increase the intensity of the tactics if the first efforts are unsuccessful
Accuracy and honesty	Be scrupulously accurate to maintain credibility and to keep opponents from successfully arguing against the issues raised
Consistency	Distribute praise and criticism fairly—if one group is criticized for its position, other groups should be treated the same way

of concern to them, by documenting complaints with evidence, by organizing consumer service audits, and by demonstrating the financial benefits of acting on their issue.

Strategies for encouragement and education include giving personal compliments and public support to reinforce other people's actions, arranging celebrations and publicizing them, developing a detailed proposal for addressing the problem being focused on, and establishing contact with the opposition organization even to the extent of influencing its decision-making processes. The advocacy group can also prepare fact sheets on the issue (and on the group) to maintain consistency and continuity in public relations, offer public education through mass media and presentations to community groups, and counterattack by explaining the group's point of view.

Interventionists can use direct action strategies to make the group's presence felt, mobilize public support, and use the system (Altman et al., 1994). Strategies to make the group's presence felt include postponing action until the issue has matured; establishing alternative programs or finding another source to provide the service; establishing lines of communication with the opponent's traditional allies; criticizing unfavorable actions (first privately and then publicly if there are no results); expressing opposition publicly; reminding those responsible; making complaints (first informally, then formally); and lobbying decision makers. Ways to mobilize public support include sponsoring a conference or public hearing; conducting a letter-writing campaign, a petition drive, or a ballot drive; registering voters; and organizing public demonstrations. For using the system, the advocacy group might file a formal complaint; seek enforcement of existing laws and policies; lobby for new laws, policies, or regulations; use other resources such as a negotiator, mediator, or fact finder to work with opponents; and initiate legal action if that proves to be the only way to address the issue. Altman and colleagues (1994) also describe strategies to use if efforts to work within the system fail. These include arranging a media exposé, overwhelming an unworkable system (for example, by arranging unmanageable requests for service), organizing a boycott, and using passive resistance.

**Media Advocacy.** Wallack and his colleagues (1993, 2008) have developed the approach of media advocacy, a set of tactics for community groups to promote social change by using the media. They recognize that the mass media, particularly television, provide a forum for surfacing and discussing issues and setting the agenda for policymakers and the public. Media advocacy seeks to influence the selection and presentation of topics by the media in order to set and achieve a public health agenda.

Media advocacy is based on three steps:

1. Setting the agenda (framing for access)
2. Shaping the debate (framing for content)
3. Advancing the policy

In framing for access, the goal is to get the media to select the story. Framing for content involves shifting the view of health from the individual to the social level and dealing with the complexity of health and social problems so that a public health perspective defines the debate. Advancing the policy is a way of framing the content so that it reaches the key decision makers whom the advocacy group is trying to influence.

To gain access, the health promoter needs to understand the various access points of each of the major media outlets. For television these points are news, public affairs, entertainment, editorials, paid advertising, and public service advertising; for newspapers they are the front page, sports, lifestyle, arts, comics, business, editorial section, letters to the editor, and paid advertising. The media advocate needs skills in determining where and how to place the particular issue within the media. Media advocacy strategies focus on earned media (that is, not paid, such as news and talk shows) and on paid placements rather than on public service announcements, in which control over the placement and framing of the story is lost. One can achieve news coverage by targeting journalists who are interested in health issues and providing them with accurate information and story ideas. Creating news and piggybacking onto breaking news are also strategies. Elements of newsworthiness include linking the story to the anniversary of an event, a breakthrough, a celebrity, a controversy, injustice, irony, a local point of view, a milestone, a personal angle, and a seasonal theme (Wallack et al., 1993). By monitoring the media, a health promoter can understand which reporters are covering which topics and what the current community concerns are.

To give the public health perspective, the health promoter can frame an individual problem as a social issue, shifting the primary responsibility away from blaming the individual. For example, the advocate can shift the subject from teen drinking to the promotion of alcohol and include a solution with an approach to policy. Story elements to be developed include compelling images, powerful symbols, and social math to show the extent of the problem (for example, in a year “enough alcohol was consumed by college students to fill 3,500 Olympic-size swimming pools, about 1 on every campus in the United States” (Wallack et al., 1993, p. 108). It is important to use voices of people who are credible because of their experiences but who are also deeply involved in the policy aspects of the issue. For example, a college president who has worked with the college board

of trustees to change rules about alcohol availability at a campus where a death has occurred due to binge drinking may be a good source for a campaign about student alcohol use. Using sound bites of fewer than ten seconds to summarize the issue is a valuable skill for the health promoter to learn.

Wallack and colleagues (1993) also provide practical advice for developing media goals and objectives, pitching the story to journalists, developing media kits, and giving interviews. Their summary rules for working with reporters are to be honest, help the press better understand the issues, only comment on issues that you know about, and remember that everything you say is on the record (Wallack et al., 1993).

**Summary: Community Organization Theories in Problem Analysis and Intervention Methods.** All community organization theories are directed to two environmental conditions: a health-promoting environment and community capacity.

The agents are community leaders and members who are taking action to change community conditions related to health. The determinants of this behavior include motivation to act, collective efficacy, political efficacy, and community structures that facilitate community action. Methods to influence these determinants include participation and participatory problem solving, organizing (grassroots organizing and professionally driven organizing), forming coalitions, using lay health workers, framing to shift perspectives, media advocacy to build community identity, and culturally relevant practice. The community, in turn, uses the following methods to create a health promoting environment: participatory problem solving, forming coalitions, advocacy, media advocacy, framing to shift perspectives, and media advocacy.

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## Societal and Governmental Theories

For the societal level, we examine theories that relate to public policy and its development. Because public policy is usually set by governments, change in policies will often focus on influencing government action at the local, state, or national levels.

### Theories of Public Policy

Public policy is “a guide to action to change what would otherwise occur, a decision about amounts and allocations of resources, made at any level of government” (Milio, 2001, p. 622). Health policy is directly related to public health and health services. Other public policies directed to issues such as

economics, housing, or public safety also have much potential to influence health. Milio (1981) views economic policy as acting directly on people's biophysical and socioeconomic environments and indirectly through various areas for public policy, such as environmental safety, energy, income maintenance, and health and human services delivery (see Figure 3.5). This framework shows policy as an environmental determinant of health behavior and of health. *Health in All Policies* is a strategy of the European Union that reflects this close linkage of policy to health (Kickbusch, 2009).

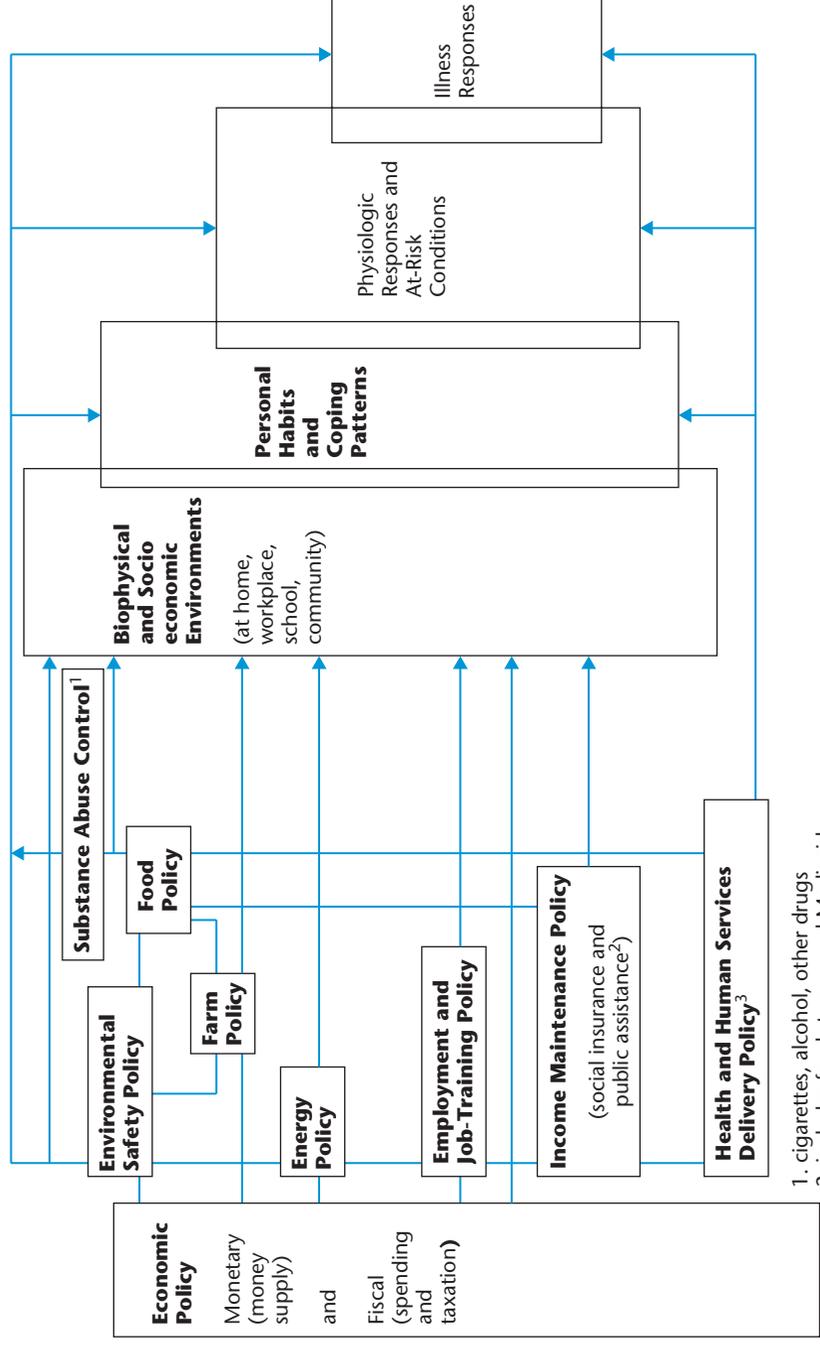
Public policy sets options for organizations and for individuals, both directly and indirectly through organizations. According to Milio (1981, p. 83), policy components should make “the creation and maintenance of healthful environments and personal habits the easiest—the ‘cheapest’ and most numerous—choices for selections by governmental units and corporations, producers and consumers, among all the options available to them.” Policy instruments include direct spending, such as grants and contracts; the production of goods and services; regulation and monitoring; and fiscal incentives such as subsidies, taxation, and tax deductions.

Policy formation is a cyclical process occurring within a system open to the environment (Longest, 2006; Themba-Nixon, Minkler, & Freudenberg, 2008). In a rational or economic decision-making model, a policymaker would select the most efficient alternative to maximize the most valuable output. However, policy formation is much more complex than that, with many stakeholders and interest groups with varying power and diverse ideologies, insufficient information about policy problems and solutions, and unique contexts for specific issues. Theorists have endeavored to isolate key constructs and their relationships in this process to create hypotheses that can be tested (Jones, 2003). We will discuss several of these theories in the context of a model developed by Longest.

Longest (2006) has identified three intertwined phases of the policy process: policy formulation, policy implementation, and policy modification. Policy formulation includes setting the policy agenda and the development of legislation. Policy implementation includes activities associated with rule making that guide operationalization and implementation of a policy. Policy modification is feedback from individuals, organizations, and interest groups to policy formulation and policy implementation. These phases and their components are displayed in Figure 3.6. Health advocates and activated communities have opportunities to influence the policy process at each phase.

In a survey of national health consumer groups in the United Kingdom, 82% indicated that influencing policy at the national level was “important” or “very important.” Three-quarters of the groups had contacted the central government on policy issues within the past three years; almost half had

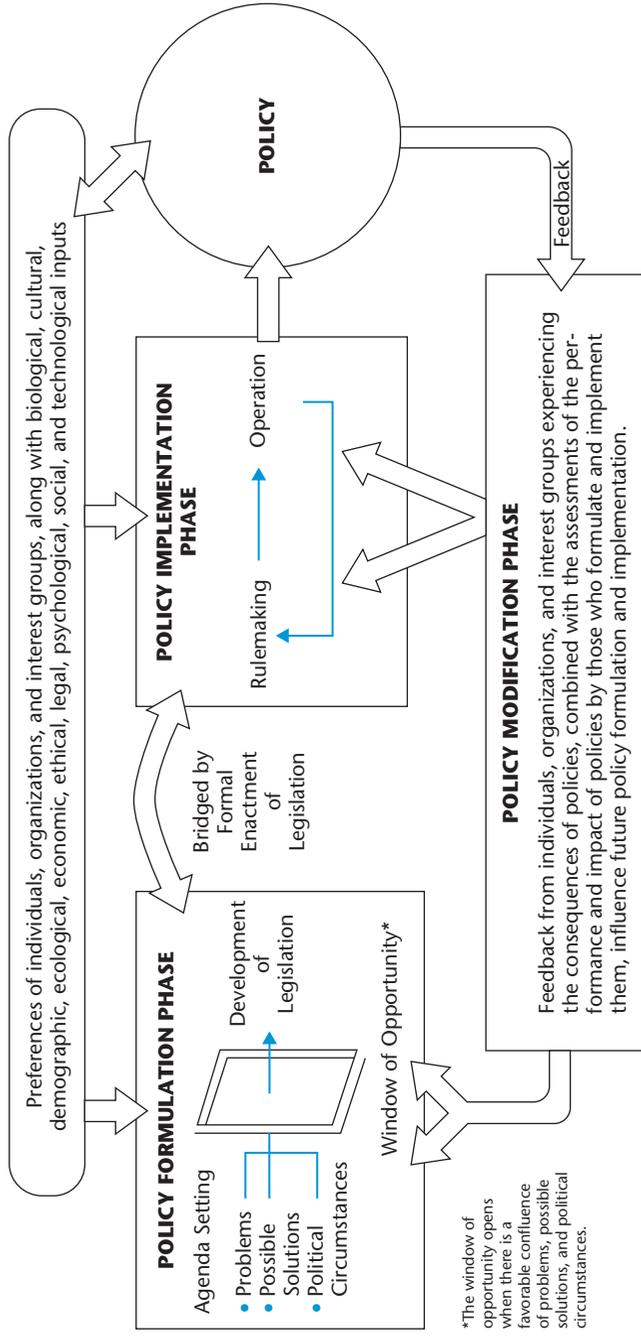
**FIGURE 3.5** Public Socioenvironmental Policy That Shapes American Environments, Personal Behavior, and Prospects for Health



1. cigarettes, alcohol, other drugs  
 2. includes food stamps and Medicaid  
 3. includes education, legal, day care, counseling

Source: Reprinted with permission from N. Milio (1981). *Promoting Health through Public Policy*. Philadelphia: F. A. Davis.

**FIGURE 3.6 A Model of the Public Policymaking Process in the United States**



Source: Reprinted with permission from Beaufort Longest (2006), *Health Policymaking in the United States*. Chicago: Health Administration Press, p. 108.

at least quarterly contacts with the Department of Health (DOH) ministers and civil servants and members of parliament. Sources of strength in the policy process identified were the groups' ability to bring the experience of patients, their relatives, and their caregivers to the table, participation in alliances with other groups with similar concerns, and close relationships with civil servants and ministers. Almost 90% of the groups participated in formal alliances of health consumer groups or linked with other stakeholders, such as other health professionals, in the policy process. Close working relationships with government officials charged with policy implementation and policy making were seen as critical to providing feedback on policy implementation and getting their issues on the policy agenda. Barriers reported were inaccurate coverage in the media, poor communication and feedback on policy developments from the DOH, lack of funding for lobbying activity, and the lack of power of consumer groups relative to other policy stakeholders, such as health professionals, commercial interests, and research charities (Jones et al., 2004).

The policy process involves the movement from “policy primeval soup” (Kingdon, 2003, p. 116) to the development of legislation. Three theories—Agenda Building, the Multiple Streams Theory, and the Advocacy Coalition Framework—are especially useful in understanding how this process occurs (Cobb & Elder, 1983; John, 2003; Kingdon, 2003; Sabatier, 2003).

**Agenda-Building Theory.** Agenda setting is the process of moving an issue to the systemic and institutional agenda for action. The systemic agenda contains issues that politicians see as meriting public attention and as being within the legitimate jurisdiction of existing governmental authority. The institutional agenda contains issues that are available for the active and serious consideration of political decision makers. Cobb and Elder (1983) propose three models for agenda building:

- Outside-initiative model
- Inside-initiative model
- Mobilization model

In the outside-initiative model, public support for an issue and the idea that the issue requires action that falls within governmental authority brings the issue first to the systemic agenda and then, with continued public pressure, to the institutional agenda. This may be accomplished through advocacy by community groups or organizations, such as the voluntary health agencies. In the inside-initiative model, the initiative comes from within the government system and does not involve the larger public; it often moves quickly from the systemic agenda to the institutional agenda. In the mobilization model, policy proposals

are developed within government, and then support is sought among the public for formal policy passage and successful implementation. When an issue is on the systemic agenda, politicians are more likely to place it on the institutional agenda if it has high and long-term social relevance, is not technical or technocratic, and is unique. These criteria suggest how advocates should frame the policy and messages concerning it.

Methods to influence policy development depend on which model best describes the process and where an issue is in the process. In the outside-initiative model, public support is needed to bring the issue to the systemic agenda. For public health issues, the methods of grassroots organizing, media advocacy, and professionally driven organizing use the media to show the importance of the issue and its effects on people, the urgency of the problem, and the power and legitimacy of the groups wishing to address the issue.

In the inside-initiative model, the initiative comes from within the government system and moves from there to the institutional agenda without involving the larger public. Here, the advocacy work is much more behind-the-scenes. Health advocates form relationships with legislative staff members, persuade them of the importance of the issue, and show how the issue fits with their legislator's agenda. Supplying information that is accurate and well timed to the legislative staff member's needs as the issue moves through the policy process enables the legislator's staff to get the issue into play. This process does not require large-scale community mobilization and media, because the issue is likely floating close to the systemic agenda. Here, individual policy entrepreneurs may be as effective as organized community groups. Policy entrepreneurs use the methods we discussed earlier (for example, persuasive communication, value discussions, and presentation of facts) to get policymaking insiders to place the issue on the systemic and institutional agendas.

In the mobilization model, policy proposals are developed within the government, and then support is sought among the public for passing the policy and implementing it successfully. In this instance, government insiders use the media and community forums to inform and persuade the public of the importance of the issue in order to mobilize broad-scale support for the policy proposal. The methods are similar to the dual-channel methods (that is, mass media and interpersonal communication) that we discussed earlier in this chapter.

Issues have a life cycle, and an understanding of the stages and their determinants allows the advocate to move an issue forward more effectively. Cobb and Elder (1983) identified five stages in the cycle:

1. Issue awareness
2. Issue recognition

3. Issue resolution
4. Issue realignment
5. Issue dormancy

In the issue awareness stage, groups and individuals begin to discuss problems and potential issues. For an issue to be recognized, a policymaker must decide that the issue should be addressed. Issues are more likely to be recognized if they are defined broadly, have a large social impact, have long-term implications, are not too technical and complex, and are not routine. Interest-group characteristics are also important. The group's ideology and values must arouse enough tension concerning the problem for the potential issue to emerge. The more powerful the group (in terms of size and legitimacy) and the more committed it is to the issue, the more likely it is to influence the policy. Time is important as well. Too rapid an emergence can lead to a crisis in which policymakers are unprepared; some issues require time to ripen. But too long a period can lead to loss of public interest.

De Leeuw (2000) raises the important question of who determines which policy is to be formulated. She suggests that the social planning model underlies traditional hierarchical policy formulation in which government sets policy. In comparison, locality development and social action community processes are most relevant to current policy agenda-setting models. The individuals or organizations that best use these processes set the policy. Social entrepreneurs—such as academicians, nongovernmental organizations, and community activists who value social justice and seek innovative solutions for social problems—can have a significant impact on policy.

**Multiple Streams Theory.** Kingdon (2003) has also investigated how issues reach systemic or governmental agenda status, inserting an element of chance that explains the fluidity and rapid change of the policymaking process. He views this process in terms of three streams: politics, problems, and policies (Kingdon, 2003; Zahariadis, 2007). The political stream includes changes in administration, party platforms, elections, and national mood regarding government. The problem stream includes issues within the various policy sectors, such as global warming, the national debt, health care costs, teenage pregnancy, specific diseases, and poor housing infrastructure. Science-based information is used to indicate the seriousness and causes of a problem and to provide evaluative information regarding current policies and programs. Policy solutions, such as pollution controls, universal health insurance, school-based clinics, or cooperative housing, “float around in or near government, searching for problems to which to become attached or political events that increase their likelihood of adoption”

(Kingdon, 2003, p. 112). In the policy stream, science offers ideas for solutions, legitimates them, and provides information about technical feasibility. Events and ideas in these streams move along independently until there is a change in one stream, such as a change in government, emergence of a large problem, or advocacy of new policies. At this point a window between the streams opens up so that a problem may enter the political stream or a policy may become linked to a problem. The role of the policy advocate is to create, monitor, and capitalize on these opportunities.

Policy advocates or entrepreneurs promote their proposals and the associated problems and facilitate coupling between the streams, linking problems, policies, and political opportunities together when the windows are open. Characteristics of effective policy advocates are recognized authority; visibility; strong political, communication, and negotiation skills; ability to engage in strategic planning; creativity; relative independence in resources and structure; and persistence (Duhl, 1990; Kingdon, 2003; Milio, 1981).

In policy advocacy, as in many other arenas, timing is everything; and opportunity knocks for those advocates who are prepared. Much of the success in placing issues on the systemic and institutional agendas and in achieving policy enactment comes from an understanding of when to act and how to frame the issue. Kingdon's notion of policy windows (2003) provides a framework for timing. Kingdon says that policy is placed on the agenda when the windows between the three streams—politics (including elections, party platforms, and national mood regarding government), problems (all the issues within different policy sectors, including the health, housing, and economic sectors), and policy solutions (such as school-based clinics and universal health insurance)—are open, so that the policy can be put forward. For example, newly elected officials may focus on certain problems, for which prepared advocates who have networked with the right gatekeepers can present their solutions. Community advocacy groups can work with each of the streams. For instance, they can support candidates for elected office or influence party platforms, build community demand to address particular problems, and develop and promote well-researched and persuasive policy proposals.

Laumann and Knoke (1987) point to the importance of organizations in the policy development process. They argue that influential organizations that have specific national policy interests and fluid resources and that are embedded within communication and resource-exchange networks are the main agents in the national policy process. These organizations are typically corporate entities, such as trade associations, professional societies, labor unions, corporations, public interest groups, government bureaus, and congressional committees. The policy

process begins when one or more of these organizations recognizes a condition as a problem or an issue and alerts other organizations to it. The interested organizations then generate options, often as solutions in search of issues. The alternative options are then narrowed to get the policy option onto the governmental agenda for consideration. Each step is a product of negotiation and advocacy.

Powerful corporate entities representing industries such as health insurance, pharmaceuticals, processed foods, and tobacco take positions opposed or aligned with those of health promoters. Developing and maintaining strong entities on behalf of public health—such as public health professional associations, associations representing public health officials, and citizens' groups—and carefully creating alliances where appropriate with corporate groups are strategies necessary to represent health promotion in the policy development process.

After policy is enacted into law, it must be operationalized; and advocates, especially strong interest groups, seek to influence this process through lobbying and other forms of influence. Especially important are long-standing working relationships between those implementing policy and the leaders of affected organizations and interest groups. These relationships are marked by the exchange of information and expertise. For complex policies that may affect a number of interest groups, advisory committees and task forces may be set up to help develop the proposed rules. Gaining a seat on these bodies allows for direct input to the process (Kingdon, 2003; Longest, 2006). According to Longest (2006), the success of the operational implementation of the policy rests on the fit between the implementing organizations and policy objectives and on the amount of resources (for example, authority, fiscal, personnel, information and expertise, and technology) that the organization has. A key consideration is the competence of agency managers related to strategy, leadership, collaboration, and conceptual and technical knowledge and skills. Implementation problems are certain to arise, and management must be able to address these challenges.

The policymaking process is cyclical, and most health policies are the result of modifying previous policies. Policy modification occurs when stakeholders incorporate feedback from policy implementation and consequences into the policy formulation and policy implementation phases. Rules and practices may be changed or the law may be amended, typically in an incremental fashion. Feedback comes from the groups affected by the policies, especially key interest groups, and from those who formulate and take charge of implementation. Pressure to change can be external, from individuals, organizations, and interest groups, and internal, through oversight by the legislative, executive, and judicial branches. Evaluations of policy implementation and outcomes of policy are often crucial to decisions regarding modification.

**Advocacy Coalition Framework.** The Advocacy Coalition Framework (Sabatier, 2003; Weible, 2008; Weible, Sabatier, & McQueen, 2009) focuses on the system of policy making. The primary focus is the policy subsystem, the set of agents who follow and seek to influence public policy in a given area across a time frame of a decade or more. Agents can be elected and appointed agency officials at all levels of government, interest-group leaders, researchers, and important journalists who cover the issue. The agents engage in coordinated activity through advocacy coalitions. Advocacy coalitions are based on deep and unchangeable shared basic values, causal assumptions, and problem perspectives in the particular policy arena, along with more changeable secondary beliefs about how to implement the policy core. A small number of coalitions within a particular policy subsystem compete, promoting conflicting strategies, and policy brokers within the subsystem attempt to find a reasonable compromise to reduce this conflict so that policy can be enacted.

Stable factors such as a society's perception of the issue area, distribution of natural resources, cultural values, social structure, and basic legal structure constrain the options available to the agents. For example, the U.S. cultural values of individualism and capitalism limit the policy options that can be advocated. Dynamic events such as socioeconomic conditions and technology, large changes in governing coalitions, and decisions and impacts from other subsystems alter the constraints and opportunities of the subsystem agents. The AIDS epidemic can be viewed as an outside event that enabled the harm-reduction coalition to overthrow the well-established abstinence coalition in the drug policy subsystem in Western Europe (Kubler, 2001). Bleach kits and needle exchange programs became policy options.

The Advocacy Coalition Framework provides guidance for carrying out policy advocacy. The framework rejects the notion that there are coalitions of convenience formed by agents motivated by short-term self-interest. Instead, core beliefs or ideology create a stable lineup of allies and opponents. Advocacy coalitions will negotiate on the secondary beliefs, including decisions on administrative rules, budgets, interpretation of statutes, and information about the problem, before shifting on the fundamental policy core. Because of this, the core attributes of a governmental program are unlikely to change as long as the coalition that instituted that program remains in power. Policy can change through a perturbation from outside the policy subsystem, policy-oriented learning, internal subsystem events that highlight failures in the current subsystem practices, and negotiated agreements between coalitions (Sabatier, 2003; Weible, 2008; Weible et al., 2009). In comparison to Kingdon's Multiple Streams Theory (2003), the Advocacy Coalition Framework sees the policy solution stream as much more integrated with the political stream because of the foundation of core normative and policy beliefs (Sabatier, 2003).

The importance of political ideology in public health has been increasingly recognized (Breton, Richard, & Gagnon, 2007; Breton, Richard, Gagnon, Jacques, & Bergeron, 2008; Cohen, 1988; Cohen et al., 2000). Particularly important has been the tension between the views that government has the duty to protect its citizens' health and that individuals have the right to make their own choices. Ideological arguments on both sides have been made regarding pasteurization of milk, fluoridation of public water supplies, use of motorcycle helmets, and tobacco control. Review of newspaper coverage of tobacco issues in the United States from 1985 to 1996 showed that the tobacco industry framed the issue around the core values of freedom, fairness, free enterprise, and autonomy. Tobacco-control advocates, on the other hand, framed the issue around the value of health (Menashe & Siegel, 1998).

Cohen and colleagues (2000) have suggested that ideological arguments be used to benefit tobacco control. They and others suggest that advocates use the perspective of the New Right, including its *laissez-faire* approach, its retreat from state intervention in economic and social affairs, and its belief in market forces; advocates should also use the values of freedom, fairness, and free enterprise to frame the argument for tobacco control (Cohen, 1988; Cohen et al., 2000; McKinlay & Marceau, 2000). This would avoid challenging normative core beliefs so that the focus can be on changing tobacco policy. With regard to framing the issue, freedom could include freedom from the influence of the tobacco industry and from the addiction of tobacco; fairness, treating bar and restaurant workers the same as workers who have protection from secondhand smoke; and free enterprise, that the tobacco industry seeks government tax breaks, trade advantages, and protection of its proprietary information.

Breton and colleagues (2008) analyzed the factors over a 12-year period of time leading to Quebec's 1998 Tobacco Act using the Advocacy Coalition Framework and a theory positing coalitions as temporary strategic alliances. Some elements of discourse were relatively stable, such as the lethality of smoking, the difficulty of quitting, the right to a smoke-free environment, and that government intervention in tobacco control is legitimate but must not impede provincial economy. Influential external events included the cigarette contraband crisis, a new Minister of Health who supported tobacco control, the Supreme Court of Canada's decision overturning federal restrictions on tobacco advertising, the Clinton administration's proposed measures to address youth smoking, and the lawsuits brought by states in the United States against the tobacco companies and demanding the release of tobacco industry documents. Their findings were consistent with a broad advocacy coalition from which a strategic alliance of agents emerged. Their work in tobacco control more generally also pointed out that health education played an important advocacy role in sensitizing the public (Breton et al., 2007). They noted the importance of making arguments that take

into account the fundamental values in the discourse of policymakers and the public, in addition to the dissemination of scientific arguments.

***Summary: Policy Theories in Problem Analysis and Intervention Methods.***

Policymakers are the agents for the environmental condition of health-promoting public policy. They enact health-promoting legislation, regulation, and policy. Determinants of this behavior include motivation and behavioral capability and barriers. Methods include policy advocacy (information, persuasion, and negotiation), agenda setting, and timing for policy windows.

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## Summary

This chapter presents both social (for example, norms and social support) and structural (for example, access to resources and policies) environmental conditions that can facilitate the health behaviors of individuals. The chapter provides an overview of theoretical constructs to describe processes and conditions at the interpersonal, organizational, community, and societal (policy) environmental levels. The chapter also explains theoretical methods for changing processes and conditions at these ecological levels.

Environmental agents, who have control of particular environmental conditions, are identified for each ecological level. Methods to change the environmental agent's behavior include both individual level methods described in Chapter Two and methods specific to an environmental level introduced for the first time in Chapter Three. Theories related to systems, power, and empowerment are applicable at more than one environmental level. Interpersonal-level theories include social networks and social support. At the organizational level, this chapter covers organizational development, the stage theory of organizational change, and stakeholder theory. At the community level, applicable theories are coalition theory, social capital and community capacity, social norms theories, conscientization, community organization, social movements, and advocacy. At the societal and policy level, we include agenda-building theory, multiple streams theory, and advocacy coalition theory.

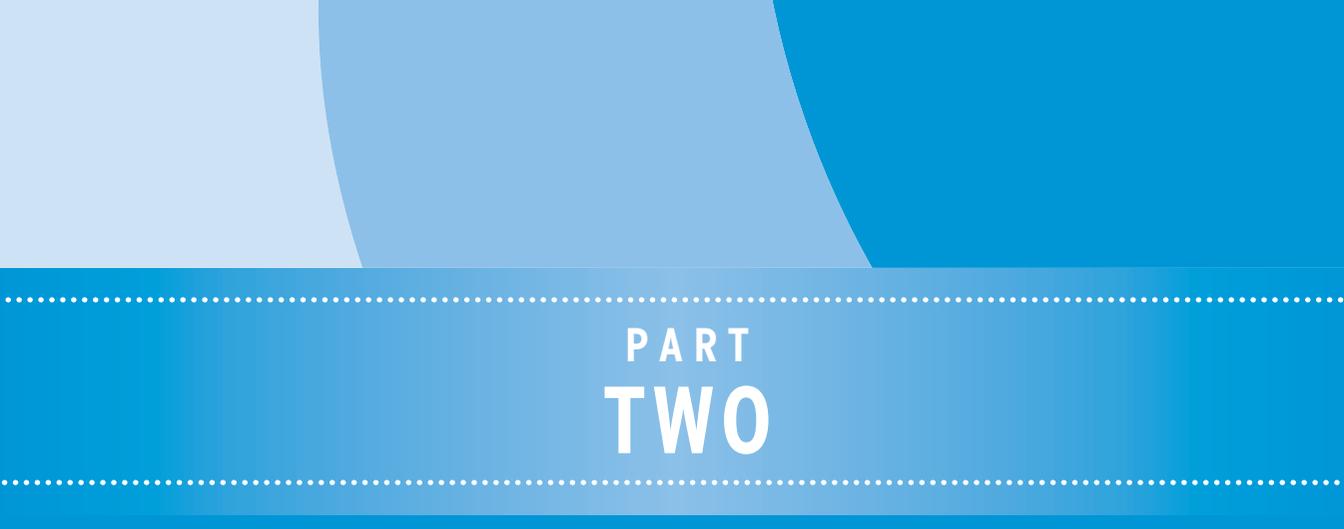
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## Discussion Questions and Learning Activities

1. Discuss why environmental conditions are considered important influences to promote health behavior.
2. Describe three examples of environmental conditions that may influence health outcomes through individual behavior.

3. Explain why agents in the environment are considered an important focus for health promotion programs. Give examples of agents for different types of environmental conditions.
4. Discuss how systems theory can be helpful for health promotion planners to consider for placing a planned intervention in the context of broader social systems.
5. Explain why the role of power in society is an important consideration in planning health promotion programs.
6. Describe how organizational theories could be used to change environmental conditions to promote health behavior and improve health outcomes.
7. How would a community organizer using Friere's conscientization techniques approach the task of organizing a community that was experiencing high incidence rates of HIV?
8. Use one or more policy theories to analyze a health issue of current interest, for example health care reform, HIV prevention, and sexuality education.





PART  
**TWO**

**INTERVENTION  
MAPPING STEPS**



# INTERVENTION MAPPING

## STEP 1

### NEEDS ASSESSMENT

#### LEARNING OBJECTIVES

- Establish a participatory planning group that includes potential program participants and implementers
- Plan and conduct the needs assessment using the PRECEDE model (Green & Kreuter, 2005)
- Balance the needs assessment with an assessment of community capacity
- Link the needs assessment to program and evaluation planning by specifying desired program goals

The purpose of this chapter is to enable the reader to perform a needs assessment and to facilitate participation by those who will be affected by the resulting program. Intervention Mapping or any other health education program planning must be based on a thorough assessment of community capacity and needs. This assessment encompasses two components:

1. An epidemiologic, behavioral, and social perspective of a community or population at risk for health-related problems
2. An effort to understand the character of the community, its members, and its strengths.

In the first part of the chapter, we discuss the pre-assessment, which includes putting together a work group for intervention development. We touch on essential elements of encouraging participation, work-group management, and culturally sensitive practice.

The needs assessment includes creating a logic model of the health problem, and for this purpose, we present the PRECEDE part of the PRECEDE-PROCEED model (Green & Kreuter, 2005). Using the logic model presented in PRECEDE, we describe defining the population and context for the assessment, asking questions, and choosing data sources for each part of the logic model of the problem. Following a focus on the needs or problems, we briefly cover assessment of community strengths. Finally, we discuss post-assessment including setting priorities and setting program goals for health and quality-of-life outcomes.

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## Perspectives

Our perspectives in this chapter highlight the importance of needs assessment and a consideration of community strengths as a part of intervention planning.

### Needs Assessment as Part of Intervention Planning

A needs assessment, the first part of intervention planning, is a systematic study of the discrepancy between what is and what should be in a group and situation of interest (Gilmore & Campbell, 2005). A statement of need is a statement of a problem; not a statement that either purposefully or inadvertently suggests a solution (Altschuld & Kumar, 2010). For example, suggesting that a community needs a new gymnasium to facilitate increases in physical activity conflates needs and solutions. In addition to focusing on needs rather than solutions, Gilmore and Campbell (2005) suggest that planners not worry too much about the difference between “real” need and perceived need because needs are always changing in character and quantity and because reports and assessments of needs are always interpreted by someone (Gilmore & Campbell, 2005).

The partially subjective nature of needs assessments suggests that they should include both a factual description of the problem and its causes and the opinions of the stakeholders, those with a vested interest in the problem and its solution (Altschuld & Kumar, 2010; Witkin & Altschuld, 1995). Because the labeling of something as a problem is a value-laden social construction, the description of problems should always include the perspectives of those who experience the condition (Suarez-Balcazar, 1992). Suarez-Balcazar and colleagues (1992) suggest that problem identification in intervention research should make sure to avoid blaming the victims, involve community participants, and examine the environmental causes of problems.

Sometimes the literature uses the term *formative research* for a needs assessment that is done for the purpose of contributing to the development of a program (Bellows, Anderson, Gould, & Auld, 2008; Kraft, Beeker, Stokes, & Peterson,

2000; Newes-Adeyi, Helitzer, Caulfield, & Bronner, 2000; Sorensen et al., 2004; Vu, Murrie, Gonzalez, & Jobe, 2006; Young et al., 2006; Zapka, Lemon, Estabrook, & Jolicoeur, 2007). Formative evaluation can refer specifically to pretesting, or testing the appropriateness of a program or program materials (see Chapter Seven). Gittelsohn et al. (2006) argue that formative work is important for understanding determinants of health behavior.

In the case of health problems, a needs assessment seeks to help the planner understand “what is” and to compare the current status to one that is more desirable in terms of quality of life and health. The needs assessment also addresses those factors that influence health or health risk, such as behavior and environment. Needs assessments of health problems include an analysis of the physiological risk factors and behavioral and environmental risks to health, even when the actual health problems have not yet manifested. For example, cardiovascular disease is a health problem; high-serum cholesterol levels are a physiological risk factor; eating high-fat foods is a behavioral risk; and poor access to healthy diet is an environmental risk factor. Finally, health-related needs assessments include the assessment of the determinants of behavior and environmental contributors to health problems or health risks. By determinants, we mean those factors that have been found to be associated with the health-risk behavior or the environmental condition. The implication for intervention is that determinants are causally related to the behavior and conditions; however, even though the logic is causal, the empirical evidence most often is not (see Chapter One).

A needs assessment should present a full description of a problem in as much detail and complexity as can be ascertained within the boundaries of the project. At some point in the planning of an intervention that addresses a health problem, planners may need to narrow the needs assessment focus. This narrowing should not be done before planners have fully analyzed the problem and its multiple causes.

## Knowing the Community

The study of a community from the perspective of capacity, or resources and strengths, rounds out the assessment (Curtis & Jones, 1999; Fawcett, 1991; Fawcett et al., 2000; Goepfing & Baglioni, Jr., 1985; Goodman, Steckler, Hoover, & Schwartz, 1993b; Issel & Searing, 2000; Kretzmann & McKnight, 1993; McKnight & Kretzmann, 1997). Studying the strengths of a community can help the health educator keep in mind a community’s unique character and its ability to plan its own interventions. An attitude of partnership between health professionals and community members can help to prevent a top-down or outsider planning approach (Minkler, 1997; Minkler & Wallerstein, 1997). For example, a class at a school of public health began an assessment of a

community that had many health problems. This minority area had originated as a community where few city services were available. Community residents and planners worked together to understand needs in a context of both current and historical community pride, entrepreneurship, and leadership. Despite a host of urban problems, inconsistent support from the city, and deficits in health services, the community maintained a strong African American culture that had begun attracting new resources. From a perspective of health needs, the community had a certain profile; and from a capacity perspective, it had another look entirely.

Furthermore, a focus on community competencies and resources from the outset of program planning along with participation of community members directs attention to the need for enhancement of capacity in the program development and implementation (Cargo & Mercer, 2008; Israel et al., 2003; Teufel-Shone, Siyuja, Watahomigie, & Irwin, 2006). All too often, health education and other social programs, especially research and demonstration efforts, have entered communities, only to leave them unchanged when funding ended (Goodman & Steckler, 1989). Programs that aim to enhance capacity from the start of planning can make this scenario less likely (Hawe, King, Noort, Gifford, & Lloyd, 1998).

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## Collaborative Planning

The first task in the Step 1 needs assessment is to establish and maintain a planning group that includes program stakeholders.

## Participation in Program Planning

In Intervention Mapping, we do not explicitly teach community-based participatory research, but we draw on many principles set forth so well by others (Belansky, Cutforth, Chavez, Waters, & Bartlett-Horch, 2009; Horn, McCracken, Dino, & Brayboy, 2008; Israel et al., 2003). Participation by community members, potential program implementers, and program beneficiaries helps to ensure that a project addresses issues important to the community, that project findings are locally relevant, and that participating communities develop capacity in intervention development and research (Teufel-Shone et al., 2006). All health promotion program development and evaluation should be based on meaningful participation of stakeholders (Hunt, Lederman, Potter, Stoddard, & Sorensen, 2000; Israel et al., 2003; Krieger et al., 2002; Minkler, Thompson, Bell, Rose, & Redman, 2002; Sullivan et al., 2003; Yoo et al., 2004). Meaningful participation can be encouraged in a variety of different planning contexts which might be

described on a continuum where at one end the health educator and planning group work *with* the community and the implementers to understand the health problem and solution to the other end in which the community members *are* the planners, and the planning becomes a part of the intervention, as in a community empowerment model (Blair & Minkler, 2009; Fisher, Auslander, Sussman, Owens, & Jackson-Thompson, 1992; Fisher, et al., 1994; Hugentobler, Israel, & Schurman, 1992).

Even though intervention planners may not always be in a position to fulfill every aspect of the tenets of community-based participatory research, planning should always be earnestly collaborative. Principles of collaboration include the following characteristics of a project as described by a number of authors (Cargo & Mercer, 2008; Christopher, Watts, McCormick, & Young, 2008; Green & Kreuter, 2005; Israel et al., 2003; Krieger et al., 2002; Minkler, 2005; Wallerstein & Duran, 2006):

- Acknowledges personal and institutional histories
- Recognizes the community as a unit of identity and promotes community involvement from the beginning of the project
- Achieves a balance between knowledge generation and intervention in locally important public health problems for mutual benefit of all partners
- Plans from ecologic perspectives that recognize and attend to the multiple determinants of health
- Involves systems development using a cyclical and iterative process
- Disseminates results to all partners and involves them in the dissemination process
- Facilitates collaborative, equitable influence on the direction and activities of the project through all or most phases of the project
- Makes sure that the project results in learning, capacity building, and sustainability
- Shows respect for the expertise, values, perspectives, contributions, and confidentiality of everyone in the community
- Allots time and resources to group function
- Compensates community participants

Members of the group with the health risk or problem—the priority population—are important stakeholders to be included in the planning group. The philosophy of health education is built on the principle of self-determination, an individual's governance of his or her own behavior (Allegrante & Sleet, 2004). Health education has a history of community participation in program development, including acknowledgment that people have both the right and

the responsibility to participate in planning for their own health (World Health Organization, 1978). Participation, as demonstrated by consensus and trust, increases the probability that health goals will be reached (Green, 1986; Green & Kreuter, 2005; Hunt et al., 2000; Kreuter, Farrell, Olevitch, & Brennan, 2000; Macaulay et al., 1999). Many examples exist of community members participating in all aspects of planning, from documenting needs (Teufel-Shone et al., 2006; Wang & Burris, 1994) to developing program materials (Edgren et al., 2005; Kannan et al., 2008; Rudd & Comings, 1994) and implementing programs (Eng & Young, 1992; Ovrebo, Ryan, Jackson, & Hutchinson, 1994).

### Composing and Maintaining Project Work Groups

No matter where a project functions on a community ownership continuum, participatory work is a foundation of practice. At least one, and sometimes more than one, well-functioning work group will be necessary to plan and complete a needs assessment, and then to implement and evaluate a program. A project begins somewhere. The initiator may be a community organization, a university research team, a government agency, or other entity. One might imagine the planner, no matter the location, thinking about how the work will get done once an initial project idea has been “hatched” or a problem identified. We always begin by developing a work group or team. Most often, a work group comprises stakeholders who have an interest in the health problem, the program, or its outcome. Community participants can be unaffiliated residents, community organizations, staff members who work with community members, and managers or leaders from community organizations (Krieger et al., 2002). Other stakeholders may come from government organizations, health care systems, professional organizations, third-party payers, media, voluntary health agencies, and academic institutions (Fawcett et al., 2000).

In a guide to engaging stakeholders in program evaluations, Preskill and Jones (2009) present many helpful suggestions for identifying and working with stakeholders that can apply throughout the life of a project. Table 4.1 presents questions to guide the identification of stakeholders for a needs assessment (Cargo & Mercer, 2008; Preskill & Jones, 2009). Having stakeholders work together is a good way to bring a variety of perspectives and a great deal of knowledge to conducting a needs assessment as a first step in creating a health promotion program. It also allows stakeholders to nurture feelings of ownership of the project. Another major reason to create a multiperspective work group is the group’s contribution to developing culturally appropriate programs. The intended recipients and implementers of a program are best able to interpret the needs and perspectives of the cultural groups to which they belong.

**Table 4.1** Questions to Guide Recruitment of Stakeholders

Planning Group Need	Questions to Consider
Expertise in the health problem or its causes	<ul style="list-style-type: none"> <li>• Who has content knowledge relative to the health problem or its causes?</li> <li>• What disciplines can be most helpful in describing problems from an ecological perspective?</li> <li>• Who knows about similar problems?</li> <li>• Who is well respected for knowledge of this health problem or ones like it?</li> <li>• Who has worked on a similar needs assessment or program?</li> </ul>
Diverse perspectives and community participation	<ul style="list-style-type: none"> <li>• Who has needs and perspectives related to the problem?</li> <li>• When programs are developed related to needs and problems, who are the potential clients, participants, or beneficiaries?</li> <li>• Who already works with potential beneficiaries?</li> <li>• Who can help the planning group clarify values related to the needs assessment and intervention development?</li> <li>• Who can help the planning group balance science, social relevance, and cultural relevance?</li> <li>• Who are the potential critics of the program or initiative?</li> </ul>
Responsibility and authority	<ul style="list-style-type: none"> <li>• Who will manage the needs assessment and program development?</li> <li>• Who is the funder?</li> <li>• Who can become a partner in the assessment and program development?</li> <li>• Who can bring resources to the endeavor?</li> </ul>
Influence	<ul style="list-style-type: none"> <li>• Who has served as a resource to community members for this problem or related ones?</li> <li>• What policy makers have worked on this type of problem?</li> <li>• Who are opinion leaders who might have an interest in this type of problem?</li> <li>• Who can help the planning team access expertise and other resources of the community?</li> <li>• Who can garner support and buy-in to the project?</li> </ul>
Commitment to the issue	<ul style="list-style-type: none"> <li>• Who will want to develop and disseminate the conclusions of the needs assessment?</li> <li>• Who might advocate for the assessment and intervention development?</li> <li>• Who has been working on the problem from a practice perspective?</li> <li>• Who has been working on the problem from a research perspective?</li> <li>• Who could bring creative energy to the project?</li> </ul>

Project leaders may need to reassess and enhance work group membership at various times in the program development process. Each time the planning group begins a new step of Intervention Mapping provides a good opportunity for a quick assessment of whether all the needed stakeholders are “at the table.” Orlandi and colleagues have described a work group as a linkage system between a resource system (program developers), an intermediate-user system (implementers), and an end-user system (participants) (Orlandi, 1986, 1987; Orlandi, Landers, Weston, & Haley, 1990). Especially, as the planning group begins to think about how a program might be delivered, it needs to assess whether all the elements of a linkage system are present in the work group to ensure that, once a program is developed, it can be fully implemented. Further, many interventions are developed and evaluated with the possibility of wider dissemination once a program is shown to be effective.

A part of developing programs with an eye to future wide dissemination is to include potential dissemination partners as a part of the initial work group (Glasgow, Marcus, Bull, & Wilson, 2004b). For example, in hindsight, the stroke project that is described at the end of this chapter (Stroke Box 4.1) and Chapters Five, Six, Seven, Eight, and Nine, produced a successful intervention that might have been disseminated on a wider scale at the end of the project. However, for this to occur we needed to have invited participation from partners with a national distribution reach such as a heart or stroke organization at the beginning of the project. Or, as an alternative, the planning group could have reassessed its membership nearer to the time of having results from the program evaluation, and then invited new dissemination-oriented members. Glasgow and colleagues (2004b) give the example of planning a cancer-related intervention with the National Cancer Institute Cancer Information Service as a planning partner that would then be available for national program dissemination in the United States.

Planners cannot be positive at any given moment that the planning group adequately represents program constituents, and they should make ongoing efforts to represent the community. They must keep asking how well they know and are communicating with those whom the intervention is meant to affect, and they must continue to build relationships based on listening and sharing in order to move to ever-higher levels of understanding. They must also be sure that they access various members of communities, not simply those who have been recruited to be part of the planning group. Health planners must be sure that they are not working only with information that is seen solely through the eyes of the planning group.

In addition to at-risk population partnerships, health educators must build linkages with the program implementers. Even though the implementers are not

usually the focus of the needs assessment, they may be one important source of information about both the problem and the community. The person who works with a health problem, rather than the individuals who have the health problem, may be the first contact for the health educator—the physician or nurse for a chronic disease, the emergency medical service for injuries, the HIV counselor for AIDS. These key informants may have very different perspectives on a problem than do the potential program recipients (Rossi, Lipsey, & Freeman, 2004). For example, in planning health services for the homeless, physicians, workers at homeless shelters, and members of the city council may all be important key informants. These stakeholders are likely to have different viewpoints from each other and from the homeless themselves. We discuss the concept of implementers in more detail in Chapter Eight, which covers adoption and implementation.

## Work-Group Management

Once a work group is put together, it must be managed for project productivity, and health promoters will need certain skills, including those used in interpersonal communication and group facilitation.

**General Guidelines for Productive Groups.** Group process skills are briefly covered here, but the successful health promotion professional will need to pursue further training to learn and practice group skills. To get started, a group will define members' responsibilities, choose a basic structure, decide how to make decisions, agree to tasks, and propose a time line (Centers for Disease Control and Prevention & Oak Ridge Institute for Science and Education, 2003). For some work, groups will function as a whole; for other tasks, members may break into a variety of smaller working and advisory groups.

Working in a group to create an effective program requires good group management by the leader of the group as well as by each individual member. Johnson and Johnson (2008) suggest that, for most tasks, effective groups have active, two-way communication that is distributed among group members, rather than strictly to and from group members and the leader (see Table 4.2). Leadership and responsibility for group function is also distributed, including group generation of goals and agendas. Furthermore, goals should be fluid and reflect both individual and group needs. Group cohesion is advanced through high levels of problem-solving competence, inclusion, affection, acceptance, support, and trust.

Johnson and Johnson (2008) also suggest that avenues to power and methods of decision making are other important aspects of a work group. Power and influence in effective groups are likely to be based on ability and information

Table 4.2 Group Facilitation Processes

Process	Description
<i>Communication</i>	
Owning a statement	Using first-person singular pronouns (I or me)
Completeness and specificity	Clearly stating all necessary information, including the context or frame of reference, intention or goal, and assumptions
Congruence	Making verbal and nonverbal communication congruent
Redundancy	Using more than one channel of communication (written, oral, graphic) to clarify meaning
Requesting feedback	Asking for information about how a communication is being understood
Frame of reference	Making the communication appropriate to the receiver's frame of reference
Feelings	Describing feelings by name
Describing behavior	Describing behavior of another person without evaluating or interpreting
<i>Task Functions</i>	
Developing the agenda	Enabling the group to list activities, set priorities, and budget time
Initiating	Beginning a discussion that includes both substantive offerings (such as the background of an issue) and methodological offerings (such as a suggestion to begin by brainstorming)
Information seeking	Eliciting pertinent information by asking for information, keeping issues from closing prematurely, encouraging members to speak, accepting both people and ideas
Opinion giving	Allowing opinions to be freely given and valued by the group as coming from the members' experience
Elaboration	Asking for elaboration on a partially stated idea
Coordination	Joining together ideas from two or more members (ideas that might seem disparate at first)
Partializing	Pointing out the fine differences in two ideas that might seem the same at first glance
Evaluating	Evaluating ideas but not people
Structuring	Deciding and facilitating the ways in which a group can work, such as using subgroups

Table 4.2 (Continued)

Process	Description
Energizing	Moving a group through a “stuck” point by restructuring the work or process. For example, introducing a process such as brainstorming, using humor, expressing feeling, giving or getting feedback
Summarizing	Summing up the points, progress, and needs of the group orally in the meeting and in meeting notes, summaries, and action items after the meeting
Synthesizing	Making meaning of various ideas expressed in the group
<i>Maintenance and Team-Building Functions</i>	
Gatekeeping	Making opportunities for participation by the less talkative members of the group
Encouraging	Encouraging members to participate in the group
Harmonizing	Seeking common goals or common ground in a conflict
Consensus seeking	Modifying group decisions and plans until group members are relatively comfortable and supportive
Giving feedback	Sharing with the whole group a direct, specific, immediate description of the impact of group or individual communication.
Standard setting	Setting and revisiting group norms regarding efficiency, fairness, power, and communication
Processing	Setting aside the final minutes of a meeting for reviewing how the work progressed and how it can be improved

rather than position and to be equalized and shared through norm setting and group facilitation processes. In addition, decision-making procedures should be predominantly by consensus and should match the various task situations that the work group encounters. A note on evidence: One dilemma that arises in part from the focus on scientific evidence in the work that we do is the tendency to inadvertently devalue contributions from nonacademics in workgroups. In this context, some people may feel less confident or less empowered to make contributions than others. As mentioned in Chapter One, every question has the potential of answers from several types of information: theoretical and empirical evidence, practice, and lived experience. Group members can use group processes to allow and encourage ideas and information from many sources.

The types of groups that we are talking about will move back and forth between three types of work group functions: idea generation, decision making,

and product development. A hallmark of productive work groups is the ability to generate many ideas from both the most accessible information and experience available to members and from less used and less available experience. Using all of the ideas and the data available, groups also have to make decisions and choose goals and direction. And, finally, based on decisions, groups produce programs and their components. All of these types of work are crucial to a project's success and moving between them is a hallmark of effective group function.

**General Meeting Facilitation Processes.** Every task group has two necessary types of activities: those related to the work at hand and those related to group process (Bradford, 1976). Project tasks are whatever must be accomplished to do the group's work. However, unless the relationships among group members, feelings of inclusivity, group norms, predictability of procedures, and issues of participation and trust are addressed through group maintenance and team building, the work of the group will suffer. The application of good task-management skills can also facilitate group team building and maintenance, which often happen simultaneously with tasks but also sometimes require dedicated group time, effort, and skills (Becker, Israel, & Allen, 2005; Bradford, 1976). Table 4.2 describes processes that can be practiced to develop a work group that matures to a team capable of producing a better program than any one team member could create alone. The list in Table 4.2 does not include processes for diagnosing and dealing with group problems. Using the skills in Table 4.2 routinely will help the work group avoid many problems and we encourage the reader to delve more deeply into and pursue in-depth training in group management and process to attain the skills to manage group problems.

Practicing group process skills requires the beliefs that individual group members bring unique types of intelligence, perspective, information, and skill to a program development situation and that the application of these diverse contributions strengthens the resulting program. Group management is built on listening to others' ideas with a willingness to review and make transparent for group review one's own assumptions about the health problem and its solutions (Senge, 2006). With this as a starting place, practicing the processes in Table 4.2 can lead to a productive work group. The set of individual communication behaviors in the table is from Johnson and Johnson (2008), whereas the group management behaviors are from Bradford (1976), Sampson and Marthas (1990), and Toseland and Rivas (2008).

**Processes for Idea Generation.** Although all work groups will have times when they conduct semi-structured meetings and "do work" they also have times when the important activity is to generate ideas. The goals of idea generation are

quantity and creativity of ideas to stimulate the group's work. More accessible ideas will arise fairly easily; less accessible material will need processes designed to elicit creativity (de Bono, 1994). Sometimes, especially in less mature groups, getting ideas into play is difficult because members may participate unequally based on status, power, relationships, and experience. A number of structured processes can be very important intermittent exercises for group functioning. Some of these techniques are structured to disallow judging the merit of ideas so that many ideas are generated. They also help to stimulate all group members to participate.

**Brainstorming or free association** encourages group members to generate and record unedited ideas in response to a question. Seeing group members' ideas recorded on a large pad or board serves to prime individual member's idea generation (Buunk & van Vugt, 2008; Preskill & Jones, 2009).

**Nominal Group Technique** is also done in response to a posed question, but the ideas are generated independently by each member and then shared one at a time (Delbecq, 1983; Moon, 1999). For needs assessment, the question might be something like, "In this neighborhood, what health threat concerns you the most?" Members give answers to the question one at a time, round-robin style. The facilitator records the answers, using a board or large pad. After clarification of the listing of answers, group members make preliminary rankings, which they record and discuss. A second vote is taken, yielding a final prioritization (Gilmore & Campbell, 2005). A more formal approach to this process, concept mapping, uses multidimensional scaling and cluster analysis to develop a visual display of themes or categories (McFall et al., 2008; Trochim, Cook, & Setze, 1994; Trochim, Milstein, Wood, Jackson, & Pressler, 2004; Trochim, 1989). These techniques equalize participation and also have the added benefit of enabling the planner to leave the meeting with lists of answers to the posed question rather than the voluminous transcripts that are the output from focus groups.

**Responding to a Paper or Presentation of Evidence** is an efficient way for a planning group to move between steps of Intervention Mapping. For example, data from one phase of a needs assessment can be summarized and presented to the planning group to build a foundation of the next phase of data collection. Data and information from the needs assessment can be presented to the group to enable decisions about what should change and the development of matrices (see Chapter Five). This process was effective in a project to develop an intervention to enable Hispanic and African American men to make informed decisions regarding prostate cancer screening. Team members conducted needs assessment data collection and analysis in two geographically distant sites. Group members met face-to-face, shared the findings from the

assessments, and, based on presentations from multiple working groups, moved rapidly through Intervention Mapping Step 2 (Bartholomew et al., 2010; Chan et al., in press).

**Off-the-Wall Thinking** is similar to nominal group process except that individuals write their answers to a single question on Post-it notes. One at a time, the members post the notes on a wall or whiteboard in emergent theme categories. The categories evolve as more and more notes are posted. Those members who post later offer category modifications to the group based on additions that change the content and meaning of categories and their boundaries.

**Decision Making by Consensus and a Recipe for Creative Conflict.** For most decisions made on a health promotion planning team, consensus is the decision-making process of choice. Most decisions require group members to weigh and understand evidence regarding a certain course of action and to argue the various group decisions based on that evidence. Voting and majority rule are not usually effective for health promotion planning because they do not work to encourage full discussion or to use minority opinion in the decision-making process. In general, decisions should depend on interpretation of the evidence, and voting is not a useful way of judging evidence. A desire to put a question to a vote in a work group usually indicates a premature closure of deliberation on an issue. To work to consensus, a group will need to seek differences of opinion among the members; help each interested person to clearly, fully, and persuasively present a position; critically consider all positions presented; encourage members to be willing to change their minds when they have been logically persuaded of the merit of someone else's argument; tolerate and even encourage intellectual conflict and avoid premature closure of arguments; and focus on the goal of reaching the best possible decision (Johnson & Johnson, 2008). Consensus is not unanimity—group members must be willing to support the decision for a trial, but they do not need to be enthusiastic about the group's direction.

Bad leadership and sometimes groupthink can result in avoidance of conflict and a cascade of poor decision-making processes including self-censoring; incomplete disclosure of reservations, counterarguments, and alternative course of action; feelings of invulnerability to the side-effects or unintended consequences of a proposed action; rationalization; and exclusion of critics (Johnson & Johnson, 2008; Sternberg, 2007). To make the best decisions possible, well-functioning groups embrace conflict in ways that build on and extend the consensus process. Group members proceed through the following process: gathering and organizing information to clarify a problem or a need for a decision; presenting various positions, answers, or alternatives; hearing from

members with opposing views; actively acknowledging conceptual conflict and uncertainty; seeking more information to understand the situation from opposing perspectives; and synthesizing ideas presented in the conflict to state a new proposition or answer (Johnson & Johnson, 2008).

**Goals, Time Lines and the Tasks at Hand.** Both idea generation and decision-making processes can vary from a few minutes to a few months! A work group needs structure and guidance to produce the end products of the initiative. The tools for keeping the group on track through the project work include participatory meeting agendas, detailed timelines, processes for goal setting, and time in each meeting for debriefing how the group is progressing. From our point of view, the group will also need a systematic work plan such as Intervention Mapping.

## The Work Group and Cultural Considerations

In Chapter One, we began to discuss the importance of cultural considerations in intervention planning and here we will build on that discussion. In Chapter One we briefly touched on a goal for practice—one of developing a perspective of cultural humility (Tervalon & Murray-Garcia, 1998). Now we will suggest some ways of preparing oneself to work interculturally (Wilson & Miller, 2003). The thread of discussion regarding the inextricable tie between understanding cultural influences and developing sensitive programs and materials will be picked up again in Chapter Seven, where we discuss cultural representations in program development.

The very first process in beginning health promotion practice in general, and any one project in particular, is to consider the community and its cultural groups and subgroups and to make sure that these groups are represented on the planning team. In order to address priority health issues effectively, health educators must be able to develop culturally appropriate programs. Furthermore, culture is not an issue of race and ethnicity alone. Ethnicity is but one of several group designations that act to define enduring aspects of a group culture.

Becoming involved in planning with the members of the potential program participants or beneficiaries is only a beginning; a second aspect is a process of continuing personal development to be able to work both across and within cultures. This personal work involves a process of deep listening to the people with whom one is working as well as an active exploration of one's personal ethnocentrism (Sue, 2003). Triandis (1994) states that, in observing other cultures, we humans see the world through a lens of who we are rather than seeing the world as it is. Culture can be defined as the implicit and explicit guidelines that individuals inherit as members of a particular group. These guidelines tell people

in a culture how to view and experience their world and how to behave in relation to other people, to supernatural forces, and to the environment (Helman, 1990). The more cultures differ from one another, the higher the cultural distance is; and the less likely it is that people from those different cultures will attach the same meaning to words, gestures, and symbols.

Triandis (1994) describes personal ethnocentrism as an individual's sense of slight superiority in response to stories from other cultures and boredom at the expectedness of stories from one's own culture. Because of this boredom, such individuals do not seek to understand their own viewpoint or explore their own culture. Stereotyping, bias, and racism can occur in the incubator of ethnocentrism if individuals begin to ascribe similar attributes to all members of a group (Sue, 2003). For example, to suggest that all members of the Hispanic culture believe in *fatalismo* is at best simplistic and at worst stereotyping. Do all members of this hugely diverse group express a belief in fatalismo? How much variation is there among members of the group who do ascribe to this belief? Do members of other cultures ascribe to this belief, and are these beliefs manifested in a way similar to beliefs among Hispanics?

Human beings have much in common as well as many attributes that differ from culture to culture. In addition, individuals within a culture have many differences from each other. Stereotyping can obscure both of these facts. A superficial effort to draw on elements of another culture in an educational situation may only exacerbate a tendency to stereotype (Rios, McDaniel, & Stowell, 1998). Rios and colleagues recommend taking a cultural plunge into another culture with concurrent efforts at self-awareness regarding both one's own culture and one's response to the host culture.

**Exploring Personal Ethnocentricity.** Beginning to describe one's own culture can be a start to liberation from ethnocentrism. Locke (1986, 1992) offers the following set of questions as a guide to first steps in developing cultural self-awareness:

- What is my cultural heritage? What was the culture of my parents and grandparents? With what cultural group do I identify?
- What is the cultural relevance of my name?
- What values, beliefs, opinions, and attitudes do I hold that are consistent with the dominant culture? Which are inconsistent? How did I learn these? For example, for someone in the United States these cultural beliefs might include beliefs in success, the inherent value of work, moral orientation, material comfort, personality and individuality, science and rationality, efficiency, and democracy (Williams, 1970).

- How did I decide to be a health educator? What cultural standards were involved in the process? What do I understand to be the relationship between culture and health education?
- What unique abilities, aspirations, expectations, and limitations do I have that might influence my relations with culturally diverse individuals?

Through a process of suspending and then observing one's habitual ways of relating to other groups and then observing one's typical ways of seeing and relating to others, a person can move through stages to attain greater cultural awareness, sensitivity or even humility. The stages may include: (1) feelings of fear, hostility, defensiveness, and superiority; (2) denial of cultural differences; (3) cultural acceptance and respect; (4) empathy; (5) integration, multiculturalism, and social justice (Bennett, 1993; Borkan & Neher, 1991; Brown & Mazza, 1997; Rios et al., 1998). Sue, in his book on overcoming personal racism, suggests a final stage of commitment to anti-racist action that includes actively seeking out information on racism; engaging in interracial relationships; discussing racial issues with persons of color; expressing positive racial and cultural views to friends and family; speaking up against racial slurs; and working in groups and for policies with goals and missions of antiracism and multiculturalism (Sue, 2003). This growth process requires active motivation to explore personal reactions and can be aided by writing field notes and journal entries during cross-cultural encounters. In addition, learning another language provides an invaluable opportunity for cultural insight. As next steps, one might structure opportunities in the working group to disclose personal backgrounds including those related to privilege and power (Tervalon & Murray-Garcia, 1998; Wallerstein & Duran, 2006).

**Exploring and Working in Another Culture.** Only the person who becomes more aware of his or her ethnocentric lens can effectively explore and work in another culture. Another absolute prerequisite for working in another culture is to be able to identify and embrace the positive aspects of that culture (Airhihenbuwa & Liburd, 2006). One way of clearly identifying the positive aspects of a culture as they are related to health is the PEN-3 model (Airhihenbuwa, 1995; 1999; Airhihenbuwa & Liburd, 2006). In this model, the planner considers three domains of culture. The first domain guides the choice of priority populations through a consideration of extended families and communities as well as individuals. The second domain, relations and expectations, considers aspects of the culture that can affect health and behavior including perceptions, enablers, and nurturers. The third dimension, cultural empowerment, suggests the valence of the relations and perceptions as either positive, negative, or existential (neither positive nor negative in relation to health) (Airhihenbuwa & Webster, 2004;

Fitzgibbon & Beech, 2009). In another model, Locke (1992) suggests scrutinizing the following ten cultural elements to begin exploring another culture:

- Degree of acculturation
- Poverty
- History of oppression
- Language and the arts
- Racism and prejudice
- Sociopolitical factors
- Child-rearing practices
- Religious practices
- Family structure
- Values and attitudes

Triandis (1994) presents a different structure for looking at cultures. He describes the cultural syndromes of individualism versus collectivism, complexity versus simplicity, and tightness versus looseness. In an individualist culture, the wishes of the individual have a very high priority, whereas in a collectivist culture, the group and its needs are paramount. In a tight culture, there is considerable agreement about norms of correct behavior. Understanding elements of these syndromes may be very helpful for health educators. Characteristics of individualism and collectivism have some specific implications. For example, the role of the group may influence the content of health education messages. If the focus in a culture is doing what the group wants, the message may be directed differently than it would be in a culture in which the emphasis is on the individual. The strong influence of norms and role-relevant goals in collectivist cultures makes for greater interdependence and embeddedness of social behavior. It may be much more difficult and basically ineffective for someone of a collectivist culture to participate in program that is solely oriented toward the individual.

Ford and Airhihenbuwa (2010) propose the explicit consideration of racism in health promotion—both in explaining disparities and in intervention development. They propose the analytic framework of Critical Race Theory (Bonilla-Silva, 2006; Delgado & Stefancic, 2001; Valdes, Culp, & Harris, 2002) as a lens with which to consider racism as a determinant of disparities in health. Key concepts in the theory are race consciousness or the explicit consideration of the possible influence of race and racism as determinants of behavior and health at the individual, interpersonal, community, and societal levels; centering in the margins, which is the focus of discourse from within the perspective of the marginalized group rather than from the majority viewpoint; and contemporary mechanisms of racism as pervasive and ordinary rather than aberrational (Bobo, 2004).

## BOX 4.1

### MAYOR'S PROJECT

Looking in on the health educator from Chapter One, we see her meeting with the department head. The two are struggling with how to keep the planning group moving. The health educator is worried that although the mayor handpicked the planning group, it is not representative enough of the diverse neighborhoods in the city. The planning group may not include some of the project's important stakeholders. The health educator wants permission to add interested community members to the planning group during the needs assessment.

*Health educator:* Adding more community people will be good for the group and good for planning. We need many diverse perspectives to work effectively on the problem of obesity.

*Department head:* Yes, but too large a committee is too hard to handle.

*Health educator:* These will be the people who understand the problem firsthand. And they will also be the people who will ensure the implementation of whatever program we come up with. Besides, people who don't feel included can sabotage our efforts.

*Department head:* OK, I'll get the mayor's approval, but I trust you to really manage this group. Better make sure your group leadership skills are not rusty. I don't have to tell you how anxious the mayor is to see something happening. I know, I know! You say we have to do a needs assessment. I'm convinced, but is the needs-assessment process going to give us the visibility we need? Can we just think of how to do this assessment in such a way that it is clear to everyone that we are actually making progress?

*Health educator:* Yes, after we talked the last time, I've been thinking about this. We need both qualitative and quantitative evidence about this problem. We also need information from our own community as well as from studies conducted elsewhere. We need information about obesity and its context, but we also need a real feel for the strengths of these communities. What if we could make the complexity work for us in two ways? Maybe the group can function as teams. Some people will go after the scientific literature. We have some talented library researchers on the team. Another group will get out into the community and talk to people. That will keep us visible. It also will help us balance our examination of needs and strengths. We could structure short interim reports based on our needs-assessment model and present them across the teams and to the mayor as we go along.

*Department head:* That sounds good. Now that we have that settled, let's get started.

## Planning and Conducting the Needs Assessment

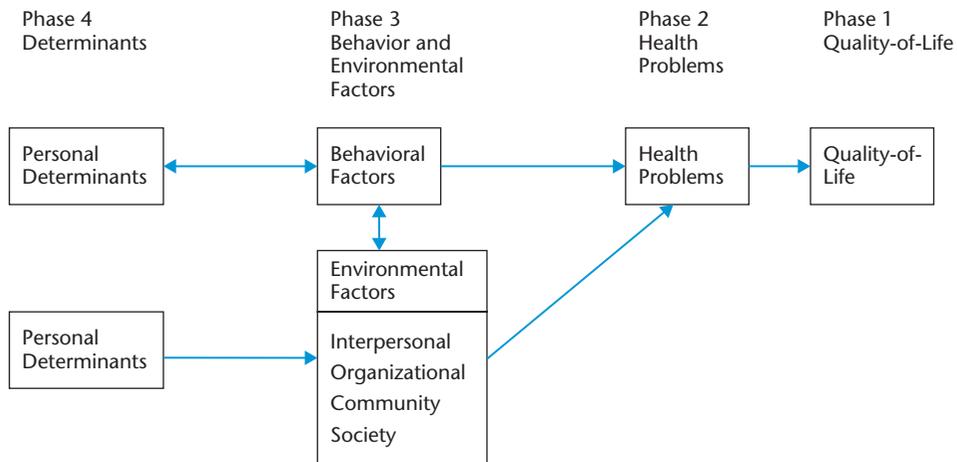
Task 2 is to plan and conduct the needs assessment using the PRECEDE model (Green & Kreuter, 2005) to analyze health and quality-of-life problems and their causes.

### Using the PRECEDE Model to Conceptualize the Needs Assessment

Before delving into assessment, the planner and the work group will need to plan how to assess the health problem or need (Altschuld & Kumar, 2010; Witkin & Altschuld, 1995). One of the first tasks will be for the work group to figure out what it already knows about the problem and the community and what further information the work group needs. Beginning to build a logic model of the problem will help a group determine what it knows and what questions need to be asked. Setting the boundaries of the system to be assessed includes the problem definition, identification of socioecologic levels, settings, and organizations, and actors relevant to the problem. This will determine what change can be leveraged and the nature of the intervention. Including stakeholders with multiple perspectives as we addressed earlier can enable the group to define “reality” and bound the system to be studied. Bounding the system includes the problem definition and identification of the levels, settings, organizations, and actors relevant to the problem (Foster-Fishman, Nowell, & Yang, 2007). The boundaries are arbitrary, but how they are drawn determines who and what is included, what change can be leveraged, and the nature of the intervention (Midgley, 2006). Different stakeholders will view the nature of the problem to be addressed differently depending on their position, role, and experiences, and dialogue is necessary to understand the system. The lived experience of community stakeholders is as important as the knowledge of experts in assessment of the problem (Flaspohler et al., 2003; Foster-Fishman et al., 2007; Midgley, 2006).

To help us guide the assessment, we use a modified PRECEDE model (Figure 4.1). A population-based epidemiologic planning framework that is also ecological in its perspective, the model directs planners to determine health problem characteristics such as morbidity, mortality, disease risk, and burden of disease in various population groups (Green et al., 1994; Green & Kreuter, 2005). The model prescribes an analysis of causation of health problems at multiple levels and the consideration of multiple determinants of health-related behavior and environment. For example, health problems such as coronary artery disease have both behavioral risk factors, such as eating high-cholesterol foods, and environmental causes, such as the unavailability of exercise facilities. The several editions of the PRECEDE model clarified and amplified

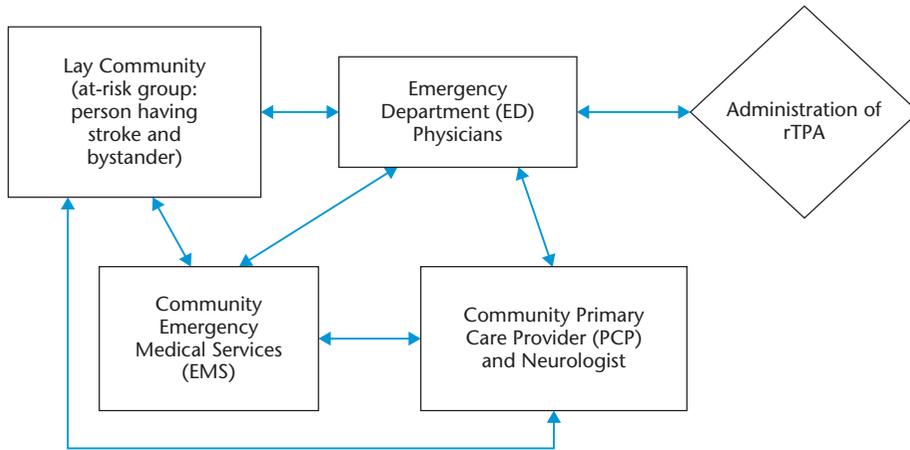
FIGURE 4.1 Logic Model for Needs Assessment



the important role of both social and physical environment in the causation of health problems (Green & Kreuter, 1991; 1999; 2005). It has been used as the basis for health education planning in hundreds of programs (see, for example, Bartholomew, Seilheimer, Parcel, Spinelli & Pumariega, 1989; Bartholomew, Koenning, Dahlquist, & Barron, 1994; Chiang, Huang, & Lu, 2003; Farley, Otis, & Benoit, 1997; Gielen et al., 2002; Goodson, Gottlieb, & Smith, 1999; Green & Frankish, 1994; Maiburg et al., 1999; Mann, 1994; Mann, Lindsay, Putnam, & Davis, 1996; Mercer et al., 2003; Paluck, Green, Frankish, Fielding, & Haverkamp, 2003; Taylor, Elliott, & Riley, 1998b; Taylor, Elliott, Robinson, & Taylor, 1998a; Welk, 1999; Williams, Innis, Vogel, & Stephen, 1999). When developed in the 1970s, the PRECEDE model was not intended to guide the health education field through all of the steps of intervention but to lead the field to a more outcome-based approach to planning (L. W. Green, personal communication, February 26, 1997).

The general form of the PRECEDE logic model can help planners make a number of decisions regarding the bounding of the system being considered. For example, in the stroke project presented in this chapter (see Stroke Box 4.1), the planning group first drew a simple diagram of what would need to happen in a community in order for an individual suffering a stroke to receive early treatment. Rather than focusing on one element of the system (such as the person having the stroke or the emergency department physician) the group considered various possible agents who might be involved in decisions made and actions

**FIGURE 4.2 Preliminary Systems Depiction for Early Stroke Treatment**



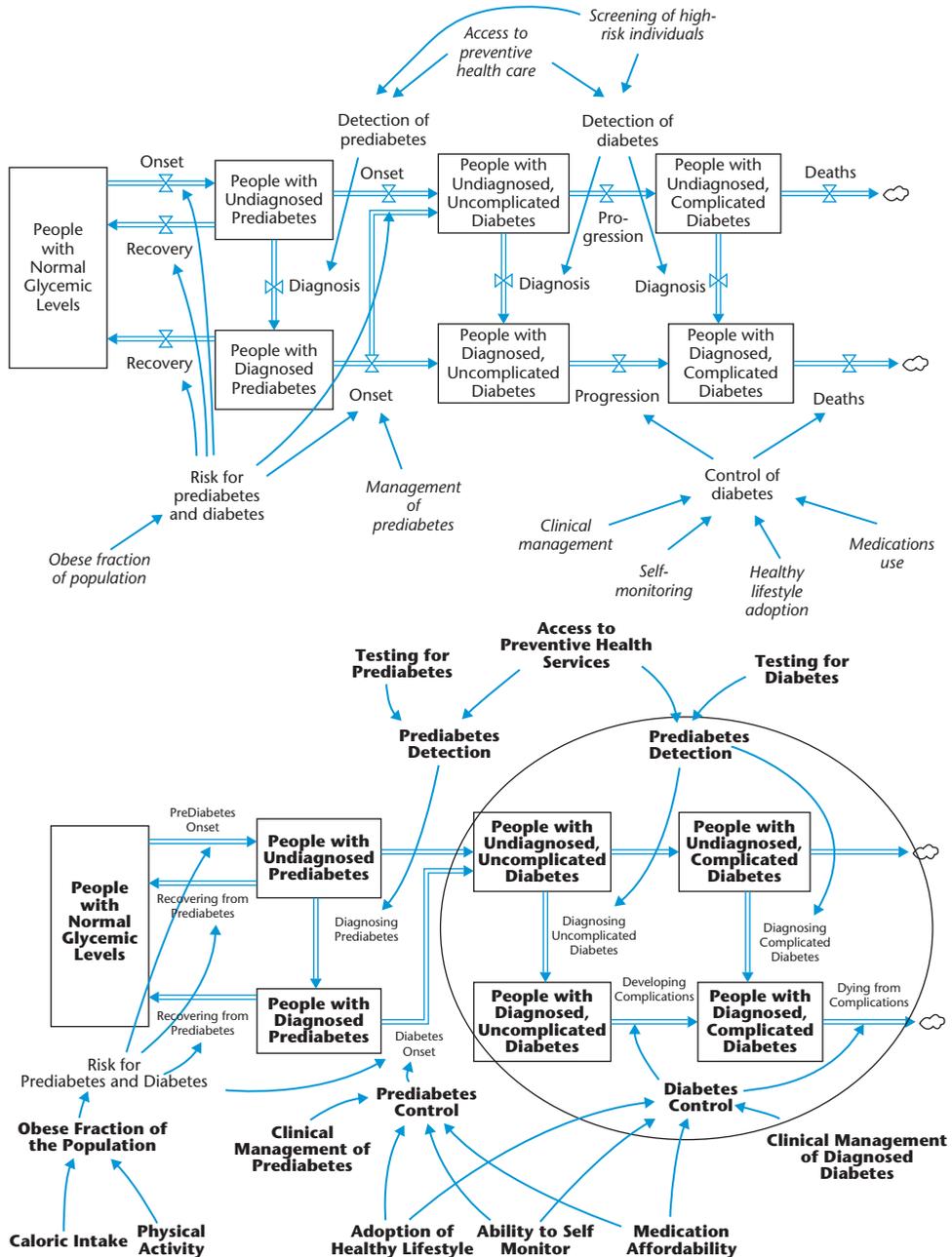
taken at the time of a stroke. The simple system depicted in Figure 4.2 was the first step in producing the PRECEDE logic model for stroke treatment that we present later. The system was bounded for the incident of stroke, but with a wide range of players.

In another example, the Syndemics Prevention Network at the Centers for Disease Control and Prevention is engaged in modeling systems for various diseases and conducting simulations to test various change hypotheses (Milstein, 2006). The systems map below (Figure 4.3 for diabetes) shows the effect of different system boundaries for defining the nature of the problem and of the solutions. The CDC presented a depiction of a system of diabetes care that moves beyond a sole focus on those already diagnosed with the disease and includes a population disease progression: those with normal glycemic levels, prediabetes, uncomplicated diabetes, and complicated diabetes, each of which can be diagnosed or undiagnosed. Following this systems expansion, a planning group would have to decide whether to retain all parts of the system and to develop either one or multiple PRECEDE analyses to examine the cognitive determinants, risk behaviors, and multiple level environmental factors related to each disease or predisease state.

### Beginning a Logic Model of the Problem

The model we use (Figure 4.1) is derived from the PRECEDE model (Green & Kreuter, 2005). Planners develop the model from right to left, usually beginning

**FIGURE 4.3 Different Systems Boundaries for Diabetes from the Centers for Disease Control and Prevention**



Reprinted with permission of American Public Health Association, from Jones, A. P., Homer, J. B., Murphy, D. L., Essien, J. D., Milstein, B., & Seville, D. A. (2006). Understanding diabetes population dynamics through simulation modeling and experimentation. *American Journal of Public Health, 96*, 488–494.

with descriptions of quality-of-life and health problems. (When completed, the model is read from left to right as a causal model of the health and quality-of-life problems.) Lessening these problems should be the intention of a health education or promotion intervention. For example, if premature mortality and morbidity from cardiovascular disease are the health problem, loss of productive years and the burden of heart disease begin to define the quality-of-life issues for society and the individual. Next, the planner must support these relationships with data and begin to find evidence of behavioral and environmental causes.

Next, moving to the left in the model, the behavioral analysis typically includes what people do that increases their risk of experiencing the health problem. In the case of secondary and tertiary prevention, the analysis investigates what people do that increases the risk of disability or death from an existing health problem.

The environmental analysis includes conditions in the social and physical environments that influence the health problem directly or through its behavioral causes. In most analyses of health problems, the environment plays a significant and modifiable role in causing the problem either directly, such as air pollution in lung disease, or indirectly through behavior, such as availability of correct medication to prevent and manage an asthma attack and the social norms to consistently use preventive medications for chronic disease.

We modified a diagram by Richard and colleagues (1996) in Chapter One (Figure 1.1) to depict individuals embedded in multiple, interacting levels of environment. When this concept is transferred to the needs assessment, it is apparent that each of the levels of environment (interpersonal, organizational, community, and societal) can influence both individual behavior and any lower level of environment. For example, social reinforcement—events that occur after a behavior that make the behavior more or less likely to reoccur—is depicted in the environment. In an example of teen alcohol use, peers' reinforcement of teenagers' alcohol use would be in the interpersonal level of the environment; lack of policy concerning alcohol use at high school parties would be in the organizational level; social norms for teen drinking, in the community level; and laws restricting sales to and possession by minors, in the societal level.

The next phase of the logic model is an analysis of the personal determinants of behavior and environmental factors. Because the evidence for these determinants is usually correlational rather than causal, these determinants are somewhat hypothetical. Personal determinants reside at the individual level. They include predisposing factors: knowledge, attitudes, skills, beliefs, values, and perceptions that motivate or hinder change (Green & Kreuter, 2005).

The original PRECEDE model had a separate depiction of nonbehavioral factors such as the natural history of disease (Green, Kreuter, Deeds, & Partridge, 1980). These were nonmodifiable factors that nevertheless should be considered in needs assessment because they may influence factors that are themselves modifiable. In the current PRECEDE model, genetics is in the model as a factor that is not yet modifiable but may be quite important in understanding the health problem and various affected groups (Green & Kreuter, 2005).

### Where to Enter the Needs-Assessment Model

A consideration in completing the needs assessment is where to begin in the logic model development: On the far right side, with assessing the quality of life in the community? With health problems or risks? With behavioral or environmental risks? Although the PRECEDE logic model is generally developed from the right side to the left, health promotion planners are often unable to enter the model by performing a quality-of-life assessment for a community because their assignment or focus is on a health problem or risk behavior or environmental condition. The agencies that employ the planners are often funded, at least in part, with categorical funds designated for one disease or risk (for example, cardiovascular disease or smoking). We often are directed to look at needs and problems in terms of the funding or employer's specific focus. The health educator who works for a cancer agency focuses on cancer. The health educator who works for an AIDS agency focuses on HIV. These are health problems, and health educators have entered the assessment model at the level of health. Perhaps, though, the health educator works for the American Cancer Society or the American Lung Association on a tobacco project. The health educator in these instances has entered the assessment model at the level of behavior. It is perfectly legitimate to begin in the middle of the assessment model with a behavioral or environmental risk so long as there is strong epidemiologic evidence for the causal relation between the risk and one or more health problems.

Some planners will be entering the needs assessment with wide parameters for the issues on which they are empowered to work, even as wide as license to work with the community as a whole to designate health and quality-of-life needs and choose health issues on which to work. These planners will begin by assessing quality-of-life indicators. Once quality-of-life issues are described for a community, health educators move to health and describe health problems related to the quality-of-life issues they have documented. Because they will have uncovered a wide range of quality-of-life issues, they will have a long list of related health problems to prioritize with the community.

Many other planners will have an assigned task that is related to a specific health problem, health-risk behavior, or environmental problem. No matter where a health educator begins the needs assessment, he or she will need to cover all the model's phases, including the relation of health to quality of life. The emphasis on covering all levels of the model regardless of where health educators begin is based on the assumption that health and behavior are instrumental values, that they are valuable because of their relation to other values. Health is related to quality of life; behavior and environment are related to health.

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## Conducting the Needs Assessment

Planners conduct needs assessments by using the core processes introduced in Chapter One. At each part of the needs assessment logic model, the planner will pose questions, brainstorm or figure out what the planning group already knows in relation to the posed question, search the literature for empirical evidence and evaluate the strength of the evidence, access and use theory when appropriate such as when questions concern determinants and conduct new research and develop a final summary of answers to the posed questions.

## Describing the Population at Risk and Environmental Context

The first question in a needs assessment may be “What is the health problem”? But it also may be “Who is the priority population”? Often the needs assessment moves back and forth between these two questions to determine the population at risk (or population in need) and to fully describe problems and causes.

The designation “population at risk” refers to a group with a definable boundary and shared characteristics that has or is at risk for certain health and quality-of-life problems, or that has health problems and is at risk for the sequelae, or has an identified need for an intervention that will enable individuals to prevent disease or promote their health. The boundaries of the priority population will help to define the scope of the needs assessment. In the preceding diabetes example, planners could have bounded the problem with diagnosed diabetes rather than expanding the description of the problem to prediabetes—and thereby expanding the leverage points for intervention to include efforts to return people screened as prediabetic to a disease-free state.

To lay the foundation for intervention, planners will also be concerned with the environmental context of the at-risk group. The environment may contribute directly to the health problem, as in the case of drinking contaminated water causing diarrhea. Or it can be a more indirect influence, such as the contribution

of social networks to the continuation of smoking. We suggest four levels of analysis of the environmental context:

- Interpersonal
- Organizational
- Community
- Societal

These levels are similar to the ones proposed by Richard and colleagues (1996). We have added the interpersonal level in order to facilitate thinking about intervention, and we have incorporated the supranational level into our societal level for the same reason. Organizations are systems with specific objectives and with formal multilevel decision making processes. Schools, stores, professional associations, and companies are examples (Richard et al., 1996). Communities in Richard's description require a geographical area comprising persons and organizations. Locus is the most commonly cited characteristic of community (MacQueen et al., 2001; Mattesich & Monsey, 1997). A geographic community is more than a physical space. It is a social place shared by individuals in units such as families, neighborhoods, and clubs and by organizations such as civic groups, churches, local media, and local government (McKnight, 1995). Groups within a geographic boundary, such as a city, village, or town, usually share a sense of living or working in a location as well as some common elements of values, culture, norms, language, and problems of health and quality of life (Institute of Medicine, 2002). Members of these geographic communities will have perceptions of boundaries, appropriate representatives, and concerns or problems (Sullivan et al., 2003). Communities are systems in which people link together in social networks that can contribute both to causes and cures for health problems. Further, communities including environmental elements such as the built environment are garnering attention for their role in both the cause and maintenance of health risks and their role in potential solutions (Economos & Irish-Hauser, 2007).

We include within communities other groups that exhibit relationships and experience a sense of community among the members of a group whose members may or may not share physical boundaries (Chavis & Wandersman, 1990; Fellin, 1995; Kraft et al., 2000; McMillan & Chavis, 1986). In addition to geopolitical boundaries, there are demographic boundaries (for example, socioeconomic status, gender, age, and family structure) and demographic-ethnic boundaries (for example, Latino, European American, African American, and Dutch of Surinamese origin). As described above, the PEN-3 model offers a set of constructs for moving beyond the labeling of priority groups by race

or ethnicity and can help health educators understand cultural factors that can influence both the causes and solutions of health problems (Airhihenbuwa & Webster, 2004; Fitzgibbon & Beech, 2009; Kannan et al., 2009).

There are also groups with shared characteristics, such as persons with a certain disease or those served by the same agency. Kraft and colleagues (2000) described community in terms of being with people you identify with and feel similar to because they have the same values, beliefs, and habits. A community may also be a group coming together for a cause or political agenda (Eng & Parker, 1994). Also, more recently, people with shared characteristics link together in Internet communities without regard to geographic proximity (Eysenbach, Powell, Englesakis, Rizo, & Stern, 2004; Frost & Massagli, 2008; Hospers, Harterink, Van Den Hoek, & Veenstra, 2002; Hospers, Kok, Harterink, & de Zwart, 2005; Richards & Tangney, 2006; Rier, 2007; Ross, Tikkanen, & Mansson, 2000).

Societies are larger systems that possess the means to control several aspects of the lives and development of their constituent systems. They may also be more self-contained than are communities. Examples of societies are provinces, states, and countries (Richard et al., 1996). We also include in this environmental level multinational structures such as the European Union and even global corporations, which certainly have characteristics of community and have even been called living institutions (Senge, 2006).

Often, in an assessment of a health problem, the relatedness in a population at risk may be that all the members have a risk factor or health problem in common, for example, cystic fibrosis, cardiovascular disease, or HIV. Sometimes these individuals come together in organizations for mutual support—the Multiple Sclerosis Society, Mothers Against Drunk Driving, and so on. Of course, the population may be defined by a combination of variables, such as adults with cystic fibrosis who are English speaking and living in North America or adolescents age thirteen to sixteen who live in the inner city and are at risk for HIV and other STIs. The important issue is that the populations and their communities are well defined during the assessment process (Altschuld & Kumar, 2010; Gilmore & Campbell, 2005; Soriano, 1995; Witkin & Altschuld, 1995).

The broad scope of the environmental context of health problems suggests not only complex causation of health and illness but also the need for health education and promotion intervention on a variety of levels and at a variety of venues (for example, work sites, schools, communities, and health care organizations). However, we do not believe that these different types of communities and program sites need a substantively different type of planning process. They do need a systematic planning process that includes community members and that allows for the incorporation of the unique qualities of the community.

An important task in performing a needs assessment is to describe the individuals who have the health problem or who are at risk of the health problem and who, consequently, are the potential beneficiaries of the health promotion intervention. The at-risk population always is the intended recipient of program benefits such as risk reduction or improvements in health status or quality of life. Therefore, when conducting the needs assessment, the health and quality-of-life analysis is always focused on the population at risk. However, it does not follow that an intervention is always focused on this group. There may be several groups in a comprehensive multilevel program. The priority populations for behavior or environmental change could be environmental agents, such as the health care provider in a case of chronic disease management, or organizations and government in a case of primary prevention policy. An intervention often addresses multiple groups, some of whom are populations at risk whereas others are agents that influence the environment.

The need to define the population at risk requires an epidemiologically and demographically defined population. Precisely defining whom an intervention is meant to affect—who will benefit from the program—enables the planner to know the numerator, the people who actually participate in the program, and the denominator, the population for whom the program is intended (Glasgow, Vogt, & Boles, 1999).

## Health Problems and Quality of Life

A population at risk is a group of people who have a significant probability of developing a health problem or of experiencing morbidity or death from a health problem they already have (Rossi et al., 2004). For example, overweight individuals who do not already have diabetes can be part of a population at risk for diabetes. Preventing diabetes in this group would be a primary prevention objective. Among those with diabetes, secondary and tertiary prevention objectives are possible: preventing morbidity and mortality from the conditions.

Most health educators begin a needs assessment with some idea of both a health risk or problem and the population groups that have it. They use concepts from epidemiology, the study of the occurrence and distribution of diseases and their risk factors in populations, to further define both the nature of the health problem and the population that is the focus of the needs assessment in a somewhat interactive process. The basic questions for this process are the following:

- What is the problem?
- Who has it?
- What are the incidence, prevalence, and distribution of the problem?

- What are the demographic characteristics of the population that faces the problem or is at risk for the problem?
- Is there a community? What are its characteristics, including its resources and strengths?
- What segments of the population have an excess burden from the health problem?
- Where can the groups at risk, especially groups at excess risk or excess burden, be reached by a program?

Not only does the health educator need to understand the health problem, but he or she must also understand how it is exhibited in the particular population of interest and what the health problem or risk means to those who have it. In the process of needs assessment, the health educator will constantly be working to develop understanding of the groups for whom the program should be a priority. Dimensions of health problems include disability, discomfort, fertility, fitness, morbidity, mortality, and physiological risk factors (Green & Kreuter, 2005). To discover dimensions of the health problem, mostly quantitative data sources are used; whereas to understand the problem's meaning and its quality-of-life effects, qualitative methods may be the most revealing. Dimensions of quality of life include effects of illness on both individual and societal indicators such as cost of health care, absenteeism, work or school performance, activities of daily living, isolation and alienation, discrimination, happiness and adjustment, self-esteem, and employment (to name a few).

The first step is to describe demographically who has the health problem and for whom it represents an excess burden. However, the health educator will also need to fully explore the cultural group or groups represented in the priority population beyond a simple description by race or ethnicity (Kreuter et al., 2003).

**Rates and Risk.** A number of risk concepts and statistics are helpful in the process of describing the health problem. The discussion here is a very brief introduction to assessing the health problem with rates and ratios, and we refer the reader to texts in epidemiology (Friis, 2009; Gordis, 2009). The extent of the health problem is usually described as a rate so that comparisons among groups and geographic areas and judgments of the importance or seriousness of the problem can be made. A rate is the number of events (people with a problem) over a period of time per population of 1,000 or 100,000. A rate can be incidence, the new cases of a problem in a certain time period, or prevalence, the number of existing cases. Usually, both types of rates are needed to fully understand a

problem. The number of new cases divided by the number of persons at risk per unit time is the crude incidence rate (Friis, 2009; Gordis, 2009; Kelsey, Whittemore, Evans, & Thompson, 1996).

The importance of rates is that they can be compared across group characteristics and geographic areas to answer questions such as: Is this an important problem in a specific community? Is it more or less prevalent in this community than in other communities? Is it more prevalent than in communities that are demographically similar? Many factors influence rates of a problem. In order to sort out the true extent of a problem in a population, rates may need to be adjusted by demographic variables such as age and gender. Rates are often reported as age-specific and can be weighted to match the age distribution in the population of interest (Gordis, 2009; Kelsey et al., 1996).

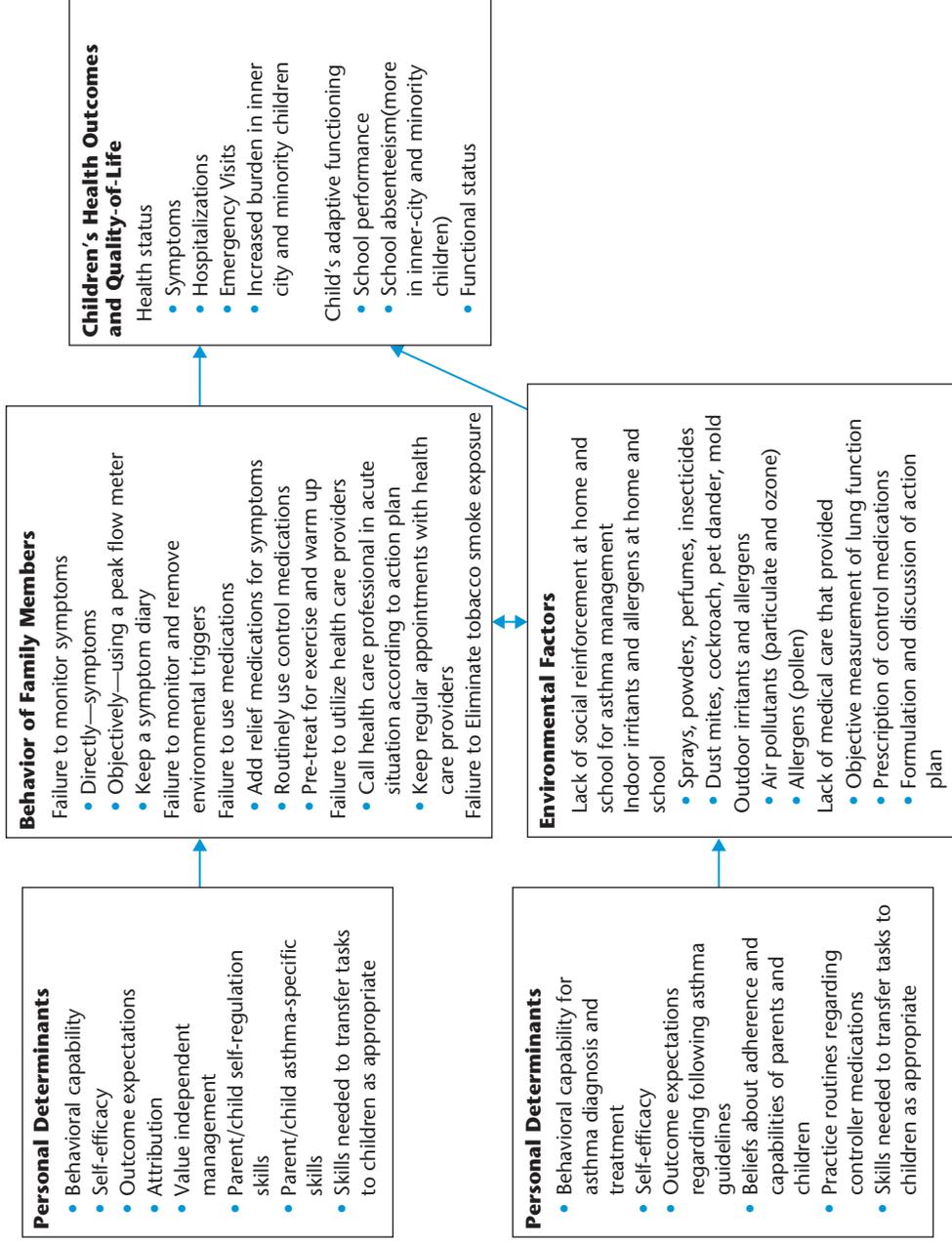
Another important concept is that of the probability or risk of developing a disease over time. The term risk is often used to refer to the average risk for a group of people. Because it is a probability, risk is sensitive to the period of time over which observations are made. For example, the risk of developing lung cancer for a smoker increases as the period of observation lengthens.

**An Asthma Example.** Two of this book's authors began working on the needs assessment for asthma in the Houston metropolitan area, entering the PRECEDE model with the health problem of asthma in children and then exploring the quality-of-life issues surrounding asthma (See Figure 4.4.) We entered a partnership with the Houston Independent School District because the district administration was concerned that children of elementary school age had high rates of asthma and symptoms that interfered with schoolwork and attendance. Following the core processes regarding the health problem, we asked: What is the prevalence of asthma in the United States and in our local community? Does the prevalence or severity vary between children of various ages and race or ethnic groups? Does the prevalence or severity vary among neighborhoods, communities or schools? We also wanted to know whether any groups had an excess burden from the disease.

First, we reviewed the literature and found that asthma is an important public health problem in the United States. At the time of our study, this disease was estimated to affect 20.3 million people (Mannino et al., 2002). The highest prevalence was among African Americans (8.3%) followed by whites (7.5%) and Hispanics (5.8%). Other subgroups with high prevalence rates were children (age zero to seventeen years) with a prevalence of 8.7%.

Next, we wanted to know how the children in the Houston Independent School District (urban and primarily low income and ethnic minority) compared

**FIGURE 4.4 Asthma PRECEDE Model**



to other children in the United States in terms of their risk of morbidity from asthma. Was asthma more or less of a problem in Houston as compared to the rest of the United States? We surveyed 21,835 children of elementary school age and the parents of 10,454 children who reported symptoms (Sockrider et al., 2005; Tortolero et al., 2002). The overall prevalence of a parent response suggesting possible asthma was about 10% for the entire population. The prevalence of asthma in African American children was significantly higher than in the other groups. Parents reported that 1,788 children had a current diagnosis, and only 6% of those were found to have a report of diagnosis or medication active in the files of the school nurse. This prevalence of possible asthma is similar to that reported by other recent studies of urban low-income areas (Clark et al., 2002; Claudio, Stingone, & Godbold, 2006; Gerald et al., 2002; Mvula et al., 2005; Quinn, Shalowitz, Berry, Mijanovich, & Wolf, 2006; Yawn, Wollan, Kurland, & Scanlon, 2002).

Next, we wanted to understand the impact of asthma on the children and their families. We asked: How does asthma affect the quality of life of children, for example, their activities of daily living such as school attendance and participation in normal activities of childhood? We also wanted to know how asthma affects parents and how asthma contributes to societal indicators such as cost of health care. We found that asthma prevalence rates do not fully illustrate the burden of asthma on individuals, families, and communities. We found that asthma exacerbations were the leading cause of hospitalization and emergency room visits in the United States at the time of our study (Mannino et al., 2002) and continue to be high. In 2004, there were 103 visits to emergency rooms per 10,000 children (Akinbami, 2006). The CDC estimates suggested 23.6% of children with asthma have activity limitations (Mannino et al., 2002). Newer studies have suggested an interference with daily activities, despite some control in asthma symptoms (Bloomberg et al., 2009). There was evidence that asthma also affects a child's functional status with an average of 20 days of restricted activity and 10 school absences per year (Newacheck & Halfon, 2000). Lieu and others (2002) found that 27% of children with asthma had missed school within a two-week period. Eleven percent of the children who missed school had missed more than three days of school during the same period. In comparison with their non-Hispanic white peers, slightly higher proportions of Latino and black children with asthma had missed more than three days of school in a two-week period. A study by Fowler, Davenport, and Garg (1992) showed that 42% of children with asthma missed more than six days per school year, compared to 12% of children without asthma. They also found that Hispanic children with asthma were more likely to suffer grade failure than were Hispanic children without asthma (23 versus 16.7%).

## Exploring Possible Causes of Health Problems

Risk factors are those behaviors or environmental conditions that affect the health of populations. The most commonly used measure of the association between exposure to a risk factor and development of a related health problem is relative risk or rate ratio (Gordis, 2009; Kelsey et al., 1996). Relative risk is the incidence of the problem in those exposed to the risk factor divided by the incidence of the problem in those not exposed to the risk factor. Another useful statistic is the risk ratio or comparison of probabilities of developing the disease when one is not exposed to the risk factor and when one is exposed (the probability of disease when not exposed divided by the probability of disease when exposed). The risk ratio is particularly applicable when the period of time over which a health problem might develop is fixed, such as the risk of the birth of a low-weight infant.

Another frequently used measure of association is the odds ratio, which is defined in terms of exposure rather than in terms of disease (probability of exposure in the presence of disease divided by the probability of exposure without the presence of disease over the probability of exposure with lack of disease divided by the probability of lack of exposure with lack of disease) (Gordis, 2009; Kelsey et al., 1996).

**Behavior of the At-Risk Group.** Some behaviors of the at-risk group may be causally related to the health problem. For example, a huge body of epidemiologic evidence shows smoking to be associated with both a variety of cancers and cardiovascular disease. Furthermore, as the number of cigarettes smoked increases, the association with cancer (for example) increases. This is a dose-response relationship, and is a higher level of epidemiologic evidence. In another example, behavioral risks for HIV transmission include intravenous drug use and unprotected sexual intercourse. When the prevalence of the health problem (or of death from the health problem) and the prevalence of risk factors and the relative risk of acquiring the health problem (or of experiencing mortality from the health problem) are known for a population group, estimates can be made of the proportion of the health problem (or mortality from the health problem) that is attributable to each risk, the attributable fraction (the risk for the exposed minus the risk for the unexposed divided by the risk for the exposed) (Kelsey et al., 1996).

**Environment.** Even though it may be intuitive to think in terms of the behavior of the at-risk group first, the physical and social environment should be a major focus in a needs-assessment study. For example, many authors are studying the effects of environment on obesity (Brownson et al., 2004; Casey et al., 2008; Economos & Irish-Hauser, 2007; Frank, Kerr, Sallis, Miles, & Chapman, 2008;

Saelens, Sallis, Black, & Chen, 2003; Sallis & Glanz, 2006). For example, in one study of the social and physical environments related to nutrition and physical activity of middle school students, Bauer, Yang, and Austin (2004) found aspects of the interpersonal environment of the students (interactions with peers and teachers) that may be related to physical activity and particularly participation in gym class. They also explored the organizational environment related to the accessibility of food in the school cafeterias and snack carts. In an example of a focus on environment regarding asthma, Parker, Baldwin, Israel, and Salinas (2004) focused on the indoor air environment in their efforts to decrease morbidity from asthma, stating that “Oftentimes, reduction or mitigation of exposure requires a change in behavior of an individual exposed or of a policy maker who can enact laws to reduce the exposure” (p. 492).

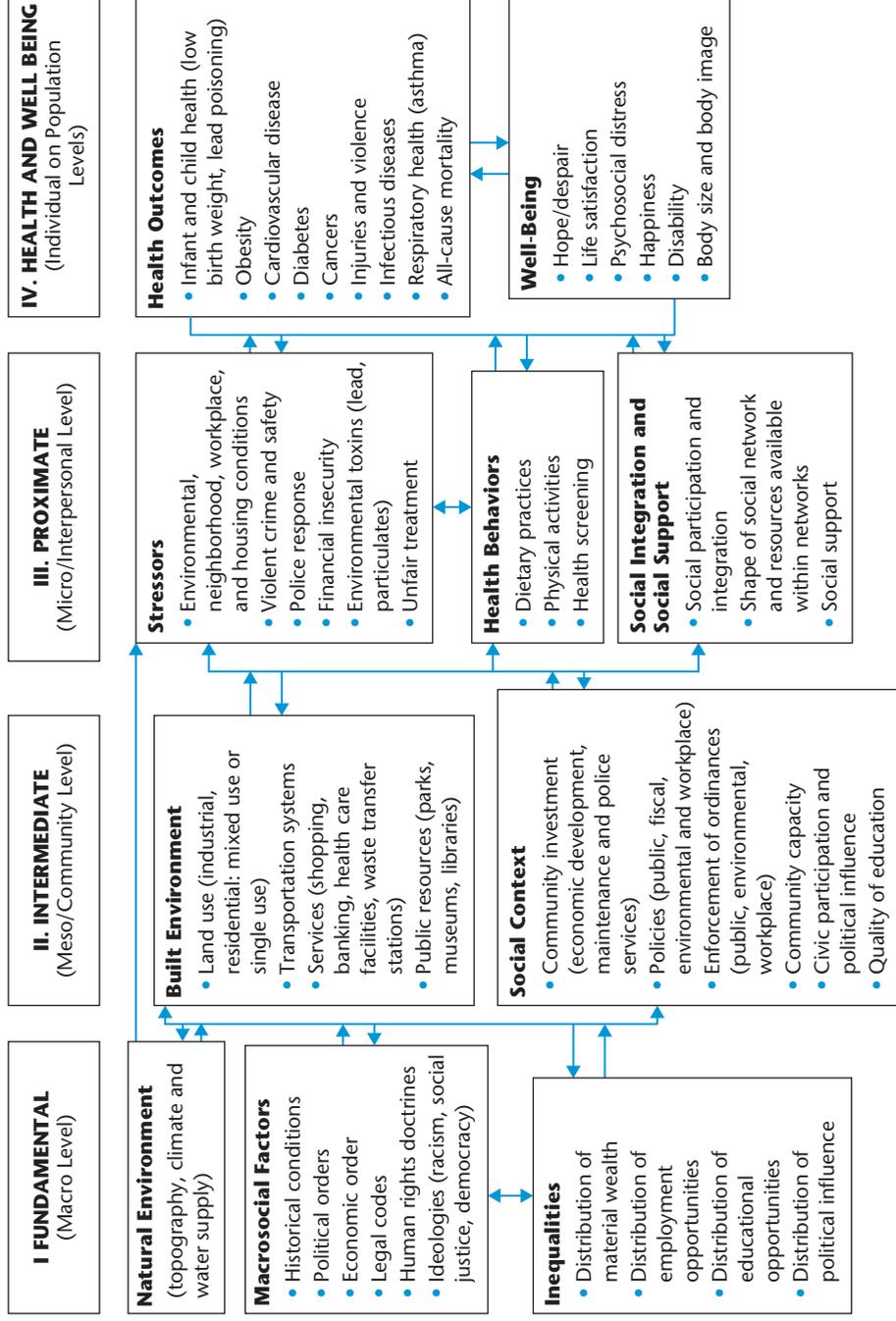
It may help to think of environmental factors that influence health directly through disease-causing exposures or indirectly by influencing health-related behavior. These factors can be understood further by ecologic levels as we have depicted in the PRECEDE-based logic model in Figure 4.1. Schulz and Northridge (2004) propose three levels of environmental determinants of health:

1. The fundamental or macro level, including macrosocial factors such as historical conditions and the economic order along with inequalities such as the distribution of material wealth
2. The intermediate or meso or community level, including aspects of both the built environment such as parks and the social context such as community capacity
3. The proximate or micro or interpersonal level, including characteristics such as working and housing conditions and social integration and support (Figure 4.5)

Another way of looking at environment is to examine exposure categories (Kelsey et al., 1996):

- Biologic, for example, vectors, presence of reservoirs, population density, and food sources
- Familial, for example, size, presence of diseases, age distribution, housing, nutritional environment, and behavioral characteristics
- Chemical, for example, substances in the air, water, soil, housing, and workplace
- Psychosocial, for example, stressful life events and social support systems
- Socioeconomic, for example, poverty and health care accessibility
- Physical, for example, climate, radiation, sound, temperature, and the built environment

**FIGURE 4.5 Environmental Levels and Their Impact on Health**



Source: Schulz & Northridge (2004); Schulz, Williams, Israel, & Lempert (2002); Northridge & Sclar (2003).

***Behavior and Environment in the Asthma Example.*** The planners in the asthma example (Figure 4.4) next asked: What are the behavioral and environmental contributors to the asthma morbidity among urban school children? We continued to review the literature to understand the behavioral and environmental factors related to asthma exacerbations and disability. In the behavioral category, lack of use of both relief medications and controller medications was a problem (Bauman et al., 2002; Becker, 2002; Burkhart, Dunbar-Jacob, Fireman, & Rohay, 2002; Wraight, Cowan, Flannery, Town, & Taylor, 2002), as was failure to monitor and protect against environmental triggers (Cabana et al., 2004; Joseph, Adams, Cottrell, Hogan, & Wilson, 2003).

At this point we used self-management theory to define what families might be doing to better care for asthma and discovered that researchers and theorists had proposed self-management steps to include watching for symptoms, judging symptoms against a standard or normal state, considering the cause of the symptoms and initiating a plan of action such as taking medication or removing environmental triggers, evaluating the effectiveness of the plan of action and returning to monitoring (Bartholomew et al., 2000b, 2000c; Shegog et al., 2006). Many children and families were not following self-management steps.

However, as we moved to the analysis of environmental factors, we discovered that families often did not use controller medications because even when their children had persistent moderate to severe asthma they are not prescribed by their children's health care providers. Appropriate health care for asthma includes a partnership between family and provider, objective assessment of lung function for diagnosis and monitoring, prescription of relief medication, prescription of controller medication for persistent asthma, and provision of an asthma action plan with instructions for routine care and management of exacerbations (National Heart, Lung, and Blood Institute, 1997). Despite the distribution of national evidence-informed guidelines more than a decade ago, good medical care for pediatric asthma is often lacking (Cabana, Rand, Becher, & Rubin, 2001; Diette et al., 2001; Mangione-Smith et al., 2007). For example, the U.S. and international guidelines recommend that all children with moderate to severe asthma use daily maintenance medications, preferably inhaled corticosteroids. Despite these recommendations, rates of inhaled anti-inflammatory medication continued to be low to moderate from both patient report and pharmacy records even for those individuals using large amounts of inhaled beta agonists (medications for symptoms and exacerbations) (Adams et al., 2001; Buchner, Carlson, & Stempel, 1997; Butz, Eggleston, Huss, Kolodner, & Rand, 2000; Eggleston et al., 1998; Goodman, Lozano, Stukel, Chang, & Hecht, 1999).

Another reason for concern is that asthma treatment differed in minority populations as compared to non-Hispanic whites, including fewer prescriptions

for anti-inflammatory medication (Diette et al., 2001; Eggleston et al., 1998; Legorreta et al., 1998) and less access to beta agonists and nebulizers at home (Finkelstein et al., 1995; Krishnan et al., 2001). African American and Hispanic American children of all asthma severity levels may be medically undertreated (Eggleston et al., 1998).

Again, we wanted to explore some of these factors in our local area. In the asthma project named *Familias y Escuelas Unidas para Controlar Asma*, Families and Schools Together to Control Asthma (*Familias*) (Fernández et al., 2000b, 2000c), the planners discovered, through focus groups, observations, and interviews, that parents have some difficulty obtaining a diagnosis for their children's lung problems, an important asthma management behavior located in the environmental analysis in the needs assessment for Hispanic families.

### Determinants of Behavioral and Environmental Risks

The next part of the needs assessment is to ask questions about what factors cause or in some way modify the behavior of the risk group or the environmental risks. Here, the planner asks Why do members of the at-risk group behave in ways to increase their risk of a health problem? Why do agents in the environment create or maintain unhealthy environmental factors? We refer to these factors as personal “determinants” because, from an intervention development perspective, causation is implied. We would not intervene on a factor that was not causing either behavior of the at-risk group or environmental conditions. On the other hand, the reality is that the evidence for causation is not usually clear and planners must weigh the strength and pattern of association between determinants and behavior to judge whether a case for causation can be argued.

In an example of asking questions about determinants in a needs assessment, Partin and Slater (2003) sought to uncover key barriers to mammography use. Using a telephone survey, women stated that their most important barriers were the following:

- Difficulty finding time
- Disagreeing that mammograms give peace of mind
- Only going to the doctor when they are sick
- Having nothing to remind them to get a mammogram

***Determinants in the Asthma Example.*** We first asked the question: Why do parents and children often not manage asthma? When we began our asthma work, for example, there was some evidence in the literature of Social Cognitive Theory constructs as answers to the question of why. For example (Figure 4.2), many parents and children do not have the necessary asthma-specific skills,

self-regulatory skills, self-efficacy, or behavioral capability (Clark et al., 1988, 1989; Clark & Starr-Schneidkraut, 1994; Creer, 1990; Wigal et al., 1993). They also may not attribute asthma control to an internal locus (versus a powerful other, that is, a physician). In our local work with Hispanic families, we also found that they may not understand asthma as a chronic disease, may rely on home remedies and indigenous healers, and may have difficulty achieving a diagnosis of the child's problems—all factors that could lead to failure to manage asthma (Lopez, 2004). We also found that environmental factors such as health care providers not providing controller medications or action plans made it very difficult for families to manage asthma.

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## Sources of Needs-Assessment Data

Most needs assessments require multiple data sources including both qualitative and quantitative measures because they are answering multiple questions and they are often seeking various perspectives on the answers. There are many examples of needs assessments and formative research that use multiple methods research. For example, Young et al. (2006) conducted several phases of research to inform a physical activity intervention for girls. In Phase 1 they conducted a school survey to determine intervention requirements; a community agency survey to review programs; parent interviews to ascertain their perceptions of girls' activities, family participation, and barriers to activity; a girls' activity checklist survey to assess favorite activities; and girls' semi-structured interviews to ascertain determinants for participation in favorite activities. In Phase 2 they held boys' focus groups to hear their perceptions of girls' activities and girls' focus groups to obtain their opinions on intervention acceptability. In another example, Wilson, Goetzel, et al. (2007) used multiple methods to develop a worksite obesity program including an observational checklist to determine aspects of support for diet and physical activity available in the environment (for example, facilities for bike parking, showering, changing; fitness facilities, vending, and food service; written policies), an organizational climate survey to assess perceived worksite support for health promotion, and focus groups and interview to further assess worksite support (Della, DeJoy, Goetzel, Ozminkowski, & Wilson, 2008; Wilson et al., 2007).

Before beginning a needs assessment, we address questions to each column of our logic model and consider sources of data to answer the questions. In deciding what data sources to use there are a number of questions that should be asked to match the characteristics of a project to available information (Altschuld &

Kumar, 2010; Witkin & Altschuld, 1995). Planners should consider the data available from other researchers, cost time and other constraints for collecting data, degree of interaction desired with respondents, and what stakeholders should be involved.

Altschuld and Kumar (2010) suggest that planners primarily choose data sources based on the questions being asked in the assessment and judgments about the types of data that can be used to answer them. Sources of data to address needs assessments for health promotion include:

1. Archival data such as organizational records, demographic data, census data, disease registries, medical records, public use data bases;
2. Communicative—non-interactive primary data collection such as written internet or mailed surveys, critical incident technique, mailed or internet Delphi technique and observations; and
3. Communicative—interactive such as focus groups, key informant interviews, individual interviews, community forums or public hearings, nominal group technique, and virtual, web-based applications of any of these processes

In doing the children-with-asthma needs assessment, the team found that the scientific literature contained considerable information about health and quality-of-life issues. Other questions, such as local impact, required data collection through surveys, observations, focus groups, and interviews. Some environmental factors such as health care providers' actions could be estimated from reports in the literature, but local data would have required a survey of providers.

We briefly present some of the more common data collection methods but also refer the reader to texts that present needs-assessment techniques in detail (Aday, 1996; Altschuld & Kumar, 2010; DeVellis, 2003; Dillman, Smyth, & Christian, 2008; Fowler, 2008; Gilmore & Campbell, 2005; Wholey, Hatry, & Newcomer, 1994).

### Combining Qualitative and Quantitative Data

As suggested in Chapter One, a relevant skill for the program planner to bring to bear in the steps of Intervention Mapping including the needs assessment step is to conduct practical, multi-method research (Goldberg, Rudd, & Dietz, 1999; Koelen, Vaandrager, & Colomer, 2001; Levy et al., 2004b; Manfredi, Lacey, Warnecke, & Balch, 1997; Nakkash et al., 2003; Thurmond, 2001). A research design using a combination of the qualitative and quantitative research paradigms is described by Creswell as an approach that is often more focused on the problem at hand or on the research question than on the method itself (Creswell, 2007). The benefits from using a practical, combination approach have been described

as providing corroboration, confirmation, or triangulation of data (Creswell, 2007). Others have suggested the complementarity of the methods such that using more than one method combines the strengths of the two method types to produce a more nuanced understanding of the topic at hand allowing planners to increase the validity of their findings (Creswell, 2007; Morgan, 2006).

Quantitative methods such as surveys and disease registries enable the planner to estimate the incidence and prevalence of health problems and related behaviors in the at-risk population. Quantitative methods also enable estimates of the strength of the correlation of determinants with risk behaviors. On the other hand, qualitative methods can help health educators to more fully understand the dynamics of communities, health problems, behavioral and environmental causes, and determinants from the perspectives of the people involved (Farquhar, Parker, Schulz, & Israel, 2006). These methods include ethnographic interviews (Braithwaite, Bianchi, & Taylor, 1994; Denzin & Lincoln, 2007; Mary Anne McDonald, Thomas, & Eng, 2001), focus groups (Basch, 1987; Gilmore & Campbell, 2005; Krueger & Casey, 2009), the problem-posing methods from Freire's education for critical consciousness (1973b; Wang, Cash, & Powers, 2000), critical incident technique (Altschuld & Kumar, 2010; McNabb, Wilson-Pessano, & Jacobs, 1986; Witkin & Altschuld, 1995), nominal group technique (Delbecq, Van de Ven, & Gustafson, 1975; Delbecq, 1983; Dewar, White, Posade, & Dillon, 2003; Moon, 1999), photovoice (Wang, 2003), and appreciative inquiry (Farrell, Wallis, & Evans., 2007; Fryer-Edwards et al., 2007; Ludema, Whitney, Mohr, & Griffin, 2003; Suchman et al., 2004).

Nakkash and colleagues (2003) describe their formative work on a community-specific cardiovascular disease (CVD) prevention program as using complementary sources and methods. First they surveyed 2,486 community residents to describe the "what"—the problem of CVD and its risk factors of sedentary lifestyle, obesity, and smoking. Following the survey, planners conducted eight focus groups to identify the "why"—barriers and facilitators to a CVD-preventive lifestyle. Finally, members of the community coalition served as "natural discussion groups" to garner information on the "how"—issues of interventions and their feasibility and sustainability.

Qualitative and quantitative approaches to problem analysis are not simply two different techniques of arriving at the same answer. They are essentially different in their philosophical origins and approaches to knowledge—and are so different that some researchers would argue that they cannot be used together. The health education field, although historically dominated by quantitative work, is adopting a paradigm integrating the two approaches. We think the two approaches used together produce a more usable, comprehensive, and accurate assessment product based on better information about and from members of

the intended community throughout Intervention Mapping. However, each approach must be used under its own assumptions, and the reader is referred to other texts for instruction in quantitative and qualitative methods.

The methods in each tradition differ in the research object and in design, data collection, and analysis. Patton (1990, 2001) describes qualitative approaches as

- Inductive
- Discovery oriented
- Iterative
- Question and theory generating
- Subjective and valid with the self as the instrument
- Not usually amenable to counting
- Case oriented
- Not generalizable

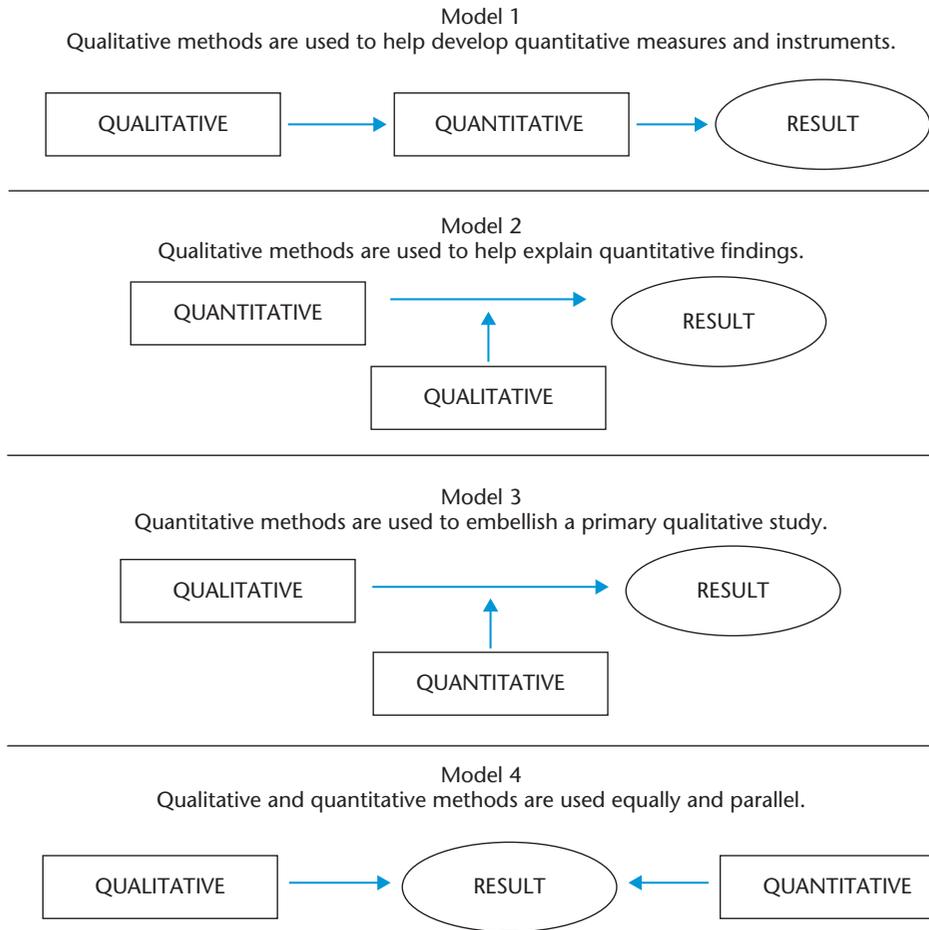
Quantitative methods are

- Deductive
- Theory verification oriented
- Question answering
- Objective and reliable, subject to reliable counting
- Population oriented
- Generalizable

Morgan (2006) suggests that when a researcher uses both types of methods, there are two dimensions of use: sequence and priority. Methods can be used with equal weighting or at the same time, but as Morgan (2006) points out, the data analysis can be more difficult when there is no prioritization or sequence. Steckler and colleagues (1992b) present a useful diagram of four ways that qualitative and quantitative methods can be used in program evaluation (Figure 4.6). The models are equally appropriate in other steps of Intervention Mapping. In Model 1, the planner uses qualitative data-gathering methods, such as focus groups, nominal group technique, observation, ethnographic interviews, or semi-structured interviews, in order to begin to hear perceptions of health problems, related behavioral and environmental causes, determinants, and quality of life in the community.

After the qualitative phase, surveys can be used to document the prevalence of the issues that emerged from a qualitative study (Desvousges & Frey, 1989; O'Brien, 1993; Thompson, Gifford, & Thorpe, 2000). Beginning with qualitative methods, in this case, gives the planner a better chance of asking pertinent and intelligible questions during a survey phase. This sequence of using qualitative

**FIGURE 4.6 Integrating Qualitative and Quantitative Methods**



Reprinted with permission from Steckler, A., McLeroy, K. R., Goodman, R. M., Bird, S. T., & McCormick, L. (1992b).

methods to inform survey design may also enable the researcher to develop new hypotheses or to refine hypotheses before the quantitative phase of the research. For example, O'Brien (1993) used focus groups in a study of the social relationships of gay and bisexual men to inform questionnaire development and to learn the language that the men in the groups used to discuss relationships and sexual experiences. These discussions led to a survey that contained careful definitions of the terms primary relationship and safer sex, two very important

and potentially ambiguous concepts. The focus groups also led to the addition of several questions to be addressed by the larger study.

In another example, Thompson and colleagues (2000) studied an aboriginal community in Melbourne to better understand the role of food among those at high risk for diabetes. They found that food was clearly segregated by its social meaning into “family food,” “fast food,” and “diet food.” Understanding more about the meaning and context of food, and especially that diet food was isolated from the normal meaning of food, contributed to the development of a culturally grounded epidemiologic risk factor survey for the next phase of the study.

In Model 2, planners use qualitative techniques to better understand the meaning of their quantitative findings. In a needs assessment, health educators might use census or epidemiologic data to describe the health problem, behavioral or environmental risk, or determinants and then conduct qualitative research to better understand the perceptions of the at-risk group (Wingood, Hunter-Gamble, & DiClemente, 1993). For example, Wingood and colleagues (1993) used the focus group technique to better understand the determinants of HIV-associated risk behaviors in African American women. They found that the women they spoke with could bring up with their partners the conversational topic of safer sex, but they could not effectively negotiate condom use. A woman demanding that a partner use condoms could imply lack of trust in a relationship, violate a woman’s conflict-avoiding stance, and prove difficult or even dangerous.

In Model 3, the health educator conducts a qualitative study in order to document the problems or needs in a community and then uses quantitative data to verify and establish the magnitude of the primarily qualitative needs assessment. Bartholomew and colleagues conducted interviews of 180 older adults to assess barriers to immunization in older adults of three racial/ethnic groups. Once the barriers were described, they then conducted a prevalence survey to document the distribution of the various barriers in the different groups (Bartholomew, 2004).

In the final model, both qualitative and quantitative methods are used in parallel to shed light on an issue or a problem (Saint-Germain, Bassford, & Montano, 1993). For example, Levy and colleagues (2004b) used data sources at the individual, family, community, and public policy ecologic levels to describe the influences on cardiovascular disease (CVD) and diabetes in two Chicago communities. They conducted focus groups, administered the Behavioral Risk Factor Surveillance Survey (BFRSS), and used a community mapping tool (Curtis & Jones, 1999). Used together, these three methods increased researchers’ understanding and helped them guard against misinterpretations in any one source. For example, members of the community mapping team interpreted the absence

of gang tags (graffiti) as positive, whereas community members explained that without gang tags, residents cannot discern safe areas from those that are unsafe.

## Archival Data

Archival or secondary data are data that have been collected for a purpose other than the needs assessment. Many governmental, health, social service, and education agencies collect data describing health problems and demographics that can be useful to the needs assessor. These can be census-type data, in which the goal is to describe every event or person, for example, birth and death records; or they can be survey-type data, in which an attempt is made to capture a representative sample of the population of interest.

Archival sources can be local, regional, national, or international. They can be obtained directly from the agency responsible for collection and analysis or from a library. For example, local health departments collect census data such as birth and death records. National agencies such as the Centers for Disease Control and Prevention in the United States collect a variety of data on disease incidence and prevalence as well as survey data regarding disease risk. The Internet makes acquiring data from agencies at all levels easy. Table 4.3 presents examples of sources of secondary data and their Web addresses.

## Primary Data from Individuals

We provide a general description of several data collection methods from individuals and refer the reader to primary sources on survey research (Dillman et al., 2008).

**Surveys.** Written (including computer assisted) and telephone surveys are the most often used, with Internet surveys gaining rapidly in popularity. These use structured forms or protocols that employ a variety of scales and response modes and are relatively easy to administer. As with all data collection activities, questions on surveys should be carefully linked to the needs assessment purpose. Key issues are the validity and reliability of items and scales, appropriate sampling to represent the population of interest, and the ability to achieve high response rates (Aday, 1996; Altschuld & Kumar, 2010; Dillman et al., 2008).

**Interviews.** Interviews can be highly structured (much like a survey) or moderately unstructured, using a general guide outlining the set of issues to be addressed. Interviews based on elicitation rather than a rigid protocol of questions have the advantage of allowing the respondent opportunities for free expression, with



	CDC Pregnancy Risk Assessment Monitoring System	<a href="http://www.cdc.gov/PRAMS/">www.cdc.gov/PRAMS/</a>
	Data Resource Center for Child and Adolescent Health	<a href="http://www.childhealthdata.org/content/Default.aspx">www.childhealthdata.org/content/Default.aspx</a>
Health Information Access	Health Information National Trends Survey	<a href="http://hints.cancer.gov/">http://hints.cancer.gov/</a>
Environmental	Environmental Protection Agency	<a href="http://www.epa.gov/epahome/data.html">www.epa.gov/epahome/data.html</a>
	AirData: Access to Air Pollution Data	<a href="http://www.epa.gov/air/data/">www.epa.gov/air/data/</a>
Local and Regional Health Data	Health Departments, e.g., Texas, Houston	<a href="http://www.dshs.state.tx.us/chs/datalist.shtml">www.dshs.state.tx.us/chs/datalist.shtml</a> <a href="http://www.houstontx.gov/health/chs/index.html">www.houstontx.gov/health/chs/index.html</a>
	Texas Department of State Health Services Center for Health Statistics	<a href="http://www.dshs.state.tx.us/chs/default.shtml">www.dshs.state.tx.us/chs/default.shtml</a>
Cancer (as an example of disease-specific sources)	Texas Cancer Registry, provides access to Texas Cancer Incidence and Mortality Rates from 1997–2001	<a href="http://www.dshs.state.tx.us/tcr/data.shtml">www.dshs.state.tx.us/tcr/data.shtml</a>
	National Cancer Institute	<a href="http://seer.cancer.gov/">http://seer.cancer.gov/</a> <a href="http://seer.cancer.gov/about/activities.html">http://seer.cancer.gov/about/activities.html</a>
	American Cancer Society— Cancer Facts and Figures	<a href="http://www.cancer.org/downloads/STT/500809web.pdf">www.cancer.org/downloads/STT/500809web.pdf</a>
The Netherlands (as an example of country-specific sources)	Demographics, the Netherlands	<a href="http://www.nidi.nl">www.nidi.nl</a>
	Statistics and health, the Netherlands	<a href="http://www.cbs.nl">www.cbs.nl</a>
	Integrated information, the Netherlands	<a href="http://www.nationaalkompas.nl">www.nationaalkompas.nl</a> <a href="http://www.zorgatlas.nl">www.zorgatlas.nl</a>

attitudes more likely to be revealed, but the method requires skilled interviewers and qualitative data analysts. As with surveys, it is important to determine the purpose of the interview and select the sample. Mall intercept interviews, in which potential respondents are approached in public places, are frequently used for structured interviews with convenience samples. Key informants can supply information about needs, barriers, and previous programs (Altschuld & Kumar, 2010; Gilmore & Campbell, 2005).

**Ethnographic Methods.** Ethnographic methods from anthropology provide a particularly key role in describing marginalized settings and hard-to-reach populations, such as drug users, persons engaging in HIV-risk behaviors, or homeless persons (Parker & Ehrhardt, 2001; Tross, 2001). Ethnographic methods include participant observation, in-depth interviews, focus groups, and analysis of written textual materials; and they are focused on the description of a culture through the experiences and perspectives of persons in their own language and on their own terms. Scrimshaw and colleagues have developed rapid assessment techniques based on anthropological methods that have been applied in the planning and evaluation of a variety of international programs in such areas as nutrition and primary health care, reproductive health, AIDS, epilepsy, hunger, water and sanitation, and emergency relief (Scrimshaw & Hurtado, 1987; 1992).

**Appreciative Inquiry (AI).** This approach involves interviews focused on positive experiences related to a topic. Unlike traditional problem-solving approaches, AI focuses on strengths within an organization; it seeks root causes for success instead of root causes for failure (Ludema et al., 2003). Once the best has been identified, the planning group can envision new possibilities; the key task is to identify and leverage strengths. The use of AI in health care settings has been used successfully in both nursing (Farrell, Wallis, & Evans, 2007) and medical school settings (Fryer-Edwards et al., 2007; Suchman et al., 2004). The main inquiry process in this method is to ask a main question with a series of tightly focused subquestions or probes regarding high-point experiences in an organization or community and then eliciting scenarios regarding what the entity would be like if the high points occurred more routinely.

### Primary Data Collection in Groups

Using groups to collect needs assessment data has recently gained significantly in popularity among health promoters and other planners. We present three examples here to give a flavor of data collection with groups. We discuss Freirian question posing, using various triggers for discussion in Chapter Three (Freire, 1973a, 1973b; Wallerstein, Sanchez-Merki, & Dow, 1997; Wang, 2003).

Community meetings, focus groups, nominal group-process groups, electronic chat groups, and many other small-group venues and methods are available for determining community members' perspectives on health and quality-of-life problems as well as the causes of those problems. We describe data collection from three groups.

**Planning Groups.** One of the first places to look for information is from the group or groups that planners have developed for the program development work. This is usually some combination of a work group and various advisory groups. Both types of groups can contribute to defining the problem and understanding the community if they include a variety of types of community members, including those with the problem. Levy and colleagues (2004b) describe a needs-assessment process in two Chicago communities affected disproportionately by diabetes and heart disease. The needs assessment began with providing structure for the planning activities by creating four work groups, each concerned with a different subject: risk factors and programs, quality of clinical care, policy and advocacy, and data and evaluation. The planning group included individuals from different racial and ethnic backgrounds. Members had expertise in public health, medicine, nursing, community organizing, and evaluation. Representatives from voluntary health associations and from the community were also included. (Levy et al., 2004b). The work groups reviewed data from all components of the needs assessment and provided critical information and analysis.

**Focus Groups.** Focus groups, a technique borrowed from the field of marketing, are led by a moderator who refers to an interview guides with five to ten questions. Data collection in these relatively homogeneous groups of five to ten people, are often used in health promotion as a part of a multi-method approach to needs assessment or program development (Basch, 1987; Fernández et al., 2005b; Fernández et al., 2008; Gilmore & Campbell, 2005; Goldberg et al., 1999; Krueger & Casey, 2009; Nakkash et al., 2003; Sorensen et al., 2004). The goal of a focus group is to stimulate discussion among six to twelve fairly homogenous persons to ascertain opinions and attitudes related to the topic of interest. Krueger and Casey (2009) describe processes in planning and conducting focus groups:

- Development of a focus group guide
- Recruitment of participants
- Discussion including introductions, facilitation, and recording
- Transcription
- Analysis

The number of focus groups to conduct is based on a variety of considerations: determining whether saturation has been reached and no additional themes are forthcoming, ensuring that different segments of the community are represented, and allowing the opportunity to ask new questions that emerge during earlier focus groups. For example, Fernández and colleagues (2008) stratified their groups on colon cancer screening on the Texas-Mexico border by gender and location. They also conducted separate key informant groups of promotores by both age and gender. Young, Gittelsohn, Charleston, Felix-Aaron, and Appel (2001) held focus groups on physical activity stratified by exercisers, nonexercisers, people who successfully lost weight, and people who did not successfully lose weight. Fernández and colleagues used a multi-method phased approach to needs assessment in the Familias program (Fernández et al., 2000a, 2000b; Lopez, 2004). The team conducted three phases of focus groups with Hispanic mothers, in addition to observations at clinic appointments and interviews with key informant health care providers. The first phase of focus groups was to address general health and health care concerns; the second was to focus on asthma; and the third was to recruit more parents who worked outside of the home, because the first two sets of groups overrepresented new immigrants.

**Delphi Technique.** This method is a group survey technique that uses an iterative process to build consensus in a group. Respondents are usually 10–15 people with significant knowledge about an issue. The first round of mailed or Internet surveys solicits responses to a limited number of focused questions; the second round follows first round analysis and asks clarifying questions; a third round often asks for ranking of preferences. Like nominal group process, this method results in focused information. It also has the advantage of crossing geographic boundaries and of not requiring the scheduling of real-time meetings (de Meyrick, 2003; De Vet, Brug, de Nooijer, Dijkstra, & de Vries, 2005; Delbecq, 1983; Gilmore & Campbell, 2005; Hsu & Sandford, 2007; Rayens & Hahn, 2000; van Stralen et al., 2008).

## Geographic Methods

Geocoding links data such as demographics, social and health indicators, and physical structures (for example, health facilities) to individual data that has been aggregated over an area by using codes for street addresses or census tract numbers to denote geographic locations (Altschuld & Kumar, 2010). For example, the immunization bureau in a large city with lower-than-average immunization rates wanted to plan interventions to improve its performance. The immunization bureau staff mapped the children known to be underimmunized

and was able to then look at groups by demographics as well as by health indicators, availability of services, and other important information for understanding what might be determining the low uptake of immunization.

Community Landscape Asset Mapping (CLAM) is a survey to determine community-level factors that may influence health behaviors (Issel & Searing, 2000). The survey is done by observation to identify four aspects of landscapes: ecological, materialistic, consumption, and therapeutic (Curtis & Jones, 1999). In the needs assessment of neighborhoods on the west side of Chicago, Issel and Searing (2000) used a modified version of CLAM to assess community and policy influences on health. The survey team noted vacant lots, streets, police presence, street lighting, and smoking in restaurants. Because they were particularly interested in factors related to cardiovascular disease and diabetes, they observed restaurants and grocery stores. The authors note the importance of including community residents in debriefing meetings with the survey teams to fully understand the data.

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## Community Capacity

The third task in this step is to balance the needs assessment with an assessment of community capacity.

### Community-Based Health Promotion

An understanding of current capacity in communities and organizations, and a focus on building capacity at relevant points in needs assessment and intervention development is good practice. An understanding of, and investment in, a community's capacity can lead to a better match with health promotion interventions and can shift intervention strategies to broader community-building approaches (McLeroy, Norton, Kegler, Burdine, & Sumaya, 2003).

In Chapter Three, we discussed the theoretical base for community capacity and social capital. In this section we will look at the assessment of characteristics of the community, with a particular focus on the strengths of a community. A healthy community has been described as one that is continually creating and improving resources in its physical and social environments that enable people to mutually support each other in performing all the functions of life (Hancock & Duhl, 1986). Community capacity assessment examines the community's social and physical infrastructure related to community problem solving and development, as well as the policy and physical environments that facilitate health-promoting behaviors.

## Assessing Community Capacity

Goodman and colleagues (1998) participated in a process to identify and define the dimensions of community capacity and examined the linkages across the dimensions. They found 10 dimensions:

- Citizen participation
- Leadership
- Skills, including group process, conflict resolution, community assessment, problem solving, program planning, intervention design and implementation, evaluation, resource mobilization, and advocacy
- Resources internal and external to the community, including social capital
- Social and interorganizational networks
- Sense of community
- Understanding of community history
- Community power
- Community values
- Critical reflection

Each of these dimensions had subdimensions that would be part of operationalizing the construct. Study authors point out the challenge of measuring the constructs and suggest that the list be used in dialogue within the community as community members assess and address their community's capacity.

Others have suggested methods of assessment such as key informant interviews, focus groups, surveys, documentation of participation logs, meeting minutes, program plans, and sociograms. Labonte and Laverack (2001) describe a spider-web mapping technique based on ordinal rankings that provide visual representation of the domains of community capacity. They review various researchers' methods to obtain these rankings by community informants and health promoters through an interactive process. Singer and Kegler (2004) determined the reliability of network analysis data from organizations participating in a community intervention to prevent lead poisoning to assess interorganizational relationships, one dimension of community capacity.

**Mapping Community Capacity.** Capacity assessments go hand in hand with participatory community development. Table 4.4 shows the differences between a needs and an assets approach to community enhancement. In asset mapping, local people and organizations explore the problems and resources in their communities and develop strategies to solve the problems together. The process

**Table 4.4** Contrasting the “Needs” Versus “Assets” Approach to Community Enhancement

Needs	Assets
Focuses on deficiencies	Focuses on effectiveness
Results in fragmentation of responses to local needs	Build interdependencies
Makes people consumers of services; builds dependence	Identifies ways that people can give of their talents
Residents have little voice in deciding how to address local concerns	Seeks to empower people

Reprinted with permission of L. J. Beaulieu and the Southern Rural Development Center (2002) who credit Kretzmann, J. P. & McKnight, J. L. (1993). *Building communities from the inside out: A path toward finding and mobilizing a community's assets*. Chicago: ACTA Publications; and Fiscus, C. & Flora, C. B. (n.d.). *Mapping spiritual and cultural assets for Native American students*. Retrieved from [www.ncrcrd.iastate.edu/nativeamerican/index.htm](http://www.ncrcrd.iastate.edu/nativeamerican/index.htm).

is internally focused, not relying on the advice of outside experts, and relationship driven, with all participants working together as a team (Beaulieu, 2002).

McKnight and Kretzmann (1997) suggest mapping three types of resources:

- Resources located in the community and under its control
- Assets within the community but largely controlled by outsiders
- Resources originating outside the neighborhood and controlled by outsiders

The community's most accessible assets are those resources located in the community and largely under its control. These include individuals' assets, such as individual capacities, personal income, gifts of labeled people (such as the physically challenged), individual local businesses, home-based enterprises, and assets of organizations and associations. The latter include citizens' associations as well as organizations of businesses, financial institutions (for example, the Grameen Bank in Bangladesh and the South Shore Bank in Chicago), cultural organizations, communications organizations, and religious organizations. Kretzmann and McKnight also include a protocol for assessing personal capacity in areas such as construction, office equipment operation and repair, food preparation, transportation, and child care (Kretzmann & McKnight, 1993). Many other domains of individual competence can be imagined, including leadership, group-process, problem-solving, and participation skills.

The second type of resources includes assets located within the community but largely controlled by outsiders. Kretzmann and McKnight (1993) consider these to be secondary building blocks. They are divided into private and

nonprofit organizations, public institutions and services, and other physical resources. Institutions of higher education, hospitals, and social service agencies fall in the first category. Public institutions and services include public schools, police, libraries, fire departments, and parks. Physical resources include unused land and buildings as well as programs to conserve and recycle energy and waste.

Finally, there are resources originating outside the neighborhood and controlled by outsiders. All public expenditures are considered to be investments in development, although often they are used for maintenance of individuals without work and of impoverished neighborhoods. These are welfare expenditures, public capital improvement expenditures, and public information.

**Measuring Social Capital.** Social capital has often been measured by questions about reciprocity, trust, and civic participation (Lochner, Kawachi, Brennan, & Buka, 2003; Veenstra, 2002). For example, Veenstra (2002) created a social capital index to measure associational and civic participation and the density of associational life, combining information on voting behavior, social involvement, and the number of community organizations within each health district. In another example, Kennelly, O'Shea, and Garvey (2003) measured membership in voluntary organizations and whether unpaid work was done for the associations. They created the variables of density of association membership and density of unpaid work. Greiner, Li, Kawachi, Hunt, and Ahluwalia (2004) used the Community Involvement Module of the Kansas BRFSS to measure two constructs. The first was an overall rating of a community as a place to live. The other measured community involvement in coalitions or civic groups focused on local problems.

In a brief review of the measurement of social capital, Baum and Ziersch (2003) suggest that a more sophisticated measurement of social capital would keep the sources (that is, networks and values) distinct from the outcomes (that is, the types of resources available through the sources). They also suggest qualitative consideration of social capital to examine the contexts in which social capital works and the complexity of the concept. The World Bank has developed an assessment tool that includes both qualitative and quantitative components (Grootaert & van Vastelaer, 2002).

**Measuring Policy and Physical Environment.** As we pointed out earlier, the policy and physical environment are important environmental influences of health-promoting behaviors and characteristics of healthy communities. Several indicators examine these elements within different community sectors. The School Health Policies and Programs Study assessed the physical education and activity, health services, mental health, social services, food service, school policy,

and environmental components of school health programs at the school, district, and state levels, using computer-assisted personal interviews (Jones, Brener, & McManus, 2003). The CDC (Centers for Disease Control and Prevention, 2005) has developed a self-assessed school health index for schools to use to assess their programs.

The Texas Department of State Health Services (2004, 2005a) has adapted the CDC's school health index for work sites and communities. The work-site instrument addresses the presence of a work-site plan; policies on physical activity, nutrition, and tobacco use; health care coverage, access to screening services, and health promotion interventions. The community index includes indicators of community accessibility to walking; access to physical activity facilities; access to healthy food through restaurants, grocery stores, and farmers' markets; and the presence of health promotion programs in work sites and schools.

Handy, Boarnet, Ewing, and Killingsworth (2002) have looked at measurement of aspects of the built environment that have been related to physical activity. These include density and intensity, land-use mix, street connectivity, street scale, aesthetic qualities, distribution of activities, and transportation across a region. An example of a checklist based on such aspects is that of the National Center for Bicycling and Walking (2002). It includes items within the categories of transportation; land use and development; schools; parks, recreation, and trails; and safety, security, and crime prevention. These measurements are still undergoing refinement for use by researchers. However, their use by a community group can result in identification of issues and assets and be a very useful tool for planning. Survey items for measuring environmental supports for physical activity have also been developed (Brownson et al., 2004; Kirtland et al., 2003).

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## Setting Goals and Linking to Evaluation

The final task in this step is to link the needs assessment to program and evaluation planning by specifying desired program goals.

Setting priorities in a needs assessment is an iterative process, occurring throughout the assessment as well as after data analysis at the assessment's end. Setting priorities about health problems and populations of interest begins when one determines in the pre-assessment which groups and problems to study. As health planners ask questions and gather information during the assessment, they make various decisions about the continuing focus. For example, the asthma needs assessment came to be focused on schoolchildren. In the stroke-project example

at the end of this chapter (and continuing through the chapters that describe Intervention Mapping steps), planners made a decision to focus only on stroke treatment (secondary and tertiary prevention) rather than on prevention of stroke (primary prevention). On what basis should these health planners make such priority decisions?

Many factors influence priorities. One is the magnitude between what is and what could be (Altschuld & Kumar, 2010). For example, in the stroke project, the needs-assessment team discovered that the rate of drug therapy for acute stroke in the United States was only about 1–2%. The rate could be much better, maybe four to five times the current rate. The difference between the current status and what was desirable and possible was great. A related criterion is the difference in burden from a problem among groups. Once a problem becomes a focus, priorities may narrow to certain groups due to a heavier burden or to a health inequality or inequity.

A set of practical issues also influences the decision. These are the potential difficulty in ameliorating the needs, the consequences of ignoring the needs, and the possible costs of implementing a solution. Political and other social factors also affect the ultimate priorities and the decision-making process. These include community values, the context of priorities (that is, the local, regional, national, and international priorities), public and leader expectations, available interest and expertise, momentum, and availability of funding and human resources.

## Relevance and Changeability

Once the health planner has decided on the health problem(s) and population(s) and completed the analysis of behavioral and environmental causes, further decisions are made. We begin to think about what factors need to change, and we move further with this analysis in Chapter Five. Green and Kreuter (2005) recommend rating the importance (that is, relevance) and changeability of behaviors and environmental conditions using findings from the needs assessment. Behaviors and environmental conditions that are both more relevant and more changeable will be a high priority for program focus; factors that are more relevant and less changeable may be a priority for innovative programs for which evaluation is crucial. Factors that are less relevant but more changeable may be deemed as lower priorities except to demonstrate initial change to encourage community support and program participation. Behaviors that are both less relevant and less changeable should not be a focus for intervention. This analysis should be carefully done so that factors that are very relevant but hard to change are not neglected.

For use in the Intervention Mapping framework, we define program goals as changes in health, quality of life, behavioral, or environmental factors from the needs assessment. Looking back at the PRECEDE model, planners target how much change can be expected in indicators over a specified time frame for the priority population.

The ultimate goals are usually related to health or quality of life. If health and quality-of-life change outcomes can be accomplished in the program and evaluation time frame, then those become the specified goals. If the time frame is too long for program effects on health and quality of life to be measurable within the program time frame (as, for example, in a program concerned with HIV or cancer), then the planning group can make a decision to define the program goals in terms of behavior or environment. For example, health indicators include morbidity, mortality, incidence, prevalence, disability, and physiological risk factors. These include a statement (with a strong verb) of what will change in a specified population, by how much, and by what period of time. The amount of expected change and the time frame must be empirically justifiable. For example:

- At the end of three years of intervention, the annual incidence of HIV infection in Austin, Texas will be reduced by 5%.
- Within one year following the intervention, the hospitalization rate for children with asthma in the Houston Independent School District will be reduced by 10% and the school absenteeism rate will be reduced by 20%.
- Following five years of programs to increase physical activity and reduce total caloric consumption, the percentage of obese children in grades 5 through 8 in El Paso, Texas, will be reduced from 35% to 30%.

At the end of the needs assessment, the planner sets program goals. In Chapter Five (Intervention Mapping Step 2), the planner decides what needs to change regarding behavioral and environmental outcomes. Because of the time required for change to occur, this level of outcome is sometimes described as the main outcome instead of health or quality of life. This is acceptable when there is an empirically documented link between the behavior or environment and the health outcome. For example, someone working in tobacco control among youth might have outcomes regarding smoking rates and access to tobacco that can be measured in the short run rather than health outcomes regarding incidence of cardiovascular disease and cancer that could be observed only after many years.

## BOX 4.2

### STROKE PROJECT

The T.L.L. Foundation Temple Stroke Project is an example of an application of Intervention Mapping to develop a successful intervention (Morgenstern et al., 2002, 2003). We present this example step by step at the end of each Intervention Mapping step (Chapters Five through Ten). We organize the example by the tasks that we present in the chapter.

#### Community Partnership

*Task 1: Establish a planning group that includes potential program participants and plan the needs assessment*

The T.L.L. Temple Foundation Stroke Project was focused in Angelina, Nacogdoches, and Shelby counties in east Texas. The program was funded by the T.L.L. Temple Foundation, which asked that we conduct the intervention in its community. We began by hiring a local health educator from one of the two midsize towns in the area, and putting together a program planning group. Our team included health educators, behavioral scientists, and neurologists from an academic medical center about 100 miles from our project area and community members concerned with stroke. We had participation from persons who had suffered a stroke (including the mayor of one of the towns); representatives of community organizations with some interest in stroke; community media gatekeepers including English- and Spanish-language newspapers, radio stations, and television stations; and health care providers who treat stroke. During intervention development, the team met bimonthly in the Lufkin city hall conference room.

#### Logic Model of the Problem

*Task 2 was to plan and conduct the needs assessment using the PRECEDE model (Green & Kreuter, 2005) to analyze health and quality-of-life problems and their causes and to decide on priorities.*

The health educator and behavioral scientist on the team helped the group choose the PRECEDE model (Green & Kreuter, 1999; 2005) as the organizing framework for our needs assessment, and we began immediately putting everything we already knew about stroke in our community into the model. We began with the project assumption that we were entering the model at the health problem. We defined the health problem as excess morbidity and mortality from untreated stroke.

Although the U.S. Food and Drug Administration (FDA) approved intravenous recombinant tissue plasminogen activator (rtPA) as the only treatment for acute ischemic stroke in 1996, only a small minority of patients (about 1–2%) receive this treatment, which can significantly improve stroke outcomes (National Institute of Neurological Disorders and Stroke rtPA Stroke Study Group, 1995). Treatment must begin within three hours of symptom onset. Despite some risk of intracranial hemorrhage, the studies of rtPA suggested that the use of the treatment resulted in at least a 30% relative benefit in reducing disability from stroke. Consensus statements from the American Heart Association (H. P. Adams, Jr. et al., 1996), the American Academy of Neurology (American Academy of Neurology, Quality Standards Subcommittee, 1996) and the American College of Chest Physicians (Albers, Easton, Sacco, & Teal, 1998) supporting the use of IV rtPA have been published. Despite the published data, consensus statements, and guidelines, the problem persists that only a very small minority of acute stroke patients currently receive IV rtPA for acute ischemic stroke in the United States. Based on this beginning problem definition, we started the PRECEDE model (Figure 4.7) and continue the description of its development below.

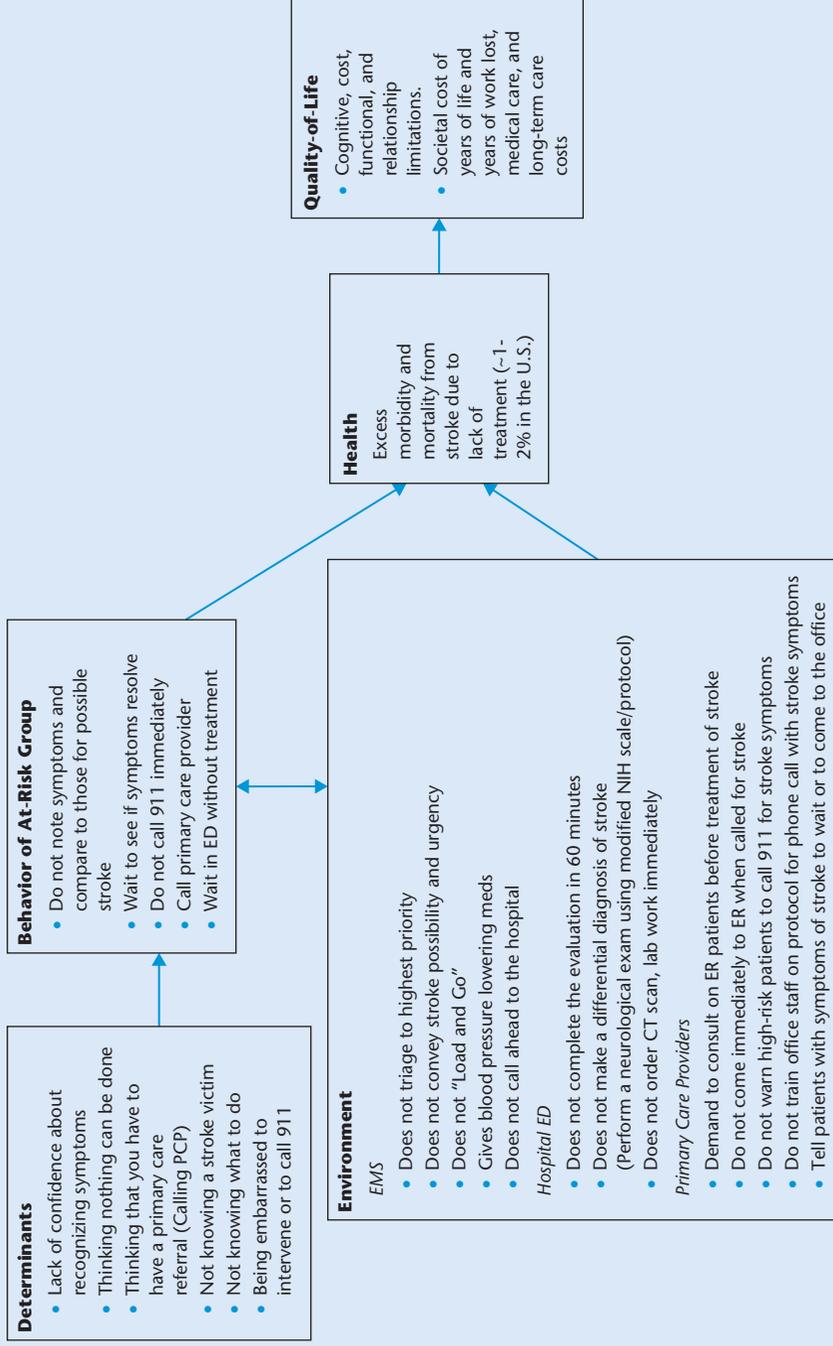
## Needs Assessment Methods

In order to flesh out the needs-assessment model, we reviewed the literature, held focus groups and interviews, led discussions with our planning group, and conducted a community telephone survey. We addressed two questions with a review of the stroke literature. We needed to be able to estimate stroke in our intervention community. The questions were the following: (1) What is the prevalence of the health problem, both stroke and untreated stroke? (2) What factors are associated with lack of treatment for stroke and delay in presentation to emergency room with stroke symptoms?

We conducted two focus groups of seven persons with stroke and significant others and four interviews of patients and significant others. Our work group served as an ongoing source of information about the intervention community. As mentioned, we had many community stakeholders in stroke including two persons who had suffered a stroke. The purpose of the qualitative data collection was to explore recognition of stroke symptoms, activities in response to symptoms, and emotions and attitudes toward the stroke experience.

We conducted a community telephone survey to address the question of what attitudes predict a rapid and assertive response to stroke symptoms in our intervention community. Variables measured in the survey are included in Table 4.5. We used random-digit dialing to conduct 106 interviews.

**FIGURE 4.7 PRECEDE Logic Model**



**Table 4.5 Stroke Project Community Survey Variables**

Variable	Definition and Measurement
Knowledge of symptoms	If a friend were feeling unwell, what symptoms in your friend would be a sign of a stroke?
Knowledge of what to do	Exactly what would you do in the face of the symptoms you described above?
Self-efficacy	Confidence in ability to call 911, get appropriate emergency department care
Perceived norms	What a person thinks known associates would do related to stroke
Barriers	<ul style="list-style-type: none"> <li>Calling the doctor first (before going to the ED)</li> <li>Family or friends do not take medical problem seriously</li> <li>Waiting before doing anything about a medical problem</li> <li>Calling insurance first</li> <li>Calling a primary care doctor</li> <li>Being embarrassed or afraid to act for a friend</li> <li>Being embarrassed or afraid to act for self</li> </ul>
Outcome expectations	A person with stroke can be treated and get better
Behavioral intentions	<ol style="list-style-type: none"> <li>1. Intention to provide assertive support to get stroke treatment</li> <li>2. Intention to call 911</li> <li>3. Intention to wait</li> </ol>
Ethnicity	Caucasian Non-Hispanic, Hispanic, or African American
Gender	Male or Female

We met with administrative representatives of the five hospitals and three emergency medical services (EMS) in the intervention community to assess the capacity of the hospitals to treat stroke in the emergency room.

### *Describing Health Problems, Quality of Life, and the Populations at Risk*

The intervention was located in the sponsoring agency's community. The community was far enough from Houston, the largest nearby metropolitan area, that referral for acute stroke care was prohibitive without an initial stop at a local hospital. The intervention community contained five hospitals in Angelina, Nacogdoches, and Shelby counties, Texas. In 1998 the intervention community

comprised an estimated 160,833 residents (77% non-Hispanic white). The incidence of stroke in the United States is about 700,000 per year or about 2.6 per thousand. The mortality rate is about 38.5% in males and 61.5% in females. Persons aged 75 and above are at the highest risk of stroke. In the counties in which we were working, we could expect about 418 strokes per year. To our knowledge, only one person had ever been treated with rtPA in the intervention community.

Stroke results in decrements of quality of life in the sufferer and family including, for example, loss of cognitive functioning, loss of financial and physical independence, and costs for medical care. Our focus groups and interviews highlighted the community view of stroke as something that results in terrible impairment of quality of life. One respondent reported: "I don't ever want to be like that, just let me die." Further, all respondents had known someone with a stroke who suffered significant impairment and restrictions of activities of daily living.

### *Describing Behavior of At-Risk Individuals*

Moving to the left in the PRECEDE model (Figure 4.7), we asked the question: What is the behavior of the lay person at risk that contributes to morbidity and mortality from stroke? The literature review indicated delay in arriving at the hospital and arriving at the hospital in a personal car rather than an ambulance (that is, not calling 911) were related to lack of treatment (Alberts, Bertels, & Dawson, 1990; Bratina, Greenberg, Pasteur, & Grotta, 1995; Feldmann et al., 1993; National Institute of Neurological Disorders and Stroke, 1997). The community survey and focus groups (to be discussed later), though intended to explore determinants of behavior, suggested new risk behaviors such as waiting to see whether symptoms resolve and calling the primary care doctor before proceeding to the emergency department.

### *Describing Determinants of Slow Response to Stroke*

Moving again to the left in the PRECEDE model (Figure 4.7), we concentrated on the determinants of delay in stroke treatment. The literature suggested that several factors related to less delay in response to stroke symptoms include exhibiting recognizable symptoms and being accessible to someone who can do the recognizing. Factors that may have been associated with recognizable symptoms were greater severity, occurrence during the day on a weekday, the fact of living with someone, and employment (Alberts et al., 1990; Azzimondi et al., 1997; Fogelholm, Murros, Rissanen, & Ilmavirta, 1996). Calling 911 and arriving at the hospital by ambulance have been noted by many investigators as factors related to decreased time to hospital arrival and faster evaluation once in the hospital (Barsan et al., 1993; Bratina et al., 1995; Menon, Pandey, & Morgenstern, 1998). Not waiting to consult with a primary care provider may also

be important (Fogelholm et al., 1996). Knowledge of symptoms and ability to recognize stroke symptoms were also found to be related to faster arrival (Alberts et al., 1990; Feldmann et al., 1993; Fogelholm et al., 1996; L. S. Williams, Bruno, Rouch, & Marriott, 1997). Symptoms that are more recognizable because the problem becomes quickly a stable deficit are also related to decreased time to the hospital (Feldmann et al., 1993).

The results of our community study also contributed to the understanding of variables related to delay in care for stroke. Although approximately 79% of people responded to an open-ended question that they would call 911 for stroke symptoms, there were several barriers: lacking knowledge of symptoms, having to call the insurance carrier first, and having to call the primary care provider first. We performed three regression analyses on the survey data (on the intention to act assertively, the intention to call 911, and the intention to wait without responding). The following factors predicted intention to act assertively:

- Being male
- Being minority
- Knowing a stroke victim
- Not tending to wait a while
- Having self-efficacy

For intention to call 911, predictors were the following:

- Being male
- Being minority
- Knowing what to do
- Having self-efficacy
- Not having to call the doctor first (in males but not in females)
- (Not) having family and friends who do not take the problem seriously (in males but not in females)

For intention to do nothing in the presence of stroke symptoms, predictors were the following:

- Being female
- Being an older minority

- Feeling embarrassment
- Needing to call the doctor first
- Having less self-efficacy
- Having less knowledge of symptoms

Focus groups and interview results uncovered the following themes related to responding to stroke symptoms to get care:

- Lacking recognition of stroke symptoms
- Thinking there is no hope for stroke victims (“Just let me die”)
- Having problems with primary care referrals (“Just wait until Monday”)
- Being reluctant to take action for self or others
- Not calling 911
- Calling primary care doctor
- Waiting to see whether symptoms would resolve

### *Describing Environmental Causes of Lack of Treatment*

For the stroke project, the hospital emergency department (ED) and the emergency medical services (EMS) are the organizations that have the agents able to make change in stroke treatment. The agents are a variety of health care providers and administrators such as medical directors and chairs of the critical care committees. Stroke patients can receive treatment only if the community ED is prepared to give acute stroke therapy and if the ED conducts a neurological examination and specific radiologic and laboratory tests within a certain time frame. Likewise, the ED can perform its function in the chain of events only if the EMS transports the individual quickly and contributes to a speedy evaluation (National Institute of Neurological Disorders and Stroke, 1997).

Even though the literature suggests that a major cause of lack of treatment for stroke was delay time in getting to the hospital and thus missing the three-hour treatment window, it is apparent that some delays occur in the medical workup once patients arrived at the ED (Albers et al., 2000) and that some physicians are resistant to treatment with rtPA (Caplan, Mohr, Kistler, & Koroshetz, 1997).

Although it was originally a part of the intervention development rather than of the needs assessment, we held meetings with hospital critical care

committees, ED medical staff, and EMS in each of the three counties. These meetings documented the failure of ED staff to work up patients for or deliver rtPA. The themes that emerged from the ED meetings were the following:

- The supposed ownership of patients by community physicians (“We can’t treat them because they are patients of primary care physicians or community neurologists”).
- What about side effects (bleeds)?
- We don’t have a protocol.
- We don’t have rtPA on the ED formulary.
- It takes too long to work up a patient.
- We don’t believe it will make much of a difference.

The themes that emerged from the meetings with community EMS were the following:

- No reason to transport at highest priority if the hospital doesn’t triage at highest priority
- Failure to call hospital en route
- Expectation that the hospital will do nothing

The ED physicians did not talk about lack of skill for neurological workup or inability to establish time of onset of the stroke, but these are high-level neurological skills that we included in the needs assessment based on the experience of the planning team.

## Community Capacity

*The next task was to balance the needs assessment with an assessment of community capacity.*

In addition, the interviews confirmed that all hospitals had some basic capacity to treat stroke. A neurologist was on staff in four of the five community intervention hospitals. The hospitals had 24-hour EDs and protocols for emergent head CT scan imaging. All three communities had full 911 EMS.

## Program Goals

### *Link the needs assessment to evaluation planning by establishing desired program goals*

Looking at the needs-assessment model, we determined that outcome goals for health should include the following:

- Over the two years of the intervention, increase the proportion of eligible patients who receive rtPA to 50% at the five hospitals in the intervention community.
- Over the two years of the intervention, increase the proportion of all stroke patients who receive rtPA to 5% in the intervention community.

We were ultimately interested in decreasing disability from stroke. However, we did not quantify this objective, and we used treatment as a proxy objective.

## Summary

Chapter Four describes the process of needs assessment that is accomplished before beginning work focused on interventions—the proposed solutions to identified health problems. The needs assessment begins with involving stakeholders and establishing a participatory planning group. This chapter provides a detailed description of the processes useful in facilitating such a planning group and in carrying out the work of the needs assessment.

This chapter recommends using the PRECEDE model (Green & Kreuter, 2005). Using the PRECEDE model as a conceptual framework the planner conducts an inquiry with a population-based epidemiologic perspective to determine health problem characteristics such as morbidity, mortality, disease risk, and burden of disease in various population groups. The inquiry includes an analysis of causation of health problems at multiple levels and the consideration of multiple determinants of health-related behavior and environment.

An important component of performing a needs assessment is to describe the individuals who have the health problem or who are at risk of the health problem and who are, consequently, the potential beneficiaries of the health promotion intervention. The at-risk population always is the intended recipient of program benefits, such as risk reduction or improvements in health status or quality of life. Therefore, when conducting the needs assessment, the health and quality-of-life analysis is always focused on the population at risk.

However, it does not follow that an intervention is always focused on this group. There may be several groups in a comprehensive, multilevel program.

Chapter Four suggests multimethod approaches to needs assessment and covers briefly the uses of and sources for archival or secondary data and the primary collection of data from individuals and groups. The authors provide a general description of several data collection methods including surveys, interviews, ethnographic methods, focus groups, nominal group process, Delphi technique, appreciative inquiry, and geographic techniques.

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## Discussion Questions and Learning Activities

1. Discuss why a needs assessment is so critical to planning a health promotion program.
2. Explain why it is important for health promotion program planners to balance a needs assessment with an assessment of community capacity and needs. Give examples of measures of community capacity.
3. To develop a health promotion program to address the health problem or related behavior and environmental condition you selected in Chapter One, describe how you would establish a planning group and who you would include. Briefly describe a process for how you would use the planning group to help conduct the needs assessment.
4. Describe the population at risk for the problem you selected in terms of demographic variables. Provide a rationale for why this population was chosen. Briefly describe the setting for the potential program.
5. Using the problem you selected in Chapter One, indicate in which needs-assessment phase you are entering the needs-assessment model (for example, quality of life, health, behavior, or environment). First describe the factor with which you are beginning your model and then describe each of the other factors and their relation to each other.
6. Describe two indicators of quality of life of the selected population. Describe two methods you would use to determine if these indicators are important to this population. Explain why you selected these methods.
7. Describe health problem(s) that could affect the quality of life for the population. Select at least one of these problems to be addressed by a health promotion program and explain the epidemiologic bases for giving the selected problem(s) priority. Describe the health problem and the incidence/prevalence of the problem in this population. Is it higher compared to other populations? Is there greater burden of disease? If you cannot find

data for your chosen population, construct estimates based on comparable populations.

8. Describe behaviors and environmental conditions that are likely causal factors for the health problem selected above. Document and provide references to support the possibility of a causal relationship.
9. From the list generated in question 9, select the most important behaviors(s) and environmental condition(s) for programmatic focus based on a rating process where you determine the importance (in terms of relation to the health problem) and the changeability of each factor. Present a rationale and evidence.
10. State program goals that would serve as an indicator for the program achieving: measurable improvements in health outcomes, quality-of-life outcomes, or behavioral and environmental impact. Consider the time period and use the research literature to justify the amount of change you expect to occur.
11. Specify determinants of the risk behavior and environmental conditions using selected behavioral or social science theories and available empirical evidence.
12. Diagram a logic model that illustrates the casual pathways for how different factors influence increased risk for health problems that have an impact on quality of life for a specified population.

# INTERVENTION MAPPING

## STEP 2

### PREPARING MATRICES OF CHANGE OBJECTIVES

#### LEARNING OBJECTIVES

- State expected program outcomes for health-related behavior and environmental conditions
- Subdivide behavioral and environmental outcomes into performance objectives
- Select important and changeable determinants of behavioral and environmental outcomes
- Create a matrix of change objectives for each level of intervention planning (individual, interpersonal, organizational, community, and societal) by crossing performance objectives with determinants and writing change objectives

The basic tool for Intervention Mapping is the matrix of change objectives. Change objectives state what needs to be achieved in order to accomplish performance objectives that will enable changes in behavior or environmental conditions that will in turn improve the health and quality-of-life program goals identified in Step 1.

In this chapter we explain how health educators use the findings from the needs assessment and other information to specify intended change in individual health-related behaviors and environmental outcomes at the interpersonal, organizational, community, and societal levels. Once intended change is specified, the planner writes performance objectives for behaviors and for environmental outcomes at each ecological level. These performance objectives describe exactly what the at-risk population members and the agents or influential people at each environmental level need to do in order to accomplish improvements in health outcomes.

## BOX 5.1

### MAYOR'S PROJECT

The mayor's planning group did a great job on the needs assessment. Many of the members commented that they had no idea that the problem of obesity was so complex. Looking at the theories helped them to delve into some of the causes of obesity among the youth in their neighborhoods. They were practically bubbling over with enthusiasm, and they were sure that they were ready to talk about intervention.

*Health Care Provider:* Now that we know what some of the factors are that are related to obesity, let's go after them.

*School Superintendent:* I could call all my associate superintendents at the district tomorrow for a big meeting, because surely we will want to intervene in the schools.

*Business Community Rep:* Yeah, and what about that Communities in Schools Group?

*Parent:* We could . . .

The health educator sat quietly for a moment, getting up the courage to tell them the truth. They had completed only the first phase of their planning. Things were likely to get more complex before a coherent planning framework could emerge. Finally, the health educator said: "Let's back up for just a minute. There are some other things we need to do before we can talk about intervention."

Amid the moans and groans, she told the group about the building blocks of matrices. She reminded the group: "Before we design an intervention, we need to know exactly what needs to change or be accomplished to prevent obesity."

The matrices in this chapter are created by the intersection of the performance objectives with determinants of the at-risk group performance objectives and the performance objectives of those who influence environmental outcomes. These matrices form the critical foundation for intervention conceptualization and program development, steps that we explain in Chapters Six and Seven. The matrices contain the change objectives that the program will address in order to influence change in determinants and the accomplishment of performance objectives. This chapter describes in detail the principal components of matrices and guides the reader to use the core processes and the information from the

needs assessment to create sound matrices. The final product of Step 2 of the Intervention Mapping process is a set of matrices that specifies the immediate objectives for a health promotion program to accomplish.

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## Perspectives

In this section we highlight the importance of continuing with the ecological perspective on program development and of building the program logic model.

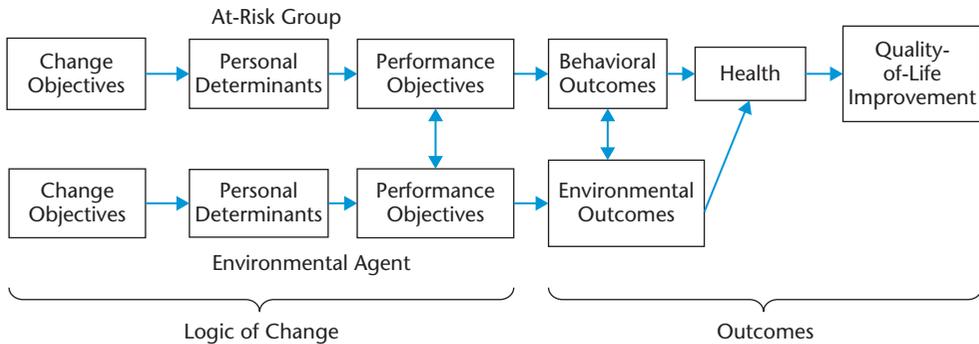
### Continuing with the Ecological Framework

The perspective for this chapter is the continued use of an ecological framework for the planning of interventions for a health promotion program. Causation of health problems is a web of factors that occur at multiple levels. Some influences external to the individual work through the behavior of the at-risk individuals, such as the effects of advertising on the smoking behavior of adolescents (Audrain-McGovern et al., 2006; Biener & Siegel, 2000; Gilpin, Distefan, & Pierce, 2004; Gilpin, White, Messer, & Pierce, 2007; Shadel, Tharp-Taylor, & Fryer, 2009; Turner, Mermelstein, & Flay, 2004), whereas others, such as air quality (Chuang, Chan, Su, Lee, & Tang, 2007; Pope & Dockery, 2006; Pope, Patterson, & Burge, 1993), work directly on health. These levels of causation are represented in this chapter's matrix products. However, in Step 2 the focus is on change in behavior and the environment instead of the causes of health problems addressed in the needs assessment conducted in Step 1.

### The Logic Model of Change

The logic model for planning in Step 2 of Intervention Mapping (shown in Figure 5.1.) is similar to the logic model for the needs assessment except that the logic model of change represents pathways for program effects rather than pathways of problem causation. It begins with the program goals for health and quality-of-life outcomes to be achieved by the health promotion program on the right side of the model. This was the last task in Step 1 and forms the basis for continued planning in Step 2. Working from right to left in the logic model of change, the program planner states the behavioral and environmental change in terms of what is necessary to achieve the health and quality-of-life outcomes. The process for creating a matrix of change objectives is based on the assumption that the needs assessment identified behaviors or environmental conditions that are causes of health or quality-of-life outcomes. The next assumption is

FIGURE 5.1 Logic Model of Change



that development of certain more favorable behavioral or environmental outcomes will lead to better health and improved quality of life. Thus, the first task in creating a causal pathway for influencing change is to specify the behavioral and environmental outcomes that the health promotion program seeks to accomplish.

The next link in the model is the specification of performance objectives for obtaining the behavioral and environmental outcomes. Performance objectives are statements of what a program participant will do or how the environment will be modified (including who will create the change). The performance objectives can be a somewhat complex list of steps or actions in preparation for performing the health behavior or environmental change. Performance objectives are then examined in light of the determinants of behavior and environmental modifications to generate change objectives. Change objectives specify what needs to change in the determinants of behavioral or environmental outcomes in order to accomplish the performance objectives.

Thus, the logic of change starts with the change objectives that will lead to changes in the determinants of the behavioral and environmental outcomes. Changes in the determinants will influence achievement of the performance objectives, which will enable accomplishment of the behavioral and environmental outcomes. Finally, if the program obtains behavioral and environmental outcomes, health and quality-of-life outcomes will improve. In Step 1, the needs assessment can be considered a “risk model” that defines the causes of the health problem. In Step 2, the planner shifts to a “change model” that defines what the intervention needs to change to reduce risk for the problem or to promote, protect, and improve health.

## Behavioral and Environmental Outcomes

The first task in Step 2 of Intervention Mapping is to state expected program outcomes for health behaviors and environmental conditions to improve health and quality of life.

The needs assessment (see Chapter Four) should provide a clear statement of behavior and environmental conditions linked to a health problem. However, before creating a logic model for an intervention, the health educator needs to reexamine the behavior and environmental conditions in order to define them in terms of what the health promotion program is intended to accomplish. Thus, starting in Step 2, the planning shifts to the intervention model with a focus on health-promoting behaviors and healthy environmental outcomes. For example, a behavioral cause of lung cancer is smoking, but the behavioral outcome for an intervention could be either not starting to smoke or quitting smoking (Centers for Disease Control and Prevention, 1994). Likewise, the environment can stimulate or support smoking, but an intervention would have to address a specific part of environmental change, such as eliminating advertising campaigns by tobacco product manufacturers (Brownson, Eriksen, Davis, & Warner, 1997; Brownson, Haire-Joshu, & Luke, 2006; Gilpin et al., 2004; Lewis, Rachelefsky, Lewis, de la Sota, & Kaplan, 1984; Lewis, Yulis, Delnevo, & Hrywna, 2004; Pierce, Choi, Gilpin, Farkas, & Berry, 1998; Pollay et al., 1996; Schooler, Feighery, & Flora, 1996; Yong et al., 2008). Well-defined behavioral and environmental outcomes will, in the next task, lead to a better specification of program objectives.

### Identifying Health-Related Behaviors of the At-Risk Group

Many types of health-related behaviors can be the focus of health education and promotion interventions. The needs assessment often identifies behavior related to increased risk, but intervention development requires restating the behaviors as either reducing risk or promoting health. For example, one of the risk behaviors for HIV infection is having unprotected sexual intercourse. For the purpose of designing a health promotion intervention, this risk behavior can be restated into two health-promoting behaviors: (1) using condoms when having sexual intercourse and (2) choosing not to have sexual intercourse when not protected. In this case the objectives of the Intervention Mapping process would be directed at obtaining and improving the performance of these

two behaviors (Schaalma, Abraham, Gillmore, & Kok, 2004; Schaalma, Kok, Braeken, Schopman, & Deven, 1991; Tortolero et al., 2002, 2008; van Empelen & Kok, 2006).

When thinking of behavioral change, planners can focus on different types of behaviors. As a matter of fact, one of the difficulties in planning health education programs is confusion over what is meant by the term behavior. Examples of types of behavior are risk reduction, health promotion, screening and early detection, adherence, and self-management.

**Risk-Reduction Behaviors.** Epidemiologists look at risk factors as a way of understanding causes of disease and factors associated with higher prevalence and incidence of disease in different populations. For example, documented cardiovascular disease risk factors include hypertension, hyperlipidemia, lack of exercise, genetics, stress, and smoking (Capewell et al., 2009; Kannel, D'Agostino, Sullivan, & Wilson, 2004; Labarthe, 1998, 1999; Luepker, 1998; Shekelle et al., 1981). The underlying assumption is that if an intervention can reduce the prevalence of the risk factors, it can reduce the prevalence of the disease (depending on how closely they are linked). The difficulty in designing interventions based on these risk factors is that they are not all clearly behavioral causes of the disease. There is a mixture of physiological and behavioral risks. The first task is to sort out which behavior is related to morbidity and mortality. For example, heart disease is associated with hyperlipidemia (a physiological risk), which is strongly influenced by diet (a behavioral risk) (Appel et al., 2005; Bayne-Smith et al., 2004; Labarthe, 1998, 1999; Smalley, Wittler, & Oliverson, 2004). Thus, risk behaviors, as opposed to risk factors, are defined as actions, such as eating certain foods that have been demonstrated to increase directly the risk of disease or disability.

An intervention can be approached from a population perspective, in which it is designed to reduce the prevalence of the risk behavior within a defined population; or it can be approached from an individual perspective, in which it is designed to help the individual stop (or not start) the risk behavior. Because of the addictive nature of some behaviors, such as smoking, the goal is the elimination of the behavior, not just a reduction. For other behaviors, for example, fat intake, the goal is a reduction. However, some behaviors that contribute to fat intake, such as cooking with saturated fat, might be eliminated altogether. The desired impact of a health education program on risk behaviors is to reduce or eliminate the practice and prevalence of these behaviors.

**Health-Promoting Behaviors.** Increasing the practice of health-promoting behavior can be viewed as an action taken to enhance health or provide protection. A health-promoting behavior is, in some cases, the opposite of a

risk behavior. For example, if eating high-fat food were the risk behavior, then eating low-fat food would be the health-promoting behavior. In contrast, some behaviors, such as getting immunizations, wearing a bicycle helmet, wearing a seat belt, or using a condom, are health promoting because they protect against a potential risk (Eluru & Bhat, 2007; Kelly, Zito, & Weber, 2003a; Kelly et al., 1992).

Often health education and health promotion are directed to primary prevention (preventing a health problem before it occurs). However, the same principles of intervention can apply to secondary prevention (reducing the consequences of a disease or slowing its progress). Secondary prevention is especially important for diseases in which early signs or symptoms are not apparent. When symptoms are not present or not easily detectable by laypeople, screening is necessary to identify individuals at high risk for the disease or to detect the disease process early so that appropriate medical treatment can be started to prevent more severe illnesses or mortality (U.S. Preventive Services Task Force, 2004). For example, mammography is used to screen for changes in the breast to detect breast cancer in the early stages, when treatment has the best chance of effectiveness (Smith, Steckler, McCormick, & McLeroy, 1995; Smith et al., 2003b). Other recommended tests are the Pap test for cervical cancer (Smith et al., 1995; Smith, Cokkinides, & Brawley, 2009; Smith, Cokkinides, & Eyre, 2003a), self-exam and clinical skin exam for skin cancer (Saraiya et al., 2004; Smith et al., 1995, 2009), and four different recommended tests for colorectal cancer (Levin et al., 2008; Pignone, Rich, Teutsch, Berg, & Lohr, 2002; Tilley et al., 1999; Walsh & Terdiman, 2003). Tests for blood pressure and blood cholesterol levels are examples of screening tests for elevated risk for cardiovascular disease (Abel et al., 1994; Chobanian et al., 2003; Labarthe, 1998; Ohkubo et al., 1997; Thompson & Byers, 1994; Thompson, Pyke, & Wood, 1996). Screening tests are also used to detect infectious diseases such as sexually transmitted infections (STIs) and HIV (Janssen et al., 2001; U.S. Preventive Services Task Force, 2009; Workowski & Berman, 2006) and genetic diseases such as Tay-Sachs disease (Natowicz & Prence, 1996) and cystic fibrosis (Brock, 1996; Livingstone, Axton, Mennie, Gilfillan, & Brock, 1993).

Screening and early detection range from self-administered tests to complicated medical procedures, but almost all require some behavior by the person at risk. Participation in screening requires an individual's decision and action. Health education programs can influence individuals to make decisions to participate. In general, interventions are usually designed to motivate individuals to participate in self-administered screening or to seek out and attend screening procedures by health professionals (Craun & Deffenbacher, 1987; Hou, Fernández, & Parcel, 2004; Smith et al., 1995, 2009). The exact nature of the behavior

is specific to the screening method and the purpose of the screening. Some screening involves a one-time or infrequently repeated behavior (that is, going to a health care facility and having blood or other specimens taken to be examined by a laboratory or health care professional). Other screening procedures, such as breast self-examination, are repeated and require skills, reliable procedures, and long-term maintenance (Agars & McMurray, 1993; Smith et al., 1995, 2009).

Some screening procedures, such as genetic testing and prostate cancer screening with a prostate specific antigen test (PSA), are controversial in that there are no agreed-on guidelines for screening (American Urological Association, 2000; Smith et al., 1995, 2009). Instead, there are recommendations for informed decision-making processes (with or without the provider) to determine whether or not to have the test (Briss et al., 2000b, 2004; Myers et al., 1999; Rimer et al., 1994; Rimer, Briss, Zeller, Chan, & Woolf, 2004; Smith et al., 1995, 2009). In these cases the behavioral goal is making an informed decision rather than engaging in screening. Thus, intervention strategies must target the type of behavior necessary to make the screening effective.

***Adherence and Self-Management Behaviors.*** Patient education, a specific type of health education, can help individuals who are receiving health care for a diagnosed health problem not only to adhere to the prescribed therapy but also to understand the disease and treatment better (Alewijnse, Mesters, Metsemakers, & van den Borne, 2002). With medical therapy, the patient is expected to follow through with the recommendations of the health care provider, and the extent to which the patient follows through with the recommended action is referred to as a level of adherence (Brawley & Culos-Reed, 2000). The field has moved from the term *compliance* to the term *adherence* to avoid the implication that the patient is being told what to do without having any involvement in the decision. For example, if a patient were instructed to take antibiotic medication three times a day for ten days, full adherence would mean taking the right dose at the right time each day for ten days. Studies have shown that, for most recommended follow-up procedures, adherence is incomplete (Claxton, Cramer, & Pierce, 2001; Dimatteo, 2004; Dimatteo & DiNicola, 1985; LaGreca & Bearman, 2003). Thus, the goal of health education interventions in this case is to improve adherence behavior.

Often the behavior required for follow-up to medical care is much more complex than simply adhering to a set of instructions, especially in the case of chronic illnesses for which management of the condition requires the patients or their families to take continuing action at home or elsewhere outside of health care facilities (Brug, Van Assema, Kok, Lenderink, & Glanz, 1994; Brug, Schols, & Mesters, 2004; D'Angelo, 2001; Fisher et al., 2005; Glasgow,

Fisher, Skaff, Mullan, & Toobert, 2007; Glasgow, McCaul, & Schafer, 1986). Self-management and self-regulation refer to the same phenomena: an active, iterative process of goal setting, choosing of strategies, self-observation, making judgments based on observation (as opposed to ones based on habit, fear or tradition), reacting appropriately in the light of one's goal, and revising one's strategy accordingly (Clark, 2003; Clark, Feldman, Evans, Wasilewski, & Levison, 1984; Creer, 2000b). The process is iterative, because feedback loops, through which one sees discrepancies between goals and outcomes, play an essential part in self-regulation (Scheier & Carver, 2003). Good disease management depends on making judgments to take action based on changing physiological conditions and life situations. For example, someone with diabetes must manage the disease by balancing the intake of food, expenditure of energy, and medication (Glasgow et al., 1986, 1992). This type of behavior is referred to as self-management because monitoring, decision making, and action must be made independently of the health care provider (Clark et al., 1984; Clark & Nothwehr, 1997; Creer, 2000a, 2000b; Dodge, Janz, & Clark, 2002; Gibson et al., 2003). The goals for self-management may include increasing the performance of the behavior as well as improving the quality of the behavior, for example, helping the patient become better at decision making and problem solving (Cameron & Leventhal, 2003; Clark et al., 1984; Clark & Nothwehr, 1997).

### Stating Behavioral Outcomes

Behavioral outcomes should be stated in terms of the behaviors to be accomplished as a result of the health promotion program. The following statements are examples of health-related behavioral outcomes:

- Reduce total fat intake to 30% of calories.
- Increase eating of low-fat foods to include five servings of fruits and vegetables per day.
- Use condoms correctly and consistently when having sexual intercourse.
- Monitor symptoms of asthma to detect early changes in status of illness.

The description of the T.L.L. Temple Stroke Project introduced in Chapter Four is continued in this chapter and presented in Box 5.2. at the end of the chapter to provide examples of tasks completed for Step 2 of Intervention Mapping. Recall from the needs assessment that the behavior that increased the risk of poor outcomes from a stroke was “delay in arriving at the hospital” resulting in missing the time window for treatment with rtPA. In Step 2 for the

change model, the behavior is stated for the at-risk population to arrive at the hospital within minutes after experiencing symptoms of stroke.

The behavioral outcome stated for the intervention is:

- Individuals at risk for stroke will arrive at the hospital within several minutes after experiencing symptoms of stroke.

The stated behavior communicates to the program planners what the population at risk will be expected to do as a result of the intervention program.

Additional examples of behavioral outcomes can be presented from Project SPF (Sun Protection Is Fun) which developed and tested an intervention to prevent skin cancer by reducing preschool children's exposure to ultraviolet rays (Gritz et al., 2005, 2007; Tripp, Herrmann, Parcel, Chamberlain, & Gritz, 2000). Children are the at-risk group for the project, and parents and preschool day-care center staff are additional intervention participants because they are part of the interpersonal and organizational environment of the children and can play a role in protecting children from sun exposure and early damage to the skin. These environmental agents also help to establish children's behavioral patterns and habits for sun protection. Because of the children's age, they can take only limited action by themselves to achieve protection from the sun and to reduce the amount of exposure to ultraviolet rays. Therefore, most of the focus of Project SPF is on the behavior of others in the children's environment and on environmental change at the interpersonal and organizational levels (see example of environmental outcomes later in this chapter). The project team stated the health-promoting behaviors for the child that will likely be brought about by changes in the child's environment this way: (1) remain indoors or in full shade during peak sun times of 11:00 A.M. to 3:00 P.M.; (2) wear sunscreen with a sun protection factor (SPF) greater than 15 when outdoors.

In a project that used Intervention Mapping to address physical activity in adults over 50, two behaviors were identified to be accomplished by a tailored intervention (van Stralen et al., 2008). The first was to increase recreational physical activity such as playing sports, walking, and cycling. The second was to increase physical activity in people's daily routines such as walking and cycling for transport, taking the stairs instead of the lift (elevator) or going for a walk during lunch breaks at work, and doing gardening, chores, and other household activities at home. The strength of this example is that specific ways of achieving increased physical activity are stated; however, a weakness is in not stating a target for the size of the increase or setting a minimum standard. In contrast, a worksite program designed to increase physical activity recognized that individuals would be at different baseline levels of physical activity and

may not be able to immediately reach the recommended goal of 30 minutes of moderate physical activity at least five days a week. The planners approached adding specificity to the expected behavior by having participants set graded goals for themselves and show cumulative increases throughout the intervention (McEachan, Lawton, Jackson, Conner, & Lunt, 2008). There are many ways to state behaviors and, to the extent possible, the statements should clearly express what participants in the program will be expected to do as a result of the intervention.

### Identifying Environmental Outcomes

In the needs assessment, environmental conditions are identified as social or physical conditions that influence risk behavior (thus acting as indirect causes of the health problem) or that cause the health problem directly. The needs-assessment process should lead to an identification of environmental conditions that influence the risk behavior or the health problem and to a prioritization of conditions according to their importance and changeability (see Chapter Four). When planners conduct an analysis of the environmental causes, they realize that they must consider each level of the environment as embedded in and having reciprocal influences with the higher levels (Richard, Gauvin, Potvin, Denis, & Kishchuk, 2002; Richard et al., 2008; Richard van der Pligt, & de Vries, 1995; Robertson-Wilson, Levesque, & Richard, 2009). In this analysis, we are making a distinction between the notion of a general environment and a condition of the environment (Commers, Gottlieb, & Kok, 2007). This allows the program planners to identify different states of the environment and how a change in a specified condition of the environment can lead to an improved outcome for health of individuals or a population. Thus, in the needs assessment, aspects of the environment identified as causes of a health problem are referred to as environmental conditions. However when stating how the environment needs to change as a result of an intervention, they are referred to as environmental outcomes. Stating environmental outcomes communicates to the planners and the recipients of an intervention the expected outcome if the intervention is successful.

***Interpersonal Environment.*** Humans are embedded in social systems. Families are the primary influence for socialization of children and continue to have an effect on behavior throughout life. As children grow older, peer groups become more important, beginning with playmates and continuing with friends, neighbors, coworkers, and members of organizations with which they affiliate (such as churches, social clubs, and service groups). Certain individuals may

hold special influence by the role they play, such as teachers, coaches, religious leaders, or health care providers.

Social support is a protective factor for health outcomes that researchers have studied extensively (Abbott & Freeth, 2008; Ganster & Victor, 1988; Heaney & Israel, 2002; Hogan, Linden, & Najarian, 2002; House, Umberson, & Landis, 1988; McLeroy, Gottlieb, & Heaney, 2001). The types of support that individuals may receive from their social networks include emotional support, information or advice, material support, maintenance of social identity, and social outreach (Abbott & Freeth, 2008; Barrera, Toobert, Angell, Glasgow, & Mackinnon, 2006; Canary, 2008; Heaney & Israel, 2002; Israel, 1982; McLeroy et al., 2001; Park, Tudiver, Schultz, & Campbell, 2004b; Park, Schultz, Tudiver, Campbell, & Becker, 2004a; van Dam et al., 2005). Social support may influence health through several pathways. There is considerable evidence that it buffers the effects of stress through the processes of cognitive appraisal of stress and coping (Berkman, 1984; Berkman & Glass, 2000; Fujishiro & Heaney, 2009; Heaney & Israel, 2002; Hirsch & DuBois, 1992; House et al., 1988; Rhodes, Contreras, & Mangelsdorf, 1994). The environment may provide modeling and reinforcement for the practice of specific health behaviors (Bandura, 1986, 2004a, 2006) and it may also directly influence physiological health, including immune function and blood pressure (Kiecolt-Glaser, McGuire, Robles, & Glaser, 2002; Reblin & Uchino, 2008; Seeman, 2000; Uchino, Cacioppo, & Kiecolt-Glaser, 1996; Uchino, Holt-Lunstad, Uno, Betancourt, & Garvey, 1999; Uchino, 2006). The presence or absence of supports from important others within the individuals' immediate interpersonal environment may have an influence on the performance of the health behavior as well as on the health outcomes.

The Child and Adolescent Trial for Cardiovascular Health, known as the CATCH program, a school-based intervention program to prevent cardiovascular disease among children in elementary school, is an example of how program planning can focus on instrumental support of children's health behaviors by parents and school staff (Nader et al., 1996., 1999; Perry et al., 1990, 1997; Perry & Jessor, 1985). Developers intended the CATCH program to influence children's diet, physical activity, and tobacco-use behavior. The school program addressed change at the individual level for the students and change at the organizational level to modify environmental conditions in the school to be more favorable and supportive of healthy eating and physical activity. In addition, the CATCH program planners hypothesized that parental support for the children eating low-fat food and being physically active would be an important environmental outcome; they therefore evaluated the added effectiveness of a program component that addressed support from the children's parents. The focus of the family component of CATCH was not on the diet, physical activity, or smoking behavior of the parents but more directly on how they could support their children's healthy

behavior (Nader et al., 1996). In a more recent school-based project that used Intervention Mapping for planning a program to increase children's fruit and vegetable consumption, two environmental components were included in the intervention: parental involvement and a distribution of free fruits and vegetables (Reinaerts, De Nooijer, & de Vries, 2008).

In another example of interpersonal environment, the Watch, Discover, Think, and Act asthma program targeted the behavior of physicians in prescribing anti-inflammatory medication to children, providing an asthma action plan, and reinforcing the child's and family's management efforts (Bartholomew et al., 2000b, 2000c; Bartholomew, Seilheimer, Parcel, Spinelli, & Pumariaga, 1989). The program developers also focused on the supportive behavior of parents, school nurses, and teachers with regard to self-management (see Chapter Twelve on the book's instructor Website). In a subsequent asthma program developed to accompany Watch, Discover, Think, and Act, the focus of the intervention was on the parents' behaviors (an important person in the interpersonal environment of a child with asthma). This program, called Families and Schools Together for Asthma Management (or Familias) (Fernández et al., 2000b, 2000c; Lopez, 2004) focused on increasing parent asthma management behavior among Hispanic parents and began with the identification of specific parental behaviors that influence management of childhood asthma. The following statements are examples of specific parent actions from the Familias project that represent important intervention outcomes for the child's interpersonal environment.

Parents will:

- Obtain a diagnosis of asthma from a health care provider.
- Reduce the child's exposure to triggers.
- Manage the child's symptoms.
- Take the child for regular medical care.

**Organizational Environment.** Organizational environments include elements such as norms, policies, practices, and facilities (Oldenburg, Hardcastle, & Kok, 1997; Oldenburg, Sallis, Harris, & Owen, 2002; Sallis et al., 2006; Sallis & Glanz, 2009; Steenhuis, Van Assema, & Glanz, 2001; Stetler, McQueen, Demakis, & Mittman, 2008). For example, policies can exert strong control over behavior, as in work-site bans on smoking, which have been shown to reduce the prevalence among workers (Brownson et al., 1997; Eriksen & Gottlieb, 1998; Fichtenberg & Glantz, 2002; Helakorpi et al., 2008; Levy et al., 1995; Levy & Friend, 2003). In other examples, combinations of preventive health care policies and health care facility characteristics such as service hours can determine whether workers obtain care. The availability of corporate exercise facilities and the personnel practices of management may each have an impact on workers' physical activity.

In the school asthma management project, the planning team assessed the physical environment of the schools to identify potential triggers for asthma symptoms (Tortolero et al., 2002).

The CATCH program also provides examples of addressing environmental conditions at the organizational level. CATCH addressed the organizational practices of cafeteria food preparation and physical education teaching. In addition, the program addressed policies regarding tobacco use on school grounds and during school-sponsored activities. Organizational-level change was needed to make it easier for children to eat healthy food, be physically active, and avoid exposure to tobacco use.

In Project SPF the unavailability of sunscreen, the lack of shade on the playground, and the time schedule for outside play are organizational conditions that contribute either directly to increased risk of exposure or indirectly by making the protective behaviors more difficult to perform. These conditions are under the control of the center directors, who may be influenced by a health promotion program to take steps to decrease children's risk of skin cancer.

**Community Environment.** The community environment contains conditions that affect the health of populations, either directly or through behavior. Examples of these conditions include availability of work and income, the quality and quantity of housing, health care, availability of recreational resources, smoking and other health ordinances, law enforcement, judicial practices, and treatment resources for social problems such as child abuse, violence, and drug addiction. Further, community environment issues deal with social capital and the capacity of the community to form and maintain problem-solving relationships (Chaskin, Brown, Venkatesh, & Vidal, 2001; Gebbie Rosenstock, & Hernandez, 2003; Kreuter & Lezin, 2002; Lempa, Goodman, Rice, & Becker, 2008; Norton, McLeroy, Burdine, Felix, & Dorsey, 2002; Springer, Parcel, Baumler, & Ross, 2006). Examples of supportive environments that communities have achieved through health promotion projects include protecting communities against diesel fuel particulates (Kinney, Aggarwal, Northridge, Janssen, & Shepard, 2000; Northridge et al., 1999), protecting children from the hazard of high unbarred windows from which they could fall (Schulz & Northridge, 2004; Schulz, Williams, Israel, & Lempert, 2002), and establishing a runaway house for young people in Finland (Haglund, Finer, Tillgren, & Pettersson, 1996).

**Society.** The societal level focuses on legislation, enforcement, regulation, and resource allocation as well as policies, programs, and facilities of large political and geographic groups. Societal influences often function through governments,

which may be at the local, state, national, or international level. For example, legislation that influences tobacco use includes minors' access laws, clean air acts, and tobacco excise taxes. These laws, along with lawsuits against tobacco companies by states and individuals, have been pivotal to the success of the tobacco control movement (Douglas, Davis, & Beasley, 2006; Helakorpi et al., 2008; Hopkins et al., 2001; Levy et al., 1995; Levy, Chaloupka, & Gitchell, 2004a; Levy & Friend, 2003; McMullen, Brownson, Luke, & Chriqui, 2005; Sweda, 2004; Task Force on Community Preventive Services, 2001; Warner, 2001; Wisotzky, Albuquerque, Pechacek, & Park, 2004). State and federal agencies—including those for health, human services, education, agriculture, transportation, and food and drugs—originate regulations, policies, and programs that affect health status. Societal influences may work on individual behavior, such as the America Responds to AIDS campaign of the CDC (Gentry & Jorgensen, 1991), or directly on the physical environment, such as regulations for road construction in New Zealand (Haglund et al., 1996) or modifying environments for the prevention of chronic diseases (Brownson et al., 1997, 2006). They may also work through organizations, for example, by allocating resources to set up drug-free schools (Brandon, 1992; Fox, Forbing, & Anderson, 1988; Gorman, 2002; Hantman & Crosse, 2000). Healthy Cities projects have focused on intersectoral policy development that aims to create supportive environments for health and to integrate health into the economy, culture, and life of the community (Awofeso, 2003; Goepel, 2007; Goumans & Springett, 1997; Hall, Davies, & Sherriff, 2010; Hall & Loucks, 1978).

## Stating the Environmental Outcomes

Intervention Mapping guides planners to consider those environmental conditions in the needs assessment that require change and to state clearly the desired environmental outcome that the health promotion program is to achieve. For example, if the needs assessment finds that a lack of low-fat food options at school contributes to schoolchildren's high-fat diets, one of the desired outcomes can be stated as follows: increase the availability of low-fat foods offered in school lunch and breakfast programs to include options with less than 30% of calories from fat at every meal. Accomplishment of this environmental outcome would result in more low-fat food options being available in the school cafeteria and would make it easier for children to select and eat low-fat foods.

Project Sun Projection is Fun (SPF) illustrates how both behavior and environmental outcomes need to be addressed to accomplish the program objectives. Young children who attend day-care and preschool education programs spend an average of six to eight hours a day at these centers during the time of day

when exposure to the sun is likely to be the most intense and most harmful. The project planning team stated the health-promoting environmental outcomes for parents and preschools that the intervention needed to address as follows:

- Apply SPF 15+ to children before their exposure to the sun.
- Reapply SPF 15+ sunscreen to children when no longer effective (every 1.5 to 2 hours, or after swimming or profuse sweating).
- Dress children in protective clothing such as hats, sleeved shirts, long shorts, and sunglasses.
- Direct children to play in shaded areas.

An assessment of preschools identified three environmental conditions at the organizational level that either contributed directly to increased risk of exposure or contributed indirectly by making the protective behaviors more difficult to perform. These conditions were the unavailability of sunscreen, the lack of shade on the playground, and the time of day for scheduled playtime. The following environmental outcomes at the organizational level were stated in the intervention model for Project SPF:

- Provide SPF 15+ sunscreen in the preschools and day-care centers for staff to apply to children.
- Increase the amount of shade in the play areas.
- Schedule activities so that children are not outside during peak sun hours.

In the Stroke Project (Box 5.2. at the end of the chapter), the critical factor in the organizational environment was the availability of acute stroke therapy at the hospital. The planners state the following environmental outcome to be achieved by the program: “Provide acute stroke therapy for all eligible patients (those who arrived at the hospital with time for a workup within the three-hour window and for whom recombinant tissue plasminogen activator (rtPA) was not contraindicated).” The environmental outcome states what the program should accomplish related to the organizational environment of the hospital.

In another example of interpersonal environmental conditions, planners using Intervention Mapping for a program to prevent STIs, including HIV among heterosexual migrant men in the Netherlands, conducted key informant interviews and focus groups as part of the needs assessment (Wolfers, van den Hoek, Brug, & de Zwart, 2007). The findings lead to the identification of sociocultural environmental conditions that would likely influence the behavior to reduce the risk for STIs including dominance of men in sexual relationships

with women; norms that girls should marry as virgins, unwanted pregnancy brings shame, sexual intercourse is not allowed outside of marriage, and having multiple sex partners is generally accepted for men; and modeling of behavior by friends, older brothers, and uncles. These conditions are likely to be a deep part of the culture of the priority population and may be very difficult to change. In designing the intervention, the planners did not define objectives to change these conditions but rather viewed them as contextual factors that could be taken into consideration for how the health-promoting behaviors are discussed and presented to the priority populations.

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## Performance Objectives

The second task in Intervention Mapping Step 2 is to subdivide behavioral and environmental outcomes into performance objectives.

Once the program planners have defined the program's behavioral and environmental outcomes, they write performance objectives for each of them. The use of performance objectives is not new, nor is it unique to health promotion. For example, therapeutic outcomes are sometimes stated in performance terms at the individual client level. On an organizational level, quality assurance defines a standard of performance to maintain certain levels of service or production. In education, performance objectives usually reflect academic performance (Bloom, 1956; Gagne, Briggs, & Wager, 1992). In the area of training, participants must perform at a criterion level in order for a program to be successful. Although the term *performance objective* may not be applied exactly the same way in each of these examples, they are used to further delineate behavioral and environmental program outcomes.

### Performance Objectives for Behaviors

When first considered, behavioral outcomes usually are broad conceptualizations: Stop smoking. Don't drink and drive. Exercise aerobically 30 minutes per day. Eat less than 30% of calories from fat. These injunctions do not have sufficient detail on which to base an intervention. Therefore, we use performance objectives to clarify the exact performance expected from someone affected by the intervention. To determine the performance objectives, planners ask: What do the participants in this program or the environmental agents need

to do to perform the behavior or to make the environmental change stated in the behavioral or environmental outcomes? Performance objectives enable planners to make a transition from a behavior or environmental condition to a detailed description of its components. For example, eating a low-fat diet is a health-promoting behavior, but many sub-behaviors or components make up that broader behavior. To perform the behavior, an individual would need to take many actions, including the following: read labels, select low-fat food, prepare low-fat food, and avoid the use of fat additives. These sub-behaviors, specified by action words, become the performance objectives. They are used to refine, focus, and make more specific what the program participants must do as a result of the intervention. For the Stroke Project presented in Box 5.2 at the end of the chapter, four performance objectives are stated for the behavioral outcome. Note that in this case, it is the behavior of bystanders and not only the stroke victim, as he or she may not have the capacity to respond due to the stroke. The performance objectives provide the detail for what the bystanders need to do to ensure that the victim of a stroke will arrive at the hospital in time to receive the stroke therapy.

The performance objectives also help ensure the appropriateness of the program's behavioral expectations. For example, eating low-fat food might have a different set of performance objectives for schoolchildren than for an adult with a high risk for cardiovascular disease. In another example, Graeff, Elder, and Booth (1993) describe an intervention focused on mothers' hand washing in Guatemala. These researchers suggest that the experts often disagree about the components of ideal performance in terms of what is really necessary to have a health impact. They describe lengthy discussions by experts about how many times the hands should be rubbed, whether fingernails should be cleaned, and whether each fingernail should be washed separately. The experts' disagreements are arguments for (rather than against) good behavioral specification. Health educators have less chance of changing a behavior if they do not know precisely what constitutes the essential components of the behavior. In the program that Graeff and colleagues described, the project team defined the ideal hand washing as a set of discrete steps that the mothers would perform at various times: they would wash hands after using the latrine, before and after preparing food, before eating, before giving food to an infant, after changing a diaper, before entering the home, before going to bed, and before touching the cooking or drinking water. Unfortunately, the original performance objectives for this project required the mother to bring an extra jug of water into her home every day and spend one hour a day washing her hands. The original objectives were impractical; they were later extensively modified to include addition of

an environmental change to make the entire process less consuming of both time and water. This example illustrates the importance of not only selecting performance objectives essential to the behavior but also objectives that are practical in terms of what the priority population is both able and willing to do.

Some branches of education, such as curriculum and instruction, sometimes make little distinction between learning objectives and performance objectives. Both usually are specified in cognitive or affective (rather than behavioral) terms, and the terms for these types of objectives are sometimes used interchangeably (Gronlund, 1978; Mager, 1984). Intervention Mapping makes a clear distinction. Most cognitive and affective performance is related to the determinants of behavior and is considered part of change objectives, which are described later in this chapter. Planners can distinguish performance objectives from change objectives by thinking of the performance objective as an observable subset of the behavior and a change objective as what the program participants must learn or change in order to meet or maintain the performance objective.

Changing health-related behaviors and environmental conditions usually requires complex multistep processes. These processes, described as performance objectives, are what have to be done to accomplish the change. The specification of performance objectives helps program planners to sequence the behavioral learning process when the learner needs to learn one part before another and to include all necessary supports for the behavior. For example, Table 5.1 illustrates how the behavior of using condoms correctly and consistently when having sexual intercourse can be broken down into subcomponents, which are the performance objectives. In another Intervention Mapping example, the following program objectives listed below were stated for the management of the daily antiretroviral treatment for persons living with HIV (Côté et al., 2008). Notice that the performance objectives are stated in a general way and could be made more specific with sub-objectives as illustrated in Table 5.1. Another option would be for the planners to make each of the performance objectives a separate behavior with each having performance objectives. Either approach can work depending on what is most useful for the planners.

- PO 1. Follow and integrate the treatment plan properly in the daily routine.
- PO 2. Handle situations in which ART is difficult to take.
- PO 3. Cope with side effects.
- PO 4. Interact and deal with health professionals.
- PO 5. Maintain relationships with resources person and immediate social circle.

**Table 5.1 Performance Objectives for Consistently and Correctly Using Condoms During Sexual Intercourse**

- 
1. Buy Condoms.
    - 1.1. Locate condom displays in drug or grocery store.
    - 1.2. Choose condoms that are product tested.

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  2. Carry condoms or have condoms easily available.
    - 2.1. Carry condoms in wallet or purse for no longer than a month.
    - 2.2. Carry or store condoms in place that is not susceptible to extreme temperatures.

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  3. Negotiate the use of a condom with a partner.\*
    - 3.1. State mutual goals such as pregnancy or AIDS prevention.
    - 3.2. State clearly intention of using a condom as a prerequisite for intercourse.
    - 3.3. Listen to partner's concerns.
    - 3.4. Pose solutions to partner's concerns that reference mutual goals and personal requirements.

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  4. Correctly apply condoms during use.
    - 4.1. Use a water-soluble rather than petroleum-based lubricant.
    - 4.2. Use a new condom for each occurrence of intercourse.
    - 4.3. Follow instructions on package insert for use.
    - 4.4. Follow instructions on package insert for disposal.

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  5. Maintain use over time.
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\*Example of using theory to specify performance objectives. This uses negotiation theory as described by Fisher and Ury (1991).

## Performance Objectives for Environmental Outcomes

The process for writing performance objectives for environmental outcomes parallels the process for writing performance objectives for health behaviors. The environmental outcome must be broken down into its component parts. For example, at the organizational level, one can break down the environmental outcome “School lunch and breakfast provide meals that are no more than 30% of calories in total fat content” into the following performance objectives for environmental change agents:

- Food service directors will modify menus so that foods have 30% or fewer calories from fat.
- Food service directors will modify purchase order specifications to reduce the fat content of vendor-prepared foods to 30% or lower.
- Nutritionists will modify recipes to reduce the fat content by replacing fat with bouillon or water for boiling or frying.

- Nutritionists will replace dessert recipes that call for fat with recipes that substitute fruit and grains.
- Cooks will modify cooking practices to reduce the fat content of prepared foods by chilling foods, removing the fat, and then reheating to serve.

The basic question to ask when stating performance objectives for environmental outcomes is: What does someone in the environment need to do to accomplish the environmental outcome? This general question addresses who is doing the action to accomplish the objective, because the agent may be different for each of the performance objectives. This question is somewhat different from the question asked about performance objectives for the health-related behavior, because the health behavior question assumes a reference to the behavior of the at-risk population. Environmental change usually requires people outside the at-risk population to take action to modify the environmental conditions.

Exactly who will be taking the action to accomplish the performance objectives will depend on the agent in the environment who has control over or can influence a modification in the environmental factor. This agent might be, for example, family members, policymakers, lawmakers, resource controllers, or service providers. In the beginning of the planning process, it may be difficult to identify specific people to include in the performance objectives for modifying an environmental condition. We suggest starting with whatever information may be available about the agent and stating the “who” in terms of general groups of people or appropriate positions of responsibility, that is, roles or agents that may be able to accomplish the performance objective. As work on the intervention progresses, the health educator can figure out specifically who, in terms of either roles or individuals, will perform the modification in the environment.

Project SPF provides a good example. The performance objectives listed in Table 5.2. were constructed to enable modification of the environment. At the interpersonal level of the environment, the focus was primarily on action to be taken by the parents and preschool staff as agents in the environment to protect children from sun exposure. The sun-protective actions of parents and preschool staff were fairly simple. However, the stated performance objectives added specificity that enabled the program planners to more effectively communicate the essential components that the intervention should address. Note that each performance objective states who will perform the action.

The Stroke Project provides additional examples of performance objectives for environmental outcomes. Recall that the environmental outcome was to provide acute stroke therapy for all eligible patients. To accomplish this outcome, performance objectives (see Box 5.2. at end of chapter) were stated for three different groups of agents in the organizational environment of the health care system: emergency department of the hospital, the emergency medical service,

**Table 5.2 Environmental Performance Objectives  
for the SPF Project**

<i>Interpersonal Environment</i>
<p>Environmental outcome 1: Sunscreen with a sun protection factor (SPF) of 15+ is applied to children before exposure to the sun.</p> <ol style="list-style-type: none"> <li>1.1. Parents and preschool staff apply sunscreen at least 30 minutes before going outside.</li> <li>1.2. Parents and preschool staff spread sunscreen evenly.</li> <li>1.3. Parents and preschool staff cover all exposed areas head to toe.</li> </ol>
<p>Environmental outcome 2: SPF 15+ sunscreen is reapplied to children when no longer effective.</p> <ol style="list-style-type: none"> <li>2.1. Parents and preschool staff carry sunscreen on outdoor outings.</li> <li>2.2. Parents and preschool staff reapply sunscreen after more than two hours of continued exposure to sun.</li> <li>2.3. Parents and preschool staff reapply sunscreen after swimming or profuse sweating.</li> </ol>
<p>Environmental outcome 3: Children are dressed in protective clothing (hats, sleeved shirts, long shorts, and sunglasses).</p> <ol style="list-style-type: none"> <li>3.1. Parents and preschool staff ensure protective clothing is with child at day care.</li> <li>3.2. Parents and preschool staff ensure protective clothing is worn before going outside.</li> <li>3.3. Parents and preschool staff ensure protective clothing stays on child when outside.</li> </ol>
<p>Environmental outcome 4: Children are directed to play in the shade.</p> <ol style="list-style-type: none"> <li>4.1. Parents and preschool staff locate shaded areas.</li> <li>4.2. Parents and preschool staff plan activities for shaded areas.</li> </ol>
<p>Environmental outcome 5: Unnecessary sun exposure is reduced.</p> <ol style="list-style-type: none"> <li>5.1. Parents and preschool staff limit time children spend in the sun.</li> <li>5.2. Parents and preschool staff avoid peak sun hours.</li> </ol>
<i>Organizational Environment</i>
<p>Environmental outcome 6: SPF 15+ sunscreen is provided in the day-care centers for staff to apply to children.</p> <ol style="list-style-type: none"> <li>6.1. Preschool director will purchase or obtain sunscreen with an SPF of 15+.</li> <li>6.2. Preschool teachers modify daily schedules to allow time to apply sunscreen to children.</li> </ol>
<p>Environmental outcome 7: Increase the amount of shade in the play areas.</p> <ol style="list-style-type: none"> <li>7.1. Preschool directors decide to prioritize increasing the amount of shade in play areas used by preschoolers.</li> <li>7.2. Preschool staff will assess the adequacy of the current natural and structural shaded areas and determine ways to increase shade.</li> <li>7.3. Preschool directors assess available resources for accomplishing changes to increase shade.</li> </ol>

Table 5.2 (Continued)

<i>Organizational Environment</i>
7.4. Preschool directors or governing board will seek additional resources to accomplish changes to increase shade.
7.5. Preschool directors determine structures to implement based on ranking of effectiveness and feasibility.
7.6. Preschool directors seek feedback from teachers and staff.
7.7. Preschool directors garner administrative approval for proposed changes.
Environmental outcome 8: Activities are scheduled so that children are not outside during peak sun hours.
8.1. Preschool teachers will determine which outdoor activities fall within peak sun hours.
8.2. Preschool teachers will modify schedules to keep children indoors during peak sun hours.
8.3. Preschool directors will approve and communicate the modified schedule.

and the community primary care physicians. These performance objectives provide a clear statement of WHO needs to do WHAT. The “who” varies with each performance objective depending on who has responsibility for performing the action that will contribute to a change in the environment.

Our last example concerns performance objectives for HIV-related stigma reduction (see sections on Stigma and Discrimination in Chapters Two and Six) to illustrate how performance objectives can be stated across all levels to address the environmental outcome of HIV-related stigma reduction. One of the environmental factors hindering HIV prevention, and especially promoting HIV testing, is stigma (Bos, Dijker, & Koomen, 2007; Stutterheim et al., 2009). People who are afraid of being stigmatized hesitate to go for HIV testing. To reduce stigmatization and promote HIV testing, we distinguish performance objectives at various environmental levels. Stigmatizing behavior involves people at all levels, starting with public stigma at the interpersonal level.

Interpersonal level:

- Relatives and friends replace blaming and stereotyping by expressing empathy when interacting with persons with HIV (Dijker & Koomen, 2007).
- Relatives and friends give social support (Stutterheim et al., 2010).
- Relatives and friends support stigmatized person if disclosing (Paxton, 2002a).
- Relatives and friends do not advise stigmatized person to conceal HIV status.

Organizational level:

- Coworkers replace blaming and stereotyping by expressing empathy when interacting with persons with HIV (Dijker & Koomen, 2007).
- Coworkers treat each other with respect regardless of HIV status.
- Health care providers protect confidential information about people with HIV.
- Hospital managers or company managers develop policies against discrimination and stigmatization and endorse providing information, training, and interventions (Link & Phelan, 2001; Parker & Aggleton, 2003).

Community level:

- Opinion leaders communicate norms for treating every community member with respect regardless of HIV status.
- Community members give social support to people with HIV (Stutterheim et al., 2010).
- Community members replace blaming and stereotyping by expressing empathy when interacting with persons with HIV (Dijker & Koomen, 2007).

Societal level (national and state government):

- Elected officials develop policies and laws against discrimination and stigmatization.
- Elected officials develop policies and laws that support programs that provide information, education, procedures, and enforcement for nondiscrimination of people with HIV (Parker & Aggleton, 2003).
- Elected officials support programs and efforts to reduce power inequalities in society (Link & Phelan, 2001).

Finally, the people who are being stigmatized because of HIV can also behave in ways that will decrease stigmatizing behavior by others:

- Seek and secure social support (Stutterheim et al., 2010).
- Disclose HIV status, when prepared to do so (Paxton, 2002b).
- Express distress to others who are most likely to be empathetic, such as women friends (Bos et al., 2007).
- Actively cope with the stigma: downward comparison, external attribution, or shift in comparison level (Crocker Major, & Steele, 1998).

## Core Processes for Writing Performance Objectives

How to break down a health-related behavior or an environmental condition into subparts is not always apparent and may require additional thinking and

information. The core processes presented in Chapter One serve as guides for writing performance objectives as applied in the following steps.

The starting place is to formulate a question. For health-related behavior, the question is: What do the participants of this program need to do to perform the health-related behavior? For environmental conditions, the question is: What does someone in the environment need to do to accomplish the environmental outcome? The answers to these questions form a provisional list of performance objectives. Often the initial list is a logical sequence of smaller steps that are necessary to perform the behavior or achieve the environmental outcome.

Next, the planner reviews the research and practice literature to determine whether the performance objectives on the initial list are consistent with what the literature reports as essential subparts of the behavior or environmental outcome. The review results in revisions, deletions, or additions to the initial list.

Sometimes theory provides a rationale for performance objectives. For example, a self-management approach to behavior change can help the planner develop performance objectives, especially for complex behavior (Bandura, 1986; Barlow, Wright, Sheasby, Turner, & Hainsworth, 2002; Creer, 2000a, 2000b; Gibson et al., 2003; Scheier & Carver, 2003; Van Kesteren et al., 2006; Zimmerman, 1990; Zimmerman, 2000a). In that case the subprocesses of self-monitoring comparison to a personal standard, self-evaluation, self-control, and reward would become performance objectives as they relate to a specific behavior. Often these processes are expanded to include goal setting, implementation intentions, monitoring and appraisal, problem identification, solution identification, action, and evaluation (Abraham., Sheeran, & Johnston, 1998; Clark, 2003; Clark et al., 1984; Gollwitzer, 1993, 1999; Lazarus, 1993; Lazarus & Folkman, 1991; Zimmerman, 1990; Zimmerman, Bonner, Evans, & Mellins, 1999). Behavior change for establishing a healthier diet, for instance, might be approached with specific dietary advice, such as choosing low-fat cheese or abstaining from snacks, but such a list of specific behaviors might be long and unmanageable. A self-regulatory approach would look quite different from a list of specific dos and don'ts, and may include the following performance objectives (the specific actions needed would vary by person and setting):

- Monitor one's own food intake.
- Compare intake to personal goals based on guidelines for a healthy diet.
- Decide if discrepancies exist.
- Make a detailed plan of implementation intentions and take action to improve dietary behavior.
- Evaluate the action's effects.
- Recycle to self-monitoring.

Health educators may find it useful to consider the self-regulatory process when designating health-promoting behaviors for the self-management of chronic disease. For example, in a pediatric asthma self-management program, Bartholomew and colleagues (2000b, 2000c) conceptualized both asthma-specific behaviors (for example, taking control medications) and self-regulatory behaviors (for example, monitoring for symptoms of asthma) in their performance objectives (see Chapter Twelve on the book's instructor Website). For the Familias project, Fernández, Bartholomew, Lopez, and colleagues (1998, 2000b) described specific performance objectives using self-regulatory constructs for parents' management of their child's asthma.

Another example of the application of a self-regulatory approach to health behaviors can be found in HIV-prevention programs. Table 5.3 presents a comparison of performance objectives for condom use. Schaalma and colleagues, (1994) working with adolescents and focusing specifically on condom use, decided on seven specific performance objectives. Van Kesteren, Hospers, Kok, and van Empelen (2005), however, in working with HIV-positive gay men and focusing on safe sex in a broader framework of sexual health, which is a more complex behavior, applied a self-regulatory approach.

**Table 5.3 Comparison of Performance Objectives**

<b>Adolescent Condom Use (Schaalma et al., 1994)</b>	<b>HIV+ Men Who Have Sex with Men (MSM) Safe Sex (Van Kesteren et al., 2005)</b>
<ol style="list-style-type: none"> <li>1. Make an adequate decision on future condom use to prevent human immunodeficiency virus (HIV) infection.</li> <li>2. Buy condoms.</li> <li>3. Carry condoms regularly.</li> <li>4. Communicate about condom use with potential sex partners within the context of both one-night stands and regular dates.</li> <li>5. Use condoms correctly and consistently.</li> <li>6. Maintain condom use in teenage years.</li> <li>7. Use condoms in relationships that are perceived as steady.</li> </ol>	<ol style="list-style-type: none"> <li>1. (MSM) Self-observe sexual behavior and compare sexual behavior to standard of safer sex.</li> <li>2. Identify when a problem exists.</li> <li>3. Implement solutions:               <ol style="list-style-type: none"> <li>3.1. Decide to use nonpenetrative sexual techniques.</li> <li>3.2. Decide to use condoms for anal sex.                   <ol style="list-style-type: none"> <li>3.2.1. Purchase condoms.</li> <li>3.2.2. Carry condoms or have condoms easily available.</li> <li>3.2.3. Negotiate condoms for anal sex.</li> <li>3.2.4. Use condoms correctly and consistently.</li> <li>3.2.5. Maintain use over time.</li> </ol> </li> </ol> </li> <li>4. Implement selected coping strategies.</li> <li>5. Evaluate actions and return to monitoring</li> </ol>

Other theories that have been used to create performance objectives are negotiation (Fisher & Ury, 1991), coping (Lazarus, 1993; Lazarus & Folkman, 1991), and relapse prevention (Marlatt & Donovan, 2005). In the Cystic Fibrosis Family Education Program (CF FEP), Bartholomew, Sockrider and colleagues (1989, 1993) used coping theory to delineate performance objectives for the self-management of cystic fibrosis. Applying work by Lazarus (1993) and Lazarus and Folkman (1991) that suggests that coping is situation specific, should be judged by its effectiveness, and depends on accurate appraisal of situations and flexibility in problem-solving alternatives, the cystic fibrosis project team specified the coping objectives in Table 5.4.

Finally, the planner will review the list of performance objectives and reduce the list to essential objectives needed to perform the behavior or achieve the environmental outcome. This step is important because each performance objective is the basis for further work. Each will be linked with determinants to form change objectives. Nonessential (interesting but not necessary) performance objectives will expand the subsequent planning and potentially diffuse the intervention's focus.

### Validating Performance Objectives

The planner may also need to collect new data to determine the validity of performance objectives. What do potential participants in the program actually do, or say they do, when performing the behavior? Data may also be collected from service providers, key informants, or persons who may implement the program (Averch, 1994).

To validate performance objectives, the planners obtain additional information by questioning and observing both members of the intervention groups and the service providers. The CF FEP illustrates the process of asking service providers to validate performance objectives (Bartholomew et al., 1993). Program planners sent the draft of performance objectives for cystic fibrosis (CF) self-management to a panel of five physicians who specialize in the treatment of CF and five behavioral scientists experienced in working with CF patients. The panel was asked to rate the importance of each performance objective in contributing to the health and quality of life of a child with CF. Following a revision of the objectives based on the experts' ratings and comments, the performance objectives were sent to all the directors of CF treatment centers in the United States. About 50% of the directors returned the questionnaire, which was sufficient to enable the program planners to revise the performance objectives. Although conducting the validation did take some time and resources,

**Table 5.4 Performance Objectives for Using Coping Theory**

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**Members of a family of a child with Cystic Fibrosis (CF) use coping strategies to manage CF-related problems**

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1. Recognize need to cope with CF.
  - 1.1. Accept CF as the medical diagnosis (e.g., genetics, prognosis, variable course).
  - 1.2. Acknowledge potential extent of the physical effects of CF.
  - 1.3. Acknowledge that disease-related problems can occur at any time.
  - 1.4. Recognize need for adjustment by child and family to the demands of self-care.
  - 1.5. Accept the occurrence of emotional distress to the child and family as a periodic consequence of CF.

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2. Appraise situations for potential CF-related problems
  - 2.1. Identify sources of stress.
  - 2.2. Identify personal and family signs of stress.
  - 2.3. Estimate likelihood of undesirable outcomes from stressful situations

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3. Generate multiple coping alternatives, including categories of action, stopping action, information seeking, and thinking or feeling about things differently.
  - 3.1. Acknowledge the value of using a variety of coping strategies (flexibility).
  - 3.2. Generate alternatives to solve problems, including strategies of seeking information and social support.
  - 3.3. Generate alternatives to ameliorate emotional distress, such as seeking distraction and social support and practicing anxiety management.

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4. Use selected alternatives from coping strategies generated
  - 4.1. Use a variety of strategies to solve problems.
  - 4.2. Use a variety of strategies to ameliorate emotional distress

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5. Evaluate effectiveness of coping strategies used
  - 5.1. Judge whether problem has been solved.
  - 5.2. Judge whether new problems have been created through application of coping strategies.
  - 5.3. Judge whether emotional distress has been reduced.
  - 5.4. If coping strategy not judged effective, return to appraisal

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the program planners could continue with the intervention development process confident that their performance objectives were in line and consistent with a wide consensus regarding CF care.

Another way to identify or validate performance objectives is to obtain a review and feedback from community representatives. Through focus groups or interviews, potential program participants can be asked whether the performance objectives fit with their views of how they would go about performing the health-related behaviors. Feedback from individuals who have had experience with the health behavior or the environmental outcome can be very helpful. For example, in planning a smoking-cessation program, talking with both those who have quit smoking and those who have had difficulty quitting can give the planner ideas of how to construct performance objectives.

An often overlooked but in some cases essential source of information about performance objectives is direct observation of the health behavior or environmental outcomes. For some health problems, there may be a limited amount of information, experience, or documentation of how the related health behavior is performed or how environmental outcomes break down into component parts. Observation of performance in natural settings as well as in simulated settings can be very helpful. For example, program planners developing a nutrition improvement program for schoolchildren can spend time in the school cafeteria observing how children select, trade, modify, and eat or don't eat food. Observations may be done by program planners or by participant observers who are interviewed by or report on their experiences to the program planners. The needs-assessment phase of the Familias program included direct observation of the patient visit with the medical provider. Data collectors described the interaction between the provider and parent and child and gathered information that informed the development of performance objectives for parents and providers (Lopez, 2004).

Performance objectives may also be validated by predicting health-related behaviors from the performance objectives specified within the priority population. This approach is illustrated by a study conducted by van Empelen and Kok (2008) to examine the role of preparatory performance in explaining condom use among adolescents. In writing the performance objectives, they relied on experts and theoretical and empirical evidence. Several theories explain that the decision to act is a very important step in getting people to act. However, making the decision to act is not enough. Thus, for young people to use condoms, they should first make the decision to use condoms, but then take the next steps. The AIDS risk-reduction model has suggested that it is also important that people engage in supportive acts to reduce HIV risk. Empirical evidence could be derived from Sheeran, Abraham, and Orbell (1999) who showed, by means of a meta-analysis,

that people are more likely to use condoms when they have condoms available and are discussing condoms. Finally, young people may not maintain condom use. Misovich, Fisher, and Fisher (1997) showed that young people are more likely to use condoms in casual than in steady relationships; but their work also showed that a relationship is rather quickly defined as a steady relationship.

Thus, from the evidence available, van Empelen and Kok (2008) derived young people's performance objectives:

1. Decide to use condoms.
2. Buy condoms.
3. Have condoms available at all times.
4. Discuss condom use with their partner.
5. Use condoms.

In order to encourage maintenance of condom use, it was also important to ensure that adolescents would use condoms with partners in both casual sex and steady sex.

To validate these performance objectives, a prospective survey study was carried out among 400 secondary school students. The research team focused on the sexually active students and determined that condom use with steady sex partners could be explained by the decision to use condoms with steady sex partners (operationalized as intention) (van Empelen & Kok, 2008). Secondly, they showed that this relationship was mediated by buying and carrying condoms and communicating condom use with steady sex partners. Thus, the results suggested that performance objectives are valuable in explaining condom use among steady sex partners. Moreover, the researchers showed that consistent condom use was negatively related to the quitting of condom use and that people who are using condoms in steady sexual relations are also likely to maintain condom use over a longer period of time. A further examination of the sequence of performance objectives indicated that the decision to use condoms predicted the buying of condoms, which in turn predicted the carrying of condoms, which finally predicted actual condom use. Although communication also increased the likelihood of condom use, the carrying of condoms did not predict communication about condom use.

When focusing on condom use with casual sex partners, van Empelen and Kok (2008) did not find the predicted sequence of performance objectives. Actual condom use with casual sex partners was predicted only by the decision to use condoms, not by the additional performance objectives. Does this mean that they are not important? Not at all. First of all, the data showed that adolescents simply do not prepare themselves for sexual encounters. Second, and possibly because

of the lack of anticipation and preparation for possible casual sexual encounters, young people were more willing to engage in unsafe sex. Thus, although the researchers were not able to validate the sequence of performance objectives in the case of casual sex, they were able to show that the lack of such performance objectives enhances risk-taking behavior (that is, not using condoms). Finally, the study showed that intended condom use did predict actual condom use and condom buying, but not carrying, whereas buying predicted carrying (van Empelen & Kok, 2008). Thus, it seemed that there was a logical sequence of performance objectives.

In summary, the study showed that performance objectives can be validated by asking the priority population what they actually do regarding the performance objectives and then determine how the actual performance predicts behavior. Not being able to validate the sequence of performance objectives may, however, also give valuable information, in the sense that performance objectives that professionals find important may not be ones that a priority population recognizes. In this case, the intervention should include those performance objectives and provide the rationale for the at-risk population. This brings us to the third task in Intervention Mapping Step 2, selecting important determinants that may facilitate change (van Empelen et al., 2003).

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## Personal Determinants

**The third task in Step 2 is to select important and changeable determinants of the health behavioral and environmental outcomes.**

Determinants are those factors that have been found to be associated with the performance of the behavior of the at-risk population or agents that have control or influence over environmental outcomes. Determinants can be hypothesized to mediate the behavior of the at-risk group or modification of the environment by the responsible agents. The needs assessment, completed in Step 1, may provide important information on determinants, but more refinement is usually necessary. The writing of the performance objectives adds specificity to the health behaviors and environmental outcomes and may help to narrow or expand the list of possible determinants. A matrix of change objectives is created by entering the performance objectives into the left column of the matrix and entering the determinants across the top of the matrix. Because each selected ecological level has a separate matrix, additional decisions will be necessary to assign determinants to each matrix. Determinants may be duplicated in more than one

matrix. Basically, if a determinant can be considered an important influence for accomplishing one or more of the performance objectives, it should be included in the matrix.

Those factors that rest within individuals (people at risk or agents in the environment) and are subject to their direct control or influence are referred to as personal determinants. These factors can be changed or influenced by interventions that involve influencing how people think about or have the capacity to change a behavior or the environment. Personal determinants usually include cognitive factors (such as knowledge, attitudes, beliefs, values, self-efficacy, and expectations) and capabilities, such as skills. In this text, when referring to determinants, in most cases this will mean personal determinants.

Those factors that rest outside the individual and influence behavior are considered environmental conditions and are addressed in Intervention Mapping as environmental outcomes as discussed in the previous section. These environmental conditions may include such factors as social influences (such as norms, social support, and reinforcement) or structural influences (such as access to resources, policies, and organizational climate). The individuals at risk for a health problem usually are not able to control these conditions directly; therefore, change is not likely to be accomplished unless action is taken by agents or groups within the various levels of the environment. Therefore, personal determinants can be identified as important influences for changing health behavior of the population at risk as well as action to be taken by agents who can exert control of change in environmental outcomes.

Coming up with an appropriate set of evidence- and theory-informed determinants for the performance objectives for behavior and environment require the use of the core processes (see Chapter One). In the needs assessment (see Chapter Four), the planner will have already asked and answered questions about determinants regarding the risk behavior(s) and environmental conditions. The needs assessment should provide a good starting list of personal determinants in answer to these questions:

- Why would a person perform a particular risky behavior?
- Why do certain environmental conditions exist?

However, the needs assessment often uncovers additional information about factors associated with the health problem and the risk behavior and environmental condition. Therefore, Step 2 requires the careful consideration of determinants of the health-promoting behavior and environmental outcomes that will support the health behavior or affect health directly. At this point the

questions posed are about the health-promoting behavior and environmental outcomes:

- Why would people perform the health-promoting behavior or performance objectives?
- Why would a certain environmental agent make an environmental modification?

To answer these questions, the planning group first creates a provisional list of answers. To refine or add to this provisional list, the health educator can follow the core processes outlined in Chapter One. In reviewing the literature, the planner begins with studies regarding the issue at hand (van Empelen, Schaalma, Kok, & Jansen, 2001). The literature search will uncover both theoretical and nontheoretical answers, but the planner will probably want to look specifically for theoretical constructs that have been used to explain the behavior of interest or related behaviors. Finally, the planner undertakes a review of the literature on general theories that include some of the identified determinants as constructs within those theories (Kok et al., 1992, 2004; Murphy & Bennett, 2004). For example, if the review of the literature identified self-efficacy as a possible determinant of the behavior, then going to the literature on Social Cognitive Theory (SCT) for which self-efficacy is a central construct would be useful (Bandura, 1986, 2004a, 2004b; McAlister, 1991; McAlister et al., 2008). A review of the general theory may suggest other constructs that might be considered as important determinants of behavior.

The process of using findings from studies of the specific health problem and theoretical literature is illustrated by an Intervention Mapping project to develop a computer-tailored intervention to prevent excessive weight gain in adolescents (Ezendam, Oenema, van de Looij-Jansen, & Brug, 2007). From reported earlier studies the planners identified social support, skills, and planning as important determinants of dietary and physical activity behavior. In addition, they used the general theories approach to accessing theory and, based on the Precaution Adoption Process Model and the Theory of Planned Behavior, they selected knowledge, awareness of risk behavior, intentions to change, attitude toward change, and perceived behavioral control as determinants of behavior.

The needs assessment and the literature reviews provide the planner with informed or hypothesized relationships of personal determinants to the health behavior or behavior of the environmental agents. Determinants on the provisional list should be well supported by the literature, and the planner should

retain only those with the strongest relation to the behaviors. The planner may want to organize the review by levels of evidence; many published systematic reviews give good explanations of how the strength of the evidence was judged and can serve as models (Task Force on Community Preventive Services, 2010; Zaza, Briss, & Harris, 2005).

Planners often need to collect data from the at-risk groups and environmental agents to identify additional determinants and to understand how determinants manifest in a particular group. Qualitative methods, such as focus groups or interviews, can be helpful in generating new ideas for determinants or in verifying some of the findings from the research literature. Quantitative data collection, using questionnaires that measure the determinants and the behavior of interest, can be especially helpful in judging the strength of the association between potential determinants and behavior. With both types of data collection, planners can estimate the presence or absence of the determinant, as well as its importance for influencing change. For example, in designing an AIDS-prevention program for adolescents, knowledge about the seriousness of AIDS may at first be viewed as an important determinant of risk-reduction behavior. However, formative research may show that adolescents already know about AIDS. Therefore, it is unlikely that an intervention to increase knowledge about AIDS will have much of an effect on a group's behavior to prevent AIDS. Another way to judge whether a determinant is important is to measure the determinant in population subgroups: those who practice the behavior and those who do not. For example, if children who eat five servings of fruits and vegetables daily have a high self-efficacy for the behavior and those who eat only two servings of fruits and vegetables daily have a low self-efficacy for the behavior, then self-efficacy is likely to be an important determinant.

Eventually, the planner must refine the list of determinants. A long list of determinants is not practical for program development. Determinants that have weak evidence of association to the performance objectives or no logical or theoretical basis for their causal relation to the performance are unlikely to be important targets for an intervention. Therefore, careful analysis of the determinants at this stage improves planning results at later stages. To conduct this analysis, planners can start by using evidence to rate each determinant in terms of relevance (that is, strength of association with the behavior) and changeability (that is, how likely it is that health education or promotion intervention is going to influence a change in the determinant). Table 5.5 shows an example of a table used to assess relevance and changeability of determinants provided by an Intervention Mapping project to develop an Internet HIV prevention program for men having sex with men (Kok et al., 1992, 2006). In this example the term *importance* is used to represent relevance.

**Table 5.5 Determinants of Performance Objectives**

Determinants	Importance	Changeability	Evidence for Importance
Knowledge	+	+++	Precondition for personal attitude.
Risk perception	+	+	Precondition for personal relevance.
Attitude	++	+	$r = .52, p < .01$ (with intention to always use condoms).
Anticipated regret	++	+	$r = .70, p < .01$ .
Personal norm	+++	+	$r = .78, p < .01$ .
Subjective norm	+	+	$r = .29, p < .01$ .
Self-efficacy	+++	+	$r = .71, p < .01$ .
Skills	++	+	Precondition for self-efficacy improvement.
Habit	++	+	Making the healthy behavior automatic behavior.

*Note:* Importance = the strength of the evidence for the causal relationship between the determinant and the behavior we want to change; changeability = the strength of the evidence that the proposed change can be realized by a program; + means: not very important, not easy to change; ++ means: important, changeable; +++ means: very important.

As much as possible, the basis for rating relevance and changeability should be based on evidence from the research literature. Sometimes, the literature will not adequately discuss a proposed determinant, and the planner will need to collect data from the at-risk group and from others in the field. Alternatively, decisions to retain or delete determinants may be based entirely on a theoretical or conceptual basis when data are not available. For example, the evidence may be strong for one determinant (such as self-efficacy), but the literature may provide little evidence to support the relevance of a related factor (such as outcome expectations). However, the theoretical literature suggests that these two constructs are interrelated, and for some behaviors it may be important to address both with methods to promote change (Bandura, 1986 1997). There may be situations in which the literature provides little evidence for a hypothetical determinant, but planners may find literature that supports the importance of a determinant for a similar behavior. For example, evidence may not be available to support the relationship between perceived risk and use of clinical breast examination, but there may be literature that supports the importance of this determinant for mammography screening.

For the Stroke Project, Table 5.11 (in the Stroke Project Box 5.2 at end of chapter) illustrates potential determinants for community members' response to stroke. The preliminary list shows the brainstorming of program planners and the final list shows the determinants selected after reviewing the empirical and theoretical literature as well as use of data collected from the community: self-efficacy, outcome expectations, knowledge, and perceived social norms. Table 5.12 in the Stroke Project Box 5.2. illustrates the potential determinants of the environmental outcome for the response of health care providers to stroke. The brainstorming lead to the preliminary list, which was condensed to the final list following the literature review and use of data collected from the community. The final list included skills, self-efficacy, outcome expectation, knowledge, and social norms. The final lists of determinants for the community members and the one for the health care providers may appear to be somewhat similar, but, in the next task involving the creation of matrices, they will be linked to very different performance objectives that will lead to different change objectives.

Some personal determinants and environmental conditions have a reciprocal relationship. For example, subjective norms are considered personal determinants because they derive from an individual's perception of the norms for behavior and are subject to his or her control. The actual norms for behavior are considered environmental conditions because they are external to the individual and outside her or his control. Both subjective norms and the actual norms may influence health behavior; however, the processes for change may be very different. On the one hand, actual norms are very difficult to change and require environmental change methods. Subjective norms, on the other hand, may be influenced by intervention methods that focus on how individuals think about and perceive norms. If subjective norms and actual norms are both considered influences of behavioral outcomes for a health promotion program, the program planners can approach change by selecting subjective norms as a determinant of behavior and linking it to performance objectives and stating change objectives in the matrix for behavior of the at-risk population. On the other hand, the planners may decide that it is important and possible to change the actual norms and address them as an environmental outcome for one or more of the environmental levels.

In some situations the actual norms are supportive of the health behavior but the perception of the norms by the priority population is not consistent with the actual norms. For example, in the United States, young adolescents tend to overestimate the proportion of youth smokers, thinking that most adolescents smoke, when in reality less than 5% of 13- to 14-year-olds and 13% of 15- to 16-year-olds smoke (U.S. Department of Health and Human Services, 2001). The focus of many smoking prevention programs is to correct the perception of what is normative for youth smoking. In other situations, it is difficult to

modify an environmental condition; program planners must decide whether to plan for an intervention for an environmental outcome or to prepare the at-risk population to deal with the environmental condition. For example, financial resources may be an important environmental condition and skills in coping with resource limitations may be a personal determinant. Availability of services in a community may be an environmental outcome or skills in seeking alternative services beyond the community a personal determinant.

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## Matrix of Change Objectives

The fourth task in Step 2 is to create a matrix of change objectives for each level of intervention planning (individual, interpersonal, organizational, community, and societal) by crossing performance objectives with determinants and writing change objectives.

Performance objectives and determinants are the building blocks of matrices. Matrices are simple tables, formed by entering the performance objectives on the left side of the matrix and determinants along the top (see the matrices for the Stroke Project in Stroke Box 5.2. at end of chapter, Tables 5.11, 5.14, 5.15, and 5.16). Change objectives are entered into the cells formed at the intersection of each performance objective and determinant. Conceptually, a matrix of change objectives represents the pathways for the most immediate changes in motivation and capability to influence health behavior and actions taken by environmental agents. Thus, each element of the matrix is interrelated, and collectively the elements are a logic model for the change process.

## Selecting Intervention Levels

A separate matrix is constructed for each level of intervention for which program planners have written performance objectives. The final number of matrices of program objectives is different for each program and is influenced by the problem's complexity, the span of the program across levels, and the population's diversity. To select intervention levels, program planners ask: At what levels of intervention is it necessary to attain the performance objectives? For example, Project SPF was developed for the organizational setting of preschools, and the project team identified only a few performance objectives for children at the individual level. Most of the emphasis was on parents, teachers, and administrators, who were to create environmental changes to reduce children's exposure to the sun. Therefore, the intervention also addressed interpersonal and organizational levels; and planners created matrices for the individual (Table 5.6), interpersonal, and organizational (Table 5.7 on p. 278) levels. Had the needs

Table 5.6 MATRIX for Children in the SPF Program

Behavior: Wear Sunscreen and Protective Clothing When Outdoors				
<i>Personal Determinants</i>				
Performance Objectives (Children)	Attitudes	Skills/Self-Efficacy	Knowledge	Outcome Expectations
PO.1. Cooperate with sun protection practices by parent or preschool staff	A.1. Express positive feeling toward being protected from the sun			OE.1. Describe how cooperating will keep skin healthy
PO.1.1. Stand still for application	A.1.1. Express positive attitude toward being a helper		K.1.1. Explain how standing still allows sunscreen to be put on evenly	
PO.1.2. Dress in covering clothes for playing outside				
PO.1.3. Leave on clothes and hat	A.1.3.a. Feel positive about protective clothes A.1.3.b. Like sun hats			OE.1.3. Expect to be safe from the sun and healthy when wearing protective clothing
PO.2. Remind parent or preschool staff to practice sun protection on behalf of the child				
PO.2.1. Tell adult that they can't go outside without sunscreen		SE.2.1.a. Demonstrate telling an adult about the need for sunscreen		OE.2.1.a. Describe expectation that an adult will help with sunscreen if reminded

Table 5.6 (Continued)

Behavior: Wear Sunscreen and Protective Clothing When Outdoors				
<i>Personal Determinants</i>				
Performance Objectives (Children)	Attitudes	Skills/Self-Efficacy	Knowledge	Outcome Expectations
		SE.2.1.b. Express confidence that they can tell an adult about sunscreen		OE.2.1.b. Describe expectation that even coverage by an adult will help every part of the skin stay healthy
PO.2.2. Bring sunscreen to adult		SE.2.2. Demonstrate bringing sunscreen to adult		OE.2.2.a. State that an adult will help with sunscreen if reminded OE.2.2.b. State that even coverage by an adult will help every part of the skin stay healthy

assessment identified important community or governmental factors influencing young children's sun exposure, then these levels would also have been reflected in the performance objectives.

For the Partners in School Asthma Management Program, the focus was on the child's behavior as well as the child's interpersonal environment, including parents and providers and the organizational environmental of the school (Chapter Twelve on the book's instructor Website). The program planners developed performance objectives and matrices for the children and parents (Table 12.2), providers (Table 12.5), and school organization (Table 12.6). Additional examples of matrices developed for the individual level and the organizational level are illustrated in Chapter Eleven (on the book's instructor Website), which describes the program Cultivando La Salud (Tables 11.3, 11.4, and 11.5) (Fernández et al., 2005a). The Cultivando La Salud program is designed to increase breast and cervical cancer screening for farmworkers and includes a matrix of change objectives for the clinics providing services for the farmworkers.

**Table 5.7 Sample of Rows from Matrix for Organizational Environmental Change in SPF Program.**

Personal Determinants						
Performance Objectives	Perceived Norms	Attitudes	Skills/Self-Efficacy	Knowledge	Outcome Expectations and Perceived Susceptibility	
PO.1. Preschool Directors decide to prioritize increasing the amount of shade in outdoor areas used by preschoolers	PN.1. Recognize sun protection and shade adequacy as concerns for preschool administration	A.1. Describe assuring shade as positive			OEPS.1.a. Describe children as susceptible to skin cancer caused by lack of shade OEPS.1.b. Argue that increasing shade will decrease risk	
PO.2. Directors assess adequacy of current natural and structural shaded areas and determine ways to increase shade	PN.2. Recognize that peers are taking action to assess shade		SSE.2.a. Demonstrate ability to assess shade SSE.2.b. Express confidence in ability to assess shade			
PO.3. Directors assess available resources for accomplishing changes to increase shade	PN.3. Talk about other preschool administrators as seeking resources for sun protection			K.3. State cost of change in terms of money, personnel and time		

<p>PO.4. Directors obtain additional resources to accomplish changes to increase shade</p>			<p>SSE.4. Demonstrate contacting community organizations about funding</p>	<p>K.4. Identify sources for seeking funding</p>	
<p>PO.5. Directors seek construction and consultation and determine structures to implement based on ranking of effectiveness and feasibility</p>			<p>SSE.5. Express confidence in ability to rank structural changes</p>	<p>K.5. Identify features that make options for shade more effective and feasible</p>	
<p>PO.6. Directors seek feedback from teachers and staff</p>					
<p>PO.7. Directors garner administrative approval for proposed changes</p>			<p>SSE.7. Express confidence in ability to discuss changes with management</p>		

## Differentiating the Intervention Population

Planners may also need to create separate matrices for subgroups at any level of intervention (most often at the individual or at-risk group level). To differentiate a population means to describe two or more subgroups in which membership affects performance objectives or determinants of the health-related behavior or environmental outcomes. Differentiating a population often occurs simultaneously with writing performance objectives or exploring determinants because of the question that guides differentiation: Are either performance objectives or determinants substantially different for subgroups?

The rationale for differentiating a population is the basic understanding that populations are made up of individuals and groups with different characteristics and needs, all of which must be considered in relation to a health problem and to a health promotion program. The greater these differences, the less likely that a single intervention focus will fit everyone in the intervention population. Differentiating subgroups within the group leads to separate matrices for the program objectives so that planners can conduct a parallel planning process. The decision to differentiate the population should be very carefully considered because each differentiation into two or more subgroups will expand the details of the planning process and potentially increase the program's complexity and costs. If identified differences in the subpopulations are not great, planners can often accommodate them within the program with a few variations of the intervention strategies to address differences.

Some of the variables that may be important to consider in the differentiation of a population are the ones that were mentioned in the needs assessment. They include age and gender, geographic location, socioeconomic status, education, and cultural group. Resnicow, Baranowski, Ahluwalia, and Braithwaite (1999) describe the importance of understanding the impact of elements of culture on health behaviors and their determinants; the cultural group can often be a basis for differentiation. In addition, using stage theories and models such as child development, adult development, stages of change models (DiClemente & Prochaska, 1998; Nidecker, DiClemente, Bennett, & Bellack, 2008; Prochaska & DiClemente, 1984; Werch, Ames, Moore, Thombs, & Hart, 2009), and stages of organizational change (Cooperrider & Sekerka, 2006; Cummings & Worley, 2009; Scheirer, 1981; Steckler & Goodman, 1989; Steckler, Goodman, & Kegler, 2002; Trice Beyer, & Hunt, 1978; Zaltman & Duncan, 1977) to differentiate populations will in many cases enhance a planner's ability to develop change objectives that successfully define the program change for a group.

Differentiation by developmental stage offers a good example. To formulate performance objectives for the CF FEP, planners asked: What should the child

with cystic fibrosis be able to do to manage the disease? (Bartholomew et al., 1989, 1991, 1993). Because children in the CF population spanned the range of 4–18, the planners asked how the performance objectives would be different for the developmental stages represented by preschoolers ages 4–6, school-age children ages 7–11, and adolescents ages 12–18. Having different objectives for different age groups was important because the behavioral, cognitive, emotional, and social capabilities of children at these various stages of development are so different that the children could not be expected to carry out similar activities to manage their chronic illness (Eiser, Patterson, & Tripp, 1984; Johnson et al., 1982).

Another reason to differentiate within a population is that determinants, the variables that lead to performing behaviors or to making environmental modifications, may be different for subgroups even when the performance objectives are the same. For example, peer norms may strongly influence a smoker in the precontemplation stage of change for cessation, whereas lack of skills for quitting might have a higher impact on the behavior of a smoker in the preparation, action, or maintenance stages of change. Furthermore, if the determinants are different, then the theoretical methods chosen to influence the determinants may be different (discussed in Step 3, Chapter Six). For example, some research suggests that determinants of condom use among high school students vary according to experience with sexual intercourse using condoms (Schaalma et al., 1991, 1994). Adolescents who had previous experience with condoms had more negative attitudes about the effects of condoms on pleasure. Self-efficacy for buying and having condoms was higher, but self-efficacy for negotiating condom use with a partner was lower. Experience with condom use was correlated with age and having a steady relationship, and when people had a steady relationship, intention to use condoms was lower. Based on this knowledge of determinant difference related to experience, program planners might choose to develop different matrices of objectives and include program strategies and messages for these different intervention groups.

Both performance objectives and determinants may be different for subgroups. In Project Parents and Newborns Developing and Adjusting (PANDA), an intervention to help pregnant women who had stopped smoking refrain from returning to smoking after the delivery of the baby, the planners differentiated the population of women by stage of change: precontemplators, contemplators, and action and maintenance stages (Mullen, 1993; Mullen et al., 1997; Mullen & Mullen, 1983). The planners hypothesized that the women, although they had stopped smoking, were not all in the action stage of change. Considerable evidence indicated that most of the women during pregnancy had not used the processes of change that would enable them to remain nonsmokers. Therefore,

performance objectives and determinants were defined for each group according to stage of change. For example, precontemplators needed to move to contemplation of remaining smoke free; and to do this, they had to shift their decisional balance to being more negative about smoking. Those women in the action stage needed to apply processes to remain in action, for example, stimulus control, removing items that stimulate smoking from their environments. The PANDA example also illustrates the point that the development of separate matrices does not imply the need for separate programs, but it does imply the need for program methods to address the different change objectives from each of the matrices.

Similar to differentiation, segmentation refers to grouping the population by variables (such as a preferred communication network) that will influence a message's effectiveness (Flynn et al., 1998, 2007; Kolodinsky & Reynolds, 2009; Lefebvre, Lurie, Goodman, Weinberg, & Loughrey, 1995; Lefebvre & Flora, 1988; Lefebvre & Flora, 1992; Lefebvre & Rochlin, 1997; Leviton, Mrazek, & Stoto, 1996; Ling, Franklin, Lindsteadt, & Gearon, 1992; Maibach, Rothschild, & Novelli, 2002; Storey, Saffitz, & Rimon, 2008). The variables used by marketers and communicators to segment a population in service of message development may imply underlying differences in determinants, but these differences may not be explained as they are in Intervention Mapping.

Differentiation is based on subpopulations, whereas tailoring is a technique of individualizing intervention messages based on certain measured characteristics of the individual (Campbell et al., 1994; Hawkins et al., 1997; Hawkins, Kreuter, Resnicow, Fishbein, & Dijkstra, 2008; Kreuter et al., 2005; Kreuter & Strecher, 1996; Latimer, Katulak, Mowad, & Salovey, 2005; Noar, Benac, & Harris, 2007; Noar & Zimmerman, 2005; Rimer et al., 1994; Rimer & Kreuter, 2006; Skinner, Strecher, & Hospers, 1994; Strecher, 1999, 2007; Strecher et al., 2000; Strecher, DeVellis, Becker, & Rosenstock, 1986; Strecher, Greenwood, Wang, & Dumont, 1999; Strecher, Wang, Derry, Wildenhaus, & Johnson, 2002). Tailored health promotion materials are any combination of information and behavior change strategies intended to reach a specific person based on characteristics that are unique to that person, related to the outcome of interest, and derived from individual assessment (Kreuter et al., 2000). Tailoring may be done on the basis of differences in behaviors or determinants, and it may be done at a later stage of program development on characteristics that did not lead to differentiation and the creation of different matrices. Tailoring and segmentation are very important for development of intervention strategies and programs, but they do not imply the need for separate matrices in Step 2. They can be done later and are discussed again in Step 4 (Chapter Seven). An example of applying Intervention Mapping to a program that used message tailoring in the intervention is illustrated in a study to promote regular mammography screening

(Vernon, 2004; Vernon et al., 2008). This project is interesting in that it made use of the Transtheoretical Model to stage the intervention as well as the use of individualized tailored messages.

In summary, differentiating the population leads to separate matrices of program objectives for each group. The matrices are used to guide program planning to design interventions appropriate for each subgroup. The result may be a separate program for each group or a single program with multiple components, methods, or practical applications that can accommodate differences between groups. Careful consideration should be given to decisions to differentiate the priority population to ensure that the differences in the subgroups are significant enough to warrant the detailed planning involved in the creation of separate matrices for each subgroup. Modest differences between the subgroups can often be dealt with by adding designated performance objectives or change objectives for the subgroups within matrices for the priority population. This avoids the potential of overlapping matrices and a duplication of change objectives that leads to the unnecessary expansion of work needed to plan the program.

### Constructing Matrices and Change Objectives

At this point, the planner has made a preliminary decision about the number of matrices for the project, based on population differentiation and levels of environmental change. For each behavioral outcome and environmental outcome, the planner enters the performance objectives down the left side of a matrix and the determinants across the top. The next task is to assess each cell of the matrix to judge whether the determinant is likely to influence accomplishment of the performance objective. It is unlikely that each of the determinants will be an important influence for every performance objective. Because change objectives are needed for those cells in which the determinant is likely to influence accomplishment of the performance objective, this task can be a review and elimination process. One way that the planner accomplishes this task is to look at each cell, decide whether change in a particular determinant is necessary for the performance objective, put an **X** through unimportant cells, and then write change objectives for the cells that remain. An example of a matrix that shows cells with multiple change objectives and blank cells in which no change objectives are stated can be seen in Table 5.8.

The planner then writes change objectives for the personal determinants. The question that leads to formation of a change objective for personal determinants is: What needs to change related to the determinant for the program participants to do the performance objective? For example, Table 5.9 (on p. 290) shows a cell in which the performance objective “purchase condoms” is paired with the

**Table 5.8 Selected Change Objectives for Asthma in Hispanic Children—Parent Matrix**

<i>Personal Determinants</i>				
Manage Asthma Problem (Family Members)	Knowledge	Skills and Self-Efficacy (For Dealing with Competing Advice)	Skills and Self-Efficacy	Outcome Expectations
<i>Get a Diagnosis of Asthma</i>				
<i>Identify Problems (Watch and Discover)</i>				
PO.1. Observe child for pattern or details of symptoms	K.1. Describe possible symptoms of asthma	SSECA.1.a. Express confidence in telling others about good asthma management SSECA.1.b. Demonstrate telling others that good asthma managers believe that getting diagnosis of asthma is important for the child's health	SSE.1.a. Express confidence in identifying symptoms and environmental conditions SSE.1.b. Demonstrate identifying symptoms and environmental conditions	OE.1 Expect that getting a diagnosis of asthma when needed is the first step toward better health for the child
PO.2. Discover that symptoms are recurrent	K.2. Analyze the pattern of symptoms over time		SSE.2. Express confidence in noticing symptoms	OE.2. Expect that by noticing and describing symptoms over time they will be able to get better health care for the child
PO.3. Discover conditions under which child has these symptoms	K.3.a. Identify where the child spends time and note symptoms K.3.b. Draw a relation between symptoms and exposure	SSECA.3. Express confidence in being able to get friends and family to help watch for symptoms and discover exposure patterns	SSE.3. Express confidence in linking symptoms to exposures	OE.3. Expect that by noticing and describing symptoms over time they will be able to get better health care for the child

<p>PO.4. Question whether this is asthma</p>	<p>K.4.a. Describe asthma as a chronic disease whose symptoms are sometimes better and sometimes worse K.4.b. Describe asthma as a disease that can be controlled</p>	<p>SSECA.4.a. Talk to friends and family about asthma as a chronic disease whose symptoms are sometimes better and sometimes worse SSECA.4.b. Talk to friends and family about asthma as a disease that can be controlled</p>		<p>OE.4.a. Expect that when the doctor and the parent agree on the nature of the illness, they will work together better to provide care for the child OE.4.b. Expect that asthma can be treated and that symptoms will be controlled</p>
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*Think (Generate Solutions)*

<p>PO.5. Identify current provider or other low-cost provider who gives good asthma care</p>	<p>K.5.a. List low-cost and no-cost doctors K.5.b. Identify characteristics of good treatment for asthma</p>	<p>SSECA.5.a. Express confidence in telling others about the importance of identifying a good asthma doctor SSECA.5.b. Demonstrate telling others that good asthma managers think that it is important to locate an asthma doctor and to be assertive SSECA.5.c. Express confidence in telling others about what is good asthma care SSECA.5.d. Demonstrate telling others the characteristics of good asthma care</p>	<p>SSE.5.a. Express confidence in calling to ask about insurance eligibility and payment SSE.5.b. Express confidence in evaluating doctors</p>	<p>OE.5. Believe if they go to good asthma doctor, it will result in diagnosis and better care</p>
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(Continued)

**Table 5.8 (Continued)**

<i>Personal Determinants</i>			
<b>Manage Asthma Problem (Family Members)</b>	<b>Knowledge</b>	<b>Skills and Self-Efficacy (For Dealing with Competing Advice)</b>	<b>Skills and Self-Efficacy</b>
<i>Outcome Expectations</i>			
<i>Get a Diagnosis of Asthma</i>			
<i>Identify Problems (Watch and Discover)</i>			
PO.6. Identify possible health insurance or benefits	K.6. Explain how to figure out what they are eligible for		OE.6. Believe if they follow steps to obtain insurance the child's health will benefit
<i>Act (Take Action to Solve the Problem)</i>			
PO.7. Make appointment with provider		SSE.7. Demonstrate finding an appropriate provider and making an appointment	OE.7. Expect that if they go to the doctor they will be treated with respect
PO.8. Tell doctor about symptoms	K.8. State symptoms	SSECA.8.a. Express confidence in telling others about asthma management SSECA.8.b. Demonstrate telling others that good asthma managers tell their doctor about symptoms in detail	OE.8. Expect that taking record of symptoms to a doctor visit will result in a diagnosis which is important in child's health
PO.9. Ask doctor about the possibility of asthma and ask the doctor to define the severity	K.9. Define asthma and severity categories	SSECA.9.a. Express confidence in telling others that good managers manage assertively SSECA.9.b. Demonstrate telling others that good asthma managers assertively ask doctor about asthma diagnosis and its severity	OE.9. Expect that asking doctor about diagnosis and severity is important to result in better treatment and outcomes

**Manage Asthma Problems**

**Identify Problems (Watch and Discover)**

<p>PO.10. Observe child for specific symptoms</p>	<p>K.10.a. Describe symptoms and episodes of asthma</p> <p>K.10.b. Explain that asthma is an ongoing inflammation (not the final result of a series of illnesses or only asthma when the child has bad symptoms or exacerbation)</p> <p>K.10.c. Discuss that early symptoms should be treated</p> <p>K.10.d. Describe asthma as a disease with chronic symptoms and periodic exacerbations</p> <p>K.10.e. Identify which symptoms can be asthma</p> <p>K.10.f. Explain how to use the symptom chart to keep track of asthma</p>	<p>SSECA.10.a. Express confidence in managing the opinions and advice of others</p> <p>SSECA.10.b. Demonstrate telling others that good asthma managers believe that monitoring of child's symptoms benefits the child's health</p>	<p>SSE.10.a. Express confidence in monitoring symptoms and episodes</p> <p>SSE.10.b. Demonstrate keeping track of symptoms and episodes</p> <p>SSE.10.c. Express confidence in being able to recognize symptoms</p> <p>SSE.10.d. Demonstrate noting symptoms</p> <p>SSE.10.e. Express confidence distinguishing between asthma symptoms and non-asthma-related symptoms</p>	<p>OE.10.a. Expect that if symptoms are monitored, asthma can be managed</p> <p>OE.10.b. Expect that identifying symptoms of asthma will enable better communication with physicians</p>
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*(Continued)*

**Table 5.8 (Continued)**

<i>Personal Determinants</i>			
<b>Manage Asthma Problem (Family Members)</b>	<b>Knowledge</b>	<b>Skills and Self-Efficacy (For Dealing with Competing Advice)</b>	<b>Skills and Self-Efficacy</b>
<b>Outcome Expectations</b>			
<i>Manage Asthma Problems</i>			
<i>Identify Problems (Watch and Discover)</i>			
PO.11. Identify severity of symptoms	K.11.a. Describe early symptoms K.11.b. Describe how to determine if symptoms are worsening in severity K.11.c. Explain that asthma is an ongoing inflammation (not the final result of a series of illnesses or exacerbation)	SSE.11.a. Express confidence in discerning mild symptoms SSE.11.b. Express confidence in discerning when a child is developing more severe symptoms	OE.11.a. Expect that by noticing worsening symptoms, they can prevent a bad exacerbation
<i>Generate Solutions (Think)</i>			
PO.12. Identify medication for symptoms	K.12.a. List prescribed medicines and treatments for symptoms K.12.b. Describe early symptoms as something that must be treated	SSECA.12.a. Express confidence in telling others about using an action plan SSECA.12.b. Demonstrate telling others that good asthma managers provide appropriate medication and treatment according to action plan	OE.12.a. Expect that if they give medicine it will not harm the child OE.12.b. Expect that if they give appropriate medicines and treatment the child's asthma can be controlled

<p>PO.13. Identify medications for control</p>	<p>K.13.a. List medicines for control (every day to keep symptoms from appearing) K.13.b. Describe how control medicine works and that it will not stop working if given every day</p>	<p>SSECA.13.a. Express confidence in telling others about managing inflammation SSECA.13.b. Demonstrate telling others that good asthma managers give medicine to control inflammation even when there are not symptoms</p>	<p>OE.13.a. Expect that if they give appropriate medicines and treatment the child's asthma can be controlled OE.13.b. Expect that when given every day the medicine will continue to work and control symptoms</p>
<p>PO.14. Talk with doctor about home remedies PO.14.1. Balance home remedies with physician-prescribed medication</p>	<p>K.14.a. Describe the treatments that they use for asthma K.14.b. Ask the physicians for advice for which treatments are ok to use with the prescribed asthma medicines</p>	<p>SSECA.14.a. Express confidence in telling others about balancing home remedies with medications SSECA.14.b. Demonstrate telling others that good asthma managers provide prescribed medication along with some home remedies</p>	<p>SSE.14.a. Express confidence in taking time to manage asthma SSE.14.b. Demonstrate taking time to manage the child's asthma</p> <p>OE.14. Expect that the doctor will be respectful of their attempts to treat asthma with home remedies</p>
<p><b>Take Action to Solve Problem (Act)</b></p>			
<p>PO.15. Get action plan and discuss with doctor</p>	<p>K.15. Describe how to use action plan</p>	<p>SSECA.15.a. Express confidence in telling others about getting an action plan SSECA.15.b. Demonstrate telling others that good asthma managers provide appropriate medication and treatment according to action plan</p>	<p>SSE.15.a. Express confidence in following an action plan SSE.15.b. Demonstrate following an action plan</p> <p>OE.15. Believe that if they discuss and follow action plan they can manage the child's asthma</p>
<p>PO.16. Follow an action plan</p>	<p>K.16.a. Explain how to give medicines K.16.b. Explain what to do when symptoms are becoming worse</p>	<p>SSECA.16.a. Express confidence in telling others that action plans are necessary SSECA.16.b. Demonstrate telling others that good asthma managers think action plan is necessary to manage child's asthma</p>	<p>SSE.16. Interpret fear and concern as a signal to act</p>

**Table 5.9 Examples of Cells from a Simulated Matrix:  
Consistently and Correctly Using Condoms During Sexual Intercourse**

Personal Determinants					
Performance Objectives	Knowledge	Skills and Self-Efficacy	Outcome Expectations	Perceived Norms	
PO.1. Purchase Condoms	K.1. Explain how to buy or obtain a condom	SSE.1.a. Reflect confidence in ability to go into a store and buy a condom SSE.1.b. Express confidence in ability to deal with embarrassment when buying a condom		PN.1. Explain that peers go into stores and buy condoms	
PO.1.a. Locate condom displays in drug or grocery store	K.1.a. List places where condoms can be purchased or obtained free				
PO.1.b. Choose condoms that are product tested	K.1.b. Compare different types of condoms and features to improve effectiveness				
PO.2. Carry condoms or have condoms easily available	K.2. List private, effective places to keep condoms	SSE.2. Express confidence that can find a private, safe, accessible place for condoms	OE.2. Describe how having condoms easily available will result in more routine condom use	PN.2. State that peers have condoms easily available	
PO.2.a. Carry condoms in wallet or purse for no longer than a month	K.2.a. Describe how long condoms can be kept without increasing risk of breakage			PN.2.a. States that peers make sure condoms are not carried too long	

PO.2.b. Carry or store condoms in place that maintains correct temperature	K.2.b. State safe temperatures for storing condoms and compare temperatures where planning to store condoms		OE.2.b. Expect that if stored properly condoms will work to prevent disease and pregnancy	PN.2.b. State that peers store condoms at safe temperatures
PO.3. Negotiate the use of a condom with a partner	K.3. List the steps of successful negotiation		OE.3. Describe personal beliefs that negotiation will lead to positive experience where both partners are satisfied and result in condom use	PN.3. Explain that peers talk to their partners about condom use
PO.3.a. State mutual goals such as pregnancy or AIDS prevention		SSE.3.a. Summarize mutual goals as would be said to a partner	OE.3.a. State belief that discussing mutual goals will result in condom use	
PO.3.b. State clear intention of using a condom as a prerequisite for intercourse		SSE.3.b. Advocate clear intention to not have sex without a condom	OE.3.b. Expect partner to maintain relationship in face of intention not to have sex without a condom	
PO.3.c. Actively listen to partner's concerns	K.3.c. Describe components of active listening	SSE.3.c. Demonstrate actively listening to partner's concerns	OE.3.c. Describe how condom use protects against STIs and HIV	
PO.3.d. Pose solutions to partner's concerns that reference mutual goals and personal requirements		SSE.3.d. Express confidence in ability to do each step of negotiation		

determinant of “knowledge.” The question used to address this cell can be worded this way: What needs to change related to knowledge in order for the participants to be able to purchase a condom? Answers to this question lead to the following change objectives:

- Describe how to buy or obtain a condom.
- List places where condoms can be purchased or obtained free.
- Compare different types of condoms and features to improve effectiveness.

In Step 3, these change objectives will become the targets for program methods and strategies to increase knowledge. In another example that uses the same performance objective (purchase condoms), a focus on the cell connected with the determinant of self-efficacy leads to the question: What needs to change regarding self-efficacy in order for program participants to purchase condoms? This question yields the following change objectives:

- Express confidence in ability to go into a store and buy a condom.
- Express confidence in ability to deal with embarrassment when buying a condom.

These examples show that change objectives are stated with action verbs. Table 5.10 includes words to help with this task (Caffarella, 1985). Notice in Table 5.10 that the action verbs are organized by complexity of learning or change process. For example “comprehension” is more complex than just “knowing” and “application” is more complex than “comprehension” (Krathwohl, 2002). The selection of the action verb enables the planners to determine the level of complexity required for a performance objective to be accomplished. Change objectives begin with a verb that defines the action and is followed by a statement of what is expected to result from the intervention. The purpose of stating a change objective in this manner is to make as specific as possible what change in the determinant needs to be achieved to accomplish the performance objective. Planners who write change objectives with an action verb and specified change in the determinants have a clear direction to the next steps in the Intervention Mapping process: selecting intervention methods and translating methods into practical applications.

### Environmental Agents and Program Implementers

A potential source of confusion for program planners is the distinction between using agents in the environment to make environmental changes and using

**Table 5.10 List of Action Words for Writing Change Objectives:  
Organized by Levels of Complexity of Learning Tasks**

<b>Knowledge</b>	<b>Understand</b>	<b>Applications</b>
define	describe	apply
label	discuss	demonstrate
list	explain	dramatize
name	express	execute
recall	identify	illustrate
record	interpret	implement
repeat	locate	interpret
state	recognize	modify
tell	report	operate
	restate	practice
	review	predict
	summarize	schedule
	translate	sketch
		use
<b>Analysis</b>	<b>Synthesis</b>	<b>Evaluation</b>
analyze	arrange	appraise
appraise	assemble	assess
calculate	collect	choose
categorize	compose	compare
compare	construct	conclude
contrast	create	critique
debate	design	estimate
diagram	formulate	evaluate
differentiate	manage	judge
distinguish	organize	justify
examine	plan	measure
experiment	prepare	rate
inspect	propose	revise
inventory	relate	score
question	set up	select
relate		value
solve		
test		

them to implement components of an intervention program. For example, in a school-based program such as CATCH, the cardiovascular disease prevention program for children, teachers may be both agents to change the environmental conditions and program implementers. A component of the intervention in the CATCH program was directed at performance and change objectives for ensuring that children have scheduled time during the school day to engage in moderate physical activity. This was part of the school's environmental change program. They were thus important agents at the organizational level. In

addition, the teachers implemented the physical education program that enabled the children to be physically active at school. A training program helped to prepare the teachers to implement the physical education program. Program implementation is not part of planning done in Step 2 but is addressed in Step 5, following a similar set of tasks with the focus on implementation outcomes rather than health behavior or environmental change outcomes.

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## Implications for Program Evaluation

Each task in Step 2 produces information that is used to guide the program evaluation (see Chapter Nine). In the first task, the planners specified the behavioral and environmental outcomes that the program would address. For program evaluation these outcomes are measured to determine the impact of the program on behavior and environmental conditions (Abbema et al., 2004; Hou et al., 2002).

In the second task, the planners further delineated the behavioral and environmental conditions by writing performance objectives. These performance objectives help to define the critical components and necessary prerequisites for the performance of the behavior and environmental conditions. As part of the program evaluation, questions can be asked to determine whether program participants achieved the performance objective, which provides valuable information to better understand a program's effectiveness. For example, if the behavior was performed, then responses to questions about the performance objectives help the evaluators to know the relative importance of the objectives to the performance of the behavior. If the behavior was not performed, then the responses to questions about the performance objectives may help to explain why the program did not have an effect on behavior and may provide important information to guide revisions of the program. In some cases the performance objectives help to define the behavior or environmental condition and can be used to construct evaluation questions to measure the behavior. For example, eating a low-fat diet so that less than 30% of calories are from fat cannot be effectively measured without more specific questions about what and how much was eaten, which can be guided by performance objectives such as "drink low-fat milk instead of whole milk."

In the final task in Step 2, the planners create matrices for change objectives that the intervention program will address. These matrices can also be used to guide the development of measures to evaluate the most immediate impact of the program. The design of the program is intended to address the change objectives, as the first effect in the logic model of change (see Figure 5.1).

## BOX 5.2

### STROKE PROJECT

#### The First Task in Step 2 is to State What Health Behaviors and Environmental Conditions Need to Change.

Following from the needs assessment for the T.L.L. Temple Stroke Project introduced in Chapter Four, the health-related behavior outcome for the at-risk group was to arrive at the hospital within several minutes after experiencing symptoms of stroke. The environmental outcome was to provide acute stroke therapy for all eligible patients (those who arrived at the hospital with time for a workup within the three-hour window and for whom recombinant tissue plasminogen activator (rtPA) was not contraindicated).

#### The Second Task is to Subdivide Behavioral and Environmental Outcomes into Performance Objectives.

The performance objectives for the at-risk group, that is, the individual experiencing symptoms and the bystander are:

- PO.1. Note symptoms and compare to those of possible stroke.
- PO. 2. Call 911 immediately (do not call primary care provider for triage).
- PO.3. Insist on rapid care from the emergency medical service (EMS) (transport at highest level).
- PO.4. Ask about treatment for stroke and rapid care in the emergency department (ED).

The performance objectives for the environment were conceptualized at the organizational level and included objectives for the emergency department (ED) of the five local hospitals, the three emergency medical services (EMS), and the community primary care physicians as listed below.

#### *Emergency department performance objectives:*

- PO.1. ED physicians and teams complete stroke evaluation in 60 minutes.
- PO.1.a. Triage nurses have patient seen by the physician in 10 minutes.
- PO.1.b. ED physicians notify the designated ER stroke team within 15 minutes.

- PO.2. ED stroke teams send lab work STAT (HCT, platelets, glucose, PT, PTT) and get it back.
- PO.3. ED physicians and stroke teams make rapid differential diagnosis of stroke (use modified NIH scale and protocol).
- PO.4. ED stroke teams perform pulse oximetry, attach cardiac monitor, and perform EKG.
- PO.5. ED stroke teams obtain accurate onset time of stroke symptoms.
- PO.6. ED stroke teams ensure patient receives CT scan within 25 minutes and notify on-call radiologist.
- PO.7. Radiologists and stroke teams read the CT scan immediately (within 45 minutes of arrival).
- PO.8. ED stroke teams rule out contraindications.
- PO.9. ED stroke teams manage diagnosed stroke.
- PO.9.1. ED staff members insert an IV in each arm if not done by EMS.
- PO.9.2. ED physicians administer rtPA within 60 minutes.
- PO.9.3. ED physicians treat blood pressure appropriately.
- PO.9.4. ED physicians give appropriate dose of rtPA; infuse properly; document time (do not give heparin or coumadin).

*EMS performance objectives:*

- PO.1. Dispatchers triage to highest priority of transport.
- PO.2. Dispatchers convey stroke possibility and urgency to responders.
- PO.3. Responders perform “load and go.”
- PO.4. Responders call ahead to the hospital.
- PO.5. Responders encourage family member or witness to accompany to the hospital.
- PO.6. Responders interview patient and witness to determine symptom onset.
- PO.7. Responders deliver patient with IV in both arms (perform in ambulance).

*Primary care provider performance objectives:*

- PO.1. Receptionists and nurses tell the person with the possible stroke to call 911.
- PO.2. Primary care providers identify high-risk patients for stroke and tell patients about their stroke risk, possible symptoms, and instructions for calling 911.
- PO.3. Primary care providers educate office staff regarding how to recognize stroke and what to tell patients (such as to call 911 immediately).

### **The Third Task in Step 2 is to Select Important and Changeable Determinants of the Health Behavior and Environmental Outcomes.**

Based on the needs assessment (Chapter Four, Stroke Project), the planning group brainstormed possible determinants. The planners worked first on the lay performance objectives and then on the health care provider objectives. The brainstormed preliminary list was limited because the information in the literature included mostly knowledge and behavioral determinants of treatment, such as arriving at the ED within a short time after symptoms arise and arriving by ambulance. Therefore, the planners modified the preliminary list using theoretical constructs from Social Cognitive Theory (SCT) and the Theory of Planned Behavior (TPB), the two theories that matched most closely the preliminary ideas from the needs assessment. The work on the determinants is presented in Tables 5.11 and 5.12.

**Table 5.11 Stroke Project Work on Determinants of Community Members' Response to Stroke**

<b>Preliminary List</b>	<b>Final List</b>
<ul style="list-style-type: none"> <li>• Confidence about recognizing symptoms</li> <li>• Thinking something can be done for stroke</li> <li>• Thinking that you don't have to have a primary care referral or call a primary care provider</li> <li>• Knowing a stroke victim</li> <li>• Knowing what to do</li> <li>• Not being embarrassed to intervene or to call 911</li> </ul>	<ul style="list-style-type: none"> <li>• Self-efficacy (for recognizing symptoms and for intervening)</li> <li>• Outcome expectations</li> <li>• Knowledge (symptoms, calling 911, not calling primary care provider)</li> <li>• Perceived social norms</li> </ul>

**Table 5.12 Work on Determinants of Health Care Providers' Response to Stroke**

Preliminary List	Final List
<ul style="list-style-type: none"> <li>• Understanding of rtPA clinical trial results.</li> <li>• Not thinking that primary care providers and neurologists want to be consulted before patient is treated</li> <li>• Not worrying about hemorrhage</li> <li>• Protocol in ED</li> <li>• rtPA on formulary</li> <li>• Skills in ruling out hemorrhagic stroke</li> <li>• Skills in determining last time seen normal</li> <li>• EMS expectation that hospital will respond urgently</li> <li>• Confidence that workup times can be lowered</li> <li>• Expectation that rtPA will produce better outcomes</li> </ul>	<ul style="list-style-type: none"> <li>• Skills (for neurologic exam, determining last time seen normal, and ruling out hemorrhagic stroke)</li> <li>• Self-efficacy</li> <li>• Outcome expectations</li> <li>• Knowledge</li> <li>• Perceived social norms</li> </ul>

### **The Fourth Task in Step 2 is to Create the Matrices.**

The planners created separate matrices for the at-risk group, that is, the community, and three different health care provider groups, the EDs, the EMSs, and the primary care providers. The matrices are shown in Tables 5.13 (p. 299), 5.14 (p. 300), 5.15 (p. 301), and 5.16 (p. 304).

Accomplishment of the change objectives is intended to influence changes in the personal determinants of the performance objectives. For impact evaluation the evaluator will want to know whether the program was successful in influencing changes in the determinants. The change objectives in the cells of the matrices can be used to help guide the development of instruments to measure the determinants. For example, to develop a knowledge instrument, the change

**Table 5.13 Stroke Project Community (Bystander) Matrix for Response to Stroke**

Behavior: Stroke Victim will Arrive at Hospital Within Several Minutes After Experiencing Symptoms				
Personal Determinants				
Performance Objectives (Persons in Proximity)	Skills/Self-Efficacy	Knowledge	Perceived Social Norms	Outcome Expectations
PO.1. Note symptoms and compare to those of possible stroke	SSE.1. Express confidence in recognizing stroke symptoms	K.1.a. Recognize stroke symptoms: numbness, weakness, ↓vision, ↓speech, ↓walking, tingling, vertigo, headache K.1.b. Describe all adults at risk for stroke	PSN.1. Recognize that others in the community take symptoms of stroke seriously	OE.1. Expect that identifying symptoms signifying stroke can improve outcome
PO.2. Call 911 immediately (does not call primary care provider for triage)	SSE.2. Express confidence in describing symptoms of stroke	K.2.a. Recall what to say to operator (“I believe someone is having a stroke, and they need to go to the ED right away.”) K.2.b. Describe stroke as a brain attack with the same urgency as a heart attack	PSN.2. Recognize that others in the community call 911 for stroke	OE.2. Expect that by acting assertively can get prompt stroke treatment and possibly minimize damage
PO.3. Insist on rapid care from the EMS (transport at highest level)	SSE.3. Express confidence in insisting on priority care	K.3. Describe stroke as a brain attack with the same urgency as a heart attack	PSN.3. Recognize that others in the community are assertive about stroke	OE.3. Expect that EMS and ED will respond to assertiveness with appropriate patient care
PO.4. Ask about treatment for stroke and rapid care in the emergency department	SSE.4.a. Express confidence in insisting on priority care SSE.4.b. Express confidence for insisting on CT scan	K.4.a. Describe what to do in ED; ask for CT scan; tell last time normal K.4.b. State that stroke requires rapid workup to allow for treatment to prevent damage	PSN.4. Recognize that others in the community are assertive about stroke	OE.4. Expect that EMS and ED will respond to assertiveness with appropriate patient care

**Table 5.14 Stroke Project Emergency Department Matrix for Response to Stroke**

Environmental Outcome: Stroke Therapy is Provided for All Eligible Patients				
Personal Determinants				
Performance Objectives (ER Staff Members)	Knowledge	Outcome Expectations	Skills/Self-Efficacy	Perceived Social Norms and Standard of Care
<p>PO.1. Emergency department (ED) physicians and teams complete stroke evaluation in 60 minutes</p> <p>PO.1.1. Triage nurses have patient seen by the physician in 10 minutes</p> <p>PO.1.2. Physicians notify the designated ER stroke team within 15 minutes</p>	<p>K.1. (1.1,1.2)a. Describe three-hour window for stroke treatment</p> <p>K.1. (1.1,1.2)b. Describe study results from rtPA trials</p> <p>K.1. (1.1,1.2)c. Describe the urgency of assessment to treatment window</p>	<p>OE.1. (1.1,1.2)a. Describe probability that treatment with rtPA will improve outcome</p> <p>OE.1. (1.1,1.2)b. Expect community neurologists and primary care doctors want patient's stroke to be managed without consultation</p>		<p>SN.1. (1.1,1.2)a. Describe that professional associations include rtPA in guideline documents</p> <p>SN.1. (1.1,1.2)b. Describe that other EDs are changing practice to provide acute treatment for stroke</p> <p>SN.1. (1.1,1.2)c. Describe other EDs in the United States as lowering their workup time for stroke</p>
<p>PO.2. ED-designated stroke team sends lab work STAT (HCT, platelets, glucose, PT, PTT) and get it back STAT</p>				

**Table 5.15 Stroke Project Emergency Medical Service Matrix for Response to Stroke**

Performance Objectives (Emergency Medical Service (EMS) Personnel)	Knowledge	Skills and Self-Efficacy	Outcome Expectations and Previous Experience with Stroke	Perceived Social Norms
PO.1. Dispatchers triage to highest priority of transport.	K.1. Recognize symptoms of stroke	SSE.1.a. Demonstrate recognition and labeling of symptoms SSE.1.b. Demonstrate interviewing informant about symptoms	OE.1. Believe that the outlook for stroke has improved dramatically with the approval of rtPA	PSN.1. Recognize that dispatchers around the country are making these same kinds of changes to make stroke more like heart attack and trauma
PO.2. Dispatchers convey stroke possibility and urgency to responders.	K.2. Recognize change in departmental protocol regarding transport of stroke	SSE.2. Participate in the development of the departmental protocol for stroke	OE.2.a. Describe that the outlook for stroke has improved dramatically OE.2.b. State probability of receiving stroke treatment is improved when patient is transported at the highest level of priority	PSN.2. Recognize that dispatchers around the country are making these same kinds of changes to make stroke more like heart attack and trauma
PO.3. Responders perform "load and go."	K.3.a. Recognize symptoms of stroke K.3.b. Describe change in departmental protocol regarding transport of stroke	SSE.3. Participate in the development of the departmental protocol for stroke	OE.3.a. Describe that the outlook for stroke has improved dramatically with the approval of rtPA OE.3.b. State probability of receiving stroke treatment is improved when patient is transported at the highest level of priority	PSN.3. Recognize that responders around the country are making these same kinds of changes to make stroke more like heart attack and trauma

(Continued)

**Table 5.15 (Continued)**

Performance Objectives (Emergency Medical Service (EMS) Personnel)	Knowledge	Skills and Self-Efficacy	Outcome Expectations and Previous Experience with Stroke	Perceived Social Norms
PO.4. Responders call ahead to the hospital.	K.4. Describe the steps the ED team takes to prepare ahead for STAT workup		OE.4. Recognize that the hospital has changed protocol to treat stroke	PSN.4. Recognize calling ahead as part of standard of care for transport of stroke patients
PO.5. Responders get family or witness to accompany to the hospital.	K.5.a. Describe the importance of having a witness to establish the last observation of baseline K.5.b. Recognize that ED personnel will need to verify time of onset before giving rtPA		OE.5. Describe probability that rtPA (medication that can only be given in a small time window) reduces disability from stroke	
PO.6. Responders interview patient or witness to determine symptom onset.	K.6.a. Describe the importance of establishing the last observation of baseline K.6.b. Recognize that ER personnel will need to verify time of onset before giving rtPA	SSE.6. Demonstrate ascertainment of stroke symptom onset with good interviewing technique		

<p>PO.7. Responders deliver patients prepared for treatment.</p>		<p>SSE.7. Demonstrate in-transport management of stroke patient</p>		<p>SN.7. Recognize that other EMS follow standard of care for in-transport stroke management</p>
<p>PO.7.a. Responders deliver patients with IV in both arms (perform in ambulance).</p>	<p>K.7.a. Describe the way rtPA is given and the ED time constraints</p>			
<p>PO.7.b. Responders deliver patient having drawn blood.</p>	<p>K.7.b. Recognize that the ER will need HCT, platelets, glucose, PT and PTT before acute stroke treatment can be given</p>			
<p>PO.7.c. Responders deliver patient having managed fluids and glucose.</p>	<p>K.7.c. Recognize the importance of good stroke management prior to acute treatment</p>			
<p>PO.7.d. Responders refrain from giving blood pressure lowering medications.</p>	<p>K.7.d. Describe the effect of blood pressure on ischemic stroke</p>			

**Table 5.16 Stroke Project Primary Care Provider Matrix for Response to Stroke**

Environmental Outcome: Stroke Victim Arrives at Hospital Within Three-Hour Window and Receives Acute Stroke Therapy				
Personal Determinants				
Performance Objectives (Health Care Staff Members)	Skills/Self-Efficacy	Knowledge	Perceived Social Norms	Outcome Expectations
PO.1. Receptionists and nurses tell the person with the possible stroke to call 911	SSE.1.a. Express confidence in recognizing a report of stroke symptoms SSE.1.b. Express confidence in referring to 911	K.1.a. Recognize stroke symptoms: numbness, weakness, ↓vision, ↓speech, ↓walking, tingling, vertigo, headache K.1.b. Describe all adults at risk for stroke	PSN.1. Recognize that others in the community take symptoms of stroke seriously	OE.1.a. Expect that identifying symptoms signifying stroke can help patient improve outcome OE.1.b. Expect that advising immediate transport to ED can help improve outcomes
PO.2. Primary care providers identify high-risk patients for stroke and teach them about their risk, how to identify symptoms and to call 911			PSN.2. Recognize that other primary care providers in the community refer to 911	OE.2.a. Expect that acting assertively can get prompt stroke treatment and possibly minimize damage OE.2.b. Expect that talking to patients about stroke risk will result in faster response
PO.3. Primary care providers educate office staff regarding signs of stroke and communication (such as telling them to call 911)	SSE.4. Express confidence in being able to educate office staff to help patients get immediate emergency care		PSN.4. Recognize that others in the community take action in the office setting to help patients respond immediately to stroke as an emergency	OE.3.a. Expect that EMS and ED will respond to assertiveness with appropriate patient care OE.3.b. Expect that patients will follow instructions and call 911.

objectives for knowledge constitute the critical knowledge needed to accomplish the performance objectives. Planners can thus use the change objectives for knowledge to construct questions to ask participants in order to measure their knowledge before and after participating in the intervention program. This same principle can be applied to the construction of items to measure other determinants, such as self-efficacy, subjective norms, attitudes, and beliefs.

It is most difficult to evaluate the effectiveness of a health promotion program if the planners have not clearly stated the program's objectives and outcomes. Step 2 of Intervention Mapping provides the program evaluators with clearly stated behavioral and environmental outcomes, performance objectives, and change objectives that can guide the program evaluation (Tripp et al., 2000, 2003).

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## Summary

In Step 2 of Intervention Mapping, a transition is made from the needs assessment conducted in Step 1 to assessing what should change to prevent a health problem or improve health and quality-of-life outcomes. This transition is a shift from a logic model for causes of a health problem to a logic model for what changes will be addressed by an intervention. The starting points for this assessment are the program goals for health and quality of life stated at the end of Step 1 of Intervention Mapping. The first task in this step is to state the behavioral and environmental outcomes that need to be achieved to reach the program goals for improvement in health and quality of life. The stated behavioral and environmental outcomes need to be specific and clearly linked to the health and quality-of-life outcomes. The basic assumption is that if the health promotion program is effective in changing the behavior and environmental conditions as stated in the expected outcomes, the result will be to prevent or improve health problems and related quality-of-life outcomes. The second task of Step 2 is to specify what change is necessary in the behavior and environmental outcomes by stating performance objectives. Essentially, this task is to subdivide the behavior and environmental outcomes into smaller parts to clarify the most important aspects of the behavior and environment that need to change or be accomplished.

The third task of Step 2 is to select potential important and changeable determinants of performance objectives for the behavioral and environmental outcomes. Determinants are factors derived from behavioral science theory and evidence from empirical studies that suggest a change in the factors may influence a change in behavior of the population at risk for the health problem or the agents in the environment capable of changing environmental conditions.

The core processes discussed in previous chapters are used to guide program planners in selecting determinants. The final task of Step 2 is to create a matrix of change objectives by linking the selected determinants to the performance objectives and forming cells to write change objectives. These change objectives state what needs to be modified as a result of the intervention to influence the performance objectives to achieve the behavioral and environmental outcomes. Thus, the matrix of change objectives describes the most immediate change to be addressed by the intervention and provides the detail for the selection of intervention methods and practical applications for the health promotion program. In addition, the matrix of change objectives provides a basis for formulating questions and measurement instruments for the evaluation of the health promotion program.

Most program planning will require multiple matrices to address the behavior of the population at risk for the health problem as well as describe each level of the environment to be addressed by the intervention. In some cases it is necessary to break down the population into subpopulations due to important differences in behavior, performance objectives or determinants and to create separate matrices of change objectives for each group. The final product of Step 2 of the Intervention Mapping process is a set of matrices that specifies the immediate objectives for a health promotion program.

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## Discussion Questions and Learning Activities

1. In Step 2 of Intervention Mapping, the program planners make the transition from a risk model created in Step 1 to a change model that describes what the intervention will change to achieve the health outcome goal. Construct a logic model that illustrates the causal pathways to influence achievement of the health outcome goal and impact on quality of life.
2. Explain why it is important to be very specific when stating behavioral and environmental outcomes.
3. Give examples of the questions planners can use to: (a) state the behavioral and environmental outcomes to be achieved by a health promotion program; (b) subdivide behavioral and environmental outcomes into performance objectives; and (c) write change objectives for the cells of the matrices.
4. For the health problem and population you selected for the needs assessment in Step 1 (Chapter Four), state the behavioral outcomes and environmental outcomes to be accomplished by the intervention. What will your intervention try to change? Justify your decisions using evidence from the literature.

5. Priority population differentiation: Whom is this intervention meant to affect? Are there important subgroups? On what variables should the population be grouped? Explain the rationale for differentiation or nondifferentiation into subgroups for planning the program.
6. Performance objectives: Specify performance objectives for the health behavior and environmental outcomes for at least one of the priority groups you have differentiated. Briefly describe the process you would use to validate these performance objectives.
7. Specify determinants of the health behaviors and environmental outcomes. Specify and justify using theory and empirical findings the most important personal determinants for each behavioral outcome and environmental outcome (that is, those most important to address in your program). Describe any new research you would plan to supplement what you are able to ascertain from the literature.
8. Change objectives: For each health behavior and environmental outcome, create matrices to write change objectives and give at least one example in each relevant cell of the matrix.



# INTERVENTION MAPPING

## STEP 3

### SELECTING THEORY-INFORMED INTERVENTION METHODS AND PRACTICAL APPLICATIONS

#### LEARNING OBJECTIVES

- Generate program ideas with the planning group and use their perspectives when identifying methods and applications
- Use core processes to identify theoretical methods that can influence change in determinants and identify the conditions under which a given method is most likely to be effective
- Choose theoretical methods for the program
- Select or design practical applications for applying the methods in the intervention program
- Ensure that the final applications (still) address the change objectives

A theoretical method is a general technique or process for influencing changes in the determinants of behaviors and environmental conditions. Practical applications are specific techniques for practical use of theoretical methods in ways that fit the intervention population and the context in which the intervention will be conducted. For example, a change objective for an intervention might be to increase adolescents' self-efficacy to resist social pressure to use drugs. For the change objective of increasing self-efficacy, theoretical methods might include modeling, skill training, guided practice with feedback, and reinforcement. One application for modeling could be a videotaped step-by-step demonstration by

adolescents of how to resist peer pressure in situations they commonly encounter. In another example, an environmental condition of adolescent drug use could be the availability of drugs for sale in neighborhoods where adolescents live, with a performance objective that the mayor would get police to actively enforce laws against neighborhood drug dealers. A change objective for this might be to increase the mayor's positive outcome expectations, for example, that this enforcement will save children's lives, be popular with constituents, be positively received by powerful groups in the city, and increase tourism to the city. The primary theoretical method for this could be advocacy, which includes methods of information, persuasion, negotiation, and coercion. One application might be for influential neighborhood activists to hold a breakfast meeting with the mayor, neighborhood constituents, and key city opinion leaders. The activists might present detailed case histories of neighborhood teens, along with pictures of open drug dealing on the street. If the mayor does not respond to this application, the group might undertake, as additional applications, media advocacy with an exposé story calling for action by the mayor on the local television channel.

Methods and practical applications form a continuum that extends from abstract theoretical methods through practical applications to organized programs with specified scope, sequence, and support materials. For instance, skills training is a theoretical method; a step-by-step instruction from a videotape with guided practice would be a practical application to deliver the skills training; and a program would include descriptions of when and how the training would be delivered and supported. The difference between theoretical methods and practical applications can be confusing. Modeling is a method, use of role-model stories is an application, and demonstrations are an application. The point is that methods should always be considered, and applications should never be devoid of the effective component—the method. Yet methods are easy to overlook because health educators often think in terms of concrete program components, such as a videotape or a brochure.

In this chapter we show how to choose methods from theory and the literature. These methods will be the basis of intervention components to modify performance and change objectives for behavior and environmental conditions of the at-risk population and environmental agents. The planner's challenge is to cover all of the objectives while creatively translating methods into applications. Planners can use methods and applications from all intervention levels (individual, interpersonal, organizational, community, and societal) to match change objectives. An intervention at higher system levels may have direct or mediated influence on lower (embedded) levels and may be the intervention of choice to change individual behaviors. For example, a media campaign may influence individuals to change their behavior directly or may influence a

change in public or organizational policy. Also, interventions at levels beyond the individual may operate directly to change characteristics of that system (that is, family, organization, or community).

As shown in Figure 6.1, planners choose methods and applications to influence change objectives. Change objectives describe the desired changes in the determinants of performance objectives for health behavior and environmental conditions, at the individual and at higher environmental levels. Modeling may change individual health behavior, but it could also be applied to influence the behavior of decision makers in organizations required to make changes in the environment. For example, persuasive communication could be applied to influence the behavior of politicians to take action to enforce laws that would change environmental conditions. In addition, the methods for change objectives can be applied to the change agent, who, in turn, may apply a method to the priority population. For example, an organization manager may provide incentives to influence employee behavior to increase physical activity. A special case is the training of persons who deliver the intervention to influence the priority population (see Chapter Eight on diffusion and implementation). Note that the decision makers' performance objectives are influenced by environmental conditions as well as personal determinants (see Figure 6.2 for an example).

In this chapter we present various methods for different determinants, starting with methods for determinants that are related to change in the individual health behavior of the at-risk group. Then, we discuss methods for changing determinants at environmental levels, which are more specifically appropriate for groups, organizations, communities, and public policy. We describe only a sample of methods that can be used to address change objectives; there are many more.

**FIGURE 6.1 Intervention Logic Model**

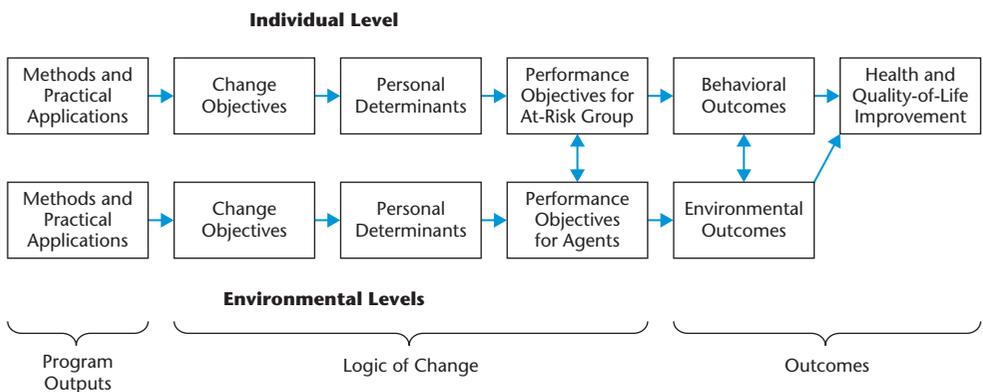
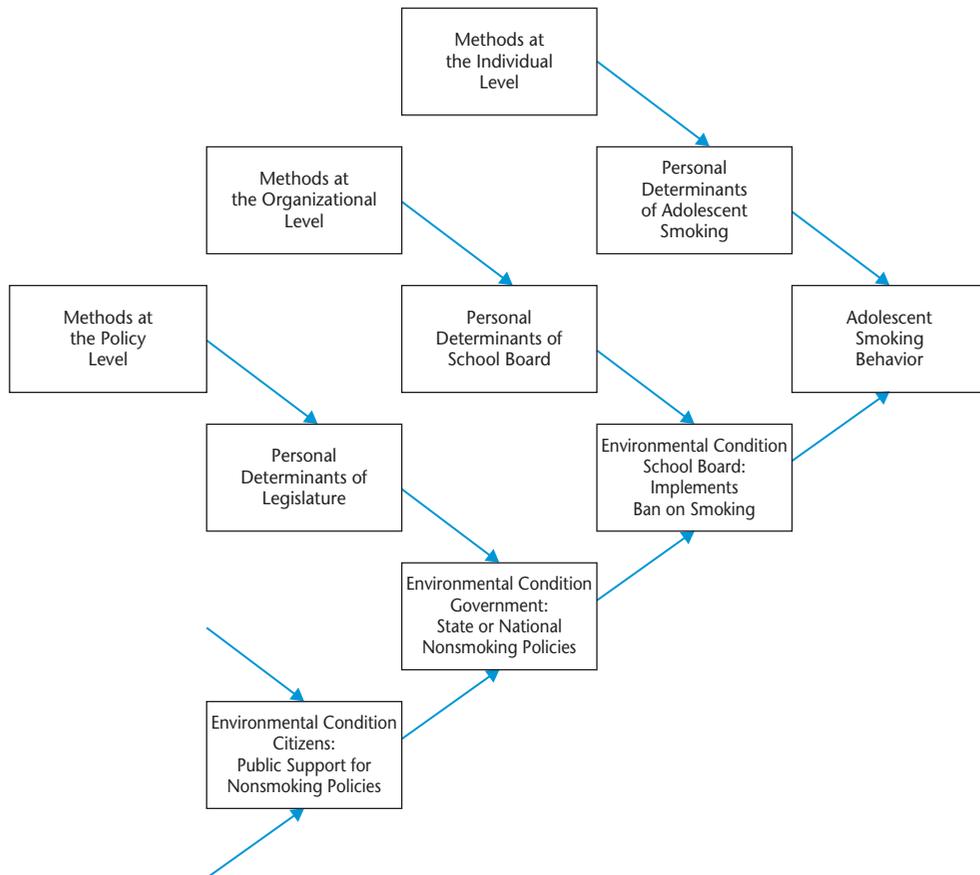


FIGURE 6.2 Schematic Representation of Shift in Environmental Levels



As mentioned in Chapter One, there is an increasing interest in systematic descriptions of health promotion interventions, the theoretical methods they contain, and the determinants that are targeted for change. For instance, Abraham and Michie (2008) provide a theory-linked taxonomy of 26 generally applicable health behavior change techniques (BCTs), all directed at individual change. That taxonomy was later extended, including techniques from reviews, textbooks, and a brainstorm, to 137. The 35 of those behavior change techniques derived from reviews were then linked with 11 theory-based determinants (Michie et al., 2008), a comparable approach to what we do in this book. Other authors combined the original taxonomy (Abraham & Michie, 2008) with the Intervention

Mapping approach, to develop a checklist for coding methods in patient education interventions (de Bruin, Viechtbauer, Schaalma, Kok, Abraham, & Hospers, 2010b; van Achterberg et al., 2010). At higher environmental levels, Khan, Sobush, Keener et al. (2009) identified and recommended a set of 24 applications and associated measurements that communities and local governments can use to plan and monitor environmental and policy-level changes for obesity prevention. For other descriptions of change methods we refer the reader to behavioral science texts, particularly those with explicit applications to health promotion (Conner & Norman, 2005; DiClemente, Crosby, & Kegler, 2009; Edberg & APA Publications and Communications Board Working Group on Journal Article Reporting Standards, 2007; Glanz, Rimer, & Viswanath, 2008; Goodson, 2009; Hayden, 2008; Minkler, 2008; Minkler & Wallerstein, 2008).

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## Perspectives

Our perspectives in this chapter concern the importance of ensuring that programs contain theoretical methods that are capable of producing the planned change at the planner's desired ecological level (Fishbein & Cappella, 2006; Glanz & Bishop, 2010; Schaalma & Kok, 2009).

### The Case of the Missing Methods

The causal chain from determinants to objectives to methods to applications is not often reported in the health education literature, and without this description, it is impossible to judge the theory and evidence base for what the planners have chosen to include in the intervention. Most publications on health education interventions, often evaluation studies, lack clear information about how the authors actually expected to cause a change. They often present the application and the program, for example, a tailored letter to encourage mammography or a videotape to teach breast self-examination. But they may not be explicit about what theoretical methods they used in the letter or how the videotape actually teaches or motivates the screening behavior. Tailoring can be considered a general method, but the letter must use specific theoretical methods that would, according to theory, "cause" a woman to obtain a mammogram. Did the researchers use persuasion, modeling with vicarious reinforcement, a cue to action, or some other method? In another example, researchers might write that they used nonsmoking contracts to stimulate resistance to smoking, but they do not mention the theoretical method of commitment on which the application was presumably based—a method that would include, in order to be effective, making a public commitment.

We want to stress here that all program components must contain theoretical methods as well as practical applications and intervention components.

### Using Methods Correctly

One source of confusion about methods may be that the same concept, such as modeling or reinforcement, can be used to describe both determinants and methods. The double use of these concepts is actually an interesting part of theories, because it suggests that the theory explains both behavior and behavior change. The difference for health promoters is that modeling as a determinant refers to what happens in the actual situation, whereas modeling as a method will be part of a well-designed program. For instance, with respect to condom use, modeling that occurs in the television shows and movies that adolescents see may be negative, whereas health educators may use positive role models in their interventions to compensate for negative role models in the media (Schaalma, Abraham, Gillmore, & Kok, 2004).

Translating methods into applications demands a sufficient understanding of the theory behind the method, especially the theoretical parameters that limit the effectiveness of the theoretical process (Kok, Schaalma, Ruiter, van Empelen, & Brug, 2004). Modeling is a strong method but only when certain parameters are met, for instance, in reinforcement of the modeled behavior. People do not just behave in the desired manner because a model shows that behavior; they follow the model when the model is reinforced for that particular behavior and when they expect to be reinforced in a similar way. Reinforcement may be in terms of outcomes or of social rewards. Translating the method modeling to a practical application includes taking care that in the actual program, from the perspective of the program participants, the model is reinforced. When we describe translating methods into applications, we will give more detail on this process and provide examples.

### Different Methods at Different Levels of Intervention

There are two basic differences between descriptions in the literature of behavioral change methods and those of methods for changing environmental conditions. One difference is that theories that focus on individual behavior change are more likely to focus on processes (that is, closer to what we call methods), whereas theories regarding environmental change are more likely to focus on practice (that is, closer to what we call applications) (Butterfoss, Kegler, & Francisco, 2008; Porras & Robertson, 1987).

The second difference is in the way that knowledge is garnered regarding the application of different types of theories to health education. In individual

behavior change, there has been a somewhat deductive approach: program planners extract behavioral science theoretical change constructs and then apply them to health. On the one hand, this approach to theory application is not theory testing—it is still a theory-of-the problem approach—but in its philosophy it resembles theory testing. On the other hand, social change activities—people doing things such as community organization and coalition building—have been reported in the literature as case examples. It sometimes is not possible to determine whether these activities are methods or applications and whether theoretical constructs are involved in the applications. Possibly this approach to intervention is more inductive, intervening with an application without naming the method. Where possible in this chapter, we label the methods inherent in community-oriented applications.

Methods at the individual level can be directed toward agents at higher ecological levels. The theoretical process behind the method is the same; however, often the application of the method is somewhat different, depending on the target. For instance, in the study about interventions to change environmental conditions (Kok et al., 2008) persuasion was applied at various levels and originating from various levels. For example, in a project to decrease carbon dioxide transmission, the health promoter reported a persuasive communication approach that illustrated to businesses, corporations and other companies the advantages of approaching and dealing with the issue of carbon dioxide emissions. The health promoter showed them how carbon dioxide reduction is profitable and made it clear to companies that being environmentally friendly is good for the company image. The potential effect on the image of and profit for the company is a typical organizational level argument. In another example in which another health promoter decided to approach an online condom store in order to increase the accessibility and availability of condoms, the persuasive message was surprisingly similar. The health promoter persuaded the company by stressing positive influences on their image and explained that cooperating would be in their own commercial and economic interest. Cooperation would mean that more customers would find their way to their online store. The educator also stressed the responsibility of the condom store in HIV and STD prevention.

Methods at the individual level are frequently bundled together as part of a change method at a higher ecological level. This is because environmental agents and organization and community members are also individuals and the determinants of their behaviors are similar to determinants of behavior at the individual level. The change target and the overall method, however, are specific to the environmental change level. For example, community organization can include the individual methods of persuasion, modeling, skills training, and public commitment; however, these methods are bundled together to

accomplish a change in a community level problem and to increase community capacity. Organizational development, in fact, has been defined as the transfer of behavioral science knowledge to increase organizational effectiveness and the process resembles behavioral self-regulation applied to the organizational level (for example, McLean, 2005).

Finally, there may be different approaches targeting a level or being targeted from a level. On the one hand, organizations may apply methods for improving the health of their employees, for instance, to increase physical activity (Abraham & Graham-Rowe, 2009). Those methods might include tailoring, goal setting, and modeling. The activities are initiated by the management and are directed at the employees. On the other hand, health promoters and health-promoting organizations may apply methods to get organizations to start health-promoting activities as in the earlier examples above, for instance, reducing carbon dioxide transmissions or increasing the availability of condoms. A national voluntary heart organization may try to encourage companies to facilitate physical activity programs for their employees. Methods that are used include persuasive communication, advocacy and lobbying, organizational modeling and facilitation. These activities are initiated outside the organization, usually by a health promoter, and are directed at the organization, often the management. An interesting parallel to this process can be found in the research tradition of corporate social responsibility (Maon, Lindgreen, & Swaen, 2009). An example of corporate social responsibility is a community focusing on a company with respect to environmental pollution. In this case, the community initiates an activity using the method of coalition formation. These communities may have themselves been the focus of health-promoting organizations applying the method of community organizing.

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## Ideas About the Program

The first task in Step 3 is to review program ideas with the planning group.

The first task in Step 3 is to review program ideas with the planning group and use their perspectives when identifying methods and applications. The planning group, which was established in the first step of Intervention Mapping, should include both members of the potential program participants and possible program implementers. While working on this step, the program planners should review the representation in the program planning group so that they have a good forum for balancing existing ideas on applications and programs, theoretical and empirical input on methods, and limitations and potentials of the program context. Establishing an appropriate planning group and adding

relevant program users during the planning process is an essential condition for the resulting program's effectiveness and will be discussed more in Chapter Seven on producing program components and materials.

Intervention Mapping guides the planner to follow the steps of conducting the needs assessment, developing the matrices for performance and change objectives, selecting theoretical methods that are translated into practical applications, and then creating the actual intervention program. However, most planners already have some ideas about the type of program that can influence the desired program objectives. It is, in fact, important to keep in mind that elaborating on theoretical methods will eventually lead to a program. The idea behind the Intervention Mapping steps is not to keep planners from thinking of programs but to help them to develop programs that have a solid theory and evidence base. Planners must find a balance between preliminary ideas for programs on the one hand and theory- and evidence-informed decisions for methods, applications, and programs on the other hand; what laypeople think about effectiveness of methods is not always congruent with the scientific evidence. For example, mass media campaigns may be useful for changing social norms but are probably seldom useful for increasing self-efficacy and skills. Fear-arousing messages may be popular with the representatives of the at-risk population and intermediates, but they often are not effective in influencing behavior.

And yet, evidence-informed methods and applications may not be easily applicable in the actual context of the program or the potential participants in the program. For instance, peer education is often cited as an effective method for change, but peer education is not appropriate in all contexts and cultures. In Chapter Twelve (on the Web at the book's instructor Website), Schaalma and Kok explain that peer education for HIV prevention among adolescents in Dutch schools was not acceptable to Dutch teachers because peer education is not part of their normal routine.

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## Identifying Theoretical Methods

The next task is to identify theoretical methods.

Theoretical methods are general techniques or processes for influencing changes in determinants of behaviors of the at-risk group or environmental agents. To match a method with a change objective, the linking concept is the determinant involved. For example, take the change objective: adolescents (the population) demonstrate skills (the determinant) in communicating with a partner about condom use (the performance objective). The method to reach this objective can be found by looking at methods for the determinant: skills. Of course, within

the various methods for skills training, the planner will need to consider the population and the performance objectives. Adolescents can be reached through the schools, and teachers may have ideas on what skills training methods they would want to apply with the topic of condom use.

To get from the matrices with change objectives as a result of Step 2 to the selection of methods in Step 3, planners reorganize the change objectives by determinants. They make a list of all change objectives that have to do with increasing knowledge, another list of all change objectives that have to do with changing outcome expectations, and so forth. Methods will then be matched to the determinants; there may be multiple methods for a determinant as well as multiple objectives for a method. For example, modeling is often used for various skills-related change objectives, but for training some skills, it may also be necessary to use guided practice. In the HIV-prevention program for Dutch adolescents, described in Table 6.1, the risk perception and awareness change objectives were matched with a number of methods. The table shows three change objectives for two performance objectives, as well as four methods for changing awareness and risk perception. The planners of this intervention elected to personalize risk for all three objectives, because that is a very broad and effective method. They also decided to apply all four methods for the third objective, because they found that objective to be especially relevant for this priority group: many adolescents see themselves as monogamous, whereas in fact they are serially monogamous, resulting in multiple sex partners.

**Table 6.1 Examples of Objectives and Methods for Changing Awareness and Risk Perception**

<b>Determinant: Awareness and Risk Perception</b>	
<b>Change Objectives</b>	<b>Methods</b>
<i>Performance objective: plan condom use</i> Recognize that HIV and sexually transmitted infections are related to behavior, not to risk group Recognize the possibility of finding oneself in situations in which infection is possible	Personalize risk  Personalize risk Scenario-based risk information
<i>Performance objective: use condoms with regular partner</i> Describe own sexual behavior as serial monogamous rather than monogamous	Consciousness raising Scenario-based risk information Personalize risk Framing Loss frame

Methods can be applied at any ecological level; however, as we have seen, methods at the higher levels often take a different form than do similar methods at the individual level. Persuasive communication with individuals in a counseling context is different from persuasive communication as a part of political advocacy in a meeting between politicians and a lobbying group or in a meeting between company managers and union representatives. The determinant may be the same (that is, outcome expectations), but the content and the vehicle for delivering a selected method, in this case persuasive communication, are different. Therefore, we present methods for individual change by determinant, and we follow up with methods at environmental levels that are directed at the same determinants but for a higher environmental level.

From the Sun Protection Is Fun (SPF) project (see Chapter Five), we describe two change objectives for attitude change, one at the individual level and one at the organizational level (see Table 6.2). Modeling is a useful method for attitude change and can easily be applied with the children. Of course, reinforcement of the model is an essential parameter (that is, a condition under which the method is effective; we will come back to parameters later in this chapter). Persuasive communication can be applied with both the children and the preschool director, but the content will be different: what are new and strong arguments for the children are different from what are new and strong arguments for the directors. In this case, the directors are responsible for the protection of the schoolchildren, so shifting perspective may be a very effective method to change the attitudes of preschool directors. For example, they have to realize how their behavior influences the health of these children, in addition to considering economic or financial concerns related to providing shade structures. If that method were not effective, planners could move to methods for other determinants, such as social pressure, by stimulating parents to write letters to the school board.

**Table 6.2 Examples of Objectives and Methods at Various Levels**

<b>Determinant: Attitude Change</b>	
<b>Change Objectives</b>	<b>Methods</b>
<p><i>Individual level performance objective:</i> child wears protective clothes and hat</p> <p>Change objective: Describes wearing protective clothes as positive</p>	<p>Modeling</p> <p>Persuasive communication</p>
<p><i>Organizational-level performance objective:</i> preschool director provides shade in outdoor areas</p> <p>Change objective: Describes enduring shade as positive</p>	<p>Shifting perspective</p> <p>Persuasive communication</p>

## Environmental Conditions: The Agent's Role

In Chapter Five we explained how to specify behavioral outcomes and environmental outcomes and translate them into performance objectives of the at-risk population and the environmental conditions. Each performance objective has an actor, either an at-risk person or a change agent in the environment. The performance objectives are influenced by determinants; and the change objectives at the individual level and at the environmental levels form the most immediate objectives for a program (see Figure 6.1). The methods and applications that we introduce in this chapter are directed at those change objectives. Many performance objectives have both personal determinants and environmental influences.

Environmental conditions are not likely to be under the direct control of the individuals at risk for the health problem. They are controlled by external agents, such as parents, peers, teachers, managers, decision makers, and other gatekeepers. Therefore, performance objectives for environmental outcomes are formulated by referring to an environmental agent. Moreover, there may be various environmental levels: interpersonal, organizational, community, and societal levels. In project SPF, there are matrices for the at-risk individual, interpersonal, and organizational levels: children, parents, teachers, school directors, and school management. The planning team focused on change objectives at all these levels and considered methods such as guided practice for parents and organizational advocacy for school management.

In another example, smoking by adolescents is influenced by personal determinants but also by a supportive school environment. When the school environment is not supportive enough, the health promoter will want to change this environmental condition by urging the school management to develop and implement a nonsmoking school policy. So the focus of the health promoter will shift in this instance to the behavior of agents related to the school. Perhaps the school management, school board, superintendent, or parents could be persuaded to implement a nonsmoking policy. The health promoter might use methods of persuasive communication and modeling to influence the school management's decision-making process. However, there are environmental influences on the school management's decision making as well, in the form of state and national regulations related to nonsmoking policies in schools. When those regulations are lacking, the health promoter might want to change this environmental condition by urging state, provincial, or national agencies to declare stricter rules banning smoking in schools. The health promoter will use the method of political advocacy to influence this policymaking process. Figure 6.2 offers a schematic representation of this chain of events. Even a government will be influenced by

external factors, such as public support. Again, by applying methods from the community level, the health promoter may want to influence citizens to advocate for school policies that ban smoking.

Note that this example illustrates two assumptions about effectiveness and evidence. The first assumption is that the environmental outcome will actually promote the health-promoting behavior, that is, that establishing a school ban on smoking will decrease the onset of and increase the cessation of students' smoking. In Step 2 (Chapter Five), the planner will have paid attention to making sure that an evidence base exists for this assumption. The second assumption is that there is evidence that the method will actually change the agent's behavior. We presented evidence for various individual and higher-level methods used to change determinants of the agents' behavior, such as persuasive communication or (parental) advocacy, in Chapters Two and Three.

To summarize, to select methods for environmental conditions, the first thing to do is to find out who may be in a position to make the expected change. The planner has to identify the performance objectives for the agent who will actually change the environmental condition. The health promoter then applies methods for influencing the determinants of the agent's performance objectives. Notice that determinants often have different content at various ecological levels, depending on the environmental agent's role. The adolescent's outcome expectations (for example, that not smoking will result in more clean-smelling breath and clothes) differ from the school management's outcome expectations about implementing a nonsmoking policy (for example, that parents will appreciate the school's having a nonsmoking policy), and those are different still from legislators' outcome expectations about declaring a national nonsmoking policy for schools (for example, that constituents will support a stricter policy). Therefore, methods directed at the same type of determinant, such as outcome expectations or skills, will be different for various environmental levels. That is why later in this chapter we describe methods for change organized by environmental level: interpersonal, organization, community, and society.

## Core Processes

Two of the core processes presented in Chapter One are essential for identifying and selecting methods: reviewing existing empirical evidence in the literature and reviewing theories of change. With the topic approach to finding and using theory, the health educator goes back to the literature on the problem. For example, when searching the topic drug abuse, the health educator will discover what methods others have used to influence various concepts including the specific concept of resistance to social pressure. Unfortunately, much of the literature is

vague about methods and more forthcoming about practical applications. The health educator can then use the construct approach, with the change objective stated as “Resist social pressure to use drugs,” and find theoretical methods specifically about resisting social pressure to use drugs, resisting social pressure to other risk behaviors such as smoking, and resisting social pressure in general. The health educator may find that this literature cites theories on conformity and nonconformity and on social comparison (Cialdini, 2008). The health educator may also use the general theories approach to explore those theories that address behavior change in general, for example, Social Cognitive Theory (SCT), and discover what those general theories have to offer about accomplishing this particular objective.

There may be several methods for one objective as well as one method for multiple objectives. In cases in which available information is extremely sparse, such as reducing fear for social contact with people with AIDS, planners may have to develop more insight on appropriate methods through a third core process: additional research with the intervention group (see the paragraph on Stigma in Chapter Two).

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## Method Selection

**The third task in this step is to choose theoretical methods for the program.**

To complete this task, planners distinguish between theoretical methods and practical applications and ensure that all program components contain methods. They also must consider their preliminary ideas on the program in light of information from theory and evidence about the strength of the method for changing a specific determinant. Finally, the planning group will evaluate each proposed method in terms of whether the proposed application meets the parameters for use.

In this section we describe the various ways that work groups can select methods and applications. To give planners an idea of the wide range of methods we review basic methods, methods for the most common determinants of behavior change, and methods for environmental change. In each review, we include the parameters or considerations for the use of this method. This review facilitates the health promoter’s consideration of a variety of methods when deciding which methods would be best to change a determinant in the context of the at-risk population, environmental agents, and program setting.

## BOX 6.1

### MAYOR'S PROJECT

When we drop in on the mayor's work group, we hear the group deliberating on what to do next. The one person who had used Intervention Mapping previously is quite comfortable continuing in a somewhat linear process.

*Teacher:* OK, now we just group the change objectives at each ecological level by determinants. Then we discuss what methods could change that group of objectives. You see, the whole process at this point is driven by the determinants.

*Business Community Rep:* What? I thought we had already dealt with the determinants. Now we are back at the matrices with the change objectives?

*Parent:* Yes, that's right. It's just that the determinant part of the matrix—the determinant grouping—guides this process.

Many in the mayor's group groan.

*Community Agency Rep:* I am so tired of tables. I just cannot think this way anymore. Isn't there any other way of doing this? I have so many ideas about this program, and I've managed to keep up my enthusiasm through this entire Intervention Mapping process to this point. But to tell the truth, if I have to do one more table, I might lose all of my creative program ideas.

*Business Community Rep:* I feel the same way. And on top of that, I don't understand the difference between a method and an application. It seems to me that this is just one more set of unnecessary vocabulary words that get in the way of really being creative about a program. Furthermore, throughout the planning process, I have been asked to hold on to my program ideas. When do I get to stop holding on? Is that now?

The health educator listens to her colleagues and recommends that they all close their Intervention Mapping notes and put away their matrices. The group structures the next hour as a brainstorming session. Brainstorming had worked well for this group in the past, and they liked generating ideas without censure or correction. The health educator draws a line down the board and labels one side *Methods* and the other side *Practical Applications*. She then asks the question: Thinking about our determinants and change objectives—how are we going to produce change? What methods would be powerful enough? As the group lists an idea, the members determine in which column to place it. Each time someone

comes up with something, the group decides whether it is a theoretical way to change the determinant—a method—or a programmatic idea about how to deliver methods—practical application.

Once the ideas are generated the group reviews the list of change objectives grouped by determinants and decides whether they have matched change objectives with methods on their preliminary list. Where they do not have adequate coverage they generate more methods and applications.

At the end of the afternoon of work, the group looks at their lists and realizes that the pieces of a program are beginning to take shape.

## Work Style

People have different work styles; work groups do too. In selecting methods and practical applications, health educators may take any of several routes based on their experience with theory and practice. Some will move carefully from objectives to methods and then to applications. Others will move from objectives to applications and then back to the underlying method. Still others will brainstorm methods and applications simultaneously. For example, one health educator may think of commitment as a theoretical method for increasing self-efficacy of adolescents to remain nonsmokers. He or she would then brainstorm about practical applications to apply that method. Another health educator may think of a nonsmoking contract as an application for improving self-efficacy and then find out from the literature that the underlying theoretical method is commitment. During that process the health educator might also find alternatives to a nonsmoking contract that may have the same or even better results.

Regardless of the work style, what is essential is that methods are identified, and the parameters of the methods—the conditions under which the methods are shown to be effective—are kept in mind during the translation from method to application and to program. For example, the health educator who likes the idea of a nonsmoking contract should be aware that commitment is only effective as a method for increasing self-efficacy when the act of commitment has been made public (parameter). Therefore, contracts that individuals make in private settings may have positive effects as reminders, but they do not have the strong effect of public commitment.

There is no reason why planners cannot start with applications and then think about theoretical methods. However, the essential question here is: Why would the particular application work? For every creative idea, there needs to be a theoretical process describing why the expected effects are going to happen. For

instance, health educators working with gay men who chat on the Internet to meet others for dating and sex decided to use a virtual guide with the characteristics of an attractive gay man to lead the user through a Web-based program for HIV prevention (Kok, Harterink, Vriens, de Zwart, & Hospers, 2006; Mikolajczak, Kok, & Hospers, 2008). The potential participants had very clear but different preferences for the choice of guides from six options. Most men selected one guide and stayed with him when they returned to the site. Why would this application be expected to work? The guides and the municipal health service that produced the site were both seen as sources of information. Research on persuasive communication (a method for attitude change) suggests that theoretically relevant source characteristics are attractiveness and expertise (parameters for the method). In this case, giving the men the choice of their own guide helped to ensure that they would see the guide as attractive and the source as credible to improve the effectiveness of the persuasive messages on the Web site. Of course, the quality of the arguments in the messages given by the guides was equally important. Guides who are chosen for their attractiveness but who lacked good arguments would probably have had little impact on the users of the Web site.

Having found methods from the list of theoretical methods or from consideration of the process behind preliminary ideas, planners should select methods for their program by evaluating all the suggested methods on the strength of the evidence that the proposed change in the targeted determinant can be realized by this specific method in this specific setting. For an elaborated example, see Table 13.6 (on the Web at the book's instructor Website) for an application in an HIV-prevention program for schools.

## Methods for Changing Behavior

In this section we describe theoretical methods for behavior change, summarized in tables. The first part presents basic methods and methods geared to changing certain determinants (for example, attitudes, and skills) of the at-risk individuals. We then move to basic methods and methods for change in determinants of agents within the various environmental levels. For instance, attitude change of an individual could be facilitated by persuasive communication. Attitude change of a politician who serves as a gatekeeper for policy change could also be facilitated by persuasive communication in the form of advocacy. However, the content and the vehicle of the messages would be quite different in the two cases. At the higher ecological levels, the content varies by the role of the agent, and the vehicle is tailored to the power involved, for example, "power over" and "power with" in organizations and community.

The following section first summarizes methods for change for the determinants of individual behavior. However, it is very difficult to imagine a health promotion intervention setting that is not embedded in some kind of social or physical system. A child with asthma is in an environment with parents, nurses, doctors, and other children with asthma. An adolescent in an HIV-prevention program is in an environment with friends, sexual partners, parents, teachers, and community leaders. Worksite employees participating in a smoking-cessation program are in an environment with colleagues, health professionals, supervisors, and worksite policies. In a later section of this chapter, we present methods for change at environmental levels. It is important for health promotion planners to realize that individual behavior change is almost always embedded in one or more environmental levels and that methods for individual change (Tables 6.3 to 6.10) need to be complemented with methods for change at those environmental levels (Tables 6.11 to 6.16).

We combine comparable determinants when they appear in more than one theory, for example, attitudes, beliefs, and outcome expectations. The various determinants are not independent of each other; we will start with knowledge as the basis for many other determinants, such as risk perception, attitude, and skill. Risk perception in turn is a specific part of attitude. Methods described for one determinant may sometimes be used for other determinants as well.

If we think that a method may be applied to almost any determinant we present that method in the table of “Basic Methods.” The theoretical background for all methods is provided in Chapters Two and Three and mentioned in the tables.

For each method we provide a definition. We do not presume to give the only possible definition; definitions differ. Most of our definitions are directly derived from the theory involved; sometimes they are based on definitions by others (for example, Abraham & Michie, 2008). We also provide the parameters for use: the conditions under which the theoretical method will be effective. Later in this chapter we will elaborate on the importance of those parameters when translating the method into a practical application.

***Basic Methods for Behavior Change.*** Some methods for change at the individual level turn out to be useful for all determinants and also at all levels at which that method is applied. The members of the intervention group, for example, must pay attention to the intervention message, understand the content, and process the information carefully. Table 6.3 lists these basic requirements of health education and promotion at the individual level: participation, belief selection, persuasive communication, active learning, tailoring, individualization, modeling, feedback, reinforcement and punishment, and facilitation. We discuss the theoretical and

Table 6.3 Basic Methods at the Individual Level

Methods (Related Theory)	Definition	Parameters For Use	Examples
Participation (Diffusion of Innovations Theory, Models of Community Organization; Empowerment theories) (World Health Organization, 2002b)	Assuring high level engagement of the participants' group in problem solving, decision making, and change activities; with highest level being control by the participants' group.	Requires willingness by the health promoter or convener to accept the participants as having a high level of influence; requires participants' group to possess appropriate motivation and skills.	A health promoter includes representatives of students in the project group that is developing a new sex education program for schools.
Belief selection (Theory of Planned Behavior/Theory of Reasoned Action <sup>2</sup> ) (Fishbein & Ajzen, 2010)	Using messages designed to strengthen positive beliefs, weaken negative beliefs, and introduce new beliefs.	Requires investigation of the current attitudinal, normative and efficacy beliefs of the individual before choosing the beliefs on which to intervene.	A program for HIV prevention for Hispanic men sought to change the belief that condoms are unclean; reinforce the importance of family values; and introduce the belief that condoms can prevent HIV.
Persuasive communication (Persuasion-Communication Matrix, Elaboration Likelihood Method, Social Cognitive Theory, Diffusion of Innovations Theory) (Petty et al., 2009)	Guiding individuals and environmental agents toward the adoption of an idea, attitude, or action by using arguments or other means.	Messages need to be relevant and not too discrepant from the beliefs of the individual; can be stimulated by surprise and repetition. Will include arguments.	Viewing a television broadcast on the health consequences to children from environmental tobacco smoke and the benefits of protecting children from smoke may influence a mother to declare her home smoke free.

(Continued)

Table 6.3 (Continued)

Methods (Related Theory)	Definition	Parameters For Use	Examples
Active learning (Persuasion-Communication Matrix, Elaboration Likelihood Method, Social Cognitive Theory) (Petty et al., 2009)	Encouraging learning from goal-driven and activity-based experience.	Time, information, and skills.	A teacher gets students to ask questions about how to prevent STIs and to search for answers.
Tailoring (Trans-Theoretical Model, Precaution Adoption Process Model, Protection Motivation Theory, Persuasion-Communication Matrix) (Lustria et al., 2009)	Matching the intervention or components to previously measured characteristics of the participant.	Tailoring variables or factors related to behavior change (such as stage) or to relevance (such as culture or socioeconomic status).	A patient educator motivates her patients to engage in vigorous physical activity by giving different messages based on the stage of change of each patient, for example developing an action plan for those in action.
Individualization (Trans-Theoretical Model) (Bartholomew et al., 2002b)	Providing opportunities for learners to have personal questions answered or instructions paced according to their individual progress.	Personal communication that responds to a learner's needs.	An AIDS services organization provides a phone facility for young gay people to ask questions about their sexual identity and coming-out.
Modeling (Social Cognitive Theory; Theories of Learning) (McAlister et al., 2008)	Providing an appropriate model being reinforced for the desired action.	Attention, remembrance, self-efficacy and skills, reinforcement of model, identification with model, coping model instead of mastery model.	The health promoter finds a role model from the at-risk group who will encourage identification and serve as a coping model: "I tried to quit smoking several times and was not successful, then I tried . . . Now I have been off cigarettes for . . ."

Table 6.3 (Continued)

Methods (Related Theory)	Definition	Parameters For Use	Examples
Feedback (Theories of Learning, Goal-Setting Theory) (Kazdin, 2008)	Giving information to individuals and environmental agents regarding the extent to which they are accomplishing learning or performance, or the extent to which performance is having an impact.	Feedback needs to be individual, follow the behavior in time, and be specific.	A physical activity counselor informs a client that her body mass index has decreased by 4% since she has begun her physical activity program.
Reinforcement and Punishment (Theories of Learning, Social Cognitive Theory) (Kazdin, 2008)	Providing reinforcement: linking a behavior to any consequence that increases the behavior's rate, frequency or probability. Providing punishment: linking a behavior to any consequence that decreases the behavior's rate, frequency or probability.	Reinforcement and punishment need to be tailored to the individual, group, or organization, to follow the behavior in time, and to be seen as a consequence of the behavior.	An elementary school teacher praises a student for selecting a healthful dessert.
Facilitation (Social Cognitive Theory) (Bandura, 1986)	Creating an environment that makes the action easier or reduces barriers to action.	Requires real changes in the environment; identification of barriers and facilitators; power for making changes; and usually intervention at a higher environmental level to facilitate conditions on a lower level.	A program that targets improvement in drug users' self-efficacy for using clean needles must also facilitate accessibility of clean needles.

empirical background for these basic methods in Chapter Two. Intervention planners should always consider these methods when identifying promising methods for change.

**Methods to Influence Knowledge.** Knowledge is a necessary (though not sufficient) prerequisite for most other determinants, such as risk perceptions, behavioral beliefs, perceived norms, and skills. Many methods for other determinants will also change knowledge. Conventional wisdom long held that giving people information could change their behavior and thereby solve health and social problems. However, knowledge does not generally lead directly to behavior change; nor is assuring that the priority population attains knowledge necessarily an easy task. Theories of information processing provide several concepts that suggest methods for successfully conveying information. Table 6.4 gives an overview of the methods and parameters for influencing knowledge.

**Methods to Change Risk Perception, Awareness, and Health Beliefs.** Before we can motivate people for a health-promoting change, they first need to be aware of a risk for themselves. Table 6.5 presents the methods from various theories that may help people perceive their risk. Most of these methods are derived from theories on risk perception and risk communication; others come from stages of behavioral change theories that start with an awareness stage.

**Methods to Change Habitual, Automatic, and Impulsive Behaviors.** Health promotion planners often assume that an individual decides on a behavior in a planned and reasoned manner. However, many behaviors are automatic and habitual. Even when people make behavioral intentions, they may fail to follow up on those intentions. Table 6.6 summarizes methods for changing habitual and automatic behaviors, as well as methods to promote action control over impulsive behaviors. The attention of the scientific community to this type of behavior has increased in recent years; however, the evidence for effective methods is still limited.

**Methods to Change Attitudes, Beliefs, and Outcome Expectations.** Table 6.7 lists some of the methods that may be used to change people's health-related attitudes. Attitudes are a positive or negative reaction to something; but they can include more specific constructs of beliefs, outcome expectations, assessment of advantages and disadvantages, perceived benefits and barriers, self-evaluation, and motivation to act. Social psychology has devoted much attention to attitude change, and we present a very brief summary of this work here (for a more in-depth review, see Albarracin, Johnson, & Zanna, 2005; Petty, Barden, & Wheeler, 2009).

Table 6.4 Methods to Increase Knowledge\*

Methods (Related Theory)	Definition	Parameters For Use	Examples
Chunking (Theories of Information Processing) (Smith, 2008)	Using stimulus patterns that may be made up of parts but that one perceives as a whole.	Labels or acronyms are assigned to material to aid memory.	Children in the asthma self-management program learned a rap song with the words "Watch, discover, think, and act" for the stages of self-management.
Advance organizers (Theories of Information Processing) (Kools et al., 2006)	Presenting an overview of the material that enables a learner to activate relevant schemas so that new material can be associated.	Schematic representations of the content or guides to what is to be learned.	In a brochure for children with asthma, graphic organizers were placed on the top of every page, with the relevant concepts highlighted by means of thick lines and shadings.
Using imagery (Theories of Information Processing) (Steen, 2007)	Using artifacts that have a similar appearance to some subject.	Familiar physical or verbal images as analogies to a less familiar process.	A patient educator helps a learner memorize a long self-care process by attaching the steps in the procedure to landmarks on a familiar daily route.
Discussion (Theories of Information Processing) (Petty et al., 2009)	Encouraging consideration of a topic in open informal debate.	Listening to the learner to ensure that the correct schemas are activated.	A classroom teacher has students discuss what they learned in a video about defusing a bullying situation.

(Continued)

Table 6.4 (Continued)

Methods (Related Theory)	Definition	Parameters For Use	Examples
Elaboration (Theories of Information Processing, Elaboration Likelihood Model) (Petty et al., 2009)	Stimulating the learner to add meaning to the information that is processed.	Individuals with high motivation and cognitive ability; messages that are personally relevant, surprising, repeated, self-pacing, not distracting, easily understandable, and include direct instructions; messages that are not too discrepant and cause anticipation of interaction.	A group discusses the surprising safe sex message: "When you want to get pregnant, use a condom." They discover that condoms protect against Chlamydia so that what they do now can prevent infertility later.
Providing cues (Theories of Information Processing) (Godden & Baddeley, 1975)	Assuring that the same cues are present at the time of learning and the time of retrieval.	Cues work best when people are allowed to select and provide their own cues.	For teens who are learning to negotiate condom use, the cues present during learning, such as what the partner says, should be as similar as possible to what teens will actually encounter in real life.

\*Always consider basic methods at the individual level: Participation, belief selection, persuasive communication, active learning, tailoring, individualization, modeling, feedback, reinforcement and punishment, and facilitation; see Table 6.3.

**Methods for Changing Social Influences.** The influence of the social environment is an important determinant of many behaviors and as such will be found in many change objectives. One theory that tries to explain social influence is the Theory of Planned Behavior (TPB) (Conner & Sparks, 2005; Fishbein & Ajzen, 2010; Montaña, & Kasprzyk, 2008). This theory states that behavior is determined by intention and that intention is determined by attitudes, subjective social norms, and self-efficacy. Social influence in this theory is seen as social expectations, a cognitive construct; and the theory does not cover social influence in the form of modeling, an environmental construct. Social influence

**Table 6.5 Methods to Change Awareness and Risk Perception\***

Methods (Related Theory)	Definition	Parameters For Use	Examples
Consciousness raising (Health Belief Model, Precaution-Adoption Process Model, Trans-Theoretical Model) (Prochaska, et al., 2008)	Providing information, feedback, or confrontation about the causes, consequences, and alternatives for a problem or a problem behavior.	Can use feedback and confrontation; however, raising awareness must be quickly followed by increase in problem-solving ability and (collective) self-efficacy.	An HIV counselor reminds a person of recent episodes of failure to use condoms when having sex and the potential consequences of that behavior on significant others.
Personalize risk (Precaution-Adoption Process Model) (Champion & Skinner, 2008)	Providing information about personal costs or risks of action or inaction with respect to target behavior.	Present messages as individual and undeniable, and compare them with absolute and normative standards.	Individuals receive personal risk feedback on their fat intake, indicating whether it is higher than their self-rated level.
Scenario-based risk information (Precaution-Adoption Process Model) (Mevisen et al., 2009)	Providing information that may aid the construction of an image of the ways in which a future loss or accident might occur.	Plausible scenario with a cause and an outcome; imagery. Most effective when people generate their own scenario or when multiple scenarios are provided.	Peer models in an HIV-prevention program present a series of scenarios in which they describe how they found themselves in risky situations, for example, a sexual relationship over the summer holidays.
Framing (Protection Motivation Theory) (Werrij et al., 2010)	Using gain-framed messages, emphasizing the advantages of performing the healthy behavior, or loss-framed messages, emphasizing the disadvantages of not performing the healthy behavior.	Requires high self-efficacy expectations. Gain frames are more readily accepted and prevent defensive reactions.	“Missing early detection of cancer by not getting a Pap test every year can cost you your life (loss frame). Getting a Pap test every year may enable you to live to see your grandchildren grow up (gain frame).”

*(Continued)*

Table 6.5 (Continued)

Methods (Related Theory)	Definition	Parameters For Use	Examples
Self-reevaluation (Trans-Theoretical Model) (Prochaska et al., 2008)	Encouraging combining both cognitive and affective assessments of one's self-image with and without an unhealthy behavior.	Can use feedback and confrontation; however, raising awareness must be quickly followed by increase in problem-solving ability and self-efficacy.	A person can compare his or her image as a sedentary person to a possible image as an active person.
Dramatic relief (Trans-Theoretical Model) (Prochaska et al., 2008)	Encouraging emotional experiences, followed by reduced affect or anticipated relief if appropriate action is taken	Preferably should be done in counseling context so that emotions can be aroused and subsequently relieved.	A counselor encourages a client to role play a traumatic experience so that the emotion can be experienced and then relieved.
Environmental reevaluation (Trans-Theoretical Model) (Prochaska et al., 2008)	Encouraging combining the affective and cognitive assessments of how the presence or absence of a personal behavior affects one's social environment.	May include awareness about serving as a role model for others.	In a smoking cessation class, participants describe how their family members feel about their smoking.
Fear arousal (Protection Motivation Theory) (Ruiter et al., 2001)	Arousing negative emotional reactions in order to promote self-protective motivation and action.	Requires high self-efficacy expectations rather than high outcome expectations alone; is rarely effective.	A health promoter shows in an emotionally moving way how a child is hurt by fireworks before demonstrating techniques for safer firework handling.
Self-affirmation task (Protection Motivation Theory) (Harris et al., 2007)	Increasing people's self-image by having them elaborate on their relevant values or desirable characteristics.	Must be tailored to individual self-image.	A stress management class includes a writing exercise in which people record as many of their desirable characteristics as they can think of.

\*Always consider basic methods at the individual level: Participation, belief selection, persuasive communication, active learning, tailoring, individualization, modeling, feedback, reinforcement and punishment, and facilitation; see Table 6.3.

**Table 6.6 Methods to Change Habitual, Automatic and Impulsive Behaviors\***

<b>Methods (Related Theory)</b>	<b>Definition</b>	<b>Parameters For Use</b>	<b>Examples</b>
De-conditioning (Theories of Learning) (Robbins et al., 2001)	Letting people experience a lack of reinforcement or even negative outcomes of the undesired behavior.	Slow process, especially when reinforcement schedule was intermittent. It may be necessary to create a continuous lack of positive reinforcement.	A health educator advises parents to ignore a child's requests to buy unhealthy foods as they shop in a store.
Counter-conditioning (Trans-Theoretical Model; Theories of Automatic, Impulsive and Habitual Behavior) (Prochaska et al., 2008)	Encouraging the learning of healthier behaviors that can substitute for problem behaviors.	Availability of substitute behaviors.	When they feel the urge to smoke, smokers in a cessation program are instructed to do other behaviors than smoking, such as taking a short walk, chewing gum, or making a positive self-statement.
Implementation intentions (Theories of Goal Directed Behavior; Theories of Automatic, Impulsive and Habitual Behavior) (Gollwitzer & Sheeran, 2006)	Prompting making if-then plans that link situational cues with responses that are effective in attaining goals or desired outcomes.	Existing positive intention.	"You are more likely to go for a cervical smear if you decide when and where you will go. Please write in below when, where, and how you will make an appointment."
Cue altering (Theories of Goal Directed Behavior; Theories of Automatic, Impulsive and Habitual Behavior) (Wood & Neal, 2007)	Teaching people to change a stimulus that elicits or signals a behavior.	Existing positive intention.	Dieters change the places they keep snack food in order to prevent taking the snack automatically.

*(Continued)*

Table 6.6 (Continued)

Methods (Related Theory)	Definition	Parameters For Use	Examples
Stimulus control (Theories of Automatic, Impulsive and Habitual Behavior; Trans-Theoretical Model) (Wood & Neal, 2007)	Encouraging removing cues for unhealthy habits and adding prompts for healthier alternatives.	Needs insight in the behavioral chain leading to the automatic response.	Smokers are encouraged to remove all smoking paraphernalia (e.g., ashtrays, matches) from their houses and cars.
Planning coping responses (Attribution Theory and Relapse Prevention Theory; Theories of Goal Directed Behavior) (Marlatt & Donovan, 2005)	Getting the person to identify potential barriers and ways to overcome these.	Identification of high-risk situations and practice of coping response.	The HIV nurse and the patient define nonadherence as caused by habits. Then the HIV nurse and the patient formulate solutions to solve or avoid the causes for nonadherence.
Early commitment (Theories of Learning) (Robbins et al., 2001)	Having people choose a (larger) delayed reward far in advance.	Making the choice may be forced but the choice for the delayed reward needs to be voluntary.	A designated driver who voluntarily refrains from alcohol (immediate reward) during a party to bring friends safely home feels good about his role and will use a friend's service as designated driver at the next party (delayed reward).
Public commitment (Theories of Automatic, Impulsive and Habitual Behavior) (Ajzen et al., 2009)	Stimulating pledging, promising or engaging oneself to perform the healthful behavior, and announcing that decision to others.	Most effective when publicly announced; may include contracting.	A patient trying to get more exercise makes a private commitment to self and then announces her decision to others in the social environment.

\*Always consider basic methods at the individual level: Participation, belief selection, persuasive communication, active learning, tailoring, individualization, modeling, feedback, reinforcement and punishment, and facilitation; see Table 6.3.

Table 6.7 Methods to Change Attitudes\*

Methods (Related Theory)	Definition	Parameters For Use	Examples
Classical conditioning (Theories of Learning) (Kazdin, 2008)	Stimulating the learning of an association between an unconditioned stimulus (UCS) and a conditioned stimulus (CS).	Most effective when the time interval is short and the CS precedes the UCS.	Women with high body concern completed a conditioning procedure in which pictures of their bodies were selectively linked to positive social feedback: smiling faces.
Self-reevaluation (Trans-Theoretical Model, Social Cognitive Theory) (Prochaska et al., 2008)	Encouraging combining both cognitive and affective assessments of one's self-image with and without an unhealthy behavior.	Stimulation of both cognitive and affective appraisal of self-image.	A person can compare his or her image as a sedentary person to a possible image of themselves as an active person.
Environmental reevaluation (Trans-Theoretical Model, Social Cognitive Theory) (Prochaska et al., 2008)	Encouraging realizing the negative impact of the unhealthy behavior and the positive impact of the healthful behavior.	Stimulation of both cognitive and affective appraisal to improve appraisal and empathy skills.	Empathy training, viewing of documentaries or testimonials, or family interventions.
Shifting perspective (Theories of Stigma and Discrimination) (Batson et al., 2002)	Encouraging taking the perspective of the other.	Initiation from the perspective of the learner; needs imaginary competence.	Parents instructing small children to cross the street kneel down to see traffic from the child's height.
Arguments (Persuasion-Communication Matrix, Elaboration Likelihood Model) (Petty et al., 2009)	Using a set of one or more meaningful premises and a conclusion.	For central processing of arguments they need to be new to the message receiver.	Hearing for the first time about the benefits of protecting children from smoke may influence a mother to declare her home smoke free.

(Continued)

Table 6.7 (Continued)

Methods (Related Theory)	Definition	Parameters For Use	Examples
Direct experience (Theories of Learning) (Maibach & Cotton, 1995)	Encouraging a process whereby knowledge is created through the interpretation of experience.	Rewarding outcomes from the individual's experience with the behavior or assurance that the individual can cope with and reframe negative outcomes.	Rehabilitation counselors in training try taking a trip while in a wheelchair. This may change their attitudes about what it is like to use a wheelchair.
Elaboration (Theories of Information Processing, Elaboration Likelihood Model) (Petty et al., 2009)	Stimulating the learner to add meaning to the information that is processed.	Individuals with high motivation and cognitive ability; messages that are relevant, surprising, repeated, self-pacing, not distracting, easily understandable, and include direct instructions; messages that are not too discrepant and cause anticipation of interaction.	A program for men in a shelter made messages relevant, surprising and repeated by embedding them in playing competitive games, storytelling, and watching videos, activities that were salient pastimes.
Anticipated regret (Theory of Planned Behavior/Theory of Reasoned Action <sup>2</sup> ) (Richard et al., 1995)	Stimulating people to focus on their feelings <i>after</i> unintended risky behavior, before any losses actually materialize.	Stimulation of imagery; assumes a positive intention to avoid the risky behavior.	A sex educator asks people to imagine how they would feel after risky behavior such as having had unsafe sex.
Repeated exposure (Theories of Learning) (Zajonc, 2001)	Making a stimulus repeatedly accessible to the individual's sensory receptors.	Neutrality of original attitude.	Adolescents may be shown condoms repeatedly in classroom HIV-prevention education.

Table 6.7 (Continued)

Methods (Related Theory)	Definition	Parameters For Use	Examples
Cultural similarity (Persuasion-Communication Matrix) (Kreuter & McClure, 2004)	Using characteristics of the target group in source, message, and channel.	Using surface characteristics of the target group enhances receptivity. Using social-cultural characteristics leads to a more positive reception of the message.	Trained members of the Latino community give culturally relevant messages for cancer prevention and screening trials.

\*Always consider basic methods at the individual level: Participation, belief selection, persuasive communication, active learning, tailoring, individualization, modeling, feedback, reinforcement and punishment, and facilitation; see Table 6.3.

through modeling is a central construct in SCT, which explicates intervention methods that change the social environment as well as perceived social influence (Bandura, 1986). Social influence may also occur as upward and downward social comparison: Facilitating the observation of nonexpert others in order to evaluate one's own opinions and performance abilities (Suls, Martin, & Wheeler, 2002). Table 6.8 presents methods for changing both cognitive and environmental social influences (see also Cialdini, 2008).

**Methods to Influence Skills, Capability, and Self-Efficacy and to Overcome Barriers.** Constructs addressed in this section are self-efficacy, perceived behavioral control, perceived barriers, skills, and perceived skills. Self-efficacy is often a crucial determinant in changing health behavior. When people are motivated, the remaining question is whether they are able and feel confident to change their behavior. Self-efficacy is a determinant for the precursors of behavior—intention, preparation to act, and decision to act. But it also directly influences behavior, implementation, and maintenance of behavior change. Self-efficacy and related concepts are all personal determinants, but there is a distinction between perceptions (for example, perceived skills) and reality (for example, real skills). Even with sufficient real skills, people may not try the new behavior when their perceived skills are low. And people with high perceived skills may fail because they have insufficient real skills. Methods to improve self-efficacy are therefore often methods that also improve real skills. Table 6.9 (on p. 343) presents methods and parameters to enhance skills and self-efficacy.

Table 6.8 Methods to Change Social Influence\*

Methods (Related Theory)	Definition	Parameters For Use	Examples
Information about others' approval (Theory of Planned Behavior/Theory of Reasoned Action <sup>2</sup> ) (Forsyth, 2006)	Providing information about what others think about the person's behavior and whether others will approve or disapprove of any proposed behavior change.	Positive expectations are available in the environment.	University students are given data showing the percentage of students who drink on campus, which usually is less than the students predict.
Resistance to social pressure (Theory of Planned Behavior/Theory of Reasoned Action <sup>2</sup> ) (Evans et al., 1992)	Stimulating building skills for resistance to social pressure.	Commitment to earlier intention; relating intended behavior to values; psychological inoculation against pressure.	Young women learn effective refusal skills to use when a partner does not want to use a condom.
Shifting focus (Theory of Planned Behavior/Theory of Reasoned Action <sup>2</sup> ) (Fishbein & Ajzen, 2010)	Prompting hiding of the unpopular behavior or shifting attention away from the behavior.	Preferably shift focus to a new reason for performing the behavior.	Young women tell a partner that they want to use a condom to prevent pregnancy (instead of preventing STI/HIV).
Stimulate communication to mobilize social support (Theory of Planned Behavior/Theory of Reasoned Action <sup>2</sup> , Diffusion of Innovations Theory, Theories of Social Networks and Social Support) (Heaney & Israel, 2008)	Prompting communication about behavior change in order to provide instrumental and emotional social support.	Combines caring, trust, openness, and acceptance with support for behavioral change; positive support is available in the environment.	An exercise in a sex education program has students talk about safe sex and using condoms to make the positive expectations for using condoms more visible.

Table 6.8 (Continued)

Methods (Related Theory)	Definition	Parameters For Use	Examples
Provide opportunities for social comparison (Social Comparison Theory) (Suls et al., 2002)	Facilitating observation of nonexpert others in order to evaluate one's own opinions and performance abilities.	Upward comparison may help setting better goals; downward comparison may help feeling better or more self-efficacious.	A breast cancer patient may have had a lumpectomy, but sees herself as better off than another patient who lost her breast (downward comparison).

\*Always consider basic methods at the individual level: Participation, belief selection, persuasive communication, active learning, tailoring, individualization, modeling, feedback, reinforcement and punishment, and facilitation; see Table 6.3.

**Methods to Reduce Public Stigma.** The last table on changing individual behavior deals with stigma. Stigma is very difficult to change (Paluck & Green, 2009), but there are methods that may be successful under certain circumstances. Therefore, sticking to the parameters is especially crucial. Table 6.10 (on p. 347) presents methods and parameters to reduce stigma.

## Methods for Changing Environmental Conditions

The next section describes methods for changing determinants of environmental conditions, including the behavior of environmental agents. First, we list basic methods for change that can be applied at all environmental levels and then methods related to specific environmental conditions at each ecological level. In many of these tables, we refer the reader back to earlier tables of methods for both individual and general determinants, indicating that these methods can be used to change the environmental condition or that the methods are embedded in the environmental change methods.

**Basic Methods for Change of Environmental Conditions.** Some individual methods for change turn out to be useful at most environmental levels. Skills training by guided practice (see Table 6.9), for example, will be applied in almost any method directed at changing an environmental agent's behavior, even when the form of the training may be different than when this method is applied at the strictly individual level. Table 6.11 (on p. 349) lists basic methods at

**Table 6.9 Methods to Change Skills, Capability, and Self-Efficacy and to Overcome Barriers\***

Methods (Related Theory)	Definition	Parameters For Use	Examples
Guided practice (Social Cognitive Theory, Theories of Self-Regulation) (McAlister et al., 2008)	Prompting individuals to rehearse and repeat the behavior various times, discuss the experience, and provide feedback.	Subskill demonstration, instruction, and enactment with individual feedback; requires supervision by an experienced person; some environmental changes cannot be rehearsed.	The trainer models the behavior a number of times and asks the trainees to do the behavior. The trainer gives feedback including both correction and emphasis on aspects done well.
Enactive mastery experiences (Social Cognitive Theory, Theories of Goal Directed Behavior, Theories of Self-Regulation) (McAlister et al., 2008)	Providing increasingly challenging tasks with feedback to serve as indicators of capability.	Requires willingness to accept feedback.	After students are taught how to intervene in situations of bullying, they perform new skills in a simulated setting to experience mastery.
Verbal persuasion/exhortation (Social Cognitive Theory, Theories of Self-Regulation) (McAlister et al., 2008)	Using messages that suggest that the participant possesses certain capabilities.	Credible source.	Teachers were shown a videotape on which teachers like them discussed their successful experiences in the regular classroom using the intervention with difficult-to-teach children.
Improving physical and emotional states (Social Cognitive Theory) (McAlister et al., 2008)	Prompting interpretation of enhancement or reduction of physiological and affective states, to judge own capabilities.	Must carefully interpret and manage emotional states.	Students in a public speaking class are taught to breathe deeply and relax prior to their presentation. They label the anxiety they feel as excitement.

Table 6.9 (Continued)

Methods (Related Theory)	Definition	Parameters For Use	Examples
Reattribution training (Attribution Theory and Relapse Prevention Theory, Theories of Self-Regulation) (Martlatt & Donovan, 2005)	Helping people reinterpret previous failures in terms of unstable attributions and previous successes in terms of stable attributions.	Requires counseling or bibliotherapy to make unstable and external attributions for failure.	The counselor suggests that a smoker's relapse was due to a temporary condition and that she can learn from this experience to stay off cigarettes.
Self-monitoring of behavior (Theories of Self-Regulation) (Creer, 2000b)	Prompting the person to keep a record of specified behavior(s).	The monitoring must be of the specific behavior (that is, not of a physiological state or health outcome). The data must be interpreted and used. The reward must be reinforcing to the individual.	Patients keep a diary on their therapy adherence in order to find out when and why medication is missed.
Provide contingent rewards (Theories of Learning, Theories of Self-Regulation) (Bandura, 1996)	Praising, encouraging, or providing material rewards that are explicitly linked to the achievement of specified behaviors.	Rewards need to be tailored to the individual, group or organization, to follow the behavior in time, and to be seen as a consequence of the behavior.	Smokers who are trying to quit smoking receive monetary vouchers for breath samples with carbon monoxide (CO) levels of 8 ppm or less.
Cue altering (Theories of Goal Directed Behavior, Theories of Automatic, Impulsive, and Habitual Behavior, Theories of Self-Regulation) (Achtiger et al., 2008)	Teaching changing a stimulus, either consciously or unconsciously perceived, that elicits or signals a behavior.	Existing positive intention.	Dieters change the route they take, walking to work in order to avoid easy access to snack shops.

(Continued)

Table 6.9 (Continued)

Methods (Related Theory)	Definition	Parameters For Use	Examples
Public commitment (Theories of Automatic, Impulsive, and Habitual Behavior) (Ajzen et al, 2009)	Stimulating pledging, promising, or engaging oneself to perform the healthful behavior and announcing that decision to others.	Needs to be a public announcement; may include contracting.	High school students sign individual contracts not to smoke, which are then placed on the classroom wall for all to see.
Goal setting (Goal-Setting Theory, Theories of Self Regulation) (Latham & Locke, 2007)	Prompting planning what the person will do, including a definition of goal-directed behaviors that result in the target behavior.	Commitment to the goal; goals that are difficult but available within the individual's skill level.	Dietician and patient discuss the weight loss goal for the next meeting, deciding on a goal that is acceptable to the patient and to the dietician.
Set tasks on a gradient of difficulty (set graded tasks)(Social Cognitive Theory, Theories of Self Regulation) (McAlister et al., 2008)	Setting easy tasks and increasing difficulty until target behavior is performed.	The final behavior can be reduced to easier but increasingly difficult sub-behaviors.	Physiotherapist and patient discuss increasingly intensive exercises for the patient in order to gradually build up the patient's condition.
Planning coping responses (Attribution Theory and Relapse Prevention Theory, Theories of Goal Directed Behavior, Theories of Self-Regulation) (Marlatt & Donovan, 2005)	Prompting participants to list potential barriers and ways to overcome these.	Identification of high-risk situations and practice of coping response.	The HIV nurse and the patient define the causes of nonadherence (lack of understanding, lack of motivation, insufficient action plan, barriers). Then the HIV nurse and the patient formulate solutions to solve or avoid the causes for nonadherence.

\*Always consider basic methods at the individual level: Participation, belief selection, persuasive communication, active learning, tailoring, individualization, modeling, feedback, reinforcement and punishment, and facilitation; see Table 6.3.

Table 6.10 Methods to Reduce Public Stigma\*

Methods (Related Theory)	Definition	Parameters For Use	Examples
Stereotype-inconsistent information (Theories of Stigma and Discrimination) (Bos et al., 2008)	Providing positive examples from the stigmatized group.	Only effective when there are many different examples. Examples are not too discrepant from original stereotype.	Positive portrayals of stigmatized individuals in mass media or leaflets.
Interpersonal contact (Theories of Stigma and Discrimination) (Pettigrew & Tropp, 2006)	Bringing people in contact with members of the stigmatized group.	Requires positive experiences. Most effective when: no status differences; externally sanctioned; intensive contact; common or shared goals.	Presentations by stigmatized persons in educational interventions.
Empathy training (Theories of Stigma and Discrimination) (Batson et al., 2002)	Stimulating people to empathize with another person, that is, imagine themselves in the situation of the stigmatized person.	Requires being able and willing to identify with the stigmatized person. Imagine how the other person would feel (this leads to empathy). Do not imagine how you would feel (this leads to both empathy and distress).	Personal stories of experiences of stigmatized individuals.
Cooperative learning (Theories of Stigma and Discrimination) (Aronson, 2010)	Engineering lessons in a way that students must learn from one another.	Requires careful organization of lesson information distribution.	Teachers give each student one piece of the lesson plan, so that good comprehension requires students to collaborate.

(Continued)

Table 6.10 (Continued)

Methods (Related Theory)	Definition	Parameters For Use	Examples
Conscious regulation of impulsive stereotyping and prejudice (Theories of Stigma and Discrimination) (Bos et al., 2008)	Forcing oneself to control impulsive negative reactions related to stigma.	Mere suppression almost always leads to counterproductive effects and is not advisable. Conscious self-regulation of automatic stereotyping can be used effectively.	Participants practice saying “Stop thinking this way” to themselves as they watch videos of stigmatizing people.
Reducing inequalities of class, race, gender and sexuality (Theories of Stigma and Discrimination) (Link & Pheelan, 2001)	<i>See methods for changes at higher environmental levels (see Tables 6.11–6.16).</i>		Mobilizing social support, community organizing, empowerment of stigmatized persons, agenda setting, creating and enforcing laws and regulations, and threatening with coercion.

\*Always consider basic methods at the individual level: Participation, belief selection, persuasive communication, active learning, tailoring, individualization, modeling, feedback, reinforcement and punishment, and facilitation; see Table 6.3.

the environmental level for the health promoter: systems change, participatory problem solving, advocacy and lobbying, modeling, and technical assistance. We discussed the theoretical and empirical background for these basic methods in Chapter Three. Intervention planners should always consider these methods when identifying promising methods for change at all environmental levels.

**Methods to Change Social Norms.** In Chapter Three we presented social norms theory as a community-level theory. However, social norms are influential at all levels. In Table 6.8 we summarized the methods to change social influence, of which social norms are a relevant form. There, the focus was on the individual’s perception of, and coping with, social norms. In Table 6.12 (on p. 351) the

Table 6.11 Basic Methods at the Environmental Level\*

Methods (Related Theory)	Definition	Parameters For Use	Examples
Systems change (Systems Theory) (National Cancer Institute, 2007)	Interacting with the environment to change the elements and relationship among elements of a system at any level, especially through dialogue with stakeholders, action, and learning through feedback.	Methods and actors depend on the level of the system.	A city's transportation department created bicycle lanes on streets to encourage people to ride bicycles to work as a result of a stakeholder advisory committee's recommendations.
Participatory problem solving (Organizational Theories, Coalition Theory, Social Capital Theory, Models of Community Organization) (Butterfoss, Kegler, & Francisco, 2008; Cummings & Worley, 2009; Minkler, Wallerstein, & Wilson, 2008)	Diagnosing the problem, generating potential solutions, developing priorities, making an action plan, and obtaining feedback after implementing the plan.	Requires willingness by the health promoter or convener to accept the participants as equals and as having a high level of influence; requires target group to possess appropriate motivation and skills.	A health promotion consultant assists employees of a small company to identify the level and sources of stress and develop a plan with management to address and monitor work stress.
Coercion (Turner, 2005)	Attempting to control others against their will.	Requires or creates a power differential.	Health promotion activists organize a consumer boycott of a company that sells formula in developing countries.

(Continued)

Table 6.11 (Continued)

Methods (Related Theory)	Definition	Parameters For Use	Examples
Advocacy and lobbying (Stage Theory of Organizational Change, Models of Community Organization, Agenda-Building Theory, Multiple Streams Theory) (Christoffel, 2000; Galer-Unti et al., 2004; Kingdon, 2003; Wallack et al., 1993; Weible & Sabatier, 2009)	Arguing and mobilizing resources on behalf of a particular change; giving aid to a cause; active support for a cause or position.	Form of advocacy must match style and tactics of the people, communities or organizations represented, and the nature of the issue; includes policy advocacy; often tailored to a specific environmental agent.	Members of the American Public Health Association use the organization's action alert system to contact their legislators to urge them to vote for pending health care reform legislation.
Modeling (Social Cognitive Theory, Organizational Theories, Diffusion of Innovations Theory, Empowerment Theory) (Bandura, 1997; McAlister et al., 2008; Rogers, 2003)	Providing an appropriate model being reinforced for the desired action.	Appropriate models will vary by level, including group members and organizational, community, and policy change agents.	An article in the state medical journal highlights the experience of a city hospital emergency department that has instituted routine HIV testing, found new cases of HIV that would have gone undetected, and received recognition from the state's HIV Community Planning Group.
Technical assistance (Organizational Theories, Diffusion of Innovations Theory, Coalition Theory, Social Capital Theory, Models of Community Organization) (Flaspohler et al., 2008; Mitchell, Florin, & Stevenson, 2002)	Providing technical means to achieve desired behavior.	Nature of technical assistance will vary by environmental level but must fit needs, culture, and resources of recipient.	A health department liaison helps a community health center design recruitment procedures, training, and supervisory guidelines as they establish a new lay health worker program.

\* Consider basic methods and all appropriate methods at individual level; see Tables 6.3—6.10.

Table 6.12 Methods to Change Social Norms\*

Methods (Related Theory)	Definition	Parameters For Use	Examples
Mass media role-modeling (Diffusion of Innovations Theory, Social Cognitive Theory) (Bandura, 1997; Rogers, 2003)	Providing appropriate models being reinforced for the desired action through the mass media.	Conditions for modeling; conditions for persuasive communication (see Table 6.3).	A feature story about mammography screening on the news includes a woman who caught the cancer early by having a routine mammogram. The cancer was removed by lumpectomy.
Entertainment-education, edutainment (Diffusion of Innovations Theory) (Bandura, 1997; Bouman et al., 1998; Moyer-Guse, 2008; Petraglia, 2007; Rogers, 2003; Wilkin et al., 2007)	Providing a form of entertainment designed to educate (about health behavior) as well as to entertain.	Consideration of source and channel; balance of media professional's and health promoter's needs.	A soap opera has a storyline about a lead character's being arrested for drinking and driving.
Behavioral journalism (Diffusion of Innovations Theory, Social Cognitive Theory) (McAlister, 1991; McAlister et al., 2000; Ramirez et al., 1995, 1999; Reininger et al., 2009)	Using by the mass and local media of appropriate role-model stories of behavior change based on authentic interviews with the target group.	Adequate role models from the community and elicitation interviews to describe the behavior and the positive outcome.	Baseball cardsize cards with a picture and a short story concerning how a woman got her boyfriend to willingly use a condom are part of a sex education program for runaway teens.
Mobilizing social networks (Theories of Social Networks and Social Support) (Heaney & Israel, 2008)	Encouraging social networks to provide informational, emotional, appraisal, and instrumental support.	Availability of social network and potential support givers.	Parents are coached on how to make their negative views about smoking clear to their children as part of a tobacco prevention program.

\*Consider basic methods and all appropriate methods at individual level; see Tables 6.3—6.10. Consider basic methods at environmental levels, that is, systems change, participatory problem solving, advocacy and lobbying, modeling, and technical assistance; see Table 6.11.

**Table 6.13 Methods to Change Social Support and Social Networks\***

Methods (Related Theory)	Definition	Parameters For Use	Examples
Enhancing network linkages (Theories of Social Networks and Social Support) (Heaney & Israel, 2008)	Training network members to provide support and members of the target group to mobilize and maintain their networks.	Available network.	A patient educator helps a patient who has had a stroke and her family link to a patient support group and community day care.
Developing new social network linkages (Theories of Social Networks and Social Support) (Heaney & Israel, 2008)	Linking members to new networks by mentor programs, buddy systems, and self-help groups.	Willingness of networks to reach out; availability of networks that can provide appropriate support and linkage agents.	Newly diagnosed breast cancer patients are linked to survivors who provide informational and emotional support.
Use of lay health workers (Theories of Social Networks and Social Support, Models of Community Organization) (Eng et al., 2009)	Mobilizing members of the target population to serve as boundary spanners, credible sources of information, and role models.	Natural helpers in community with opinion leader status and availability to volunteer for training.	<i>Promotoras</i> from a local clinic provide information and outreach to community members at risk for diabetes.

\*Consider basic methods and all appropriate methods at individual level; see Tables 6.3—6.10. Consider basic methods at environmental levels, that is, systems change, participatory problem solving, advocacy and lobbying, modeling, and technical assistance; see Table 6.11.

focus is on changing the social norms themselves with methods derived from sociological and social-psychological theories.

**Methods to Change Social Support and Social Networks.** As discussed in Chapter Three, social networks are the basis for social support. In Table 6.13 (on p. 352) we describe methods at the interpersonal level to change social

networks so that they offer support more effectively to their members, help members mobilize support from their networks, and link members with other networks. Networks can engage in participatory problem-solving processes aimed at finding ways to solve specific problems of individuals, families, or communities. We highlight the use of lay health workers specifically (Eng, Rhodes, & Parker, 2009). These are natural helpers (community members to whom other persons turn for advice, emotional support, and tangible aid) who receive special training to support others, including linking them to the formal service delivery system.

**Methods to Change Organizations.** In Table 6.14 (on p. 353) we present methods from organizational change theories, including organizational development, the Stage Theory of Organizational Change, Diffusion of Innovations Theory (DIT), and Stakeholder Theory. These include organizational processes, such as participatory problem solving and team building, which can create changes in organizational norms and practices (Butterfoss et al., 2008; Jones, Baggott, & Allsop, 2004; Rogers, 2003; Schein, 2004). DIT and the Stage Theory of Organizational Change provide methods that can be used to direct the adoption of an innovation, such as a nonsmoking policy, as well as the adoption, implementation, and continuation of a full health promotion program. These methods are often led by a consultant, hence the use of technical assistance as a method. Stakeholder Theory, which focuses on change influences external to an organization, provides methods that can be used by a health promoter or community to get an organization to change.

**Methods to Change Communities.** In Table 6.15 we summarize methods that reflect various types of community change. These include problem-posing education or conscientization, community development, social action, forming coalitions, and framing to shift perspectives (Butterfoss, 2007; Freire, 1973a, 1973b; Minkler, Wallerstein, & Wilson, 2008; Wallerstein, Sanchez, & Velarde, 2004) that we discussed extensively in Chapter Three. The skillful community organizer uses these models to select processes that fit the context of the community and the key issues to be addressed. These often shift over time. The community methods relate to two separate interventions: (1) that of the health promoter with the community directed to empowerment and community capacity and (2) that of the community toward the environmental agent

Table 6.14 Methods to Change Organizations\*

Methods (Related Theory)	Definition	Parameters For Use	Examples
Sense-making (Organization Change Theory) (Weick & Quinn, 1999)	Leaders reinterpret and relabel processes in organization, create meaning through dialogue, and model and redirect change.	Used for continuous change, including culture change.	A supervisor in a hospital talks to his staff about the positive aspects of finding and correcting mistakes in documentation of medication administration.
Organizational diagnosis and feedback (Organizational Development Theory) (Cummings & Worley, 2009)	Assessing of organizational structures and employees' beliefs and attitudes, desired outcomes and readiness to take action, using surveys and other methods.	Methods appropriate to organizational characteristics, for example, size and information technology.	An organizational consultant conducts a survey of employees' health behaviors and determinants and holds focus groups of employees to review the results and plan for health promotion programs.
Team building and human relations training (Organizational Development Theory) (Cummings & Worley, 2009)	Grouping development activities based on the values of human potential, participation, and development.	Compatible with the culture.	Participants in a retreat work interdependently to solve a puzzle.
Structural redesign (Organizational Development Theory) (Cummings & Worley, 2009; Jones, 2004)	Change organizational elements such as formal statements of organizational philosophy, communication flow, reward systems, job descriptions, and lines of authority.	Management authority and agreement.	A health promotion consultant works with an organization to renew the organizational vision statement to include the health of employees.

Table 6.14 (Continued)

Methods (Related Theory)	Definition	Parameters For Use	Examples
Increasing stakeholder influence (Stakeholder Theory) (Brown et al., 2003; Mitchell et al., 1997)	Increase stakeholder power, legitimacy, and urgency, often by forming coalitions and using community development and social action to change an organization's policies.	The focal organization perceives that the external organization or group is one of its stakeholders.	A community group uses media advocacy to highlight the groundwater pollution by gas storage tanks located in the community and to demand that the tanks be moved by the gas company that owns them.

\*Consider basic methods and all appropriate methods at individual level; see Tables 6.3—6.10. Consider basic methods at environmental levels, that is, systems change, participatory problem solving, advocacy and lobbying, modeling, and technical assistance; see Table 6.11.

(see Figure 3.3). For example, the health promoters carry out a facilitated community intervention designed to assist the community in understanding the issues it must face, setting priorities, and developing and implementing action plans to address the key issues. Then the community implements the action plan, using methods of change appropriate to the environmental agent and desired change. This may involve individuals, organizations, and government. We discuss specific methods for political change in the next section.

**Methods to Change Policy.** Political change takes place using many of the methods for individual, organizational, and community change that we presented earlier. However, these are in service to theories that explain how policy is formulated, implemented, and modified. In Chapter Three we discussed the Agenda-Building Theory, the Multiple Streams Theory, and the Advocacy Coalition Framework (Cobb & Elder, 1983; John, 2003; Kingdon, 2003; Sabatier, 2003). These theories provide insight into when to use various individual and community influence methods, such as information giving, negotiation, and advocacy, including media advocacy (see Table 6.16).

Table 6.15 Methods to Change Communities\*

Methods (Related Theory)	Definition	Parameters For Use	Examples
Problem-posing education (Conscientization Theory; Empowerment Theory) (Freire, 1973a, 1973b; Wallerstein et al., 1997, 2004)	Participatory analysis using critical reflection, self-disclosure, and dialogue regarding the social forces underlying a problem and a commitment to change self and community.	A safe environment for participation and disclosure; a critical stance.	In facilitated small-group discussion, adolescents share the effects of their own and others' alcohol abuse on their lives. They reflect on what this means both personally and to their community. They ask "What can we do about this?" and take action.
Community assessment (Models of Community Organization) (Rothman, 2004)	Assessing a community's assets and needs, with feedback of results to the community.	Requires expert assistance and possibilities for feedback.	Community members and the health department used surveys, interviewing, and community mapping to conduct an assessment. The findings were reported at a community meeting.
Community development (Models of Community Organization; Theories of Power) (Minkler & Wallerstein, 2004, 2008; Rothman, 2004)	A form of community organization, based on consensus, in which power is shared equally and members engage together in participatory problem solving.	Starting where the community is; may be grassroots or professional-driven.	A community organizer convenes a task force of the school board, the mayor's office, the disenfranchised community, and a city council member to discuss a report documenting inequities in the schools and to make plans to address them.

Table 6.15 (Continued)

Methods (Related Theory)	Definition	Parameters For Use	Examples
Social action (Models of Community Organization; Theories of Power) (Minkler & Wallerstein, 2004, 2008; Rothman, 2004)	A form of community organization, based in conflict, in which disenfranchised people wrest power from the official power.	Starting where the community is; may be grassroots or professional-driven.	A community organizer works with a low-income community that has identified a need to improve educational resources available to their children. They document the inequities in the schools and extracurricular programs across the city, present their findings and challenge the school board to act on them in a press conference. They organize community members to attend the next school board meeting to demand that this inequality be redressed.
Forming coalitions (Models of Community Organization; Social Capital Theory) (Butterfoss, 2007; Butterfoss & Kegler, 2009)	Forming an alliance among individuals or organizations, during which they cooperate in joint action to reach a goal in their own self-interest.	Requires collaboration across various agendas; requires attention to stages of partnership development.	A grant application requires that a community develop a tobacco prevention coalition with representatives from public health, education, voluntary health associations, law enforcement, businesses, the health care sector, and other community groups to address the issue of youth smoking.

(Continued)

Table 6.15 (Continued)

Methods (Related Theory)	Definition	Parameters For Use	Examples
Reporting, social planning (Models of Community Organization) (Rothman, 2004)	Using information based on research to address issues.	Requires credible source of the information.	The health department planner presented epidemiological data on HIV/AIDS prevalence and trends to the Prevention Planning Group as they selected priority populations for programs.
Framing to shift perspectives (Models of Community Organization) (Snow, 2004)	Assigning meaning and interpretation to relevant events and conditions in order to mobilize potential constituents, gain bystander support, and demobilize antagonists.	Match with culture.	Community organizers in tobacco prevention frame youth smoking as the result of heavy targeted advertising by the tobacco industry rather than as an individual decision.

\*Consider basic methods and all appropriate methods at individual level; see Tables 6.3—6.10. Consider basic methods at environmental levels, that is, systems change, participatory problem solving, advocacy and lobbying, modeling, and technical assistance; see Table 6.11.

## From Methods to Applications

The fourth task in Step 3 is to select or design practical applications.

As we discussed earlier in this chapter, one method may be accomplished by many applications, and the planner must decide which applications best fit the situation's context. The case studies in Chapters Ten through Thirteen (Chapters Eleven through Thirteen can be found on the Web at the book's instructor Website) give examples of the links between objectives, methods, applications, and programs.

The challenge that this task presents for most health educators is how to come up with creative applications. Many people find themselves stymied by having looked at boxes and arrows for too long. We suggest that health educators step back from the details of the program planning at this point and discuss all the ideas that have been bubbling up for intervention applications. After

Table 6.16 Methods at the Societal Level\*

Methods (Related Theory)	Definition	Parameters For Use	Examples
Media advocacy (Models of Community Organization) (Wallack et al. 1993, 2008)	Expose environmental agents' behaviors in the mass media in order to get them to improve health-related conditions. A type of advocacy.	Requires the media to approve the news value of the message and accept the message without changing its essential content.	A public-interest group holds a press conference to focus attention on the serving sizes, fat and calories in foods served in fast food restaurants, how that contributes to the obesity epidemic, and what the restaurants, as responsible community businesses, should do.
Agenda setting (Agenda-Building Theory, Multiple Streams Theory, Advocacy Coalition Theory, Theories of Power) (Cobb & Elder, 1983; Sabatier, 2003; Weible, 2008; Weible et al., 2009)	Process of moving an issue to the political agenda for action; may make use of advocacy and media when initiated from outside government.	Requires appropriate timing (see policy window) and collaboration of media gatekeepers.	An advocacy group developed a position paper on the expansion of the child health insurance program. They released the report to the media and held meetings with key state legislators.
Timing to coincide with policy windows (Multiple Streams Theory) (Kingdon, 2003; Zahariadis, 2007)	Advocating policy when politics, problems and policy solutions are aligned to be receptive to a policy issue.	Requires an astute policy advocate who is well-prepared.	Health care reform advocates in the United States began to develop coalitions and position papers with the election of a president known to be supportive of that issue.

(Continued)

Table 6.16 (Continued)

Methods (Related Theory)	Definition	Parameters For Use	Examples
Creating and enforcing laws and regulations (Theories of Public Policy, Theories of Power) (Kingdon, 2003; Longest, 2006)	Forcing compliance or dictating or precluding choices. Sometimes implementing existing laws to accomplish change. Laws and regulations may also provide incentives.	Requires unequal power and availability of control and sanctions.	Based on a citizen group's request, the police department began to enforce the loitering ordinance to reduce drug-related activity in the community.

\*Consider basic methods and all appropriate methods at individual level; see Tables 6.3—6.10. Consider basic methods at environmental levels, that is, systems change, participatory problem solving, advocacy and lobbying, modeling, and technical assistance; see Table 6.11.

that, they must return to the work the planners have done on methods and objectives at each intervention level to evaluate the theoretical and empirical support for their ideas. The determinants in the matrices will help guide the planning toward theoretical methods; the change objectives, which provide more specification and detail, will help the planning team to select or design practical applications of the methods. The case study chapters provide detailed examples of applications linked to methods.

It is important at this time for health educators to revisit the intervention population and the proposed program setting, because applications will depend greatly on to whom and where the program is being delivered. For example, the Cystic Fibrosis Family Education Program (CF FEP) (Bartholomew et al., 1991) included many SCT constructs, so the planning team might logically have thought of applications that included a lot of interaction, such as group sessions and role playing for modeling. However, the team knew from having met with parents and adolescents during the needs assessment that they could reach only about 25% of the parent intervention group and almost none of the adolescents in a group setting. They therefore used applications such as role-model stories in newsletters, and they integrated delivery into the clinical encounter. These types of application decisions, based on formative work, are very important. In Chapter Twelve (on the Web at the book's instructor Website), for example, the authors describe trying to operationalize modeling with role playing as part of an HIV-prevention program in vocational schools. The teachers, however, had a different idea. They were so uncomfortable with organizing and moderating role playing that the planners knew they had to choose another application.

The following section provides examples of program elements that illustrate the translation of methods to applications with careful attention to theoretical parameters.

### Stick to the Theoretical Parameters

In the methods tables presented earlier, we provided a consideration of use for each method. These considerations included theoretical parameters and, particularly at the environmental levels, characteristics of the context that program planners must take into account. In the following section, we provide examples of the translation of methods into applications, focusing on the parameters, the conditions under which the method will work. The challenge for health promotion program planners is to design creative intervention applications that fit the context and characteristics of the program participants while ensuring that the applications also address the parameters for the selected methods.

First, we give an example of an intervention that failed to use theory correctly. One activity that is frequently proposed for school-based programs aimed at the prevention of drug abuse is to have former drug users warn students about the dangers of drugs. This activity is very popular among students, teachers, parents, school boards, and politicians. However, evaluation studies have shown that this application may lead to a significant increase in drug use among students (de Haes, 1987). The program planners made two mistakes in translating the method of modeling into a practical application. First, the former drug users provide an incorrect model for the students by showing that even people who start using drugs may end up in a very respectable position—in this case, lecturing in schools. The second mistake is that the focus of the model's message is on the dangers of drug use, whereas the most important determinants of drug use initiation are decision-making skills, skills to resist social pressure, and self-efficacy for those skills. In this case, program planners did not adequately use evidence in the form of theory and empirical data. They should have focused on interventions dealing with social norms and social-cognitive skills (Peters, Kok, Ten Dam, Buijs, & Paulussen, 2009).

When translating theoretical methods into practical applications, planners have to consider the theoretical parameters very carefully. The following are examples of adequate theory use in this translation process.

**Modeling.** One of the change objectives of the Dutch HIV-prevention program (see Chapter Twelve (on the book's instructor Website) was this: "Adolescents express their confidence in successfully negotiating condom use with a sex partner." As we reviewed in Chapter Two, in SCT, modeling is a method with the potential to increase self-efficacy (Bandura, 1997). The determinant here is

self-efficacy. To find methods for improving self-efficacy, we first turn to SCT (Bandura, 1997). Modeling is effective under specific conditions or parameters:

- The learner identifies with the model.
- The model demonstrates feasible subskills.
- The model receives reinforcement.
- The observer perceives a coping model, not a mastery model.

Using modeling in the final program would be effective only when the parameters for this method are kept in place during the development of the practical application. As part of their program, Schaalma and colleagues (Chapter Twelve (on the book's instructor Website) developed video scenes, in which models demonstrate skills for negotiating condom use with unwilling partners. These skills, which were taught earlier in the program, include rejection, repeated rejection with arguments, postponement, making excuses, avoiding the issue, and counterposing (Evans, Getz, & Raines., 1991; Schaalma et al., 2004). The models were carefully selected to serve as identifiable models for the priority population. In all scenes the modeled behavior was identifiable, and the models were rewarded for the behavior with a positive ending. The models were coping models; they were clearly struggling a bit with their task of persuading their partners to use a condom. Keep in mind that these scenes were only a part of the program, in which various methods for many objectives were translated into practical applications within an integrated program.

**Active Learning.** Schaalma and colleagues (Chapter Twelve on the book's instructor Website) presented their models in a context of active learning: video scenes presenting high-risk situations were stopped after the situation had developed, and the students were asked to elaborate on what they would do in the situation or to give advice to the role model actor, first individually, then in a group. After the break the video was started again, and the students observed the scene's further development and ending. Again, the group discussed the scene's development. Active learning may be effective in almost any change method, as long as the situation provides sufficient motivation, information, time for elaboration, and skills-related advice. The example on page 363 presents one scene from the video, a dating situation in which an adolescent girl stands up to social pressure from her date about going home on time. Note that the role model uses techniques about how to resist social pressure that were taught earlier in the program: rejection, repeated rejection with arguments, counterposing.

In this example we see modeling in combination with active learning, while all parameters of these methods are taken into account: identification,

## SCENE FROM HIV-PREVENTION ACTIVE LEARNING VIDEO

### Video scene: In the discothèque

*Boy:* Would you like another drink?

*Girl:* No, I have to go home.

*Boy:* Come on, don't be lame.

*Girl:* No, I've got to be home at twelve.

*Boy:* This is a great tune, let's dance.

*On screen: Assignment.* Sasja really likes Mike. How can she make clear that she still wants to be home at midnight? How will Mike react? (Video stops, students discuss possible effective reactions. Video starts again.)

*Boy:* Don't you care about me anymore?

*Girl:* Yes, but that's not the point. They'll get on my case again if I don't get in before midnight.

*Boy:* Come on, it can't be that bad.

*Girl:* How do you know? I just want to go home. Besides, you'll ruin the whole evening if you're going to sulk.

(Boy sinks to his knees in feigned apology.)

*Girl:* (Laughs) Come on, if I'm late, you'll be kneeling for my dad on Saturday.

*Boy:* So, you'll come on Saturday?

*Girl:* That's the plan.

*Boy:* Let's go then.

skills demonstration, reinforcement (happy ending), coping model, information (on negotiation skills), and time for elaboration. The parameter of motivation may have been underrepresented. Skills training often needs to be combined with methods to enhance motivation. In this case, the health promoters might have used several methods for increasing HIV-risk awareness and creating an

attitude favoring reduction of sexual risk: risk-scenario information, anticipated regret, and fear arousal, among others.

**Risk Perception Information.** Another change objective in the HIV-prevention school program was: “Adolescents recognize the possibility of ending up in situations in which contracting HIV/sexually transmitted infection cannot be ruled out.” Here the determinant is risk perception. We turn to theories on risk perception and risk communication for methods to improve personal risk perception. These theories suggest the provision of risk information and risk feedback, message framing, self-reevaluation, and fear arousal. For instance, Hendrickx, Vlek, and Oppewal (1989) state that people may base their risk judgments on information that aids the construction of an image of the ways in which a particular outcome may occur. An essential parameter for this method is that the information includes a plausible and imaginable scenario with a cause and an outcome, instead of only an outcome. Therefore, the peer models in the HIV-prevention program presented a series of scenarios in which they described how they found themselves in risky situations (for example, a sexual relationship over the summer holidays). These scenarios clearly presented a cause and an effect to make these contingencies more likely. As mentioned in Chapter Two, it would have been even more effective if the students could have generated their own scenario; however, choosing from multiple risk scenarios has also been shown to be effective (Mevissen, Meertens, Ruiter, Feenstra, & Schaalma, 2009; Mevissen, Meertens, Ruiter, & Schaalma, in press).

**Anticipated Regret.** Anticipated regret (Abraham & Sheeran, 2004; Richard, van der Pligt, & de Vries, 1995) is a method for attitude change. TPB and TRA<sup>2</sup> suggest insight in relevant beliefs as the basis of attitude change methods (Fishbein & Ajzen, 2010). Schaalma and colleagues (see Chapter Twelve on the book’s instructor Website) used various methods to change beliefs, for example, anticipated regret, active processing of information, linkage of beliefs with enduring values, and association of the attitude object with positive stimuli. The risk-scenario information we discussed earlier may be combined with the method of anticipated regret: asking people to imagine how they would feel after risky behavior such as having had unsafe sex. The parameter for anticipated regret is that the regret question should stimulate imagery.

**Fear Arousal.** Many health promotion interventions use some kind of fear-arousing message to promote safer behavior. Theories of fear-arousing communication and recent meta-analyses suggest that although fear arousal may enhance the motivation to avert the threat (Kessels, Ruiter, & Jansma, 2010),

acceptance of health recommendations is mainly dependent on people's outcome expectations regarding the recommendations (What will happen if I follow the recommendations?) and their self-efficacy (How confident am I that I can do the recommendations?). In addition, high levels of fear may easily inhibit persuasion through processes of denial and defensive avoidance especially when response efficacy or self-efficacy is low. Thus, when using fear arousal, program developers should always provide coping methods for reducing the perceived threat and teach the skills for applying these coping methods (Ruiter & Kok, 2010).

One way that fear appeals may be better able to motivate people into precautionary action is to include recommendations that can be easily performed, such as calling a help line. First, motivate people by presenting threatening information, and second, provide specific instructions about what to do. The current state of the art with respect to fear arousal in health promotion suggests that health promoters should be rather reserved in scaring their participants. Typically, of the four information components composing a fear appeal, severity information has been found to be the weakest predictor of protection motivation as compared to susceptibility information and information about the effectiveness and feasibility of recommended action. The optimal application might be a combination of creating personal risk awareness, without arousing too much fear, and developing skills for the desired behavior change (Ruiter & Kok, 2010).

Combinations of risk-scenario information, anticipated regret, and fear arousal may promote risk awareness and attitude change. In the example in the following box these three methods are combined in one video scene, again using modeling. This part of the video shows a series of scenes in which students interview fellow students about safe sex. The example interview is introduced as a story of a girl who had contracted a chlamydia infection. Her boyfriend is with her.

In the example illustrated here, risk-scenario information is combined with anticipated regret and fear arousal. The source of the information is a peer, representing another example of modeling. All the parameters have been taken into account: scenario imagery, cause and outcome, regret imagery, personal susceptibility, outcome expectations, and self-efficacy. Moreover, the parameters for modeling are met, such as reinforcement of the desired behavior. A careful analysis of the parameters makes clear that methods for risk awareness and attitude change have to be combined with methods for self-efficacy improvement and skills training. People need to be motivated for active learning and skills training, but they also need to be self-efficacious for opening up to unpleasant information (Bandura, 1997).

## COMBINATION OF ANTICIPATED REGRET, RISK SCENARIO, AND FEAR AROUSAL

*Girl:* I wasn't with him [current boyfriend] last year. It was a boy I fell in love with on my holiday. So we ended up in bed. I was prepared and had brought some condoms, but he refused to use them. He kept on saying, "Trust me, no AIDS." He was very persistent. "It's okay to do it without, just once." It was so stupid. But he was such a hunk. I wouldn't pass him up. I've got a much bigger hunk now (looks at current boyfriend). What's more, the boy looked very clean. But I was so stupid. I slept with him without using a condom. I was on the pill at the time.

*Interviewer:* But why did you do it? It's risky as hell.

*Girl:* I didn't know what to think anymore. I thought, "Maybe it won't come to that." I thought, "As long as I'm careful." And I was afraid I'd turn him down. I was doing it for him, basically. It was brought home to me later how stupid it was. I was pretty scared afterward. And sure enough I got a discharge. I went to a doctor, who said I had chlamydia. I was petrified. It can make you infertile.

*Interviewer:* That would mean that you could never have children!

*Girl:* I acted quickly, so it wasn't that bad. I was so angry with him afterward for saying that he cared but refusing to use a condom. Of course, I was angry at myself as well. I was stupid.

*Interviewer:* So, now you always use a condom?

*Girl and Boy:* Yes!

*Interviewer (to boyfriend):* I guess you don't agree with the holiday guy?

*Boyfriend:* No, I was glad she brought it up.

*Interviewer:* What do you mean?

*Boyfriend:* She mentioned it first. I don't talk about it very easy. I was afraid she'd think I jump into bed with any girl.

*Girl:* Nonsense, I think it's great if a boy brings it up. It means that he really cares about you. I like boys who can talk about it. And sex is more fun if you know you are safe. No worries the next day.

*Boyfriend:* You bet. She takes care of the pill, and I take care of the condoms. We've got a nice condom joke (both start laughing).

*Interviewer:* Are you going to let me in on it?

*Boyfriend:* Before we make love . . . I say I've got to put on a CD!

*Interviewer:* That's a good one. I've got to remember that.

**Behavioral Journalism.** Many methods may be covered by the application of behavioral journalism. Behavioral journalism is an approach of media-delivered behavioral modeling that makes use of role-model stories that are based on authentic interviews with the priority population (McAlister, 1995; McAlister & Fernández, 2002). Within every priority population, some people perform the desired behaviors or are at the desired stage of behavioral change. These models give their reasons for adopting the new behavior and state the perceived reinforcing outcomes they received. The use of authentic interviews with actual community members ensures that the content of the message is appropriate to the culture and level of understanding of the at-risk population and gives a realistic and credible picture of the group's lifestyle. Of course, the challenge of behavioral journalism is to find the real-life stories that represent the theoretically correct message, without having to compromise the authenticity of the original interview. This is done by asking interview questions designed to elicit answers comparable with theory and sometimes by combining interviews.

Behavioral journalism is effective in covering various other methods, such as risk scenarios, anticipated regret, and fear arousal. Van Empelen, Kok, Schaalma, and Bartholomew (2003) applied behavioral journalism to a program for HIV-risk reduction for Dutch drug users. Based on interviews with drug users, printed role-model stories were developed and distributed within the network of the drug-using community.

**Computer Tailoring.** Information about personal risk, provided in reaction to information obtained from a program participant, has been identified as a potentially strong method in motivating people to adopt healthier habits. Individual counseling used to be the only practical application for delivering personal risk information, but now computer tailoring or expert systems can

deliver personalized risk feedback to large groups of people at relatively low costs with substantial effects (Kroeze, Werkman, & Brug, 2006). The effect has even been shown through measures of brain activity (Ruiter et al., 2006). The personalized messages can be delivered through such communication vehicles as a report, a letter, or computer-assisted instruction.

It is essential that health promoters keep the theoretical parameters in place in this process. For example, lack of awareness is often a major barrier for behavior change. According to the Precaution-Adoption Process Model (PAPM) (Weinstein, Sandman, & Blalock, 2008), information about personal risk has been identified as a promising method to raise awareness. However, in order for risk feedback to be effective in raising awareness of personal intake levels, it should include personal risk feedback, in comparison with an absolute and normative standard (see Table 6.5).

For example, computer-tailored feedback could be used to promote a reduction in dietary fat intake. First, the individual receives personal risk feedback on his or her fat intake, indicating whether it is higher than his or her self-rated level, to increase awareness. The person then receives feedback on whether it is higher than the recommended intake level (the absolute standard). Last, the individual receives normative feedback in which a person who had a fat intake higher than the peer-average level of intake (the normative standard) would receive feedback specifically stating this fact. Normative feedback is only given to people who are doing worse than the mean of the reference group. Normative feedback is especially effective in preventing people from rationalizing away the results of the factual feedback. The personal risk feedback is followed by practical and personalized suggestions for behavioral change (see the earlier discussion on fear arousal). Later, individuals can also receive feedback on their progress.

### Examples of Methods and Applications at Different Levels

We conclude this section with more complete examples of the translation of methods to applications at the individual, organization, and community levels. Translating methods into applications for interventions to change environmental conditions, such as those directed toward social networks, organizations, communities, and policymakers, brings in some special considerations. At each of these levels, the environmental agent is influenced by methods addressing change objectives derived from the person's role. For example, outcome expectations for a legislator related to her voting to support funding to provide low-cost

mammograms to low-income women might relate to constituent response or to expectations of improved constituent health.

The use of methods and practical applications to change determinants vary with ecological level. Although the individual methods that we discussed earlier for increasing knowledge, awareness, attitudes, skills, and social influence are used for environmental agents, these methods are often packaged into broader methods or processes that take into account the level and context of the situation. These include participatory problem solving, advocacy, or organizational development.

***HIV Prevention for Incarcerated Women.*** El-Bassel, Ivanoff, Schilling, Borne, and Gilbert (1997) carefully described an HIV-prevention program for incarcerated women prior to release. Their behavioral outcomes were the reduction of unsafe sex through condom use and abstinence and the reduction of needle sharing. The researchers' program focused on the following determinants: knowledge about HIV and STI risks, perceived vulnerability to HIV and STIs, cognitive behavioral and technical skills tailored to cultural and social factors, motivation to use condoms (that is, attitudes, barriers, pros and cons, and access), social support, and formal and informal help-seeking skills. Theoretical methods were derived from various theories, particularly social cognitive and relapse prevention theories. The researchers used two basic methods: tailoring (that is, adaptation of the program to knowledge, beliefs, circumstances, and prior experiences of the intervention population based on focus groups and surveys), and active learning facilitated by professional group workers and trained peer educators (booster sessions).

The program methods were applied in an organized group intervention that consisted of eight weekly sessions of 90 minutes each. A facilitator and a cofacilitator used a standardized protocol to lead the groups of 10 women. Group members received a workbook of exercises that could be completed by persons with minimal literacy. Group facilitators were experienced in working with drug users, were credible and comfortable with the group, and valued group work and skills-training approaches.

Within this program various applications were used to apply the methods. For instance, planning coping responses was delivered through discussions and homework exercises. Facilitators reviewed common triggers (that is, places, people, moods, and substance use), and group members learned to identify high-risk situations that served as personal triggers for engaging in risky behaviors. Participants discussed how these triggers influenced their decisions to have unsafe sex

and to use drugs. Using members' examples (modeling), facilitators emphasized the powerful, multilayered connections between using drugs (particularly crack) and having unsafe sex. Through awareness exercises in and outside the group, each member identified her own list of triggers. As participants shared their lists of triggers, facilitators and other members helped identify potential steps to minimize, avoid, or counteract the triggers' influence.

Guided practice for negotiation and assertiveness skills was taught within the context of risk appraisal. The women assessed the possible adverse outcomes of being assertive and identified avenues of escape from partners who might respond abusively. They learned four steps to negotiate safer sex when partners are not interested in using condoms:

1. State what you want.
2. Explain, without blame or accusation, why you want it.
3. Indicate understanding of the other's position.
4. Attain a solution to the problem without compromising your needs.

Members then practiced refusing unsafe sex in situations in which negotiation fails. Facilitators encouraged direct refusal of unsafe sex in situations in which the women are confident that partners will cooperate, and they encouraged indirect refusal when partners are unresponsive or threatening. The program relied on videotaped stimulus vignettes for teaching these and other skills. Participants evaluated the effectiveness of the assertions, negotiations, and refusals used in the stimulus vignettes and generated alternative responses. They then practiced these skills in multiple role plays. Facilitators provided constructive feedback and support throughout the training.

Prior to the participants' release from prison, counselors met with participants individually to review their triggers for risk behavior, their plans for reducing risk behaviors, the resources they had on the outside, and the steps they would take during the first few days after release to carry out their plans. The counselors applied the method of enhancing network linkages and encouraged the women to broaden their supportive non-drug-using networks and to identify other, new potential network members. They offered assistance as the women made phone calls or wrote letters. Individual booster sessions delivered by counselors in the community took place during the first two months after release. During booster sessions counselors and participants linked problem-solving goals and objectives with concrete action plans, and they role played to access skills and practice plans.

**Participatory Problem Solving.** Participatory problem solving as an environmental change method includes basic individual methods and those specific to knowledge change, attitude change, skills building, self-efficacy and collective efficacy, and other individual-level determinants. It includes diagnosing the problem, generating potential solutions, developing priorities, making an action plan, and obtaining feedback after implementing the plan. At the social network level, the application might take the form of calling together the family, friends, and helpers of an older person living alone for a meeting to discuss what the situation is and how they can come together to handle increasing needs for activities of daily living. At the organizational level, an intervention to improve employee morale might include conducting a survey of employee attitudes, giving feedback on the findings to employees and managers, holding small-group discussions of what the findings mean and how to address them, discussing the importance and changeability of the proposed activities, setting priorities, putting the changes into place, and getting feedback concerning their effectiveness through focus groups and surveys. At the community level, the application might be a visioning workshop to develop a strategic plan for a community problem, such as obesity. Persons representing government and other organizations in the community meet with residents with a stake in the issue to discuss data concerning the problem, possible solutions, and available community resources. They brainstorm and evaluate applications for solutions, prioritize them, and develop action plans using committees for different community sectors.

The approach used for adoption and implementation of the Put Prevention into Practice program by Texas primary care clinics provides an example of an organizational intervention using participatory problem solving (Murphy-Smith, Meyer, Hitt, Taylor-Seehafer, & Tyler, 2004; Tyler, Taylor-Seehafer, & Murphy-Smith, 2004). The program is an initiative that consists of a kit of office-based tools, including a guide to preventive services, a health-risk profile, a flow sheet of dates of services and counseling with findings, and patient education materials, all intended to support the provision of clinical preventive services (Gottlieb, Huang, Blozis, Guo, & Murphy-Smith, 2001). Applications to increase risk assessment and counseling by providers include a process to assess organizational readiness to adopt the program, using a checklist and facilitated discussion and reflection based on an adaptation of the total transformation management process (Mink, Downes, Owen, & Mink, 1994). At that point an advisory committee (application) is established to guide the rest of the process and to plan and carry out needed changes in policies, space, continuing education, systems for prescreening charts, clinic flow, referral protocols, and quality measures.

**Community Participation.** The Healthy Cities movement illustrates applications for the broad method of participation applied in community settings, as discussed in Chapter Three. The World Health Organization (WHO) has developed a tool kit of applications to facilitate the community participation process (World Health Organization Regional Office for Europe, 2002). Many of the applications use group-work techniques, including icebreakers, brainstorming, mind mapping, and research tools such as focus groups. The tool kit is organized around five stages of action planning: assessing needs and assets, agreeing on a vision, generating ideas and plans for action, enabling action, and monitoring and evaluating. Healthy Cities staff chooses applications based on the level of participation required for the task and the community context. One example is a guided visualization in which people imagine time traveling ahead 20 years and going through a typical day. They then draw images of the future as they would like it to be. These are discussed first with another participant and then in small groups. Most of the techniques require technical assistance from a planner, trainer, arts worker, community organizer, or evaluator.

### Where Have All the Objectives Gone?

The final task in Step 3 is to ensure that the final applications of methods (still) address the change objectives.

At the end of Intervention Mapping Step 3, the planner has moved from objectives to methods, parameters, and applications. During that process, the planner has made many decisions, from theoretical and practical perspectives. The planner has estimated the strength of the evidence of methods and the feasibility of applications. The planner has anticipated issues in implementation by program users. At this point it is necessary to ensure that all the objectives that were selected for the program are still matched in the current list of applications. If that is the case, the planner may continue to the next step; if not, the planner has to decide whether to leave some objectives out or to go back and develop methods and applications to cover the neglected objectives.

In previous tasks in Step 3, we suggested that the planner make a list of change objectives for each determinant in each of the matrices. In this final task for Step 3, the planning group should return to this list to check that the selected methods or designated applications address each objective. This is done to ensure that the planning group has not overlooked any of the change objectives. If any

of the objectives have been missed, the planning team should either address the objectives by linking them to methods and applications for other change objectives associated with the determinant, or go back through the preceding tasks to select additional methods or applications for the missing objectives.

## Implications for Evaluation

The choice of appropriate methods and applications for a program will have a lot to do with whether the program is effective or not. However, the direct implications for evaluation of the methods and application choices are in the process evaluation. The process evaluation includes whether the theoretical methods that have been chosen are based on evidence and theory to support that they can produce changes in the determinants and change objectives from the matrices. Another question is whether the methods have been operationalized in ways that adhere to the parameters or the assumptions inherent in the use of the proposed theoretical change methods. For example, parameters for modeling would include whether the participants can identify with a role model, and whether the model is reinforced for the behavior that is performed. Finally, a process evaluation question that relates to this step is whether the correct methods and parameters are apparent in the applications that are ultimately delivered to participants.

### BOX 6.2

#### STROKE PROJECT

- **The first task in Step 3 is to review program ideas with the planning group.**
- **The second task is to identify theoretical methods.**
- **In the third task the planner chooses program methods**

The methods and applications for the T.L.L. Temple Foundation Stroke Project are shown in Tables 6.17 and 6.18, matched to the categories of determinants from the matrices for the community and the hospital emergency departments (EDs). Methods and applications for the emergency medical services (EMS) and primary care physicians are not shown. EMS and primary care physician methods

and applications were very similar to those for the EDs. As the tables indicate, the methods are quite similar for the community and professional components of the program with the exception of the addition of organizational development for the hospital EDs. Even though the matrices are different, the determinants are similar, which accounts for the similarity of methods.

Applications for the two sets of methods are fairly different because even though the determinants are similar, the performance objectives are quite different. The EDs required more skill development and more systems intervention, such as the development of protocols for stroke workup and recombinant tissue plasminogen activator (rtPA) administration. Other applications were equally important to the changes on both matrices. For example, newspaper articles delivered role-model stories that influenced both the lay public and physicians.

The advisory committee that we described in Chapter Four's Stroke Box helped to generate ideas for methods and applications and also to provide the local role models. We wanted locally recognizable role models who had had strokes and recovered. Three committee members were stroke survivors including the mayor of Lufkin. This multiethnic group of three agreed to be models on billboards, posters, and brochures.

- **The fourth task in Step 3 is to select or design practical applications.**
- **Finally, the planner ensures that the final applications (still) match the change objectives.**

To ensure that we had methods and applications to cover all change objectives on all matrices and to ensure that all applications contained well-translated methods, we organized design documents for each application that covered intended methods and the change objectives that were to be influenced by that method. Even after all the planning, it is quite easy for a team to become distracted and leave methods out of application. For example, the newsletters that went to EDs were each to contain a model of a physician who was reinforced by good patient outcomes for treating with rtPA. As the health educator on the team was reviewing the fourth newsletter, she realized that the role-model story had been deleted and found that the physicians had decided "physicians don't like this sort of thing. We thought we would include just the science." Armed with the design documents and matrices, she lobbied to reinsert the method.

The other important issue when designing applications is to ensure that as the methods are translated, the parameters under which a particular method could

be expected to be effective are present. For example, in order to be effective, the role-model stories had to be credible so that people could identify with them; the behaviors that were desired needed to be clearly discernible; and the role model had to be reinforced. We had to keep these parameters in mind for every application that included a role model, for example, public service announcements and newspaper articles.

**Table 6.17 Methods and Applications for Community Matrices in the Stroke Project**

<b>Determinants and Change Objectives</b>	<b>Methods</b>	<b>Applications</b>
Knowledge of stroke symptoms	Modeling	Community members telling their stories in newspaper articles
Knowledge of stroke as emergency and call 911	Modeling Elaboration Cues to action	Community members telling their stories in newspaper articles Public service announcements (PSAs) showing stroke as emergency Billboards with local role models—stroke is an emergency, call 911 Posters
Skills and self-efficacy for symptom recognition	Verbal persuasion Modeling	One-to-one instruction at worksites accompanied by a brochure Community members telling their stories in newspaper articles
Perceived social norms to intervene and call 911	Cues to action Modeling Social comparison Reinforcement	Newspaper articles of bystander or significant other recognizing symptoms and intervening and the intervention being socially reinforced PSAs showing intervention and reinforcement

(Continued)

Table 6.17 (Continued)

Determinants and Change Objectives	Methods	Applications
Perceived social norms to intervene and ask for priority transport and fast ED care	Mass media role modeling Reinforcement	Newspaper articles of bystander or significant other recognizing symptoms and intervening; intervention is socially reinforced PSAs showing intervention and reinforcement Billboards with local role models
Outcome expectations	Modeling	Billboards with local role models showing good recovery
Barriers	Modeling	PSAs with doctor saying to go straight to ED, don't call primary care

Table 6.18 Methods and Applications for Emergency Department Matrices in the Stroke Project

Determinants and Change Objectives	Methods	Applications
Knowledge of rtPA study results	Persuasive communication Elaboration	Presentations at medical staff meetings, committee meetings Newsletters delivered to emergency departments (EDs) with science articles and news
Skills and self-efficacy for stroke workup	Modeling Guided practice	Training in EDs Community mock stroke activity

Table 6.18 (Continued)

Determinants and Change Objectives	Methods	Applications
Perceived social norms and standard of care to lower stroke workup times	Cues to action Modeling Social comparison Reinforcement	Newspaper articles of treatment of stroke patients by hospitals in the community Provision of national association guidelines
Perceived social norms and standard of care to treat stroke	Information about others' approval Social comparison Facilitation	Newspaper articles of treatment of stroke patients by hospitals in the community Provision of national association guidelines
Outcome expectations, attitude	Mass media role-modeling Feedback	Newsletters delivered to EDs with role-model stories of physicians treating patients who had good recovery and reports on treated patients
System barriers	Organizational diagnosis and feedback	Meetings with hospital teams—including administration, ED medical and nursing directors, and physicians—to plan rtPA use, discuss barriers, and develop protocols

## Summary

Chapter Six describes how to choose methods of change from theory and the literature. A theoretical method is a general technique or process for influencing changes in the determinants of behaviors and environmental conditions. Practical applications are specific techniques for use of theoretical methods in ways that fit the intervention population and the context in which the intervention will be conducted. Theoretical methods are the basis of intervention components to modify performance and change objectives for behavior and environmental

conditions of the at-risk population and environmental agents. Planners use methods and applications from all intervention levels (individual, interpersonal, organizational, community, and societal) to match change objectives.

Chapter Six presents methods for different determinants, starting with determinants of change in the individual health behavior of the at-risk group. Then the chapter describes methods for changing determinants at environmental levels, which include groups, organizations, communities, and public policy. The chapter explains that theoretical methods at the individual level can be applied at higher levels; however, although the basic action of the method is the same at all levels, often the application of the method is somewhat different.

This chapter explains that translating methods into applications demands a sufficient understanding of the theory behind the method, especially the theoretical parameters that limit the effectiveness of the theoretical method. The methods presented in the chapter include those to change risk perception, knowledge, habitual and impulsive behaviors, attitudes, beliefs, outcome expectations, social influence, skills, self-efficacy, public stigma, social norms, social support, social networks, organizations, communities, and policy.

Planners have different work styles. In selecting methods and practical applications, they may take any of several routes based on their experience with theory and practice. Regardless of the work style, what is essential is that methods are identified, and the parameters of the methods—the conditions under which the methods are shown to be effective—are kept in mind during the translation from method to application and to program. We describe theoretical methods for behavior change, summarized in tables. For each method we provide a definition. We also provide the parameters for use: the conditions under which the theoretical method will be effective. Finally, we give a practical example for each method.

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## Discussion Questions and Learning Activities

1. Explain the characteristics that distinguish theoretical methods from practical applications. Give examples of theoretical methods and related practical applications.
2. Discuss why it is important to review program ideas with intended program participants before making decisions on what methods and practical applications will be used to plan the interventions.
3. Describe how core processes can be used to choose theoretical methods. Give an example of a question that can be asked to guide the use of core processes to choose theoretical methods.

4. Discuss examples of basic methods that can be applied at the individual level and examples that can be applied at environmental levels of intervention.
5. For each of the following categories of determinants or environmental change, select one method and describe the parameters for use that are critical for the method to influence a change: knowledge, awareness and risk perception, habits and automatic behavior, attitudes, social influence, skills and self-efficacy, social norms, organizational change, community change, and policy change.
6. Using the matrices created from discussion question 9 in Chapter Five, list the methods (from theory) and practical applications you propose to use in an intervention to influence a change in the determinants of the behavioral and environmental outcomes. Justify the selection of the methods and applications by indicating the support from empirical and theoretical literature to make a case that the methods and applications are likely to accomplish the change objectives and influence a change in determinants.
7. For each of the theoretical methods selected for the intervention, discuss the parameters that would have to be considered to ensure that the application of the methods would likely be effective in changing the determinants of behavior and environmental outcomes.



# INTERVENTION MAPPING STEP 4 PRODUCING PROGRAM COMPONENTS AND MATERIALS

## LEARNING OBJECTIVES

- Consult with the intended program participants to determine preference for program design
- Create program scope and sequence including delivery channels, themes, and list of needed program materials
- Prepare design documents for the production of materials that meet the program objectives and parameters for the methods and practical applications
- Review available program materials and select materials that match change objectives, methods, and practical applications
- Develop program materials
- Pretest program materials and oversee the final production

The purpose of this chapter is to enable the planner to produce creative program components and materials in support of health education and promotion programs. We speak of materials “in support of” to circumvent the temptation of referring to support materials or products such as newsletters, billboards, and videotapes as “the program.” The program will often be a multicomponent, complex entity with components for both at-risk groups and environmental agents, and each part of the program may be supported by certain products or materials. The goal is that these products are creative, effective pieces of the planned behavioral- and environmental-change program. A challenge in this step is one of translation: getting the support pieces right so that the methods and

practical applications are adequately (and sometimes brilliantly) operationalized and the change objectives accomplished.

The planning steps completed to this point should enable production of creative products that emerge from the thinking captured in the matrix development and the selection of methods and practical applications. In particular, the products should do an excellent job of representing the parameters that pertain to the methods that have been chosen. For example, if a planning team decides to use modeling (method), they must ensure that their program's role-model stories (practical application) have models that participants can identify with (parameter). The end product of this step should be a plan for a coherent program that remains true to the planning that has been accomplished in Steps 1, 2, and 3.

### BOX 7.1

## MAYOR'S PROJECT

The health educator from the mayor's office thought that the planning group had jumped the last of the major planning hurdles. The group had decided on intervention levels, written performance objectives at all those levels, and then created matrices. Group members even put the matrices aside for a bit and planned theoretical methods and practical applications with a lot of energy and creativity. They had found ways to listen to everyone's ideas. What a team! At the end of the year, they had enough energy and goodwill to plan a celebratory dinner to commemorate six months of hard work and productive (and sometimes loud) discussions. That dinner was just before the city hit low gear at winter break and everyone took a breather.

Now it is January, and the first meeting of the New Year is in full swing. The health educator can't believe what is happening. What is all of this regression? Why don't the group members remember the pre-winter break ideas about what the program should include? Why is the group talking about what the billboards should look like and which celebrity should narrate the videotape? What billboards? What videotape? The group hadn't decided to have products such as billboards and videotapes as part of the program, and the health educator thought that some members had learned a thing or two about the characteristics of effective role models, but that was the least of the problems. This meeting is beginning to look like a free-for-all. Before members can become entrenched in these resurfaced old ideas, the health educator has to take action. She wants to make sure that the program components incorporate powerful

theoretical methods and feasible practical applications to accomplish the change objectives.

The mayor's health educator begins to capitalize on the natural energy of the planning group and to encourage group members to dream about what their program can look like—without any of their matrices or previous planning materials in front of them. She encourages members to keep in mind the change objectives and the methods and applications they need the program to deliver.

*School Board Member:* Well, since we want to reach parents and city government, we probably need a coalition of community organizations and agencies. Churches, social service agencies, professional organizations, youth organizations, that sort of thing. The coalition could oversee the program implementation, especially the change directed at the parents and the neighborhoods.

*City Council Representative:* Since I represent the organization of pastors in the areas of the city that have the biggest obesity problem, I think that a coalition is a good idea. My congregation would like to be very involved, and I know that my colleagues are interested too.

*Community Member/Parent:* Yeah, and from our point of view at the schools, we need the support of the school district to reach the age groups of youth we are addressing. I think the youth component should have a school focus. Of course, we need a way to reach dropouts as well. The theme could be . . .

*Parks and Recreation Representative:* OK, let's get down to basics. What would a school program look like? How would we use our methods of modeling, skill building for problem solving, negotiation, resistance skills, planning and studying, goal setting, self-monitoring? Do you think we could use community organization methods in the schools?

*Community Member/Teacher:* What about even having the youth from the school program recruit the community agencies for the coalition?

Brainstorming about the program went on for quite some time. Gradually the group "firmed up" ideas about program components and delivery. The group then went back to their list of methods and practical applications to figure out where they were delivered in the program they had sketched out. When an important method or application was missing, the group found places to incorporate the ideas and also came up with new ideas for program and delivery. Through a process of moving back and forth between Steps 3 and 4 they mapped out an initial program.

Another challenge in this step is to ensure that the final program fits with both the populations to whom it will be delivered and the contexts in which it will be delivered. This step provides an opportunity to revisit the potential program participants to ensure that the program materials result in attention, comprehension, and central processing. Only then will there be a chance that the change objectives will be accomplished and behavior and environment affected. Health educators can use this juncture in the planning process to check not only the depth of their understanding of the intended participants and contexts but also the status of participation in the planning group by the people who will adopt and implement the program (see Chapter Eight).

In Chapter Eight we present the development of interventions to influence program adoption, implementation, and sustainability. These interventions are directed to the gatekeepers of organizations who will adopt the new program and to the program deliverers who will implement it. In this chapter we focus on program design and materials development. Although our discussion is centered on the health education program that is directed to the priority population, the same creative and technical process needs to be applied to the intervention for program adoption and implementation.

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## Perspectives

Our perspectives in this chapter are about encouraging full use of the program plan to this point and at the same time encouraging creativity in the development of program components and materials.

### Using Steps 1, 2, and 3

Planning groups will often shy away when confronted with the perceived complexity of converting all their planning into a program. Members may tend to revert to overly simplistic thinking, such as “We can solve the obesity problem with a brochure.” This was what the mayor’s health educator faced, and one thing that helped was staying focused on the thorough work the team had done on Intervention Mapping Steps 1, 2, and 3. In Step 2 the mayor’s team developed matrices for the at-risk group (school-age children and their parents) and matrices for various segments of the environment (parents through churches and neighborhood groups and the city government through the mayor and city council). In Step 3 the team developed lists of theoretical methods and practical applications for each matrix. With these foundations they could use Step 4 to ensure good communications that incorporated the methods and practical applications to accomplish the change objectives.

Just as Step 3 has two styles of accomplishing the tasks, Step 4 has at least two contrasting styles, but neither of the styles means abandoning the previous work. One style is to take each method and practical application, consider it, and develop a program component to deliver it. Another style is to put away all lists, matrices, and other planning papers and allow the group to bring forth all the ideas that group members have had to this point about what the program should look like. After all, the planning to this point is at its best if it has stimulated many creative thoughts about the program's nature. If the work group chooses this style, then members must check back periodically to their methods, practical applications, and change objectives to make sure the program components are actually delivering what they are supposed to deliver.

### Enabling Creativity to Flourish

Planning should allow creativity to flourish. In this step, program planners liberate all those ideas that have been put on hold during the work of the previous steps. Sometimes they close the books, turn the matrices over, and even close their eyes to dream what a program could look like. The planning group should be cohesive by this point, so it should be all right to come forth with some crazy ideas and to get carried away with some ridiculous themes. Out of this creative mess often emerges a great program. The foundation is laid; the design task should be fun. A related point is making use of the talents of any production contractors the team may have. In this chapter we build on the planning documents developed to this point to create design documents that can guide contractors without hamstringing them.

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## Designing Culturally Relevant Program Materials

The first task in Step 4 is to consult with the intended program participants to determine preference for program design.

### Aiming at Cultural Relevance

We believe that if a program is not culturally grounded at this point in the planning process, the project is in trouble. From the program's very inception and through each step, community members will have been involved if the health promoter knows his or her business. However, the issues of cultural relevance resurface when the planning team begins to think of materials. Resnicow, Baranowski, Ahluwalia, and Braithwaite (1999) define what we mean by cultural relevance

(although they label it cultural sensitivity). They describe this characteristic to exist to “the extent to which ethnic/cultural, characteristics, experience, norms, values, behavioral patterns and beliefs of a priority population as well as relevant historical, environmental, and social forces are incorporated in the design, delivery, and evaluation of targeted health promotion materials and programs” (p. 13). Even though there is sparse evidence about the impact of cultural relevance on the effectiveness of health promotion interventions or materials, there is considerable expert agreement that cultural relevance is closely related to the principle of participation in program development and is a good thing (Kreuter, Lukwago, Bucholtz, Clark, & Sanders-Thompson, 2003; Resnicow et al., 1999).

Resnicow and colleagues (1999) define two primary dimensions of culture that are relevant to public health and to program development in particular: deep structure and surface structure. Deep structure refers to the factors that influence the health behavior in the intervention’s proposed recipients. According to Deshpande and colleagues (2009) aspects of culture that are relevant to the study of and intervention in health behavior include “family relationships, rules for emotional expression, communication and affective styles, collectivism, individualism, spirituality and religiosity, myths, time orientation, ethnic identity, level of acculturation, resilience, medical mistrust and . . . coping behavior” (Deshpande, Thompson, Vaughn, & Kreuter, 2009). In the process of planning programs with Intervention Mapping, these aspects can influence what behaviors, environmental conditions, performance objectives, and determinants become the program focus. We hope that it is clear that if planners have not characterized these factors correctly to this point, attention to cultural relevance of materials is unlikely to be effective because the program will not have salience to the intended cultural group.

Assuming that the planner has worked with the cultural group to adequately bring to bear the group’s insights into the behaviors and determinants, he or she can turn attention to surface structure and the creation of materials. According to Resnicow and colleagues (1999), surface structure comprises the superficial but still important characteristics of a cultural group such as familiar people, language, music, clothing, and so on.

Kreuter and colleagues (2003) propose five categories of mechanisms by which health promoters can work to achieve attention to both surface and deeper aspects of culture in their program planning.

- Peripheral processes match materials’ characteristics to the culture’s surface characteristics. This attempt to make materials familiar and comfortable to the intended audience relies heavily on visual aspects of production (Kostelnick, 1996; Moriarty, 1994; Schiffman, 1995).

- Evidential strategies remind the cultural group of the health problem's significance to them, for example: "African American children suffer twice the hospitalizations for asthma as white children."
- Linguistic strategies provide programs and materials in the language of the cultural group.
- Constituent-involving approaches cover several strategies for involving the intended program group, including hiring staff from the cultural group, using lay health workers from the group, and continuing to work with the group as members of the planning team.
- Sociocultural strategies embed health education in the context of broader cultural values and issues.

### Formative Research

Formative or preproduction research discovers characteristics of the intended participants that relate to message, medium, and situation; whereas production testing (pretesting) is a process in which prototypes of program materials are tested for audience reaction (Atkin & Freimuth, 1989; Baranowski, Cerin, & Baranowski, 2009; Bellows Anderson, Gould, & Auld, 2008; Cullen & Thompson, 2008; Kraft, Beeker, Stokes, & Peterson, 2000; Newes-Adeyi, Helitzer, Caulfield, & Bronner, 2000; Sorensen et al., 2004; Vu, Murrie, Gonzalez, & Jobe, 2006; Young et al., 2006; Zapka, Lemon, Estabrook, & Jolicoeur, 2007). We develop a description of the processes of pretesting and further pilot testing later in the chapter. However, working with the people who will use and those who will benefit from the program starts as soon as the work group begins to have program ideas, and it continues throughout the process of developing materials.

In the preproduction research phase, health educators explore interpersonal as well as media channels. Freimuth (1985) also suggests ascertaining the credibility of vehicles and sources and the recall of previous messages on a topic. Preproduction testing can include both informal feedback and ratings of sources, messages, themes, persuasive arguments, and stylistic devices. Focus groups are a good mechanism for preproduction testing (Della, DeJoy, Goetzl, Ozminkowski, & Wilson, 2008; Gilmore & Campbell, 2005; Krueger & Casey, 2009; Wilson et al., 2007; Young et al., 2006). Work at this point can be very important in determining program messages. For example, in the development of the Cystic Fibrosis Family Education Program (CF FEP) we held focus groups with children, adolescents, and parents who would be using the program. One issue that stood out was the adolescents' discussion of being different from their peers. The program developers had thought that they should deal explicitly with the young people's worry about being different in the program. However, the

adolescents with cystic fibrosis said in no uncertain terms that they are not different and would object to program materials that addressed their “differentness.” With this and other feedback, it was back to the drawing board for the developers.

**Culture-Oriented Formative Research.** Formative research should include specific exploration of cultural issues (Horner et al., 2008). Resnicow and colleagues (1999) describe a process of explicitly culturally oriented preproduction activity. They use focus groups, for example, “to explore the thoughts, feelings, experience, associations, language, assumptions, etc. regarding the target health behavior” (p. 15). They suggest exploratory research with both the population of interest and with a comparison group to clarify ethnic differences. They work primarily in African American communities, and with these groups they suggest asking specific questions about how the group members see the health behavior. They find that the perceptions of African Americans about the health behavior often differ relative to European American communities. In a smoking-cessation project, for example, the African American participants saw cigarette smoking as a significant stress relief whereas the “white folk . . . can just take a vacation” (Resnicow et al., 1997). They also use an approach they call ethnic mapping, in which aspects of the health behavior can be rated by the cultural group as compared to another group. In the work of Resnicow and colleagues, aspects of behavior are rated as one of these three options: mostly a black thing, equally a black and white thing, or mostly a white thing. They used this technique to classify foods for a nutrition project but also suggest its usefulness to gain culturally centered information about other behaviors such as brand preferences, quitting techniques, and perceptions about smokers; physical activity; HIV-prevention practices; and substance use (Resnicow et al., 1999).

### Reciprocity in Teaching and Learning

In coming up with program ideas, successful teams keep in mind the reciprocity between the teacher and the learner. A powerful way to strive for culturally relevant health education programs is to be in constant interaction with program participants so that the creation of meaning is both shared and fluid. This interaction does not require that the health educator be of the same ethnic group as the community, and health educators may become complacent if they have a team member who can be the designated cultural match to the community. This unfortunate tokenism does not guarantee any real cultural similarity between the resource group and the community. We are not saying that recruiting ethnic diversity to program development teams is not essential; it is! But it is not enough to ensure culturally sensitive practice. Cultural humility, as represented in programs, is based on reciprocity in teaching and learning

as described by Ladson-Billings (1992, 1995, 2009). She describes four broad categories of characteristics of effective educators in the context of culture. They see themselves as members of the community, and they see community members as capable of changing and learning. They believe in the Freirian notion of “teaching as mining,” in other words, as facilitating the emergence of existing capabilities and competencies (Freire, 1973a). They see social relations as fluid within a community of learners, and they encourage program participants to learn collaboratively and be responsible for one another. Finally, they see knowledge as needing to be created jointly between teachers and learners and viewed critically. If the information flows both ways, then health educators have some opportunity to be congruent with the learner’s culture. Program components based on reciprocity make the creation of meaning a mutual task between teacher and learner. To put it another way, with reciprocal activities every participant is both a teacher and a learner. Such methods should be used in every complex health education situation. For example, Majumdar and Roberts (1998) describe a method of HIV/AIDS awareness in which women were organized into like-culture groups with a facilitator from that cultural group. They then planned the way the program would be delivered in their group.

### Checking In with Potential Implementers

At this step of planning, planners pay particular attention to the characteristics of their program’s setting. What is the school, hospital, or community really like? Who will be involved in implementing the program? Is there any group involved in implementation that has not been involved in development? What additional facts about the setting does the planner need to consider in program design? Step 5, which requires the development of an adoption and implementation plan, really requires consideration at the beginning of program development and resurfaces here. As planners think about program components, they consider how to implement them and what tasks will be required. Planners must also consider the impact of perceived program characteristics on the gatekeepers, those responsible for adoption decisions (see Chapter Eight).

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### Creating Program Plans and Structure

The second task in Step 4 is to create the program scope and sequence, delivery channels, themes, and a list of needed program materials.

The product of the first part of this step is a plan that outlines the scope and sequence of the program, all the program channels and materials that must be

produced, and the budget and resources for the program materials. The program plan should account for every intended contact of the program participants with some element of the program. The health educator should specify both the amount of the program that is expected to be delivered and the way the program should look at each interface with participants. The summary plan's format will vary from program to program, but it should include at least three elements: the program scope and sequence; a description of each population group and program interface with a list of the program materials and staff required for that interface; and a program budget for materials production.

### Program Ideas

A central problem plagues communicators in every profession—how to have a good idea . . . how to think “outside of the box” . . . how to be creative. The key to having a good idea is to have more than one idea—maybe even hundreds (de Bono, 2008; Gedney & Fultz, 1988). Planners often use brainstorming to generate ideas that encompass the entire program (We could go to schools and do X) or to address specific methods and practical applications (The role-model stories could contain Y). This step is a good time to throw away all preconceived notions and program constraints. Planners should ask themselves, “What would we do if we could do anything that comes to mind? What would be the most powerful things we could do?” Brainstorming allows no evaluative comments and is therefore a good mechanism to generate, generate, generate! When the group gets stuck, planners can try a paradoxical approach: If we wanted to have the opposite effect, what would we do? Sometimes we use a more visual brainstorming at this point and have the group draw what the program would look like.

The core processes (Chapter One) also will be useful here. A literature review can elucidate to some extent the types of practical applications and programs others have used. Using theory can help with generating thoughts about methods and ways to use them. Finally, going to the potential participants and continuing to fuel the process with their ideas is imperative. Focus groups can be used for this purpose and are particularly suited because stimulus materials can be created from the change, objectives, methods, and practical applications. Sample questions include: If you were trying to figure out how to [change objective X], what would you do? For example, If you were going to increase the confidence of teenage girls in negotiating condom use, what would you do? We are thinking about using a role-model story to influence [objective Y], what do you think about this story? Bartholomew and colleagues (2005) developed messages to

encourage older persons to be vaccinated for influenza. When they conducted their formative research in community grocery stores, they also asked participants if they would be willing to return to work with the team on communications about influenza. The team then met with African American, Hispanic, and white groups and asked for ideas about how to influence the factors related to influenza vaccination found for that group (Bartholomew et al., 2005).

## Scope and Sequence

Health education and promotion programs have components (units or modules) with an identifiable scope and sequence. However, unlike objectives of typical curriculum planning, which are cognitive or academic skills, these program components have more diverse change objectives. Therefore, the modules or units might be, for example, combinations of methods, practical applications, and delivery mechanisms aimed at various objectives. For example, a program might comprise messages that neighborhood volunteers deliver one-to-one and mass media messages delivered in public service announcements (PSAs) and billboards, all loosely tied together across time with a theme.

Scope is the breadth and amount of a program, whereas sequence is the order in which programs are delivered across time. For example, the Safer Choices 2 program has been delivered in alternative high schools intensively over a period of two to two and a half months because the attrition from school is high and the planning team wanted to reach as many adolescents in as short a period as possible (Tortolero et al., 2005) (see Table 7.1 on p. 391).

## Channels and Vehicles for Program Methods, Practical Applications, and Messages

Program design demands decisions not only about themes but also about messages and how to deliver them. A communication channel can be interpersonal or mediated; a vehicle is more specifically how a message is actually packaged and delivered. Before the planners can choose channels and vehicles for delivery of program components, they must ascertain the preferred media use by intended audiences:

- Do they watch television, listen to the radio, and read newspapers and magazines?
- Do they attend mostly to certain ethnic media?
- Who are credible sources for certain information or persuasive messages?
- What amount of time do they spend with each medium?

- What content do they attend to (for example, news, talk shows, PSAs, entertainment)?
- What channels and informants are used to get information about the program topic?

Various communication vehicles are described in Table 7.2 (on p. 394) with examples of the methods and practical applications the vehicles often carry (Elder, Geller, Hovell, & Mayer, 1994; Moriarty, Mitchell, & Wells, 2008; Wells, Burnett, & Moriarty, 2006). Choosing vehicles is a matter of balancing the needs and preferences of the intended program participants with logistics and budget. With children, for example, planners might use school-based education using teachers and peer leaders; to health care providers; to magazines, radio, and television addressed to children; and to computer and video games and instruction. Techniques from social-marketing market segmentation can help define the various segments of a priority audience in terms of the context in which they will interact with a new behavior, their current behavior, readiness to change, benefits desired from the new behavior, the competition the behavior will have, and ways to reach certain population groups including their media habits and preferred information channels (Andreasen, 1995; Cheng, Kotler, & Lee, 2011; Forthofer & Bryant, 2000; Lefebvre & Flora, 1988; Maibach, Maxfield, Ladin, & Slater, 1996; Randolph & Viswanath, 2004; Slater, 1995).

**Examples of Program Channels and Vehicles.** One program can use both interpersonal and mediated channels as well as many different vehicles. The *A Su Salud* program used both media (circulating print, radio, and television) and interpersonal communication through community volunteers to promote smoking cessation among Mexican Americans in south Texas (McAlister et al., 1995; Ramirez et al., 1995). Program implementers, using the method of behavioral journalism, worked with mass media journalists to produce news and features with information regarding cessation and with stories of real-life people from the population at risk who were in various stages of change regarding the behavior. Trained volunteers then handed out calendars containing the times of the news and talk show broadcasts, tips for quitting, and information of public interest (for example, the high school basketball game schedule). They encouraged their friends and acquaintances to consider quitting smoking; and reinforced any efforts those friends made. In another example, the program *Cultivando La Salud* used flip charts (small noncirculating media) delivered by *promotoras* (interpersonal channel) to deliver messages regarding breast and cervical cancer screening to farmworker women (see Chapter Eleven on the book's instructor Website) (Fernández, Gonzales, Tortolero-Luna, Partida, & Bartholomew, 2005a; Fernández et al., 2009).

**Table 7.1 Safer Choices 2 Program Scope and Sequence**

<b>Timing</b>	<b>Lesson</b>	<b>Activities</b>
Week 1	1. What This Means to Me	An introductory activity helps students understand some of the pressures that young people face related to sexual relationships. Students and the facilitator generate agreements for classroom discussion. This lesson introduces “My Choices,” the journaling component of the curriculum.
	2. Understanding STIs and HIV	Using visual materials, the facilitator provides an overview of six common STIs—how they are spread, their symptoms, treatment, and prevention. Students play a game to learn about the ways in which HIV is transmitted. Students brainstorm reasons that teens might not get tested for STIs or HIV, and identify ways to address these barriers.
Week 2	3. Making Choices: Video	Students view the video Choices. The video shows three teenage couples facing decisions about sex. It also depicts some of the consequences of unprotected sex.
	4. Setting Personal Limits	Students discuss the need for setting personal limits regarding sexual behavior, and discuss three steps to avoid making UNSAFE choices. In a journaling activity, students address their own personal limits regarding sex.
Week 3	5. Talking with a Person Infected with HIV	A guest speaker shares his or her experience living with HIV infection or AIDS. A question and answer period follows the speaker’s presentation. In a journaling activity, students personalize how being infected with HIV would affect their life.
Week 4	6. Ways to Say “NO!”	Verbal and nonverbal refusal skills are introduced and demonstrated through scripted role plays. Discussion and practice using a half-scripted role play help students distinguish between ineffective and effective statements and actions.
	7. More Ways to Say “NO!”	After reviewing characteristics of clear NO statements, two new refusal skills are modeled: alternative actions and delay tactics. Students practice refusal skills in small groups using half-scripted role plays.

*(Continued)*

Table 7.1 (Continued)

Timing	Lesson	Activities
Week 5	8. Healthy Relationships	Students identify the characteristics of healthy and unhealthy relationships. Students rank the qualities that are personally important to them in a boyfriend/girlfriend, and assess their values and expectations in dating situations.
	9. Healthy and Unhealthy Relationships	This lesson reinforces what the students learned in Lesson 8. Through the use of case studies, students identify the characteristics that make a relationship healthy or unhealthy. Students brainstorm tips to avoid and end an unhealthy relationship.
Week 6	10. Using Protection— Part I (Condoms)	This lesson focuses on the use of condoms to protect against HIV, STI, and unintended pregnancy. Barriers to planning, getting, and using condoms and ways to overcome these barriers are discussed. After the facilitator demonstrates the proper use of condoms, students examine condom packages to identify characteristics, and practice correct steps for condom use.
	11. Using Protection— Part II (Condoms)	Students practice responding to typical pressure lines in role play situations in which young people are being pressured to have unprotected sex.
Week 7	12. High-Risk Situations	Through role plays, students review and practice methods to avoid high-risk situations that may promote sexual behavior. Students discuss how drugs and alcohol affect an individual's decision to avoid unwanted or unprotected sexual activity.
	13. Personalizing the Risk for Pregnancy and Methods of Protection	Students participate in an activity to personalize their risk for unintended pregnancy. HIV, STI, and pregnancy prevention methods commonly used by teens are presented and discussed. Students differentiate between methods that offer little or no protection, those that reduce the risk of pregnancy only, and those that reduce the risk of HIV, STI, and pregnancy.

Table 7.1 (Continued)

Timing	Lesson	Activities
Week 8	14. Playing It Safe	Students brainstorm common barriers to using condoms and contraception and ways to overcome these barriers. Students practice communication skills for talking with a partner about using protection in half-scripted role plays.
	15. What You Can Do	Students reflect on what they have learned from the program and complete the final journaling activity, making a personal commitment regarding responsible sexual activity.

Channels for communication will vary depending on the audiences and the expected behavior. For example, two programs directed at men who have sex with men (MSM), one addressing HIV-prevention and one addressing HIV-testing, chose the Internet as their channel. The program developers chose the Internet because it has become an increasingly popular venue for seeking sex partners (Hospers, Kok, Harterink, & de Zwart, 2005). Also, the Internet provides an excellent medium for reaching large numbers of people with tailored health promotion. The program objectives of “The Gay Cruise” were to get e-dating MSM to use condoms consistently and those of the second program, “Queermasters, the Online Gay Health Show” were to promote regular STI/HIV-testing among MSM.

In contrast, two other HIV-prevention programs, this time directed at HIV+ MSM, chose interpersonal channels with communications delivered by nurses employed in HIV treatment centers. These nurses see most of the HIV+ MSM on a regular basis, which provides an excellent opportunity to address sexuality and related issues. Based on the earlier steps of Intervention Mapping, the program “HIV & Sex” comprised a self-help guide, a motivational interviewing session, and a motivational interviewing telephone call; both delivered by nurses specialized in HIV (Van Kesteren, Kok, Hospers, Schippers, & De Wildt, 2006). The second program, the “Adherence Improving Management Strategy” (AIMS), addressed optimizing HIV+ patients’ adherence to prescribed treatments. The intervention delivered on counseling for self-management and provided electronic adherence feedback (de Bruin, Hospers, van den Borne, Kok, & Prins, 2005; de Bruin, van Breukelen, Kok, & Hospers, 2010a).

Table 7.2 Communication Channels and Vehicles

Channels and Vehicles	Typical Uses, Methods, and Practical Applications	Advantages	Disadvantages
<i>Interpersonal</i> Community volunteers Peer leaders	<ul style="list-style-type: none"> <li>• Skill training</li> <li>• Social reinforcement</li> <li>• Modeling</li> <li>• Tutoring</li> <li>• Small-group discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Powerful source of influence and persuasion</li> <li>• Can be inexpensive</li> <li>• Involve community and enhance capacity</li> </ul>	<ul style="list-style-type: none"> <li>• Difficult to train and motivate individuals to deliver one-on-one or small-group messages</li> </ul>
<i>Interpersonal</i> Teachers	<ul style="list-style-type: none"> <li>• Mastery learning</li> <li>• Tutoring</li> <li>• Small-group discussion</li> <li>• Lecture</li> <li>• Modeling</li> </ul>	<ul style="list-style-type: none"> <li>• Expert in teaching techniques</li> <li>• Fit organizational context of school</li> </ul>	<ul style="list-style-type: none"> <li>• Can be resistant to truly interactive techniques</li> <li>• Can be crippled by curriculum time constraints</li> </ul>
<i>Interpersonal</i> Health care providers	<ul style="list-style-type: none"> <li>• Skill training</li> <li>• Social reinforcement</li> <li>• Modeling</li> <li>• Counseling</li> </ul>	<ul style="list-style-type: none"> <li>• Powerful source of influence and persuasion</li> <li>• Expert in patient assessment and counseling</li> <li>• Captive audiences interested in personal health issues</li> </ul>	<ul style="list-style-type: none"> <li>• Can be difficult to train and motivate</li> <li>• Lack of time</li> <li>• Have difficulty integrating counseling techniques if they are used to a more directive “medical model”</li> <li>• Can be perceived as too dissimilar from the patient</li> </ul>
<i>Circulating Print</i> Newspapers	<ul style="list-style-type: none"> <li>• Letters to the editor</li> <li>• Editorial commentary</li> <li>• Role-model stories</li> <li>• Information</li> <li>• Persuasion</li> <li>• Vicarious reinforcement</li> </ul>	<ul style="list-style-type: none"> <li>• Inexpensive</li> <li>• Wide audience</li> <li>• Extends expertise</li> <li>• Detailed</li> <li>• Very flexible</li> <li>• Positive consumer attitudes about vehicle</li> <li>• Can be niche based</li> </ul>	<ul style="list-style-type: none"> <li>• Depends on literacy</li> <li>• Reaches only certain segments</li> <li>• Short life span</li> <li>• Clutter (many vehicles on the market compete for attention)</li> <li>• Not for demonstration</li> </ul>

Table 7.2 (Continued)

Channels and Vehicles	Typical Uses, Methods, and Practical Applications	Advantages	Disadvantages
			<ul style="list-style-type: none"> <li>• Poor visual quality</li> <li>• Require health educator cultivation of relationship with gatekeepers such as health reporters at the newspaper</li> <li>• Require health educator to capitalize on short media attention span for issues</li> </ul>
<i>Circulating Print</i> Magazines	<ul style="list-style-type: none"> <li>• Editorial commentary</li> <li>• Role-model stories</li> <li>• Information</li> <li>• Persuasion</li> <li>• Vicarious reinforcement</li> </ul>	<ul style="list-style-type: none"> <li>• Good audience segmentation</li> <li>• High audience receptivity</li> <li>• Credibility and prestige</li> <li>• Long life span</li> <li>• Visual quality</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of flexibility</li> <li>• Lack of control of distribution</li> </ul>
<i>Circulating Print</i> Newsletters	<ul style="list-style-type: none"> <li>• Letters to the editor and editorial commentary</li> <li>• Role-model stories</li> <li>• Information</li> <li>• Persuasion</li> <li>• Vicarious reinforcement</li> </ul>	<ul style="list-style-type: none"> <li>• Good audience segmentation</li> <li>• High audience receptivity</li> <li>• Strong possibility for tailoring</li> <li>• Control of distribution</li> </ul>	<ul style="list-style-type: none"> <li>• Require high degree of novelty</li> </ul>
<i>Display Print</i> Billboards Posters	<ul style="list-style-type: none"> <li>• Attention</li> <li>• Awareness</li> <li>• Cue to action</li> </ul>	<ul style="list-style-type: none"> <li>• Can be very effective in calling attention to a campaign</li> </ul>	<ul style="list-style-type: none"> <li>• Can only effect limited learning and change objectives (such as knowledge and awareness)</li> <li>• Expense can be significant</li> </ul>

(Continued)

Table 7.2 (Continued)

Channels and Vehicles	Typical Uses, Methods, and Practical Applications	Advantages	Disadvantages
<i>Display Print</i> Brochures Flip-charts	<ul style="list-style-type: none"> <li>• Skill training</li> <li>• Modeling</li> <li>• Information with extensive detail</li> <li>• Persuasion</li> <li>• Vicarious reinforcement</li> </ul>	<ul style="list-style-type: none"> <li>• Can effect a variety of learning and change objectives</li> </ul>	<ul style="list-style-type: none"> <li>• No standard distribution routes exist as they do for circulating print</li> </ul>
<i>Radio</i> News Items Interviews Public service announcements (PSAs)	<ul style="list-style-type: none"> <li>• Information</li> <li>• Awareness</li> <li>• Role-model stories</li> <li>• Persuasion</li> </ul>	<ul style="list-style-type: none"> <li>• Good audience segmentation</li> <li>• High audience receptivity</li> </ul>	<ul style="list-style-type: none"> <li>• Require cultivation of relationship with station gatekeepers</li> <li>• Require ability to capitalize on short media attention span for issues; also short life span</li> <li>• Require high degree of novelty</li> <li>• Role-model stories not supported by visuals</li> </ul>
<i>Television</i> News stories Talk shows Interviews	<ul style="list-style-type: none"> <li>• Skill training</li> <li>• Modeling</li> <li>• Information with extensive detail</li> <li>• Persuasion</li> <li>• Vicarious reinforcement</li> </ul>	<ul style="list-style-type: none"> <li>• Wide distribution</li> <li>• Possibility for segmentation</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of control over content</li> <li>• Require cultivation of relationship with station gatekeepers</li> <li>• Require ability to capitalize on short media attention span for issues; also short life span</li> <li>• Require high degree of novelty</li> <li>• Competition with broadcast clutter</li> </ul>
<i>Television</i> Entertainment TV	<ul style="list-style-type: none"> <li>• Intense role-model stories</li> </ul>	<ul style="list-style-type: none"> <li>• Wide distribution</li> <li>• Natural segmentation</li> <li>• Norm changing capabilities</li> </ul>	<ul style="list-style-type: none"> <li>• Require relationships with producers</li> <li>• Can be very long</li> </ul>

Table 7.2 (Continued)

Channels and Vehicles	Typical Uses, Methods, and Practical Applications	Advantages	Disadvantages
Television PSAs	<ul style="list-style-type: none"> <li>To stimulate awareness</li> </ul>	<ul style="list-style-type: none"> <li>Wide distribution</li> <li>Natural segmentation</li> </ul>	<ul style="list-style-type: none"> <li>Channel surfing cuts down on audience.</li> <li>Must have excellent production qualities</li> <li>Often used at off-peak or not used</li> </ul>
Television Infomercials	<ul style="list-style-type: none"> <li>Product awareness and persuasion</li> </ul>	<ul style="list-style-type: none"> <li>Can provide large amounts of detail</li> </ul>	<ul style="list-style-type: none"> <li>Channel surfing is problematic.</li> </ul>
Computer-assisted instruction	<ul style="list-style-type: none"> <li>Skill training</li> </ul>	<ul style="list-style-type: none"> <li>Has a very wide and quickly expanding repertoire of vehicles, such as CD-ROM, Decision-support, simulations, games, learner-controlled instruction</li> </ul>	<ul style="list-style-type: none"> <li>Can be costly to develop</li> <li>Programming skills are rare and in high demand.</li> </ul>
Videotape Training Documentary	<ul style="list-style-type: none"> <li>Just about anything</li> </ul>	<ul style="list-style-type: none"> <li>Control over content</li> </ul>	<ul style="list-style-type: none"> <li>Can be costly</li> <li>Distribution systems must be planned.</li> </ul>

In addition to health care providers in the previous two examples, interpersonal channels include teachers, lay health workers, and many different types of community volunteers. These various program deliverers may use many communication vehicles. For example, teachers may use tutorials (one-on-one instruction), group discussions, and lectures, depending on the context and on the content and objectives of the instruction. Tutorials and small-group learning have the advantage over lectures in that learner performance can be elicited and feedback provided with greater individualization.

More abstract and interactive vehicles for change, such as community coalitions, are also frequently used in health promotion programs. They have been used to address alcohol, tobacco, and other drug abuse prevention, immunization promotion, oral health promotion, injury prevention, HIV/AIDS prevention, asthma, children's health insurance, and chronic disease prevention (Butterfoss, 2007). For example, The Walk Texas! program (Texas

Diabetes Program/Council & Texas Department of State Health Services, 1998), a community program aimed at getting Texans to exercise, is conducted by local health departments and other community-based organizations. An early task was to identify and connect to partners who could establish local walking groups. In another example, the Texas Department of State Health Services currently funds six community coalitions to implement a comprehensive tobacco prevention and control program (Sneden, Robertston, Loukas, & Gottlieb, 2008).

These coalitions draw members from education, law enforcement, local government, health care, human services, business, and other community sectors. They aim to prevent youth tobacco use, to ensure compliance with state and local tobacco laws, to increase tobacco use cessation, and to eliminate exposure to secondhand smoke (Loukas, Sneden, & Robertston, 2009). Blueprints for accomplishing these performance objectives are comparable to the program design documents we discuss later in this chapter and include guidelines for selecting coalition members, guidelines for meeting agendas, protocols for legislative visits, and sample letters for advocacy. These channels for delivering methods and practical applications to accomplish program objectives should be considered as a possible part of every program.

**Computer-Delivered Intervention.** The current research on the computer environment in health education suggests that the computer can be an effective way to deliver health promotion to many diverse groups (Markham, Shegog, Leonard, Bui, & Paul, 2009; Portnoy, Scott-Sheldon, Johnson, & Carey, 2008; Prokhorov, Kelder, Shegog, Conroy, Murray, Peters, et al., 2010; Prokhorov, Kelder, Shegog, Murray, Peters, Agurcia-Parker, et al., 2008; Shegog, Bartholomew, Gold, Pierrel, Parcel, Sockrider, et al., 2006; Tortolero, Markham, Peskin, Shegog, Addy, Escobar-Chaves, et al., 2010; Walters, Wright, & Shegog, 2006). Interactive technology is attractive to program participants because it includes both user control, the extent to which the user can modify the form and content of the computer environment and can determine which topics and services are selected, and responsiveness, the extent to which a program takes into account the user's previous activities (Street & Rimal, 1997). A highly responsive program gives feedback on health choices made within a program and provides opportunities to practice new skills (Funk & Buchman, 1995). Another aspect of interactive media is that they comprise modular units that are linked together to enable the program to employ an array of databases such as animation, narration, graphics, and services and to enable the user to move from one part to another

(Dede & Fontana, 1995). All of these characteristics give computer-delivered programs high potential to be engaging and attractive to participants. In addition, they are deliverable in a broad range of settings including isolated locations. These characteristics are attractive for program development in health education because they provide a powerful medium for delivering methods and practical applications that influence a wide range of determinants. Interactivity promotes active information processing and satisfaction (Dede & Fontana, 1995; Rafaeli, 1988; Schaffer & Hannafin, 1986) and may contribute to central processing as discussed by Chaffe and Roser (1986), Petty and Cacioppo (1986a, 1986b), and Webber (1990) (see Chapter Two).

Another advantage of interactive multimedia is that a single application can support a wide variety of learner needs (Rimal & Flora, 1997). For example, users who lack sufficient background (including language skills) can supplement text learning with other modalities, such as pictures, and can be presented significant redundancy across modalities. Redundancy is needed because a novice learner has to construct cognitive schema and then attach new information. On the other hand, users who already have the schema can reduce redundancy and cut to the chase. The computer environment also is an excellent mechanism for balancing novelty (to acquire and maintain attention) and redundancy (to facilitate processing). With computer-delivered programs, both environments can be available simultaneously. A further advantage is temporal flexibility. The user can control not only when to get the message but when and how to manipulate the message. All these types of user control—the ability to control when the program is used and the aspects of novelty and redundancy—can facilitate learning and the development of self-directed learning skills (Lieberman & Linn, 1991).

The Comprehensive Health Enhancement Support System (CHESS) is an example of the explicit use of theoretical methods such as problem solving, decision support, self-monitoring, social support, and action planning in a computer-delivered program. CHESS also is a good example of developing a carefully limited design and adhering to it across content domains. The program is intended for people who have health crises; and the first problem areas to be developed were breast cancer, HIV, sexual assault, adult children of alcoholics, academic crisis, and stress management (Gustafson, Bosworth, Chewning, & Hawkins, 1987; Gustafson et al., 1994, 2002; Shaw et al., 2006). The program shell consisted of three components:

- Information delivered through an instant library, questions and answers, “ask an expert,” and help and support

- Decision and planning support delivered through decision analysis, action planning, and risk assessment
- Social support delivered through personal stories and a discussion group

Other program developers have demonstrated that the computer-assisted instructional environment is a good way to teach self-management skills and to enhance self-efficacy (Brown et al., 1997; Lieberman, 2001). Lieberman (1997) describes a series of Health Hero video games that provide simulated self-management environments for diabetes and asthma and that solidify negative attitudes regarding smoking. She notes that children will continue playing games until they can easily complete them. Bartholomew and colleagues had the same experience with the Watch, Discover, Think, and Act program (Chapter Twelve (on the book's instructor Website)) (Bartholomew et al., 2000b, 2000c). Children would often encourage entire families to wait for them in the clinic so that they could just complete one more level in the asthma management program. All these programs have design elements geared toward promoting attention and active processing, motivation, knowledge and skills of disease management, self-efficacy, communication, and social support. Watch, Discover, Think, and Act makes use of the computer's capabilities by enabling children to enter their personal asthma characteristics, which the computer then uses to modify the simulations to be more tailored to the individual child.

**Telephone-Assisted Interventions.** The telephone has been used as an instrument of health care since its debut (Soet & Basch, 1997). There is a large literature on the use of the telephone as an instrument of health education and promotion, ranging from simple information hotlines through a midrange of standardized messages aimed at health behavior, to more complex live coach and computerized counseling for behavior change (Hawkes et al., 2009; Ramelson, Friedman, & Ockene, 1999). The telephone as a delivery mechanism has many advantages. It is interactive, and messages can be not only tailored but also individualized. Visual privacy can make intervention less stressful and more productive for individuals who are reluctant to discuss a particular issue. The telephone also can reach dispersed or homebound populations and can accommodate low literacy and language differences. There is some risk of loss of meaning in this medium (as there is for print vehicles) because 65 to 95% of social meaning comes from visual cues in face-to-face interaction. However, it is possible that the novelty and different set of expectations for electronic media may liberate the delivery from the burden of interpersonal

empathy as long as the messages are developed with appropriate counseling sophistication.

Perhaps the most exciting development in telephone delivery is the combination of expert system technology and interactive (digitized voice) telephone counseling. This technology enables a real-time assessment and contingent delivery of messages and feedback regarding attempts to perform a health behavior. Automated systems are being used more and more in managed care situations and other health care settings. For example, the Telephone Linked Communication (TLC) system is based on interactive voice recognition (IVR), which can function as an at-home monitor, educator, and counselor for patients and consumers (Friedman, Stollerman, Mahoney, & Rozenblyum, 1997; Migneault, Farzanfar, Wright, & Friedman, 2006; Ramelson et al., 1999). The TLC has been used to counsel smoking cessation (Ramelson et al., 1999), improve medication compliance for hypertension (Friedman et al., 1996), promote physical activity and diet (Estabrooks & Smith-Ray, 2008; Jarvis, Friedman, Heeren, & Cullinane, 1997; King et al., 2002, 2007), encourage parents of overweight children to change the home environment resulting in reduced BMI (Estabrooks et al., 2009), and promote cancer screening (Friedman, 2000). A sample conversation from the smoking intervention in which messages are tailored by stage of change is included in Exhibit 7.1.

**Computerized Tailoring of Interventions.** For the past twenty years, health education researchers have been testing computerized expert systems that enable tailoring of communications to certain participant characteristics (Bental, Cawsey, & Jones, 1999; Brug et al., 1999; Kreuter et al., 2000, 2004a; Lustria, Cortese, Noar, & Glueckauf, 2009; Krebs, Prochaska, & Rossi, 2010; Noar, Black, & Pierce, 2009; Revere & Dunbar, 2001; Strecher, 2007). Although research is continuing to determine exactly on what characteristics tailoring should be based (that is, what characteristics influence the intervention's effectiveness), there is enough evidence of effectiveness to continue to work in this area and to import these practical applications into common practice (Hawkins, Kreuter, Resnicow, Fishbein, & Dijkstra, 2008; Rimer & Kreuter, 2006; van Stralen, de Vries, Mudde, Bolman, & Lechner, 2009). The characteristics on which to base tailoring in a particular program must be well justified empirically and theoretically (Brug, Glanz, Van Assema, Kok, & van Breukelen, 1998; Brug, Steenhuis, Van Assema, & De Vries, 1996; Dijkstra et al., 1998a; Dijkstra, De Vries, Roijackers, & van Breukelen, 1998b; Kreuter & Strecher, 1996; Kreuter & Wray, 2003; Rimer et al., 1994; Skinner, Strecher, & Hospers, 1994; Strecher et al., 1994; Vandelanotte, DeBourdeauhuij, & Brug, 2004).

## EXHIBIT 7.1

### COMPUTERIZED TELEPHONE SYSTEM FOR SMOKING COUNSELING

#### Example A: Contemplation dialogue.

The caller's responses to the questions posed by the system are underlined. The dashed lines represent a jump to another part of the conversation.

Hello Mr. [name]. I'm glad that you called in today. About how many cigarettes are you now smoking a day?

Caller: 25

You are smoking more cigarettes than the last time we spoke. I hope you will be able to cut down when we speak next. In the conversation, we will identify reasons why you smoke and reasons why you want to quit. This will help me to give you specific suggestions to help you quit.

---

If you haven't smoked for a while, do you get a strong craving or desire to smoke? Press 1 for yes and 2 for no.

Caller: 1

Write down on your list the words, "I smoke to satisfy my craving for a cigarette." Press 1 when you are done.

Caller: 1

Do you smoke to give yourself a lift or to keep yourself from slowing down? Press 1 for yes and 2 for no.

Caller: 2

Do you smoke when you are under stress or feeling depressed? Press 1 for yes and 2 for no.

Caller: 1

Write down on your list the words "I smoke to reduce stress." Press 1 when you are done.

Caller: 1

---

Now I would like to identify reasons why you want to quit. This will help me to give you specific suggestions to help you to quit. Do you want to quit for your health? Press 1 for yes and 2 for no.

Caller: 2

Dr. [name] recommends that you quit for your health. Passive smoking occurs when you smoke around other people. They inhale your cigarette smoke and the cancer-causing substances in it. Do you want to quit for the health of those close to you? Press 1 for yes and 2 for no.

Caller: 1

Write down on your list the names of the people who you are thinking about. Press 1 when you are done.

Caller: 1

The money that you spend on cigarettes adds up to a lot. Since you started smoking, approximately how many cigarettes on an average day would you say that you have smoked?

Caller: 30

Approximately how many years have you been smoking?

Caller: 25

Do you realize that over the time that you have smoked, you have spent \$27,375 on cigarettes? I'll bet that you wish you had that money now. Well, it's not too late to quit smoking and save money now. If you continue to smoke for the next ten years, you will spend another \$16,425 on your habit. Do you want to quit to save money? Press 1 for yes and 2 for no.

Caller: 1

We have finished making our lists. I would like you to put these lists in a place where you will see them every day—like near your telephone or on your fridge. Try to look at them at least once a day. You may think of more reasons why you want to smoke and why you want to quit. Add them to the lists as you think of them.

### **Example B: Preparation dialogue.**

Did you try to quit on [your quit date]? Press 1 for yes and 2 for no.

Caller: 1

Don't be discouraged. Most smokers need several tries before they quit. Did something unexpected come up that made it hard for you to quit? Press 1 for yes and 2 for no.

Caller: 1

I understand. I hope that you will try again. Are the suggestions that we discussed helping you? Press 1 for yes and 2 for no.

Caller: 2

We will review the suggestions, and if you want, I will give you some other ones to help you out. After we do this, I will ask you to choose another goal for quitting.

---

You told me that you smoke to satisfy a craving. You wanted to satisfy your craving by taking ten deep breaths. Did you try this suggestion? Press 1 for yes and 2 for no.

Caller: 1

Did this suggestion help you with your cravings? Press 1 for yes and 2 for no.

Caller: 2

Don't be discouraged. I will give you some other ideas to help you to quit. If you get a strong urge for a smoke, try putting something in your mouth instead of a cigarette. You can carry around with you a carrot, celery, cinnamon sticks, chewing gum, or toothpicks. Do you think you will do this? Press 1 for yes and 2 for no.

Caller: 1

Write down on your list the thing that you will put in your mouth when you get a craving. Examples are carrot, celery, and cinnamon sticks. Press 1 when you are done.

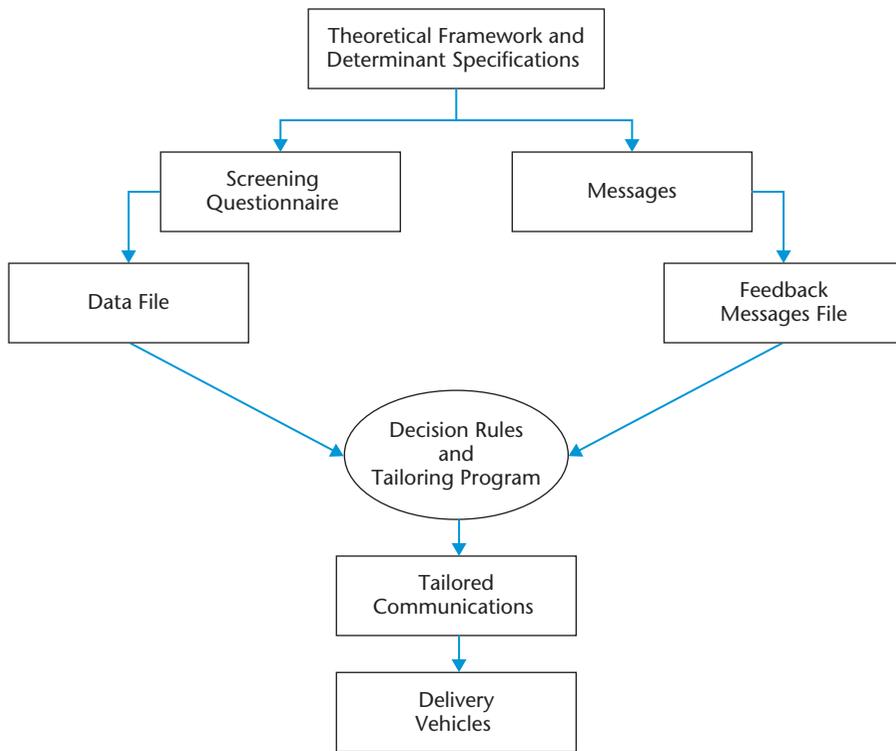
Caller: 1

*Source:* Reprinted from Ramelson, H. Z., Friedman, R. H., & Ockene, J. K. "An Automated Telephone-based Smoking Cessation Education and Counseling System," *Patient Education and Counseling*, 36(2), copyright (1999), with permission of Elsevier.

Velicer and colleagues (1993) define an expert system as a collection of facts and rules about something and a way of making inferences from the facts and rules. The most common type of expert system in health education is a computer program that generates behavior-change messages tailored to the receiver's specific characteristics. In other words, the expert system contains one or more

databases of messages based on theoretical constructs that vary as they apply to different characteristics of individuals and algorithms for matching the messages to the individual. The message channel could be anything that facilitates delivery of the message. In the expert system by Velicer and colleagues, for example, the vehicle is a report; but the message could also be delivered by newsletter, video, or computer-assisted instruction. In the Velicer work, messages were based on the Transtheoretical Model (TTM) and included processes of change tailored to the stage of the individual in regard to quitting smoking. Feedback included current smoking status and stage of change, current use of change processes, suggested quitting strategies, and high-risk situations. Feedback was compared against a normative database as well as against the participant's own progress. All the systems described in the literature are based on similar configurations (see Figure 7.1), with a theoretical framework and specification of relevant

**FIGURE 7.1** Developing Tailored Feedback



Source: Adapted with permission from Brug, Steenhuis, Van Assema, and De Vries, 1996.

hypothesized determinants of the health behavior; use of the determinant model to create a data collection tool and a series of messages; several databases, including at least a data file and a feedback message file; decision rules and a tailoring program; communications; and delivery vehicles (Dijkstra & De Vries, 1999; Rhodes, Fishbein, & Reis, 1997).

## Program Themes

A program theme is a general organizing construct for a program. A program often has a theme as well as several recurring visual and linguistic subthemes or ideas. Both themes and recurring subthemes can be based on the health topic, such as the themes for the stroke project, “call 911” and “is there treatment for stroke?”. Themes also may be based on the behavioral or community change objectives. For example, the Watch, Discover, Think, and Act theme of an intervention for asthma is based on the self-regulatory processes taught in the computer program. It became the program title and a structure for recurring visuals (Figure 7.2) (Bartholomew et al., 2000b, 2000c; Shegog et al., 1999, 2006). Themes may be unrelated to the program content. The third-grade component of the CATCH program (Perry et al., 1997) used a theme of space creatures that had come to earth to teach earth children about diet and physical activity. Themes may also derive from characteristics of the at-risk groups, cultures, or preferred learning styles. In the CF FEP (Bartholomew et al., 1991), the theme of the adolescent modules was “taking charge” of one’s health and one’s life and was based on an adolescent developmental task, whereas the modules for the school-age children emphasized exploration and mastery, a developmental task of children this age.

The most important factors in choosing themes and organizing subthemes or ideas for a program is whether the chosen idea will attract people to the program and aid participants’ attention, awareness, and comprehension (Bernston & Cacioppo, 2009; Perry, 2002; Petty & Cacioppo, 1986a; Petty & Wegener, 1998). As a second tier of effectiveness, it is possible that themes can also affect determinants and change objectives directly. For example, in the stroke program materials, the theme of urgency paired with the theme that treatment is available was meant to directly affect certain change objectives.

A good example of the development of a comprehensive program theme designed to appeal to the intended participants is from the project Parents and Newborns Developing and Adjusting (PANDA) (Mullen et al., 1999). When Mullen and her colleagues first characterized a program to help women who had quit smoking during pregnancy not to return to smoking, they thought of the theme “tender loving care for the mother.” As they worked on program

**FIGURE 7.2** Watch, Discover, Think, and Act Screen with Self-Regulatory Icons



development and talked to the women, they became even more convinced that a theme that enabled the mother to focus on herself and get ready for the baby would garner the prospective mother's attention, whereas a theme more closely related to cigarette smoking would not.

The Internet programs for MSM described previously used themes of a cruise and a game show. "The Gay Cruise: Dating and Sex Without Worries? Come Aboard Now!" was chosen as an integrating theme, which was acceptable to the gay subculture. The theme provided a context for role models with virtual ship's pursers acting as counselors and daters as passengers (Kok et al., 2006). In the second program, the concept of an online gay health show allowed developers to include different program components in various game rounds, virtual counselors as the show master and his assistant, and a virtual MSM audience in the background representing a reference group, and expressing a social norm (Mikolajczak, Kok, & Hospers, 2008). In contrast, the developers of a program for HIV+ MSM derived the theme of men gaining control of their sexual and social lives from the performance objectives for the men (Van Kesteren et al., 2006).

## Producing Program Materials

The next task in Step 4 is to prepare design documents for the production of materials that meet the program objectives and parameters for the methods and practical applications.

Developing design documents to guide the process of program creation is the next task in Step 4. Sometimes members of the planning group will develop the support materials for health education programs. In other cases the budget will allow hiring of a variety of creative consultants. Either way, planners must prepare documents to guide the producers to produce what the planners intend for the program.

### Hiring and Working with Creative Consultants

In an ideal budgetary world, health educators should take the advice of Balderman (1995), who says that if you weren't trained to do something, don't do it. A creative consultant should be hired when the health educator does not have the specific skill needed to create a component of the program. Commonly used creative resources include graphic design studios, copywriters, instructional designers, video and film writers, and video and film directors. In addition, production resources can include photographers, illustrators, talent (models and actors), location search companies, printers, videographers, and computer programmers.

In order to find the creative or production resources they need, experienced health educators talk to people. Good sources of referrals are printers or other people who have produced work and can introduce a designer, photographer, or illustrator. Branching out from the health field can often help. Balderman (1995) suggests the following ways to recruit talent to a project:

- Put together a synopsis of the job including approximate budget, length, purpose, concept, and producing agency
- Send the synopsis with a request for statements of interest. Schedule meetings with the persons who respond. Interviewing talent is a good way not only to look for help on the current job but also to build a file of possible resources for future work.

- Look at the portfolio of work. Is there any evidence that this person has conveyed the type of message needed and gotten the desired response? Does the planning team like the work? Does the range of previous work of the creative person include the type of work needed for the project?
- Ask about several of the projects in the portfolio. Is a range of budgets represented? Ask the person to talk about each project. If the type of product the team wants is not represented in the portfolio (which is the best of the best), then it is probably not available from this vendor.

Remember that members of the team will not be designing the piece; the creative consultant will. At no point should health educators have to take over for the creative person. That person should understand the project's intent well enough that he or she brings to the team something that is even better than what the team imagined. This scenario implies that the person should not only be creative but also willing to thoroughly understand the team's intent. How does this creative person present herself? Is this purely a salesperson, or does he or she ask questions to understand the project? Is the person too quick to assume that it is just like other projects he or she has done? Does the person seem insensitive to the team's needs, making statements such as, "But I'm the producer" or "We never do it like that"? If so, proceed cautiously.

A word about second-guessing the creative resources: don't. Health educators should give their creative people the most understandable background possible and then try not to interfere with their creativity. The opportunity to allow a creative resource to create something independently is one of the reasons for all the planning up to this point. The creative people hired for the project will produce their best effort, and fiddling with it will decrease the quality in some way. It is possible that the person you hire for a project just cannot deliver acceptable work. Some creative people are unable to stay within the project parameters. Planners may encounter the video producer who, no matter what, will try to turn the team's role-model story into her documentary or the graphic designer who wants the team's newsletter to be his award winner. Health educators must know when to end the relationship with the vendor. If the initial ideas, preliminary sketches, or other proposed work are not acceptable, the health educator may want to look for other talent. The health educator might ask for one more attempt from the consultant after clarifying the project intent. But after a couple of unsuccessful tries, the health educator should go back to the hiring process.

## Initial Design Documents: Conveying the Project Intent

The first step in working with a creative resource is conveying the intent of the project and the project parameters. The first design document includes answers to the following questions:

- What pieces will be produced?
- What creative and production elements will be necessary to produce the project, and who will provide them?
- How and when will each piece be produced?
- What is the deadline?
- What is the budget?
- What preexisting pieces can the production resource of the planning team provide (for example, videotape, photos, illustrations, logos, copy)?
- Does the piece need to follow a particular format?
- Does the group have a corporate or agency manual of style?
- Whom does the piece need to acknowledge?
- What will the approval process be?
- Who will be involved in approval?

The planning team members who are working with creative resources want them to understand the project as well as possible and to wholeheartedly adopt the planning group's intent. The team members want the creative consultants to understand the program then to bring their talents to producing the needed materials. The person's creative additions should bring to life rather than override or misinterpret the team's understanding of the problem and its solution. The key to working with the creative production team is to create design documents so that the producers come to fully understand what the planning team intends.

To get started with a creative person, health educators usually invite him or her to a team meeting to talk about the project once the team can give a fairly consistent message. If possible, the health educator takes the creative person to visit with members of the community. Sometimes the creative person can go to focus groups or interviews. The people that he or she encounters at these meetings may end up in the final materials. For example, the production team consulted pregnant women and their partners in focus groups for formative research for Project PANDA (Mullen & Bartholomew, 1991) and then later invited them to be interviewed for the resulting videotapes.

In an ideal situation, the designer (or writer or producer) can work with the team almost from the beginning of planning, offering ideas as to format

and serving as an expert witness on what is (and is not) doable. The next best approach is to bring the designer in when the matrices, practical applications, and methods have been hammered out but before the team has decided on the formats of the support materials. This approach allows the designer to bring his or her creativity to the table as the planning team figures out what precise form the product will take. The earlier the designer can enter the process, the more his or her skills will enrich it. Designers and other creative consultants need to be compensated for their time in participating in the planning process.

## Writing Design Documents

Planners must communicate in words what someone else will return in various forms of pictures, stories, movement, color, sound, and so forth. We have already talked about including the creative people in meetings with the team and the intended audience, but doing so does not alleviate the need for documents to convey the team's intent in detail. We suggest two types of design documents:

- A series of design documents from the health educator to the creative people
- A series of production design documents from the creative people to the health educator

The first design documents from the planning team to the creative team are the matrices, with all the change objectives that are pertinent to a given product highlighted. A second document from the planning team is a project prospectus that gives the length of the product, a brief description of the audience, the way that the user will interact with the product, the purpose of the piece (the intended impact), the central messages, and the target budget.

The design documents then become more specific to the desired product. For example, Table 7.3 illustrates the initial design documents used for Project PANDA. This project delivered methods through a series of newsletters directed to pregnant women and another series directed to their partners. It also included a videotape for each partner, delivered to their home; the man received his just prior to the baby's arrival and the woman just after. This design document gives an overview of the women's intervention across time and across the weeks of pregnancy.

A second design document (Table 7.4) for project PANDA is included to show the progression from the overview to a more detailed description of the content to be developed for one specific newsletter. The PANDA development team decided to write the first draft of the newsletter copy themselves, so the development team members used the design document in-house to convey intent to all the team members who were writing copy.

**Table 7.3 Project Panda Preliminary Design Document—Newsletter**

<i>Women’s Intervention: Smoking over Time</i>						
	29–30 Weeks	32–34 Weeks	34–36 Weeks	Immediate Postpartum	2 Weeks Postpartum	4–6 Weeks Postpartum
<i>Target</i>	Smoking: Precontemplator Passive smoking: Contemplator Action (model all 3; have them find selves)	Smoking: Contemplator Passive smoking: Contemplator	Smoking: Contemplator Passive smoking: Contemplator	Smoking: Action Passive smoking: Action	Smoking: Action Passive smoking: Action	Smoking: Action Passive smoking: Action
<i>Action</i>						
<i>Outcome</i>	See self as nonsmoker Attribute success to self Reassess benefits of nonsmoking	Be a healthier you	Acquisition of further skills for not smoking Preparing for delivery and return home as nonsmoker	Relapse prevention: Stress reduction Modeling Emotional support	Relapse prevention: Specific smoking, cognitive, and behavioral strategies for healthy lifestyle	Relapse prevention: Specific strategies for coping with resurfacing of environmental cues
<i>Primary messages</i>	Where are you now?	Personal health and recovery	Aids for creating a nonsmoking environment Cognitive and behavioral strategies for staying off cigarettes postdelivery	Having that new baby at home is like nothing before. We’ve been there. Here’s what to do for you.	Baby and you: A healthier lifestyle; Order out of chaos	As you settle in: preparing for return to work or settling into new schedule
<i>Medium</i>	Print	Print	Print	Video	Print	Print

Consistent contexts: (1) from your health care provider; (2) health of new family (not just smoking)

**Table 7.4 Project Panda Newsletter Design Document***Women's Intervention Number 3: 34–36 Weeks: Newsletter*

<b>Description</b>	<b>Content</b>	<b>Impact</b>
<p><i>Element 1:</i> Bulletin Board Working title: "Let the Preparation Begin!" Assignment: Sarah</p>	<p>Preparing bags for hospital: what to bring and what not to bring</p> <p>Preparing the house: freeze food for use after delivery; hang "No Smoking" signs; have some of your favorite things around for when you return from the hospital</p> <p>See home and hospital as places not to smoke (don't pack cigarettes in hospital bag)</p>	<p>Use strategies to enhance environment and control stimuli</p>
<p><i>Element 2:</i> Feature Story Working title: "Using Your Senses" Assignment: Sarah and Kay</p>	<p>Using senses to experience newborn baby: new baby smell, feel of new skin, and so on</p> <p>A quasi-research report that talks about the role of senses in mother and includes those senses that are enhanced after quitting smoking</p>	<p>Focus on benefits of not smoking</p>
<p><i>Element 3:</i> "No Smoking" signs (these are separate from newsletter so mother can post) Messages on back of signs Assignment: Marianna</p>	<p>For the home and car</p> <p>Slogans: "Please don't smoke—tiny lungs at work." Cig with circle and slash through middle "I'm a new mom and I cared enough to quit." Effects of passive smoke: "Thanks, Mom, you've saved me from (number) of colds and doctor visits." Reasons not to smoke: list from baby's point of view (such as "I can breathe better;" "My clothes smell good;" "I don't get so many colds and coughs"</p>	<p>Stimulus control: cues</p> <p>Decide not to smoke and to not let others smoke for the baby's sake</p> <p>Protect the baby</p>

*(Continued)*

Table 7.4 (Continued)

Description	Content	Impact
<p><i>Element 4:</i> Tip Sheet (detachable) Working title: “Baby’s Message to Relatives and Friends” Assignment: Maryann and Angie</p>	<p>Yes, the baby’s cute, but Mom needs the most attention and help right now.</p> <p>Suggestions for helping Mom: cooking, grocery shopping, cleaning, laundry</p>	<p>Use tip sheet to structure help after delivery</p> <p>Lessen environmental stress</p>
<p><i>Element 5:</i> Special Feature Working title: “Creating Your Own Smoke-Free Zone” Assignment: Pat</p>	<p>“Because you know the effects of passive smoke and others might not, you’ll need strategies for helping other people not to smoke around you or your baby.”</p> <p>Validate woman’s effort to remain smoke-free</p> <p>Provide concrete tips on how to be assertive with others about where they can and cannot smoke—modeling</p> <p>Phrases to use in certain situations Encourage assertive control over amount of smoke that reaches their babies</p> <p>Focus on husband’s smoking and how to deal with it</p>	<p>Recognize they have the skills to assertively deal with problematic smoking situations</p> <p>Remember passive smoke issues</p>
<p><i>Element 6:</i> Cartoon Assignment: Sarah</p>	<p>Mom in a tank protecting her baby’s “smoke-free zone”</p>	<p>Feel empathy for difficulty of controlling passive smoke</p>
<p><i>Element 7:</i> Small Box Working title: “Baby Status Report” or “Baby Facts” Assignment: Marianna</p>	<p>What’s happening with your baby right now (describe development at 34–36 weeks)</p>	<p>Stay interested and feel informed</p>

Preparing design documents for a computer-assisted program requires a particularly intensive process, usually entailing creation of an initial description of the program, various flowcharts, and one or more storyboards (a sequential depiction with words and pictures of the product). Table 7.5 is an initial design description from the Health Heroes video game series (Lieberman, 1997).

Figure 7.3 presents the overview flowchart that the team for Project Promoting Colon Cancer Screening in People 50 and Over (Project PCCaSO) (Vernon, 2004) developed to guide themselves, the video writer-producer, and

**Table 7.5 Design Document for Health Hero Video Games**

Goals	Design Features
<i>Attention and Active Processing</i>	
To reduce psychological distance; increase attention to the content; and make the content seem personally relevant to young people.	Present content on the popular video game medium in a format young people perceive to be targeted to them.
To boost player's self-esteem; increase attention; optimize credibility; and increase the likelihood that young people will emulate the character's behaviors.	Use attractive, competent role-model characters who have the same health condition as the target user group and are about 2 to 3 years older.
To increase attention, involvement, learning, and retention.	Provide cognitive challenges, compelling characters and relationships, experiential learning, user control over the action, and individualized feedback.
<i>Motivation</i>	
To make games motivating, engaging, and appealing.	Present clear, intriguing, and challenging goals, and provide continuous updates on progress toward the goals; provide individualized interaction and feedback.
To enhance enjoyment and individualize the learning experience.	Allow game players to customize the content according to preferences and to match their own health status (e.g., player can select the frequency and dose of a diabetic character's daily insulin.)
<i>Knowledge</i>	
To teach explicit content.	Use direct instruction; include game strategies that require the player to learn information in order to succeed in the game; use very graphic and memorable illustrations such as disgusting tar, plaque, and debris shown in a smoker's body.

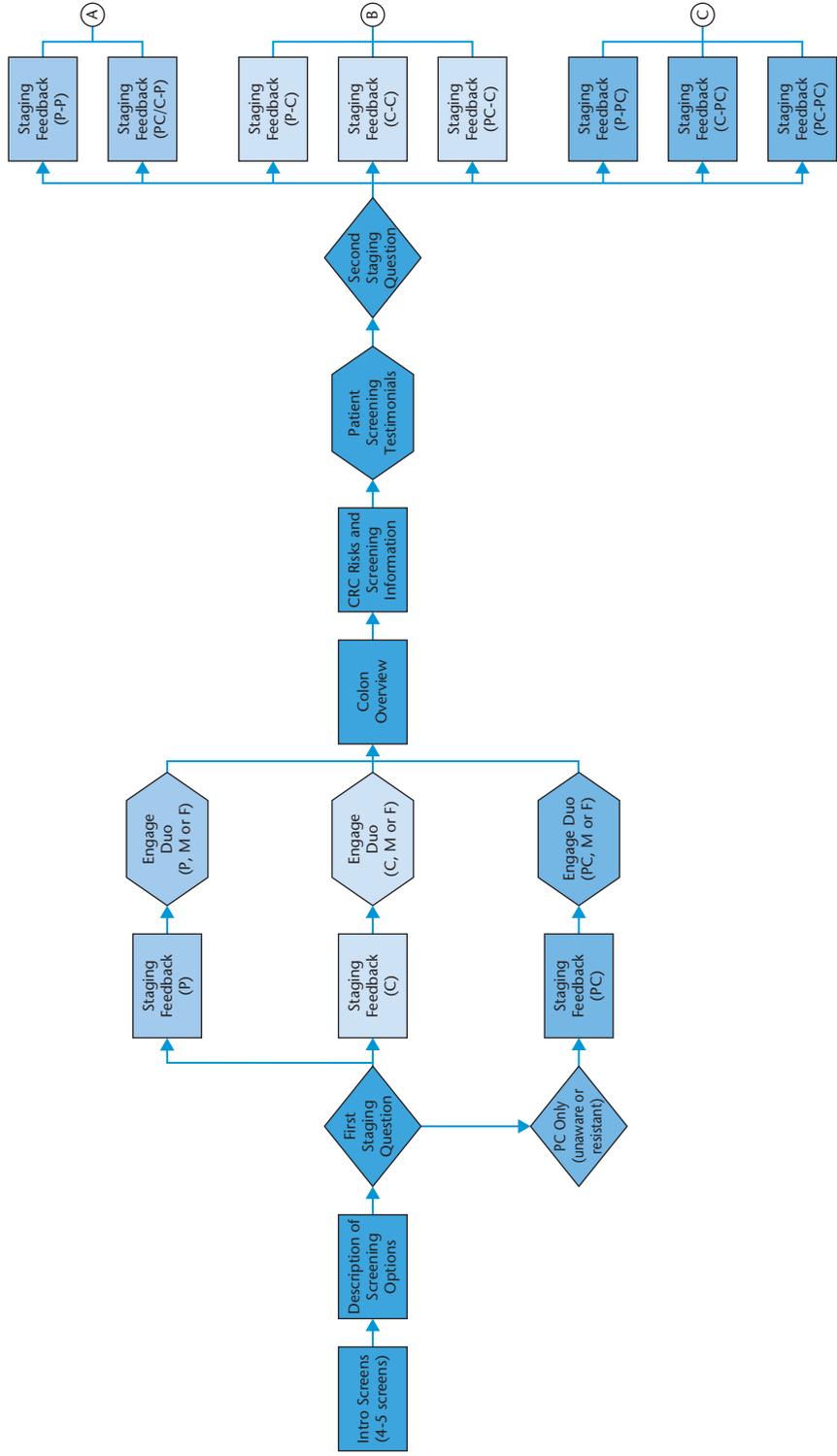
(Continued)

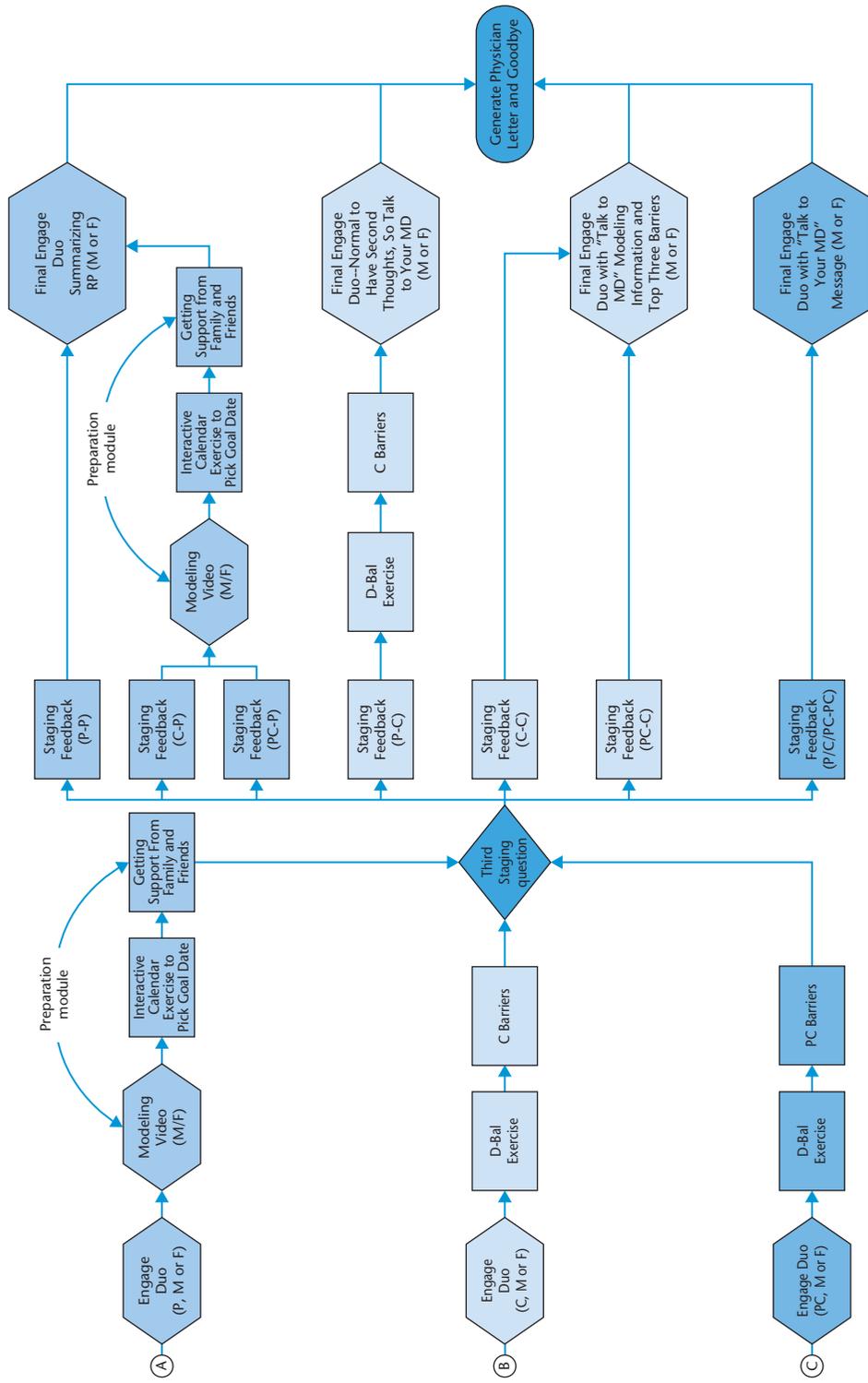
Table 7.5 (Continued)

Goals	Design Features
To teach skills.	Present animated demonstrations such as how to use an inhaler for asthma medication; provide opportunities to rehearse skills and solve problems in simulations that show realistic outcomes based on the player's actions.
To ensure that players will retain the information and skills they have learned in the game.	Repeat information and animated demonstrations for review when players give a wrong answer; make the game difficult enough that players will repeat game levels dozens of times and therefore will be exposed repeatedly to the same content.
To correct mistakes and improve performance.	Provide constructive feedback about the player's actions and choices, and offer remediation as needed.
To provide background information on demand.	Enable easy access to dynamic databases such as a food chart showing the food exchanges in a serving of each food that players may select in the game.
To provide a cumulative record of performance in the game; increase the player's understanding; and encourage the use of personal logbooks.	Use on-screen, automatically updated logbooks that record, for instance, medications the character has taken and blood glucose or peak flow measurements attained in each game level.
<i>Perceived Self-Efficacy</i>	
To increase player's perceived self-efficacy for prevention and self-care.	Create opportunities for players to rehearse new skills and to apply new knowledge in the game until they are successful.
To help players feel more confident and willing to discuss their health concerns with peers, parents, and caregivers.	Present issues and questions that players must address in the game, thereby allowing them to rehearse the answers while playing alone or to discuss the answers when others are present.
To encourage social interaction that can increase peer tutoring, learning, and retention.	Offer a two-player option in the game.
To provide a springboard for discussion about prevention or self-management.	Create an appealing game that young people will want to talk about and will be proud to play.

Source: Reprinted with permission from Lieberman, D. A. (1997). Interactive video games for health promotion: Effects on knowledge, self-efficacy, social support, and health. Table 6.1, pp. 108–109. In R. Street, W. Gold, & T. Manning (Eds.), *Health promotion and interactive technology: Theoretical applications and future directions*. Mahwah, NJ: Lawrence Erlbaum Associates.

FIGURE 7.3 Project PCCaSO Flowchart Design Document





Key: PC = Precontemplators; C = Contemplators; P = Preparation; A = Action; CRC = Colorectal Cancer; Tailored story = Serial role-model story tailored to stage of change and gender

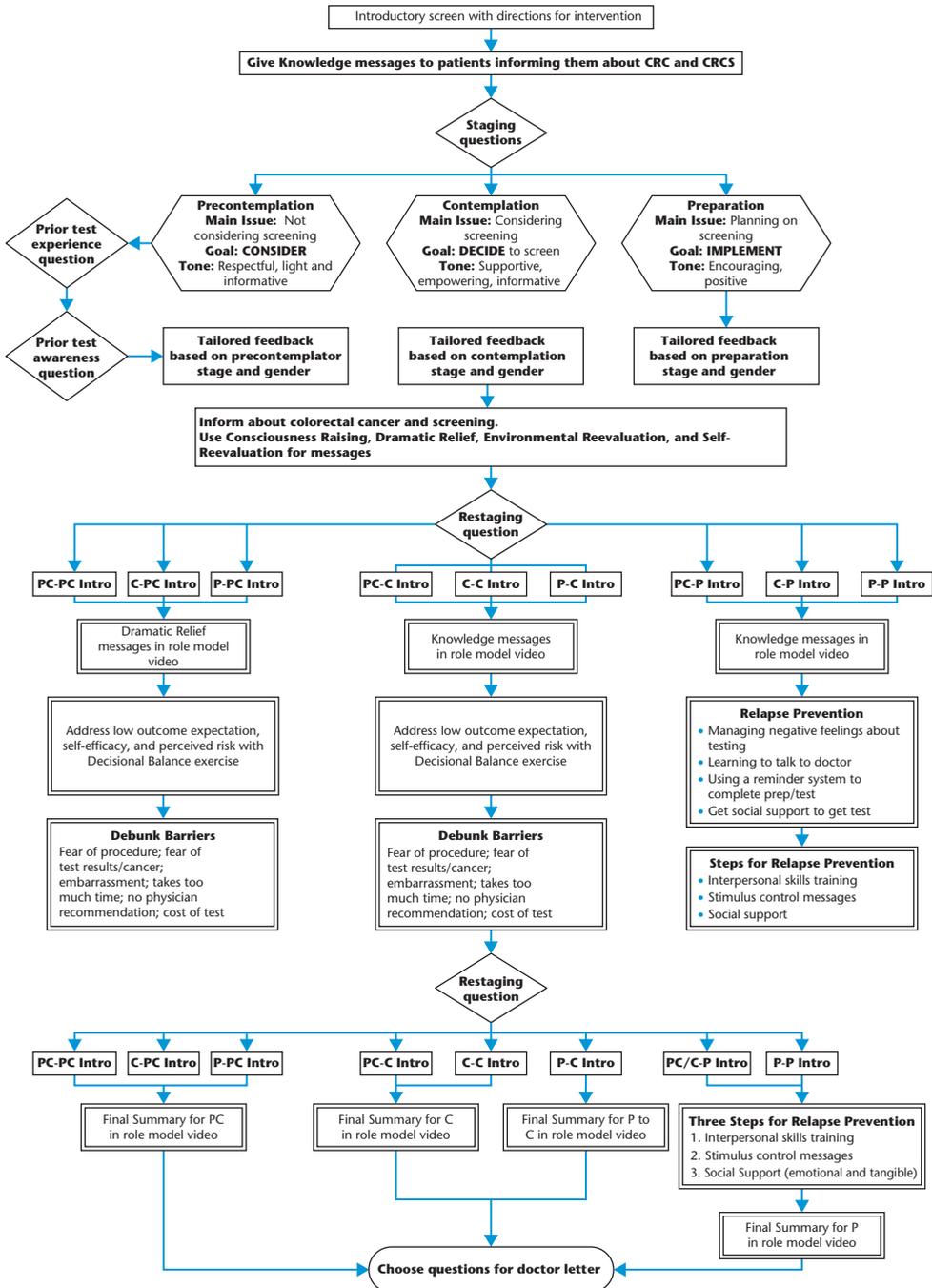
the computer programmer through developing the message, writing video scripts for role-model stories and narration, and programming the computer-assisted instruction. The theoretical framework for Project PCCaSO is the Transtheoretical Model (DiClemente et al., 1991; DiClemente & Prochaska, 1985). The planning team worked from the matrices to develop a flowchart to show the components of the intervention addressed to each stage of change. The team then worked from each part of the flowchart to develop a more detailed flowchart, one arm of which appears in Figure 7.4. The storyboards depict both the visuals and the messages for the five types of content: assessment and feedback on stage of change, instructions for navigating the program, information about colorectal cancer and screening, role-model stories about screening, and a fictitious role-model story depicting stages of change to match the learner and provide a guide for stage movement (one part of which is shown in Figure 7.4 on p. 420).

The production design documents that flow from the creative person to the health educator are usually more than written words. They might be written, as in a concept for a videotape, or they might be a combination of words and pictures, as in a storyboard or a rough sketch of a layout. They also might be illustrations or photographs in a layout or rough-cut videotape. These documents are all elements of conveying the creative person's image of the final product as it is developed first in the mind of that person and then in some medium. The number of these intermediate production design documents the health educator requires will affect the budget.

### Creating Design Documents for Community Processes

At this point readers who are planning an intervention that includes only such methods and practical applications as policy development, coalition building, and media advocacy may be thinking: "All this discussion about design documents doesn't refer to me! I won't be developing traditional materials." However, design documents can be very helpful to guide program components that are not products such as videotapes, public service announcements (PSAs), and the like. Products can be processes such as advisory board and committee meeting structure and function, coalition development and maintenance, and lobbying. Each of these products needs a design document and sometimes more than one. Coalitions, for example, need a design document that specifies how coalition members will be recruited, how meetings will be run, how minutes or meeting summaries will be constructed and delivered, and so on. A coalition might also need training for membership, and the training session will need a design document. Not only can these documents prevent breakdowns in communication, such as occurred in the mayor's group, but they can also make the processes smooth, productive, and reinforcing to the participants.

**FIGURE 7.4 Detail from Project PCCaSO Flowchart Design**



Key: PC = Precontemplators; C = Contemplators; P = Preparation; A = Action; CRC = Colorectal Cancer; CRCs = Colorectal cancer screening; Tailored story = Serial role-model story tailored to stage of change and gender

## BOX 7.2

### MAYOR'S PROJECT

The mayor's task force was well on its way to the production of support materials for the multicomponent program. The health educator, while busily looking at portfolios, choosing designers, and trying to understand what the video writer-producer would require in terms of design documents, received a panicky call from the chair of the group working on the community coalition method. She and her cochair were in the neighborhood, so the health educator decided on a spur-of-the-moment, face-to-face discussion of whatever was engendering the panic.

*Group chair:* Oh my gosh! We had our first coalition organizational meeting, and it was a free-for-all. I couldn't get control of the agenda. I know it is supposed to be a participatory agenda. I've read the books. This was participatory, all right—participatory by one small group! They took over at the beginning, and none of the rest of us could say a thing!

*Cochair:* Yeah, and one woman felt her ideas were so criticized that she walked out right in the middle of the meeting.

*Group chair:* Several of our most dedicated supporters stopped me afterward and said they didn't know if they could stand to come back. And on top of all that, we are not sure whether we can develop cohesion with this new group after all the groundwork the planning group has already laid.

The health educator helped the two make a plan. Before their next meeting, the cochairs put together a couple of meeting design documents. One was on how a participatory agenda would be created; the other was a format for meeting summaries that used the meeting that had just occurred. Finally, they put together the coalition overview and task document that would serve as a beginning for group development and task orientation in the coalition.

Exhibit 7.2 is a coalition design document showing the steps used in recruiting community partners for the Walk Texas! program (Texas Diabetes Program/Council & Texas Department of State Health Services, 1998). Local health departments followed the steps in the design document to establish community walking groups. Coalitions must not only recruit members, they must do so in a manner that ensures inclusiveness and a broad representation of appropriate stakeholders. Johnson, Grossman, and Cassidy (1996) suggest a

## EXHIBIT 7.2

### WALK TEXAS! STEPS FOR RECRUITING COMMUNITY PARTNERS

**Recruiting community partners can be an exciting challenge when you proceed in an organized, well-planned manner.**

*Step 1:* Determine the characteristics of your ideal partner and list them. Here are some attributes of an ideal community partner:

- One who reaches the community (that is, a gatekeeper to audiences such as nutrition centers, senior centers, and churches)
- One whose goals and priorities are in line with your organization
- One who is willing to join a partnership
- One who has credibility (people respect them; they do what they say they will)
- One with resources (time, money, expertise, facilities, and so on)
- One who is enthusiastic and willing to work
- One who is a leader in the community
- One who can serve as a positive role model
- One who will champion the cause

*Step 2:* Find potential partners

- Satisfied past partners are easy to sell
- Ask everyone you talk to for more names of potential partners
- Talk to people who have influence in the community
- Participate in promotional activities (advertising, booths, and so on)
- Use lists and directories; don't forget the library

*Step 3:* Do your homework

- Gather information about the individual and the organization

*Step 4:* Make an appointment

*Step 5:* Prepare your presentation

- Know what you want to accomplish at the meeting
- Make it clear what's in it for them, but let them express and work through reservations

three-columned worksheet as a design document. The first column is a listing of appropriate community sectors (for example, local government, media, and parents). The second column is for the name of a recruitment contact within each sector, and the third column is for listing the level of participation that each has agreed to. Similar worksheets and other design documents can be deceptively simple but keep the group pointed in the right direction.

In another illustration of design documents for the common tasks of advocacy by coalition members, examples of advocacy design materials include a guide for three-person teams to interview legislators (Exhibit 7.3). A less elaborate guide can be used for preparing coalition members to make telephone calls to state or national legislators. A typical guide might outline how an advocate should identify him- or herself as well as provide talking points or brief summaries of relevant data, the conclusion the advocate wishes the legislator to make from this data, a straightforward statement of support (or opposition) to a specific

### EXHIBIT 7.3

## ADVOCACY DESIGN DOCUMENT: ORGANIZING THE INTERVIEW TEAM

The interviewing team should consist of three members, each of whom has a specific function. These functions should be thoroughly delineated, and there should be no overlapping of function.

1. **The leader or team captain:** This is the person who sets the tone of the interview. He establishes rapport with the candidate. He is a “nice guy” type. He must be friendly and courteous, and never show any hostility. He asks the question—objectively—and supplies whatever background information is needed.
2. **The listener or reporter:** After this person says “How do you do?” he doesn’t say anything at all. He bends all his efforts toward being perceptive, and committing as much of the interview to memory as possible. *He does not take notes.* Nothing inhibits free discussion more than a pencil and notepad in someone’s hands. He not only listens to what is said, but he also listens for attitudes, for signs of strain. (Example: Every time salary is mentioned, the candidate pulls his earlobe. What could this mean?) He tries to spot the candidate’s “hidden agenda.” Why is he seeking office?
3. **The track man:** This man has either a big job or a small one depending on how the conversation goes. If the interview seems off on a tangent, he can courteously interrupt with phrases such as, “You said a moment ago that . . .” “Did you mean . . .?” or “I think Mr. Leader meant to ask if . . .” The track man keeps the interview moving, and could signal its change of pace or termination. *But* he should not attempt to stifle a discussion that is giving some insights, even though it is off track. He keeps the conversation from meandering fruitlessly.

Do	Don't
1. Be prepared to state your views clearly	1. Prolong the interview.
2. Have appropriate materials to leave	2. Tip off the best answer
3. Be on time	3. Do all the talking; sometimes silence will bring out interesting information
4. Be friendly, positive, and constructive	4. Let the candidate interview you.
5. Be specific about your position	5. Attempt to exact rash promises; obtain reasons for opposition and ask what you can do to help support efforts
6. Be brief! Be brief! Be brief!	

piece of legislation, and an appropriate close (Center for Pediatric Research, 1997). A legislative contact report allows simple but structured record keeping of such telephone calls and can be used to plan follow-up. A contact report might, for example, provide room to record the caller's name, the name of the person called, the topic of the discussion, checkboxes for indicating the legislator's overall reaction, space for significant comments or suggestions from the legislator, and the caller's comments or recommendations for follow-up. Such materials provide how-to information for members and could be used as part of an advocacy training session; as with legislative contacts, letter and telephone scripts can in themselves serve as micromedia messages.

## Reviewing Existing Program Materials

The next task in this step is to review available program materials for possible match with change objectives, methods, and practical applications.

After working from the matrices to prepare initial design documents, planners should consider using existing materials when available. However, if existing materials are considered to be acceptable after the review described here, they

must be pretested with the intended participants, just as one would test materials that have been newly developed (National Cancer Institute, Center for the Advancement of Health & Robert Wood Johnson Foundation, 2002).

To review existing materials, planners first ask the following questions:

- Do the program materials enable the change objectives to be met?
- Do they deliver the intended theoretical methods and practical applications?
- Do the materials fit with the intended audience?
- Are the materials attractive, appealing, and culturally relevant?

To determine the answers to these questions, the planning team reviews existing materials against matrices and lists of methods and practical applications. The match should be almost perfect. Questions to ask include the following:

- Are all the messages that are needed to influence change objectives included?
- Are the required methods executed appropriately? For example, do role-model stories use coping models, and are they derived from a group that matches the community on important characteristics?

It is difficult to make all these matches, but sometimes parts of existing programs work well.

## Determining Suitability

Existing materials that match objectives, methods, and practical applications can be reviewed for production quality and suitability (Doak, Doak, & Root, 1996; Medline Plus, 2010). Doak and colleagues (1996) describe factors that can contribute to reading difficulty. In addition to attributes measured by readability formulas, these are the print size and type style, color contrast between ink and paper, the difficulty of reading the text, the number of concepts in each paragraph, and the unfamiliar context that may be represented by health or medical topics. The Suitability Assessment of Materials (SAM) is a useful guide to reviewing and improving the appropriateness of health education materials (Daley, Cowan, Nollen, Greiner, & Choi, 2009; Doak et al., 1996; Kaphingst, Zanfini, & Emmons, 2006; Neuhauser, Rothschild, Graham, Ivey, & Konishi, 2009; Shieh & Hosei, 2008). For example, Kaphingst and colleagues reviewed 19 colorectal cancer screening Web sites and found problems with lack of summary presentation, visual crowding, inappropriate type size, and lack of interactive features (Kaphingst et al., 2006). SAM guides the scoring of materials in six

categories: content, literacy demand, graphics, layout and typography, learning stimulation, and cultural appropriateness. This yields a final score and indicates whether the materials are superior, adequate, or not suitable. The SAM scoring rationale is presented in Table 7.6.

One factor that is often missed in assessment of materials is their appropriateness in terms of showing nonstereotypical power and social relations. Check to see whether there is anything stereotypical about the materials. For example, are only mothers portrayed giving certain kinds of care to children? Do the materials display stereotypical power relations, with only males or only females in certain occupations or with only whites as physicians and people of color as patients? Does the text make inappropriate assumptions as to the reader's socioeconomic status or environmental resources?

### Determining Availability

Before engaging in a thorough evaluation, however, the planner should determine whether the materials are available in the needed quantity and time frame. Some agencies may allow reproduction. Some materials may be available in electronic form, for instance, as a PDF file over the Internet. In some cases copyright holders allow materials to be adapted, but any changes must usually be made with the express permission of the copyright owner (Fishman, 1997). Materials produced by the U.S. government are free for use by U.S. citizens, and more and more such materials are available on the World Wide Web. The National Institutes of Health (NIH), for instance, are making a concerted effort to upload their patient education material onto the Web. For example, the Cancer Control Planet Web portal is a collaborative effort aimed at providing access to data and resources that can help cancer control planners, health educators, program staff, and researchers design, implement, and evaluate evidence-based cancer control programs (National Cancer Institute, 2005). If a piece is adapted or reproduced, all copyrights, adaptations, and permissions must be acknowledged on every piece; and it is appropriate to provide courtesy copies to the people who created the original material.

### Determining Reading Level

Reading levels indicate a grade level beyond which the message is likely to be difficult to decipher. Reading levels are almost always an issue for written materials—actually two issues: What should the reading level be for a program's intended audience? What is the actual reading level of the material? Pertaining to the first question is the persistent finding that a significant proportion of adults

**Table 7.6 Suitability Assessment of Materials Rationale**

<b>Factor to Be Rated</b>	<b>Considerations for Rating</b>
<i>Content</i>	
Purpose is evident.	Readers should be able to readily discern the purpose.
Content is about behaviors.	The content is about what the reader is expected to do without superfluous information.
Scope is limited.	The scope is limited to the objectives.
Summary or review is included.	Reviews help the reader process the main points.
<i>Literacy Demand</i>	
Reading grade level.	9th grade or more is usually not suitable; grade should match the intended readers' competence.
Writing style, active voice.	Text should be active voice and conversational with simple sentences.
Vocabulary uses common words.	Common explicit words should be used. Imagery words are good. Concept and category words are avoided or examples are used.
Context is given first.	Tell the purpose first.
Learning aids via advance organizers.	Headers, topic captions and statements of what will be presented help orient the reader and aid encoding to memory.
<i>Graphics</i>	
Cover graphic shows purpose.	The first thing the reader sees may determine attitude. It should portray the purpose, be friendly and get attention.
Type of graphics.	Illustrations should be familiar, age appropriate, without symbols and distracting details.
Relevance of illustrations.	Illustrations should tell the key messages visually with no distractions.
Lists, tables, figures explained.	Graphics must include step-by-step directions for interpretation.
Captions used for graphics.	Graphics should tell the reader what the graphic is and where to focus.

*(Continued)*

Table 7.6 (Continued)

Factor to Be Rated	Considerations for Rating
<i>Layout and Typography</i>	
Layout factors.	Most of the following should be present: low gloss paper, high contrast of paper and ink; consistent information flow, visual cues such as shading or arrows to guide the reader, illustrations next to text, adequate white space, appropriate/nondistracting use of color.
Typography.	Text is uppercase and lowercase, type is serif, type is at least 12 point, typographic cues such as size, color emphasize key points, no all caps.
Subheads and “chunking” of information.	Lists should be grouped so that people do not have to remember more than a few points.
<i>Learning Stimulation, Motivation</i>	
Interaction used.	Enhances central processing to solve problems, respond to open ended questions, make choices.
Behaviors are modeled, specific, and reinforced.	Learner must be able to distinguish and practice the exact behaviors to be learned.
Self-efficacy is enhanced.	People are more able to engage in the task and persist when they are confident about their task-related ability.
<i>Cultural Appropriateness</i>	
Match in logic, language, experience.	Matching will facilitate engagement, reading and learning.
Culturally relevant images and examples.	All learning materials should present recognizable images and present the culture in positive ways.

Source: Adapted with permission from Doak, C. C., Doak, L. G., & Root, J. H. (1996). *Teaching Patients with Low Literacy Skills* (2nd edition). Philadelphia: J.B. Lippincott, pp. 41–60.

in the United States have limited reading skills. The National Assessment of Adult Literacy was a survey of 19,000 adults that assessed functional literacy (Kutner, Greenberg, Jin, & Paulsen, 2006; Kutner et al., 2007). Prose literacy was based on newspaper stories, quantitative literacy on bus schedules, and document literacy on job applications. Findings indicated that 46–51% of the adults in the United States have limited or extremely limited reading and quantitative skills and that approximately 21–23% would have difficulty using these skills for everyday tasks. For the first time, the national survey assessed health literacy

defined as in the IOM report as the degree to which individuals have the capacity to obtain, process, and understand information to make appropriate health decisions (Institute of Medicine, Committee on Health Literacy, 2004). The survey results indicated that 22% of adults have only basic skills and 12% are below the basic skill level. The organization also reported that many adults with these low skill levels did not see themselves as limited and do not seek help with reading tasks (Kirsch, Jungeblut, Jenkins, & Kolstad, 1993). Poor readers share certain characteristics. They often read (decode) one word at a time; they skip over common words and do not classify or categorize information; they often miss the context of the information; and they fail to make inferences from data (Doak et al., 1996).

Low literacy, including the ability to use formal oral language, has implications for health status including disease outcomes (Baker et al., 2007; Institute of Medicine, Committee on Health Literacy, 2004; National Institutes of Health, 2003; Osborne, 2005; Schillinger et al., 2002; Schwartzberg, VanGeest, & Wang, 2005; Zarcadoolas, Pleasant, & Greer, 2006). The overestimation of patient's ability to understand medical instructions may be a source of health disparities (Kelly & Haidet, 2007). The mechanisms of the link between literacy and health status include access and utilization of health care, patient-provider relationship, and self-care (Paasche-Orlow & Wolf, 2007). Within these categories, impact may include diagnostic assessment of patients (Parikh et al., 1996; Weiss & Coyne, 1997); participation in health risk behaviors (Wolf, Gazmararian, & Baker, 2007); the inability to understand and follow a care plan for illness (Baker, Parker, Williams, & Clark, 1998; Chew, Bradley, Flum, Cornia, & Koepsell, 2004; Estrada, Martin-Hryniewicz, Peek, Collins, & Byrd, 2004; Kalichman & Rompa, 2000); lack of medication adherence (Osborn, Paasche-Orlow, Davis, & Wolf, 2007; Persell, Osborn, Richard, Skripkauskas, & Wolf, 2007); communication between patient and physician (Schillinger, Bindman, Wang, Stewart, & Piette, 2004; Williams, Davis, Parker, & Weiss, 2002) and the influence on use and access to health care (Baker et al., 1998., 2002).

Studies have addressed whether materials are written at levels that patients can be expected to read and have found that many health and health care topics are presented at levels beyond patient skills: for example, medication instructions (Estrada, Hryniewicz, Higgs, Collins, & Byrd, 2000; Estrada et al., 2004), cancer information (Helitzer, Hollis, Cotner, & Oestreicher, 2009; Kaphingst, et al., 2006), domestic violence information (Yick, 2008), Medicaid application enrollment forms (Wilson, Wallace, & DeVoe, 2009), and patient education for chronic diseases such as diabetes, arthritis, and epilepsy (Foster & Rhoney, 2002; Hill-Briggs & Smith, 2008). Wallace and Lennon (2004) tested the readability of a

random sample of 171 patient education materials from the American Academy of Family Practice and found that over 70% of materials were at a ninth-grade or higher reading level.

A large number of studies have measured patient reading skills and compared them to the materials that patients were expected to comprehend. For example, studies have noted the gap between the reading ability of cancer patients and cancer education materials (Beaver & Luker, 1997; Cooley et al., 1995; Foltz & Sullivan, 1996). Materials for other illnesses may also represent a mismatch. For example, materials for patients with diabetes (Hosey, Freeman, Stracqualursi, & Gohdes, 1990), arthritis (Hill, 1997), and lupus (Hearth-Holmes et al., 1997) fell between a seventh- and thirteenth-grade reading level, whereas the patients were able to read between a sixth- and tenth-grade level.

The most reliable way to determine what the reading level of any print materials should be is to assess the health literacy of the intended program participants (Institute of Medicine, Committee on Health Literacy, 2004). This is commonly done in patient education settings and less commonly practiced in community settings, although short assessments based on instruments such as the Rapid Estimate of Adult Literacy in Medicine (REALM) or the Test of Functional Health Literacy in Adults (TOFHLA) may be feasible (Parker, Baker, Williams, & Nurss, 1995). The REALM is a three- to five-minute test in which the participant is asked to read a list of health-related words arranged from very simple one-syllable words to multisyllable words (Davis et al., 1991). The test, as well as a shortened version, correlates well with the Wide Range Achievement Test-Revised (WRAT-R) (Bass, Wilson, & Griffith, 2003), although there appears to be some discrepancy between scores of African Americans and Caucasians (Shea et al., 2004). Another option is the shortened version of the TOFHLA (s-TOFHLA), which uses a modified Cloze procedure on two passages of health-related material (Taylor, 1953). The passages lack every fifth to seventh word, and the respondent chooses the correct word from multiple-choice passages (Baker et al., 1999).

The second issue is how to assess the reading level of a document. Many techniques are available; most include an assessment of the average number of words in a sentence and the average number of syllables in a word. The former is used as a measure of complexity and the latter as a measure of vocabulary level. Many word processing and grammar-checking programs will now do the math, but the programs are still using algorithms set up in the precomputer era. Common protocols include the SMOG formula, the Fry Readability Graph, the Flesch Reading Ease score, and the Flesch-Kincaid grade level (Flesch, 1974; Fry, 1977; McLaughlin, 1969). These various protocols will not necessarily give comparable results; we suggest picking one protocol to use consistently. By using

one protocol, the health educator learns over time to write very close to a target grade level and to edit passages to achieve the target.

Many health educators find it simplest to use the protocols included with Microsoft Word: Tools → Options → Spelling and Grammar → Show Readability Statistics. To fine-tune their assessment, writers can use a graded vocabulary list (Mogilner, 1992). Such a list gets past the assumption that a longer word is necessarily a harder word (*grandfather* is a first-grade word in the United States, despite its three syllables). Using words at a third-grade level and below ensures capturing an audience with fifth-grade reading skills. Health educators may find such restrictions difficult, but they can inspire genius; it was such an assignment that launched the career of Theodore Geisel as Dr. Seuss.

A different approach to assessing document complexity is the PMOST/KIRSCH document readability formula, which looks at both the organizational pattern (simple list, combined list, intersected list, nested list) and density (number of labels and number of items) (Mosenthal & Kirsch, 1998). This formula is an attempt to evaluate the readability of charts, graphs, tables, forms, and other nonlinear presentations of written words. In conjunction with Tufte's work on visual display (1997), it may prove a useful adjunct to standard reading-level formulas.

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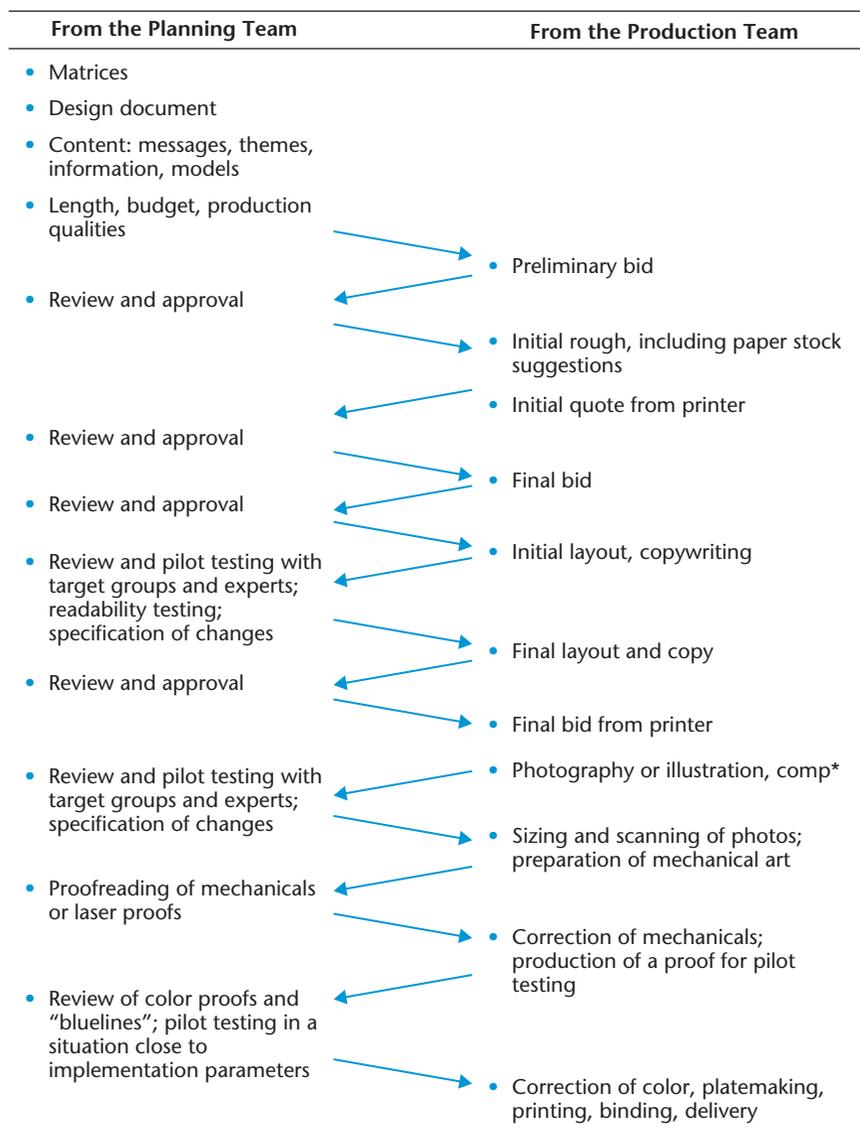
## Developing Program Materials

The next task in Step 4 is to develop program materials.

It is beyond the scope of this book to provide specific instruction on every task for the production of the wide variety of possible program materials. We attempt to give some insight into the number and types of tasks for print materials and videos as models and briefly discuss the added tasks when the product is more complex, such as a multimedia program. We also provide some instruction on writing messages.

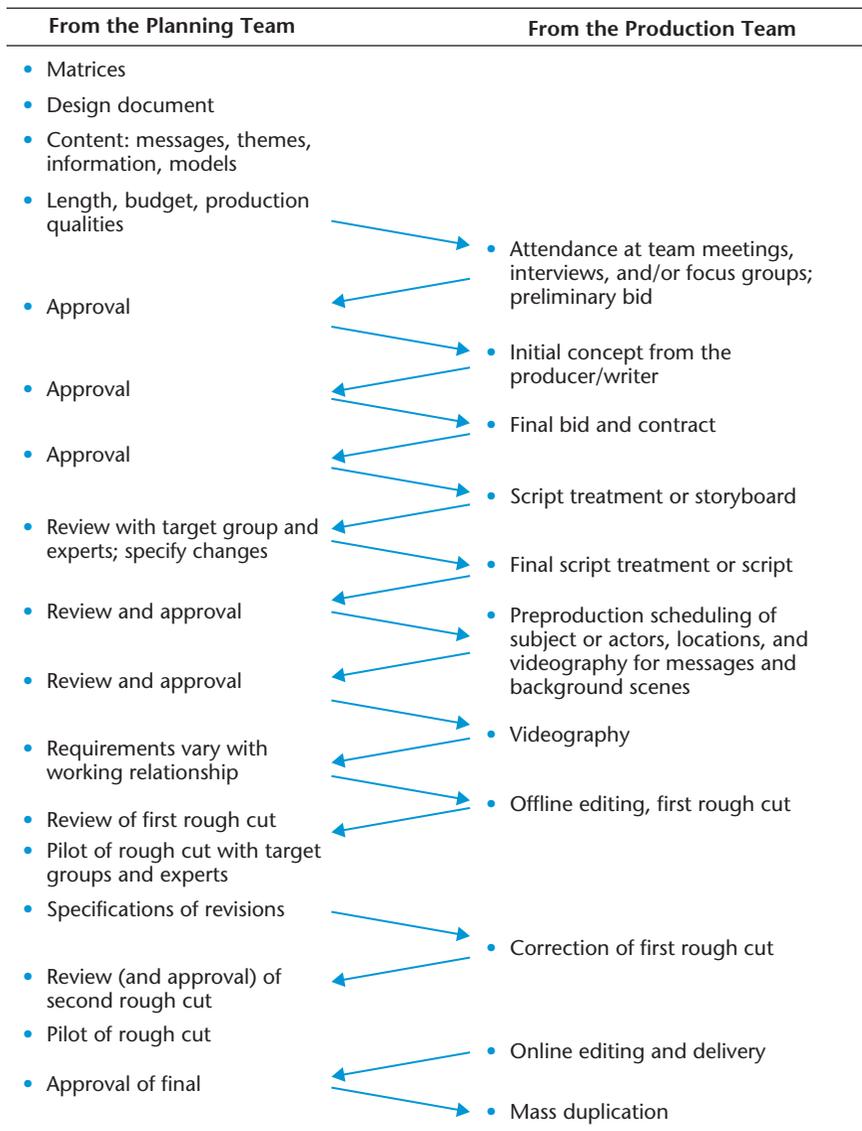
Once the planner has created initial design documents and the team has added creative resources to its membership when needed, the original group and the new participants will work together to produce program materials. We present Figures 7.5 and 7.6 to give a sense of the steps involved in the production process for two types of materials (a print piece and a video) and also of the back-and-forth movement between the health promotion development team and the creative consultants who will produce the materials. These figures give an idea of how important the communication of ideas is in this process. A large part of that communication burden falls on the health educator.

FIGURE 7.5 Tasks for Producing a Print Piece



\*A comprehensive or "comp" represents the finished product in a more accurate form and detail than a rough. It shows as closely as possible how the final product will look. These are for presentation and pretesting only. They may be required but will add to the budget.

FIGURE 7.6 Tasks for Producing a Video



## Producing Printed Material

Figure 7.5 gives an example of the process involved in producing print material. Whoever is doing the design and managing the production must have read several design documents and must understand the team's intent for the piece by this phase of the process. Designers may benefit from contact with the intended audience for the piece as well. The design document should have already given a clear description of the audience, its special needs, and the contexts in which the material will be used. Material that is to be published in a three-ring binder, for instance, normally calls for larger type than does a brochure, because readers will set it on a table for reading. An item that a parent will be consulting while bathing a baby had best be waterproof. All the facts must be clear before the design process starts. In the production phase, the designer will work with the team to consider the following:

- What design elements or types of copy will the piece have? Examples to consider are levels of subheads, lists, tables, graphs, charts, illustrations, captions, pull quotes, footnotes or references, interviews, and step-by-step instructions. The more elements there are, the more complicated the design process, though the best result is usually something with a simple design.
- When and how will the project need updating?
- What are the costs and constraints?
- What are the graphics standards of the organization producing the piece?
- What process will be used to review the piece?
- What aspects of the production process is the team responsible for?
- Who will produce the camera-ready copy?
- Will the piece be photocopied or printed?

Next, the designer lists all the elements of the design that will be needed to carry the important messages. Will the piece have line illustrations, photos, or frequent bulleted lists? Should there be places for people to enter personal information? Does the piece serve as a reference tool in which people have to find a particular section quickly? It is also important to consider how the finished piece will be put together. For example, if a piece is lengthy and requires frequent additions or changes, a three-ring binder is a good choice.

Once a designer offers an acceptable design, the content will have to be edited to conform to it. Asking for changes to a completed design is counterproductive; changing the design will cost more money and decrease the resulting quality. Also, a good adage to remember is: "You can get it good, you can get it fast, and you can get it cheap; but you can't have all three." Health educators aim for

two out of three by talking with suppliers about how long it will take to get the quality of product they desire. We also refer the reader to works on basic design principles. Understanding a little about the designer's process can help health educators work with rather than against the designer.

**Writing and Organizing to Help the Reader.** The greatest design in the world can't make up for poor writing or confusing organization. Refer to SAM (Table 7.6) to consider the elements of good writing for health promotion materials. Here are a few pointers for writing copy:

- Match the reading level of the intended audience.
- Write in the active voice.
- Make lists understandable without introductory sentences (For example, in a list of things people should not do, every item should begin with “Do not”).
- Write as clearly as possible (For example, if the meaning is “do not,” copywriters should not use the term avoid. Readers often interpret the word to mean “try not to do this, but do it when you have to.”)
- Present the material in the order the reader will need it.
- Include only messages in support of the change objectives; remove superfluous material unless it provides an appropriate context.
- Use subheads to break up or chunk the text.
- Use a careful hierarchy to support comprehension.
- Use advance organizers (see Chapters Two and Six).
- Use sentences and designs that encourage interaction, such as checklists with boxes that readers can check.
- Use one- and two-syllable words and short, simple sentences with definitions of more difficult words in appositional phrases and parenthetical statements.
- Provide visual cues.
- Use strong topic sentences for paragraphs.

It seems self-evident, but an intervention program should not use print media if the intended participants can't read. Sometimes technical material is difficult to write below a fifth-grade level without losing meaning and becoming patronizing. Such technical material is perhaps better presented through another medium. Copywriters should avoid the trap of replacing commonly heard words with less commonly heard (but shorter) words (for example, replacing medicine with meds); doing so may lower the computed reading level but will interfere with comprehension. When possible, health educators can prepare participants for the material by determining what the group members need to know before they read (for example, vocabulary) and teaching it and by discussing the point of the material (that is, what readers are supposed to get from it).

## Producing a Video

Video can be a good solution to some problems and most multimedia programs use some video. Many people do not read well enough to learn skills from print materials, for example. The production costs for videos are in producing the master; the distribution can be inexpensive. VCRs, DVD players, and televisions are ubiquitous in many countries; and the equipment to make a video is also commonplace.

**Contracts and Budgets.** Figure 7.6 presents processes in the production of video. Early in the process, the producer must develop an understanding of what the development team has planned, and optimally the producer has participated in some contacts with the intended audience. An early step in working with a video producer is agreeing on the contract. The contract and the budget should include a rough cut for review and approval. A rough cut is usually an offline edit of the production prior to final online editing, which is when all the bells and whistles, such as music, are added to a tape. In our experience, the rough cut is the moment to perform pretesting with the development team, the intended participants, and the gatekeepers or program implementers. The budget must contain money for production at this intermediate stage and for revisions. It helps greatly if the health educator has been at the video shoots so that the material included in the rough cut does not come as a surprise. Other examples of contract considerations are casting approval, credits, and copyright. The program development team (not the video producers) should have the assigned copyright so that the organization can recycle the video images from one medium to another. Any artwork bought for the videotape will also have a contract with it that specifies who owns the material. It is important to have legal title and custody of the master tape. Health educators should obtain from the production company copies of all releases and should make sure that everyone signs a release before filming begins.

**Scripts and Script Treatments.** A vital component of video production and a centerpiece of work between a development team and a video producer is the script or script treatment. A script works from the design document that the development team has written to detail the audio and visuals for every scene, whereas a script treatment—a scene-by-scene message, a look-and-feel description, or a storyboard with the same information plus visuals—is used when stories will be obtained directly from members of the community and edited together. A script is very different from material that is meant to be read; it is meant to be seen and heard. In addition, a video has about 15 seconds to

grab the audience's attention, and it has to recapture that attention every few seconds after that. To use the video medium to best advantage, it is important that the picture tells the story and that words complete the messages. A producer should first offer a preliminary script treatment. After receiving approval at this stage, the producer can move to creating the final script treatment or script.

Script approval is a formal process and a key point in the creative cycle. The planning team will want to list the number of people who should approve the video, because it is easy to underestimate the number of stakeholders. These same people also should review the script. Reshooting can break the budget and in some situations may not even be possible; incorporating changes at the script stage often makes more sense. If the same video is needed in more than one language, the script should be translated as soon as the stakeholders have approved the original. For live-action shots, it can be cost-efficient to shoot all language versions at the same time. For voiceover footage, producers need to allow for the difference in length of the narration and shoot the footage to allow for the longer narration time.

The final script should be compared against the budget, because the more complex the script is or the more difficult it is to shoot, the greater the shooting and editing costs will be. Health educators should consult an experienced videographer before approving the final script. Script approval is also the time for everyone to approve the credits and the copy for the labels and packaging. Although the credits can seem a simple task, if left to the last minute, they will invariably contain errors; and revising credits can be quite time-consuming for the production house.

**Pre- and Postproduction.** Script approval is followed by preproduction. Preproduction includes such tasks as finding locations, actors, and props and scheduling the film crew. Although some preproduction can be done in tandem with script development, some items are contingent on the final script.

The first task of postproduction is the creation of a rough cut that can be checked for appropriate execution of methods and practical applications and then pretested. Checking the rough cut is a crucial point in program development. For example, in Project PANDA (Mullen et al., 1999), the videotape for women who had stopped smoking during pregnancy was to be delivered to their homes immediately postpartum, when stress and sleep deprivation are at their height. Even though the program planners had been present during shooting and had seen the raw tapes, the rough cut came as a surprise. The development team was looking for role models for the immediate postpartum period, and the video producer (who had not yet had children) had included only the most "together" women. These mastery models seemed to have handled the transition

to nonsmoking parenthood flawlessly, and they might have caused the self-efficacy of the women participants to decrease in comparison. Before pretesting the tape, the development team asked for a second rough cut that would include more models who were moving toward success rather than models who were already there. Following approval of the rough cut, the music soundtrack, graphics, and credits are finalized; and a final master tape is produced.

## Creating a Multimedia Program

Producing a computer-delivered multimedia program contains many of the same production steps as producing a videotape except that it is more complex and involves a computer programmer as a part of the production team. With computer-assisted instruction, the program is able to deliver tailored messages in real time. Depending on the amount of user control, the program can also deliver an individualized learning experience. Because the vehicle has branching pathways for the learner and may contain many different methods and practical applications, the design documents are more complex, as illustrated by the flowcharts (Figures 7.5 and 7.6).

For example, in Project PCCaSO, a learner might interact with the following program components, depending on their current moment-to-moment intentions regarding colorectal cancer screening: role-model video vignettes with professional actors, computer graphics, interactive decisional balance exercise, video interviews with laypeople, and a personalized letter for their doctor regarding their plans for colorectal cancer screening. Following the initial charting of the program flow, the planning team worked with the production team to create storyboards to serve as the main source of communication between the planning team and the computer-programming design team. The storyboard presented each proposed screen in the computer program (Exhibit 7.4) with a visual layout of the screen and the following elements: module and screen number, screen title, screen objective, screen description, video description (if applicable), graphic description, dialogue (narration and video vignettes), navigation buttons, data to be captured, and project team notes. There were practical elements specifically for the programmers (that is, data to capture, navigation buttons needed); organizational elements for the project team (that is, module number, screen title); and theoretical elements (that is, screen descriptions, dialogue) that were included so that both teams could have the performance and learning or change objectives from the matrices at their fingertips at all times. The high level of detail in the storyboards was instrumental in communicating with the computer programmers; it allowed them to truly understand the processes that were at work behind the program's components.

## EXHIBIT 7.4

### STORYBOARD: PROJECT PCCaSO

**Module/Screen Number: 3.2 (C, Female)**

**Title:** First role model duo conversation

**Objective:** Engage patient in conversation between two friends, to generate interest in continuing program

**Description:** Thirty- to sixty-second video between two friends (AA-F/W-F)

**Video Description:** Opening shot appears in the frame we saw in the open. Two women in their fifties are talking as they walk in the park for exercise. They're dressed in sports clothes—T-shirts and workout pants. Corrine, an African American woman, is walking a little faster than Anna, a Caucasian woman, as they come toward the camera.

**Dialogue:**

**Anna and Corrine: "Missing Jen"**

*(Anna is in the contemplation stage and Corrine is in preparation).*

**Scene 1: Bring music in and under as we hear dialogue.**

*Anna (wincing):* Corrine, can we stop and stretch some? I've got a cramp in my leg.

*Corrine:* Sure.

*(Women pause by a bench or other area where they can stretch and take a breather. Anna rubs her calf and tries moving her leg up and down. Corrine looks over at Anna as they stretch.)*

*Anna:* I sure wish Jen were here . . . It's just, you know, I can't believe she has colon cancer.

*Corrine (looking down and nodding):* I'm still in shock, too. It seems strange to be exercising without her since we always do this together. She is usually the first one down the trail . . . I miss her.

*Anna:* I hadn't thought about colon cancer much before. I mean, you just don't think someone you know will actually have it. It makes me feel so helpless.

*Corrine:* I know—just hearing the word *cancer* is scary. But I found out that there are things we can do. I think the key is getting that test.

*Anna:* Have you been tested before?

*Corrine:* Yeah, I have. A few years ago I had a colon test, and I found out I had polyps, you know, these little abnormal growths on my colon. But I had them removed before they grew into cancer. I didn't know I would ever need to have it repeated though, but Jen says that her doctor told her everyone over 50 is supposed to get tested every so often. It makes me realize that I do need to go in again to get checked out. It's been too long.

*Anna:* So colon cancer testing is that important?

*Corrine:* Yeah, I'm starting to think that it is! The earlier you find cancer, the easier the treatment, and the better chance you have of a cure. If Jen had gone in before she had symptoms, her doctor might have been able to find her cancer even earlier . . . Should we keep walking?

*(Anna nods and they start down the trail.)*

**Navigation Buttons:** Repeat and Back

**Data to capture:** Time spent on screen, navigation buttons used

**Processes:** Dramatic relief and consciousness raising

**Notes:** Role model "guide duo" will be matched to gender. The "guide duo" will reflect the same stage as the participant as they move through the intervention, moving forward and back as the participant's ideas about CRCs change.

## Writing Program Messages

Many health promotion program materials contain two types of messages. One is a focused attempt to accomplish a change objective. For example, in Project PCCaSO, the team provided some information in order to influence the change objective regarding risk perception and provided feedback occasionally to remind the participant of his or her stage of change. The other type of message is contextual. These messages might tell the reason for the first type of message, for example: "To help you understand your likelihood of getting colon cancer, we are going to give you some facts and figures." Or contextual messages might flesh out the vehicle for the presentation of the change-oriented messages. In Project PCCaSO the team embedded many change messages in a story about two friends who were worried about a third friend with colon cancer (Vernon, 2004) (see Exhibit 7.4). A contextual message might also be related to the health and well-being of the intended audience, though not specifically to the targeted health behavior. In Project PANDA, Mullen and colleagues realized that women who had quit smoking during their first pregnancy probably would

be more interested in contextual pregnancy messages than in messages about not returning to smoking. For both the women and their partners, the program change messages were a part of a wider context of pregnancy and entry into parenthood. Messages, a part of all health promotion materials, are focused attempts to accomplish a change objective. The following processes can get a health educator started on message development:

- Think about the methods and practical applications that the team has decided on for a particular set of objectives and that will fit together in a particular vehicle, such as a newspaper story
- Decide what vehicle would be appropriate to deliver the methods and practical applications
- Note the change objectives organized by determinants
- Draft messages matched to each change objective or combinations of change objectives
- Draft contextual messages that will be incorporated into the vehicle

In illustration of both change messages and contextual messages, Exhibit 7.4 presents a storyboard for one scene in the multimedia program in Project PCCaSO. The following types of messages can be found in this document:

- Contextual: the visual of the two women on the track and the words, “Corrine, can we stop and stretch some? I’ve got a cramp in my leg.” Other messages pertain specifically to change objectives from the project matrix.
- Dramatic relief: Anna says: “I sure wish Jen were here . . . It’s just, you know, I can’t believe she has colon cancer.” Corrine looks down and nods. “I’m still in shock too. It seems strange to be exercising without her since we always do this together. She is usually the first one down the trail . . . I miss her.”
- Positive outcome expectations for screening: Anna says: “So, have you been tested before?” Corrine replies: “Yeah, I have. A few years ago I had a colon test, and I found out I had polyps, you know, these little abnormal growths on my colon. But I had them removed before they grew into cancer.”

***A Cultural Perspective on Writing Messages.*** Many cultural characteristics directly influence both how people communicate and how they understand and respond to the messages they receive. Message writers will want to know a lot about the preferred communication styles of the intended program recipients and will also want to pretest the messages with them. Many aspects of cultural preferences can affect message writing. For example, the structure of arguments (with the main point first or with a build-up to the climax), the use of words, and

the standards used to judge credibility. Most often health educators will create messages that match a cultural group's communication expectations, although Triandis (1994) points out that message construction can influence people to respond in more or less culturally congruent ways.

Health promoters must be particularly careful to clearly understand a cultural communication method before using it. Airhihenbuwa (1994) gives the example of the pitfalls of superficial use of oral culture (ear to mouth) versus visual culture (eye to object) storytelling methods. He points out that stories are a reciprocal vehicle that depend on the listeners' interaction with the teller to create the learning. Any adaptation that makes this vehicle a one-way street loses the method's power. On the other hand, he points out that imposing a delivery vehicle from outside the culture has different pitfalls. For example, if posters are used to convey information in an oral culture, learners will face problems with attention, comprehension, and memory because the learner will first have to learn to attend to this novel source of information.

**Translation.** Translation of health education and promotion materials into another language is usually aimed at symmetry: a translation that is loyal to the meaning of the source language while ensuring equal familiarity and colloquiality in both languages. Another term for this symmetry is decentering (from the source language). Decentering implies a deemphasis of the developer's language in such a way that the system of symbols supersedes a single culture. At best, decentering eliminates the distinction between source and target language. Decentering requires a multistage translation that allows for paraphrasing the meaning of the source materials and of the translation before deciding on a translated version. The translation is then translated back to the original language, and the versions are compared. The process of translation and back translation are continued until the two versions are acceptable. The goal is a dynamic equivalence in which a cultural symbol in the source language is translated into a cultural symbol in the target language that evokes the same functional response from the reader or listener. For example, Werner and Campbell (1973) relate the problem of finding a Navajo word for measles; presenting a list of symptoms might have evoked a more meaningful response than trying to find one word that did not originally exist in a language. They relate an even more significant problem of meaning when they explain that the literal translation of the word meningitis into Navajo would be "the covering of the brain is getting red." Translation is at best approximate, and program development is better done using methods and practical applications that are built from within the intended participants' language and culture. When that is not possible, the health educator should use a decentering approach to translation, introduce redundancy into the text, and use a rich context (Werner & Campbell, 1973).

The translation period is another good time to work with focus groups to understand the words used to describe certain phenomena. In creating the Spanish version of the Watch, Discover, Think, and Act program, Bartholomew, Shegog, and colleagues (2000c) used focus groups to discover the ways people described asthma and related concepts such as wheezing and inhaler. Some of these words related to asthma had no equivalents in common Spanish.

### Creating and Choosing Program Visuals

Kreuter and colleagues (2003) suggest that visuals, unlike text, can be perceived and understood almost immediately. Visuals should help the materials developer to gain attention, interest and credibility for the message (Moriarty, Mitchell, & Wells, 2008; Schiffman, 1995; Wells et al., 2006). Furthermore, the visuals can and should capture elements that are familiar and pleasing to the cultural groups that will use the materials. For example, in the Familias program development, Fernández and colleagues (Bartholomew et al., 2000b) picked fabric and objects with Mexican and Central American designs and worked with the community advisory committee members to choose which of the objects to photograph to provide the visual backgrounds in the multimedia program.

In addition to visuals being pleasing to the audience and stimulating interest, Doak and colleagues (1996) argue strongly that visuals should assist the reader with deciphering and remembering a message. According to these authors, the visuals should have the following characteristics:

- Be realistic rather than symbolic
- Be simple with little distracting background
- Be used to reduce text by showing, for example, steps in a procedure
- Show all important elements of a gestalt, for example, the entire body rather than just the chest so that the reader does not have to struggle with orientation
- Be used to stimulate interaction

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### Pretesting, Revising and Producing Program Components

The next task in Step 4 is to pretest and pilot test  
program components.

The final task is to oversee production of materials.

Pretesting is the process of trying out the specific messages of the program products with the intended participants before final production. Pilot testing is trying out the program as it will be implemented, with both the implementers and intended participants, prior to the actual implementation. Both pretesting

and pilot testing are crucial to determine whether planning to this point has resulted in appealing, understandable messages and whether the program can be implemented. Program materials must be culturally relevant and the implementers culturally competent as well. In other words, not only must the program and its delivery be understandable in a particular culture and not offensive, but it must also make use of particular cultural concepts related to the health, behavior, and community changes inherent in the program and leave the community with greater capacity than before the program.

Sometimes program planners do not conduct pretesting and pilot testing because the planners are experiencing a time crunch at this point in production. No matter how big the hurry, planners must make time for pilot testing. One of us has had the experience of consulting with an HIV/AIDS-prevention agency that had an advertising firm develop a series of messages. The agency refused to pretest and produced and implemented messages that had the reverse of the intended effect: the messages made people feel that they were safe from HIV/AIDS under certain circumstances that were actually irrelevant to risk. The ad campaign might actually have increased risky behavior among the intended audience.

Sometimes the planning team may object to pilot testing by pointing out that the planning group already contains representatives of the potential program participants. Representatives, however, have probably come to value the program that they have developed in a way that colors their objectivity. This step requires going back out into the communities you are serving, talking to community members, and getting their responses to ideas and to all the various aspects of support materials: graphics, illustration, photography, messages, and delivery.

## Methods for Pretesting

Table 7.7 presents various pretesting and pilot testing methods. This is a brief overview, and we refer readers to other sources of information on pretesting (National Cancer Institute, Center for the Advancement of Health & Robert Wood Johnson Foundation, 2002). The first pretesting that health educators conduct is to test initial program concepts, including key phrases and visuals proposed to portray the main ideas. Focus groups and interviews are good for this purpose. A very important reason for this process is to discover the words, phrases, and vernacular that members of the at-risk group use when discussing the topic.

In addition to the methods of focus groups and in-depth interviews, the techniques of central location–intercept interviewing and theater testing are good for pretesting. In central location intercept, interviewers armed with

**Table 7.7 Pretesting and Pilot-Testing Methods**

	<b>Concept Testing</b>	<b>Readability Testing</b>	<b>Executing the Message</b>	<b>Effect on Determinants</b>	<b>Adoption and Implementation Characteristics</b>
<i>Purpose</i>	To test the key phrases and visuals that portray the main ideas; to discover vernacular	To estimate school-grade reading level required to read text	To determine whether program material messages are attended to, comprehended, appealing, and culturally relevant	To get a sense of possible effect or to actually measure impact	To see how the materials are perceived in terms of complexity, trialability, observability, and relative advantage  To determine problems with implementation
<i>Participants</i>	Program participants	Program participants	Program participants and implementers	Program participants and implementers	Program adopters and implementers
<i>Materials and Strategies</i>	Interviews and focus groups	Text and readability formula or computer program	Interviews, focus groups, questionnaires after exposure, theater testing	Interviews, focus groups after exposure Measurement via instruments designed from the determinants columns of the matrices	Interviews, focus groups after review by potential adopters and implementers Observation of trial implementation

(Continued)

Table 7.7 (Continued)

	Concept Testing	Readability Testing	Executing the Message	Effect on Determinants	Adoption and Implementation Characteristics
<i>Instructions</i>	Use concept ideas as stimulus materials; ask people how they would convey an idea	Apply the program or formula to each component	Ask people to tell you what they "got" from the product; separate components Assess identification with questions such as "How much did these people seem similar to you? What thoughts and feelings did they express you might have?"	See Chapter Nine	Ask for review by naive potential implementers, not those who have worked on development. Make the pilot as realistic as possible.
<i>Can't Be Used For</i>	Nothing at this stage attributable to the executed materials	Determining whether intended readers will understand text	Estimating total impact	This is only a formative evaluation. Without a comparison group, change is not attributable to the program.	

questionnaires ask for responses from people in high-traffic areas such as malls and grocery stores. In theater testing for television spots, groups of watchers are asked to respond to programs or other television components amid simulated television clutter. For example, spots are aired between two 30-minute television shows. After the first show, spots appear between irrelevant material; and after the next 30-minute show, viewers are tested for recall. Viewers are then shown the messages again and asked about specific characteristics. Day-after recall can also be used to assess what participants remember from various program materials a day later.

Program developers must also conduct gatekeeper reviews and use testing so that the people who will implement and maintain the program review the components; the materials must also be tested in real life or a simulation of real life. This review is to ascertain how participants perceive the materials in terms of characteristics that have been shown to influence adoption and implementation. Such testing can also uncover potential problems with implementation plans. (See Chapter Eight for more on adoption and implementation.) For this pretesting it is important to find potential implementers and gatekeepers who have not been a part of program development.

For final pretesting the various program components are executed in preliminary formats and are tested to determine attention, comprehension, strong and weak points, and personal relevance. At this point program planners can gauge potential objection to sensitive or controversial issues. A major question at this stage is how to get materials in final-enough form to be good stimulus material without spending too much extra money. For example, videotapes can be presented in storyboard format, as can PSAs. Radio PSAs can be read aloud, and newsletters can be produced with a word processing program. However, as much of the final product as possible should be included: illustrations, photographs, and graphics for newsletters rather than just the words, for example. It is also important to evaluate individual aspects of materials rather than just the whole. For example, two panels of consultants, one of women and one of partners, reviewed the Project PANDA newsletters. Response boxes were included for each newsletter article, rather than for the newsletter as a whole. The team wanted to judge the impact of individual message groups for acceptability, interest, and change objectives.

### Checking for Parameters of Theoretical Methods

As we discussed in Chapters Two, Three, and Six, theoretical methods can produce changes only if they are used as intended. The pretesting period is

a good time to review and check how well methods were operationalized. In Intervention Mapping Step 3, program planners made decisions about theoretical methods and practical applications. For instance, in the development of the HIV-prevention program (Chapter Thirteen on the book's instructor Website), the developers selected modeling, active learning, and feedback as methods for improving self-efficacy. For the practical applications, the developers created an interactive video presentation: peer models present scenarios on video; the students stop the video and discuss solutions to dilemmas presented in the video; the peer models on video present a solution; and the teacher gives the students feedback on their solutions. In this example, the assumption for the use of peer models is that students will find these models attractive and credible (Bandura, 1986). Pretesting of the program should provide assurance that these assumptions were correct. The developers of the HIV program tested their video segments with members of the potential audience and found all but one role model to be attractive and believable to the youth. Another assumption for the educational program was that students will pay attention because they think that the program is personally relevant (McGuire, 1986). Again, pretesting addressed this assumption (Chapter Thirteen on the book's instructor Website).

### Making Sense of Pretest Data

At every step of pretesting, there is the likelihood of obtaining conflicting data. Table 7.8 presents one method for organizing data from the participant review. This sample table does not include the equally important opinions of gatekeepers and implementers. The point is to use some mechanism to make clear what program participants are saying about the program and how strongly they hold their opinions. The note labeled "implications" reminds the planner to consider what would be left out of the intervention in terms of methods, practical applications, and messages if the material was changed on the basis of reviewers' comments. For example, according to Table 7.8, some reviewers did not particularly like the role-model stories. The developer then has to decide whether to leave the stories as they are, change them, or delete them. If the developer deletes the stories, then he or she deletes the method of role modeling (and the practical application of role-model stories) and should replace them with an equally powerful method. Making appropriate use of pretest data requires working back through messages, practical applications, and methods to matrices to ensure that changes in the program materials do not leave gaps in the intervention chain of causation.

**Table 7.8 Making Sense of Pretest Data**

Material Title: Managing HIV in Your Child				
Pretest Methods: <i>Waiting Room Use (N = 6) and Parent Focus Groups (N = 10)</i>				
Category ⇒ Component ↓	Role Modeling	Skill Training	Technical Content	Other
<b>Module 1: Observing Signs and Symptoms</b>	<p><i>Comments:</i> The stories are just a waste of space. (1) The stories are great. I felt exactly like that. (1) In response to specific question about stories: Leave them in. They're OK. Not bad, not good. (8) <i>Implications:</i> Leave in. There will be damage to methods if role modeling deleted.</p>	<p><i>Comments:</i> Steps are not broken down enough. (2) <i>Implications:</i> Observe teaching; break steps down further</p>	<p><i>Comments:</i> This is not what I was taught by the nurse. (3) <i>Implications:</i> Check with nurses; observe teaching again</p>	<p><i>Comments:</i> I always thought this was the doctor's job. No one ever told me I had a role. (3) Doctors do not ask me what I have observed. (6) <i>Implications:</i> Work with physicians to use parent data</p>
<b>Module 2: Treating Infections</b>	<p><i>Comments:</i> Same as above <i>Implications:</i></p>	<p><i>Comments:</i> Steps are not broken down enough. (6) Cards with medications are too easy to lose. (4) <i>Implications:</i> Combining drug information will give some families names of drugs they are not using.</p>	<p><i>Comments:</i> None <i>Implications:</i></p>	<p><i>Comments:</i> None <i>Implications:</i></p>
<b>Module 3: Maintaining Good Nutrition</b>	<p><i>Comments:</i> Same as above <i>Implications:</i></p>	<p><i>Comments:</i> Impractical (1) Can't do this (3) My child won't eat these things. (4) <i>Implications:</i> Work with parents to devise more practical nutrition advice</p>	<p><i>Comments:</i> None <i>Implications:</i></p>	<p><i>Comments:</i> None <i>Implications:</i></p>

### BOX 7.3

## STROKE PROJECT

- **The first task in Step 4 is to consult with the intended program participants to determine preference for program design.**

As we mentioned in Step 1, the planning team included university faculty along with community members. The community members included persons who had had a stroke, significant others of those who had suffered stroke, media representatives, health care providers, and members of various organizations. Working with these community members, we decided that the program should have two major components, one for the health care providers—emergency departments (EDs), emergency medical services (EMS), and primary care providers (PCPs)—and one for lay members of the community. The group was involved in all of the decisions related to these two components.

- **The second task in Step 4 is to create the program scope and sequence, delivery channels, themes, and a list of needed program materials.**

The program's two major components, community and professional, each had multiple channels and vehicles to deliver the major messages (7.9). Each intervention module had more detailed sequences of its own. As Table 7.9 indicates, the professional module activities began ahead of the lay activities to ensure that community services were in place as the demand for emergency care for stroke increased. The scope and sequence of the stroke project needed to accommodate the methods and practical applications chosen in Step 3. For the community these methods and practical applications were role models for treating stroke as an emergency, delivered by radio and television PSAs in English and Spanish and by billboards and posters; and skill training in recognizing stroke symptoms by one-to-one training, role modeling, and information transfer through brochures and newspapers.

Changes in the behavior of health care providers were created and reinforced in three ways:

- Organizational change consultation to assess awareness, increase perceptions of need, and diagnose needed support for change in EDs and EMS. (Most hospitals and emergency medical services needed support for getting revised stroke care guidelines in place, including individualized guideline development and staff training.)
- Skill training individualized to the provider and the setting.
- Reinforcement for using new treatment protocols through newsletters and newspaper stories of successes.

**Table 7.9 Scope and Sequence of the T.L.L. Temple Foundation Stroke Project**

Weeks 1–2	Weeks 2–8	Weeks 8–16	Weeks 16–32	Weeks 32+
<i>Professional Module 1:</i> Change planning meetings with hospital EDs	<i>Professional Module 2:</i> Orientation meetings with hospital medical staff	<i>Professional Module 3:</i> Training meetings (mock stroke code at a worksite) for ED and EMS teams	<i>Professional Module 4:</i> Review training meetings for ED and EMS teams	<i>Professional Module 5:</i> Reinforcement for protocol use via newsletters
Change planning meetings with local EMS	Guideline and protocol development with medical staff and critical care committees	<i>Community Module 1:</i> One-to-One Train the Trainer + Brochure	<i>Community Module 1:</i> One-to-One Train the Trainer + Brochure	<i>Community Module 1:</i> One-to-One Train the Trainer + Brochure
	Guideline and protocol development meetings with EMS directors and medical directors	<i>Community Module 2:</i> Placement of billboards and PSAs		<i>Community Module 2A:</i> Change out billboards and PSAs to use real stories
		<i>Community Module 3A:</i> Newspaper stories and news releases introducing the program and objectives; coverage of the mock stroke code	<i>Community Module 3B:</i> Newspaper stories regarding stroke symptoms, new treatment and steps to take	<i>Community Module 3C:</i> Newspaper stories about stroke treatment successes

Of course, all these activities could not happen at once, and the success of many of them depended on prior requisite activities, thus the need for a well-defined program sequence.

The program had two themes:

- Every minute counts—call 911
- Is there life after stroke? (with positive outcome expectation messages)
- **The next task in Step 4 is to prepare design documents for the production of materials that meet the program objectives and parameters for the methods and practical applications.**
- **The fourth task in this step is to review available program materials for possible match with change objectives, methods, and practical applications.**
- **The fifth task in this step is to develop program materials.**

Table 7.10 shows the materials for the stroke project's community component and highlights from the design documents. The team decided that materials available from various voluntary health organizations and government agencies did not present messages well matched to the change objectives. Table 7.11 shows a full design document for four items from the stroke project. For each product the planners thought about what methods and practical applications they had decided to use to influence the change objectives. They decided on vehicles to convey those methods and practical applications, and partial planning for four of the vehicles is shown in the table. Finally, the planners composed first drafts of the messages to be contained in the newspaper stories, newsletter, and billboard they were planning.

- **The next task in Step 4 is to pretest and pilot-test program components.**
- **The final task is to oversee production of materials.**

All stroke materials were drafted by the project health educator, reviewed by the neurologist for stroke content, and then reviewed by the project advisory committee. Because much of the project material was newspaper stories or television and radio PSAs, the media gatekeepers on the advisory committee were particularly helpful as reviewers and potential implementers of the public education part of the program.

**Table 7.10 Highlights from the Stroke Project Community Component**

Material	Design Document Highlights
<i>Community Module</i>	
Billboard	Recognizable community role models participating fully in life after stroke Is there life after stroke (outcome expectations) Every minute counts—Call 911 (behavioral capability)
PSAs Time One—Bystander Response—TV	Use actors to depict response to stroke Show rapid treatment Show recovery Reinforce bystander for acting
PSA Time One—Physician Response—TV	Show physician saying that his patients should call 911 Stroke is an emergency Reviewing symptoms
PSAs Time One—Radio	Same as above for TV
Brochure	Symptoms Call 911 Treatment results in better outcomes
One-to-One Training	Script with symptoms Call 911 Treatment results in better outcomes
PSAs Time Two—Television	Same as above with actual local cases
Newspaper Story—Intro Type	What is the T.L.L. Temple Stroke Project? What the community can expect Stroke is an emergency Call 911
Newsletter Story—Stroke Code	Coverage of local hospitals and EMS practicing stroke response
Newsletter Story—Symptom Recognition and Response	Stroke symptoms Call 911 New medication leads to better outcomes
Newsletter Story—Success Story	Local individual experienced stroke Bystander/significant other called 911 Good outcome Reiteration of symptoms

Table 7.11 Message Development Guide for the Stroke Project

Proposed Vehicle	Change Objectives Grouped by Determinant	Methods and Practical Applications	Message Content
<i>Emergency Department Staff and Physicians; Community Physicians</i>			
<i>Newspaper Article</i>	<p><i>Social norms:</i> Recognize that other physicians in the community respond rapidly to symptoms of stroke; believe that other emergency departments are lowering their workup times for stroke</p> <p><i>Outcome expectations:</i> Expect that stroke patients (especially those presenting with moderate disability) can recover function with acute treatment of stroke</p> <p><i>Reinforcement:</i> Prepare and share patient success stories because there may be a lack of feedback to emergency department staff</p>	<p>Modeling through role-model stories and testimonials</p> <p>Modeling through role-model stories and testimonials</p> <p>Modeling through role-model stories and testimonials</p>	<p>I had a stroke patient who got to the hospital on time; the hospital emergency department treated my patient</p> <p>I wasn't sure about this new treatment before, but I am really pleased with the improvement I saw in my patient</p> <p><i>From the patient or family's point of view:</i> I am back (or my family member is back) to full functioning—the doctor saved our quality of life by acting quickly</p>
<i>Newsletter</i>	<p><i>Knowledge:</i> Describe the results of the rtPA clinical trial</p> <p><i>Social Norms:</i> Recognize that other EDs are lowering workup times and treating patients</p> <p><i>Reinforcement:</i> Recognize that patient did well after treatment</p> <p><i>Outcome expectation:</i> Recognize that when workup times are lowered patients can get function-saving treatment</p>	<p>Information transfer—science article</p> <p>Modeling through physician testimonials</p> <p>Reinforcement through patient stories</p> <p>Modeling through actual hospital role model stories</p>	<p>Stroke clinical trial article and references</p> <p>Article from physician's view point of actual treated case</p> <p>Article about patient treated in ED</p> <p>Article about patient treated in the ED</p>

Table 7.11 (Continued)

Proposed Vehicle	Change Objectives Grouped by Determinant	Methods and Practical Applications	Message Content
<i>Community Member; Bystander</i>			
<i>Billboard</i>	<p><i>Knowledge:</i> Describe importance of calling 911 for stroke symptoms</p> <p><i>Outcome expectations:</i> Expect that getting to the emergency department fast will allow treatment to minimize effects of stroke</p>	<p>Information transfer</p> <p>Modeling through recognizable community member</p>	<p>Call 911; Every minute counts</p> <p>Is there treatment for stroke? (Ask Mr. Annon Card, stroke victim, who is playing golf)</p>
<i>Newspaper Story</i>	<p><i>Knowledge:</i> List symptoms; describe to call 911</p> <p><i>Skills:</i> Recognize symptoms</p> <p><i>Outcome expectations:</i> Describe that treatment can prevent disability</p>	<p>Information transfer</p> <p>Modeling; Information transfer</p> <p>Modeling through role model story with vicarious reinforcement</p>	<p>Every minute counts; symptom list</p> <p>Symptom list and someone responding to symptoms</p> <p>Some bystander or significant other does the right thing; the patient is treated; the outcome is good</p>

Examples of program materials are included in Figures 7.7, 7.8, and 7.9.

FIGURE 7.7 Tasks for Producing a Print Piece



FIGURE 7.8 Tasks for Producing a Print Piece

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**TREAT STROKE → PREVENT DISABILITY  
AND SAVE A LIFE!**

**Local Doctor's view  
on rt-PA**

An interview with Gavin McGown, MD, Director of Emergency Medicine, Nacogdoches Medical Center

Dr. Gavin McGown, MD, Emergency Medical Director of Nacogdoches Medical Center for the past 17 years, is pleased with the changes he has seen in stroke care. Dr. McGown had the opportunity to recently treat one of Dr. Randall Vinther's patients, Mrs. Lois Moss. Mrs. Moss, a very active 73-year old, was rushed to the Nacogdoches Medical Center after suffering from aphasia and experiencing left-sided paresis. "As soon as Mrs. Moss came through the door we began the protocol. We felt very comfortable with it", stated McGown. "Mrs. Moss met the criteria and we administered rt-PA. She showed almost immediate improvement."

"Saving time with stroke is the most important thing," stated Dr. McGown. "We know we only have 3 hours. If the EMS can call ahead, we can clear the CT scanner, and help streamline things once the patient arrives." Dr. McGown says that if he or a family member suffered a stroke, he would want rt-PA.

**Local Medical Staff  
"Make the Grade"**

Are the tri-counties prepared for treating an acute stroke with rt-PA therapy?  
The answer is an overwhelming "yes!"

On July 20-21, 1999, mock stroke codes were held in Lufkin, Nacogdoches, and Center. Volunteers were coached on stroke symptoms and then suffered a "stroke" at a predetermined time and location. Emergency Medical Services were alerted.

Dr. Robert Felberg, who was in attendance from the Temple Foundation Stroke Project was impressed by the professionalism and efficiency of the hospital staff and ambulance crews. The ambulance crews remembered the 3 tenets of EMS stroke care:

1. Load and Go
2. Determine last time seen normal
3. Call ahead to the Emergency Department

The crews did not treat hypertension en route and a witness was asked to ride along.

The emergency departments also showed the professionalism and competence that has made the tri-county region the envy of many Texas counties. All patients were appropriately screened and CT scans performed quickly. Blood samples were drawn by the EMS crews and handed off to the triage nurses who personally ensured delivery to the lab. The hand-off of labs cut about 20 minutes off work-up time. Overall, participation and knowledge were outstanding. CONGRATULATIONS from The T.L.L. Temple Project for a job well done.

FIGURE 7.9 Newspaper Article (*The Daily Sentinel*)

## The Daily Sentinel

Sunday, June 18, 1999

### Son's Quick Action, New Therapy Help Woman Recover from Stroke

*Her son Jeremy discovered Ms. Moss could not get up, was totally paralyzed on her left side, had facial droop and garbled speech. He immediately called 911.*

**By ROBBIE GOODRICH**  
*Sentinel Staff*

It began as a normal day.

Lois Moss, 73, had been to Henderson to get her hair done and had returned to her home off FM 343 at around 2:30 PM that day.

Her son, Jeremy, had given her a plant that she wanted to plant outside. She grabbed a set of post hole diggers and headed for the yard.

"I had my post hole diggers in my hand, and suddenly, I fell to the ground," Ms. Moss said. "That's all I remember."

She estimates that she was on the ground for as long as 30 minutes before someone saw her. That "someone" happened to be Jeremy.

"I had tried to get up, but I couldn't," Ms. Moss said, adding that it didn't occur to her at the time she had suffered a stroke. "I didn't have any symptoms of a stroke. I just fell, and I don't remember much after that."

Jeremy hadn't planned on stopping by his mother's house that day. But he found himself in that part of the county and decided to check on her. He guessed she would have gotten home from taking care of errands in Henderson.

As he pulled into the driveway, he saw her and thought at first she was just kneeling down.

But when he spoke to her, and she didn't respond, he knew something was wrong.

He discovered Ms. Moss could not

get up, was totally paralyzed on her left side, had facial droop and garbled speech. He immediately called 911.

Paramedics from the local volunteer fire department arrived within 15 minutes, and an ambulance arrived within another 15 minutes. Ms. Moss was taken to Nacogdoches Medical Center.

At the hospital, doctors asked Jeremy about the time of onset, and he was told his mother likely suffered a stroke. It was then that Jeremy was told of a clot-busting agent—tissue plasminogen activator, or TPA—that had proven effective in stroke victims if it is administered within a three-hour time window.

"It's very new," Dr. Randal Vinther, internal medicine physician, said. "There's been a lot of research in the past two or three years, but it's been only within the past six months that it's becoming common to use as state-of-the-art therapy for stroke treatment. And you have to get to the patient within three hours of developing symptoms, so it's very important to be evaluated immediately."

Almost immediately after receiving TPA, Ms. Moss' symptoms began to disappear. Prior to receiving TPA, she had been completely unresponsive, had significant neurological deficits and a facial droop. By the time Vinther got to the hospital and saw her, she was beginning to move her left side. By the next day, the facial droop was gone, and she was moving her left side.

Vinther said he was convinced

that had Ms. Moss not received TPA, she would be totally paralyzed on one side.

"But now, she's able to resume a fairly normal quality of life," he said.

Ms. Moss said that she's been extremely weak since suffering her stroke, but she's been getting better. She also said being administered TPA so quickly in the hospital "made all the difference" in her quality of life.

But Vinther said the public needs to understand that TPA may not be the answer in every circumstance.

"There is a potential for complication," he said.

One such complication is bleeding, Vinther said. TPA restores blood flow into the brain, as a result, a person can bleed into the stroke, such as in the case of Ms. Moss. However, that problem was countered with blood pressure control, he said.

There is risk in using TPA on anyone who has undergone recent surgery or had recent CPR chest compression. It's also risky in using on anyone with high blood pressure that can't be brought under control quickly.

But given the right circumstances, the potential for benefit outweighs the risk, Vinther said.

"It's been my experience, given the right circumstances without these complications, the drug should be very seriously considered and administered in the majority of cases," he said.

*Mary King, health educator with T.L.L. Temple Foundation Stroke Project, contributed to this story.*

## Implications for Evaluation

This chapter has two categories of evaluation implications. The first is formative evaluation. We have given an overview of pretesting and pilot testing, evaluation that is done while program materials are being developed and that seeks to incorporate into the final materials the opinions of both intended recipients and intended adopters and implementers. The second category is part of summative evaluation, and it includes a later assessment of how the audience received the materials during implementation and whether the methods and practical applications were well enough operationalized to have an impact on the change objectives (Chapter Nine).

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## Summary

Chapter Seven presents the process of producing program components and materials. The purpose of this chapter is to enable the planner to produce creative program components and materials in support of health education and promotion programs. The program will often be a complex entity with components for both at-risk groups and environmental agents. Each part of the program may be supported by certain products or materials. The goal is that these products are creative, effective pieces of the planned behavior- and environmental-change program. A challenge in this step is one of translation: working from the previous planning to get the support pieces right so that the methods and practical applications are adequately (and sometimes brilliantly) operationalized and the change objectives accomplished. The planning steps completed to this point should enable production of creative products that emerge from the thinking captured in the matrix development and the selection of methods and practical applications.

As in the other Intervention Mapping steps, the first order of business in this step is to consult with the intended program participants to determine preference for program design. This initial and ongoing process facilitates the creative thinking required for developing a program scope and sequence including delivery channels, themes, and list of needed program materials.

Chapter Seven describes in detail how to organize ideas for program components into design documents that can serve as the guides for production of any materials needed to support the program. The process used for creating these materials should ensure that they meet the program objectives and the parameters for the methods and practical applications. The chapter also gives some guidance in how to review available program materials and select materials that match

change objectives, methods, and practical applications. Finally, suggestions are made for pretesting program materials and overseeing the final production.

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## Discussion Questions and Learning Activities

1. Continuing with the program planning you have done in the previous chapters, describe your ideas for organizing the methods and applications from Step 3 into an intervention program.
2. What are the program components, themes, scope and sequence, delivery channels, and needed support materials?
3. Create an example of a design document that you would use to convey to someone to produce program materials. Include communication channels and vehicles, message, and themes. Match the program component to change objectives so that the producer of the program materials is clear about what you intend to change.
4. If you propose that the materials are to be tailored, explain how tailoring will be done and on what variables.
5. Explain how you will pretest your program.
6. Explain how cultural issues have played a role in your Intervention Mapping project thus far (for example, needs assessment, decisions about what should change, performance objectives, determinants). Describe how cultural considerations will influence your program components and materials.



# INTERVENTION MAPPING STEP 5

## PLANNING PROGRAM ADOPTION, IMPLEMENTATION, AND SUSTAINABILITY

### LEARNING OBJECTIVES

- Identify potential adopters and implementers of the health promotion program
- Reevaluate the planning group to ensure representation of potential program adopters and implementers
- State program use outcomes and specify performance objectives for program adoption, implementation, and sustainability
- Specify determinants of program adoption, implementation, and sustainability
- Create matrices of change objectives for program adoption, implementation, and sustainability
- Select methods and practical applications for program adoption, implementation, and sustainability
- Design interventions for program adoption, implementation, and sustainability

Effective health education and promotion programs will have little impact if they are never used or if they are discontinued while still needed to create the desired health outcome (Oldenburg & Glanz, 2008; Oldenburg, Hardcastle, & Kok, 1997; Parcel, Perry, & Taylor, 1990). Without a planned intervention to ensure appropriate adoption, implementation, and maintenance, the health promotion program may stay on the developers' shelf if the program is not adopted—or on the organization's shelf if the program is adopted but not implemented. If the program is not sustained, it may not produce the desired outcomes or

if outcomes are observed, they may be short-lived. Systematic planning for each stage of program use is essential if the program is to have its optimal effect on the population for whom it was designed (Caburnay, Kreuter, & Donlin, 2001; Heath & Coleman, 2003). Other authors have suggested that to reduce the gap between the development of effective programs and their actual use in communities, it is important to use a systematic framework during planning (Klesges, Estabrooks, Dzewaltowski, Bull, & Glasgow, 2005). For new programs, demonstration projects, and research projects, the focus of Step 5 is on planning for program use for initial testing of the program's efficacy or effectiveness. If the program proves effective, then its greater impact on public health will depend on a greater exposure of populations to the program, and developers can use Step 5 to plan larger program diffusion. This will include the development of a clear implementation and sustainability plan that will guide future program users.

In Step 5 of Intervention Mapping, the focus is on planning an intervention to ensure that the program developed in the previous steps will be used and maintained over time, for as long as it is needed. The purpose of this chapter is to ensure that health educators are developing program plans that consider how programs will be adopted and implemented and how they will be continued.

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## Perspectives

Planning for program use involves two aspects. The first is to design the health education program in ways that enhance its potential for being adopted, implemented, and sustained (Steps 1–4). The second is to design interventions to influence adoption, implementation, and continuation (Step 5).

In this section, we describe the process of planning for program adoption, implementation, and continuation. This step can be used for two different situations. The first is for initial use of a newly developed health promotion program. In this case, Step 5 is part of the overall program planning and would be completed prior to implementing the program for the first time. In the second situation, a health promotion program has been implemented, evaluated, and shown to be effective. In this case, Step 5 is used by itself to plan for dissemination of the program beyond initial use. Essentially, it is applying Intervention Mapping to plan interventions to disseminate a tested and effective health promotion program. If a program requires adaptation, we recommend that the planner follow all steps of Intervention Mapping to adapt the program as described in Chapter Ten. Step 5 then will help plan adoption, implementation, and maintenance of the adapted intervention in the new setting.

Using this step of Intervention Mapping during the development phase or for dissemination efforts of an already developed and tested intervention

can help address the controversy surrounding whose responsibility it is to ensure that developed programs are adopted and used widely. One of the factors that may explain why interventions are often developed and tested but left unused is that both developers (often researchers) and practitioners believe that the responsibility for dissemination efforts lies elsewhere (National Cancer Institute, Center for the Advancement of Health & Robert Wood Johnson Foundation, 2002). A consensus conference held by the National Cancer Institute showed that none of the three groups of participants—researchers, practitioners, and intermediaries (including funders)—felt that dissemination was their responsibility. Researchers (who often develop and test health promotion interventions) said they did not have the training or interest in communication and other approaches to enhance dissemination of the products of their research, and that their grants usually do not support these types of activities. Practitioners (for example, clinicians and public health professionals) said that the responsibility for summarizing research findings and making them usable for practitioners lay elsewhere, and that they would be more likely to act on findings if they were easily accessible and easy to use. Intermediaries, including public or private funders, or nonprofit policy organizations, said they could provide leadership for dissemination efforts but that it was the researchers and practitioners who must take responsibility for the process. After much discussion, participants agreed that the responsibility for dissemination must be shared. Participants also agreed on the importance of incorporating dissemination planning during the development of the programs and that community-based participation is necessary for both intervention development and dissemination (National Cancer Institute, Center for the Advancement of Health & Robert Wood Johnson Foundation, 2002).

A potential barrier that contributes to the gap between findings based on intervention research and program use in communities is that dissemination is often seen as another step along the “discovery to delivery” continuum in which developers must “push” their products out into the community for use (Rimer, Glanz, & Rasband, 2001; Wandersman et al., 2008). This perspective presents some problems, often stemming from the failure to involve community stakeholders during the development process, and the community’s perception that research-tested interventions are not necessarily appropriate for a new context. It also fails to take into account the importance of market “pull” or demand and fails to address questions of delivery capacity (National Cancer Institute, Center for the Advancement of Health & Robert Wood Johnson Foundation, 2002). Conversely, community-centered approaches begin with a focus on community needs and capacity. Intervention Mapping provides a process that incorporates both resource and user perspectives. The community is an integral part of the planning process—beginning in Step 1 and continuing through Step 5—where we consider the needs, performance objectives, and

determinants of program adopters, implementers, and maintainers during the development of the program (Step 5). By including these players from the beginning as integral members of the planning group, we can help enhance program adoption and use (Miller & Shinn, 2005; Wandersman et al., 2008).

### Planning for Program Use Is Essential

The impact of a health education program will be determined not only by the effectiveness of the interventions, but also by the quality of program implementation and the proportion of intended participants exposed to the program over time (Parcel, 1995). Program failure can often be traced to problems with program adoption and use (Green & Kreuter, 1999). A recent review of over 500 studies of prevention and health promotion programs demonstrated that the level of implementation affected program outcomes (Durlak & DuPre, 2008). Recently, authors have presented frameworks for considering how programs are adopted and implemented and what types of resources, capacity, and systems influence their ultimate use (Klesges et al., 2005; Mendel, Meredith, Schoenbaum, Sherbourne, & Wells, 2008; Wandersman et al., 2008). Although these frameworks provide new perspectives on contributing forces influencing the dissemination process, they lack specific guidance about how, during the planning process, we can design interventions that include dissemination intervention components to increase adoption, implementation, and maintenance. These frameworks can be very useful during Step 5 by helping the planner consider who the adopters and implementers may be, what may influence their actions (personal and contextual factors), and what types of capacity building may be required.

In this chapter we take the perspective that preparing for program use is a critical step in health promotion program planning. The dissemination interventions to enhance program adoption, implementation, and maintenance developed from this phase of planning (Step 5) are essential components of an effective health education program. Designing the program with broader dissemination in mind from the beginning, and creating a plan for adoption, implementation, and maintenance during the intervention planning process, can greatly enhance the potential public health impact of the program.

Whereas some health education programs may be self-selected and directed by the audience, most programs require someone to deliver the program. Often the person or persons who present the program will be different from the program developers; therefore, developers cannot assume that the implementers will know how to implement the program. Under these circumstances, especially, planning is needed to increase the likelihood that the program will be used and continued over time.

Most programs have program implementers, people who deliver the program and are actively involved in program activities. Program implementers can be teachers who present health education programs to students or nurses who present programs to patients. By contrast, some programs such as online or mass media programs are presented without anyone implementing intervention activities. However, these media-based programs still need to get to the intended participants through a delivery system. Gatekeepers for delivery systems, even though they are not program implementers like a teacher or nurse, may be program adopters because they are necessary to get the program to the program participants. For example, the principal of a school may not be the user of a health education curriculum, but his or her support may be critical for program adoption. A program manager at a radio station may not be directly involved in conducting a mass media campaign, but his or her support is essential in getting the program on the air. Identifying who the program adopters and implementers are and defining what they must do is an essential task in the process of designing interventions to enhance adoption and implementation (described in the following section).

### Planned Interventions Can Make a Difference

We have experience with programs whose implementation was characterized by the echoing lament, “We should have thought about that.” One of these was Bartholomew and colleagues’ computer-assisted instructional program for self-management of asthma. In the first implementation, we relied on research assistants and underestimated the roles of clinic nurses and physicians. Without specifying in advance what these individuals would need to do to implement the program and without delineating the determinants (and the methods and practical applications to change them), we received little cooperation from the health care providers (Bartholomew et al., 2000b).

On the other hand, well-conceptualized diffusion interventions, using theory and evidence to design methods and practical applications to promote program adoption and implementation, can help to ensure that the program not only fits the contextual realities of the setting, but can also be used as planned and sustained over time. For example, Glanz (2005) developed a carefully planned, theory- and evidence-informed intervention to disseminate an effective skin cancer prevention program. This dissemination intervention incorporated methods based on an integration of Social Cognitive Theory (SCT) (Bandura, 1986, 2001), Diffusion of Innovation Theory (DIT) (Rogers, 1983a, 1995) and theories of organizational change (Glanz, Steffen, Elliott, & O’Riordan, 2005; Steckler, Goodman, & Kegler, 2002) to create a multicomponent program that targeted organizational as well as individual change. In another example,

Gordon and colleagues demonstrated that a tobacco cessation intervention could be effectively disseminated to and implemented by dental hygienists using either a self-study or a personal channel (2005).

### Who Will Adopt and Implement the Program?

The first task in Step 5 of Intervention Mapping is to identify potential adopters and implementers of the health promotion program.

Determining who will decide to adopt a program and who will implement its components begins in the early steps of Intervention Mapping and continues here. Planners work with the potential program adopters and implementers, and seek to incorporate their concerns during all steps of the planning process. It is critical in Steps 3 and 4, methods and applications and program design, to know as much as possible about the program adopters and implementers to ensure a good fit. As we discussed in Chapter Seven, planners need to involve potential program adopters and implementers in the planning process, to know the context in which the program will be implemented, to know how the potential program implementers typically practice, and to conduct pilot tests of program components with potential implementers (Renaud & Paradis, 2001).

Usually, program planners know the organization or setting that will be adopting and implementing the program, and thus can begin this task by answering the questions below. In some cases, however, this task must start with selecting among several possible venues and organizations for adoption and implementation of the program. This situation is particularly relevant when adapting an existing program or replicating an effective program in new settings. In this case, the planner may have various options for how to disseminate the program within a community and who will be involved in considering adopting, implementing, and sustaining the program. In this second scenario, it may be useful to answer questions regarding feasibility, fit with organizational goals and values, organization readiness, size, leadership, absorptive capacity, and general capacity. These and other factors may influence adoption and implementation of health interventions in organizations (Flaspohler, Duffy, Wandersman, Stillman, & Maras, 2008; Greenhalgh, Robert, MacFarlane, Bate, & Kyriakidou, 2004; Weiner, Amick, & Lee, 2008). Another important criterion in selecting the implementing organization is the potential reach (Glasgow, Marcus, Bull, & Wilson, 2004b; Klesges et al., 2005). Organizations that have ready access to the priority populations and that could potentially reach large numbers of people will have a greater overall impact if the intervention is effective.

Once the planning team has made at least a preliminary decision about the setting for program implementation, they must answer the following questions:

- Who will decide to use the program?
- Which stakeholders will the decision makers need to consult?
- Who will make resources available to implement the program?
- Who will implement the program?
- Will the program require different people to implement different components?
- Who will ensure that the program continues as long as it is needed?

Program participants and program adopters may be the same people; however, most of the time health promotion programs are made available to the population at risk or influential environmental agents through intermediary agencies such as schools, clinics, health departments, neighborhood organizations, churches, interest groups, support groups, health care providers, hospitals, or community organizations. Within the agencies there are people who will be responsible for making decisions about whether or not to adopt the program, how to garner support from other decision makers, and how to allocate resources for its implementation. There will also be people who will be responsible for delivering the program (program implementers) such as teachers, parents, peer educators, or school nurses. Recent advances in dissemination and organizational theory have identified the important role that formal leaders play in dissemination efforts—even beyond the role of “program champion” or “opinion leader” described in classical Diffusion Theory. Senior management buy-in and support are often required for implementation (Dearing, 2008), and organizational leadership has been consistently associated with innovation in organizations (Greenhalgh et al., 2004).

Mass media programs—available through TV, radio, newspaper, or through the Internet—that may be accessed directly by participants may not be viewed as having an intermediary adopter. However, even in these cases, someone or a group of individuals acting for their agencies is involved in deciding if, how, and when a health promotion intervention will be made available. These agencies are also responsible for carrying out the key elements of the program to the priority population group (Dariotis, Bumbarger, Duncan, & Greenberg, 2008). It is these intermediary agencies or groups that we refer to as the program adopters. There are cases in which there are no immediately visible intermediaries such as online or DVD-based health promotion programs immediately available and accessible to the priority population. However, even in these cases, there is usually someone who makes the decision to make it available or to communicate its availability to potential users.

The program adopters and implementers will have a set of characteristics and a context that will influence their interest, motivation, and ability to adopt, implement, and sustain a health promotion program. The more the program planners can understand about the context and characteristics of the

potential program adopters and implementers as well as involve them in the planning process, the more likely the health promotion program will be a good fit and acceptable to the intermediary agency (Klesges et al., 2005). In recent years researchers have extended the early work of Rogers and others on the diffusion process. For example, whereas previous diffusion models focused on individuals as adopters and concentrated on communication channels to influence the adoption decision, current dissemination research focuses more on organizations as the unit of adoption and acknowledges the importance and the challenges of implementation (Dearing, 2008). Dearing (2008) describes a “societal sector” as units operating in the same topical domain that have similar goals, organizational structures, and functions. Representatives of organizations in a sector typically provide similar services, know the same stories, and respond to similar opinion leaders (Dearing, 2008). A focus on identifying and intervening, using dissemination interventions on these “societal sectors,” could enhance diffusion efforts.

Recent research has also begun to identify organizational influences of program adoption and implementation. For example, certain organizational characteristics—such as size, decentralized administration, high interconnectiveness and informality, organizational resource availability, greater complexity, and leaders who are positive toward change—have been found to be associated with innovativeness (Glasgow et al., 2004b; Glasgow, Klesges, Dzewaltowski, Bull, & Estabrooks, 2004a; Greenhalgh et al., 2004). Characteristics of settings that may act as barriers to adoption include: competing demands; imposition of programs from the outside; unstable finances; unstable organizational structure; limited staff time; limited organizational support; low levels of organizational capacity to deliver a program, lack of innovation fit with prevailing practices; and incentives or regulations that work against change (Glasgow et al., 2004a). As we identify adopters, implementers, and maintainers in this step, we should also begin to characterize the organizations within which they work to inform the selection of environmental conditions that may influence program use outcomes, performance objectives, and determinants.

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## Planning Group for Program Use

The second task in Step 5 of Intervention Mapping is to reevaluate the planning group to ensure representation of potential program adopters and implementers.

In Chapter One we presented the notion that potential adopters, implementers, and maintainers of the program should participate in the planning

## BOX 8.1

### MAYOR'S PROJECT

The mayor's task force continues to work on program development. Group members are planning support materials and considering implementation networks. The team has grown into a cohesive working group. Its members have a commitment to inclusivity and, along the way, have added members. Anyone who wanted to work hard on preventing childhood obesity was welcome. For a while it seemed that every new meeting generated a new member, and every planning success attracted another contingent of community members. The health educator handled this by creating an orientation packet for new members, with information designed to quickly bring a new member up to date on the planning milestones the group had accomplished and the alternate paths it had considered.

The planning committee members were pleased with their efforts to keep an intact linkage with the community. Members who joined the task force along the way included representatives of churches, community centers, and advocacy groups. However, as the subgroup on implementation began to list the types of people and agencies that might be involved with the program, they were astounded by who was *not* at the table. Neighborhood social groups, parent organizations, and (interestingly enough) other arms of the mayor's city government who controlled environmental services relevant to physical activity were absent.

The task force went back to the community. The members were assigned to recruitment efforts, and the mayor personally invited her colleagues from other city departments to meet and discuss the history of the child obesity prevention task force with her and the health educator. She encouraged department heads to assign both management and neighborhood specialists to the task force. Fortunately, the group members prided themselves on inclusivity, and the health educator had been facilitating integration of new individuals all along. The group understood the need to encourage a certain amount of covering old ground and even reinventing programs to integrate these new members who were so crucial to the linkage system. Soon the group returned to making progress toward planning the adoption, implementation, and sustainability of program objectives.

group and provide input into each aspect of the design and development of the intervention. Program planners must consider the needs of the communities and their environmental and contextual realities throughout the planning process. We should not wait until Step 5 of Intervention Mapping to involve potential program adopters and implementers (Peterson, Rogers, Cunningham-Sabo, & Davis, 2007). However, in Step 5, the composition of the planning groups should

be reevaluated to make sure that program adopters and implementers are well represented. At this step, the planning group will have a clearer understanding of how the program will be adopted and implemented, and what may be needed to sustain the program. If they are not yet well represented, there may be a need to add new members to the planning group who can better represent the views and experience of specific program implementers. An additional issue to consider in this stage is the need for fresh views of how the program will be received and how it will fit into the practice. For example, potential program implementers who have been part of the planning group for the previous four steps are often influenced by participation in the planning process; they may now have different views about the usability of the planned program from other potential program implementers who are new to the program. A fresh look and assessment of the program by others outside the original planning group may provide additional information and insights that can be used in planning for program adoption, implementation, and continuation.

### Linking Program Developers and Implementers

If a health promotion program is being developed by essentially the same people who will be using the program, there is a marked overlap between program developers and implementers. In that case, the planning group can easily make the transition from planning the program to implementing the program. In most cases, however, the planning group, even with representation from program implementers, will be somewhat distinct or different from the program adopters and implementers. Adding potential program implementers to the planning group is one way to link program planners and implementers; however, there may still be a need to create additional linkages. An examination of seven case studies of how prevention programs or policies were utilized by communities concluded that program champions or agents linking research resources to the community users moved adoption and implementation forward and that greater community participation resulted in more advanced utilization (Peterson et al., 2007). In this task of Step 5, a plan is made for how the resource system that developed the health promotion intervention will be linked to the systems that will adopt and implement the program.

### Linkage Systems

To ensure access to the planning process for program implementers, and to facilitate the development of user-friendly programs, the linkage system should provide a means to exchange information and ideas between planners and

implementers, to ensure access to the planning process for program implementers, and to facilitate the development of user-friendly programs (Ammerman et al., 2002; Havelock, 1971; Johnson, Hays, Center, & Daley, 2004; Kocken, 2001; Kolbe & Iverson, 1981; Orlandi, 1986; Orlandi, Landers, Weston, & Haley, 1990; Robinson et al., 2005). The linkage system serves a dual purpose: to enable collaboratively developed user-relevant health education programs, and to accomplish program adoption and implementation (Durlak & DuPre, 2008). Health promoters should establish the linkage system at the beginning of program planning because it aids the program planners at each stage of the Intervention Mapping process and aids the user system in expressing needs, expectations, and limitations for the health education program. Glasgow, Marcus, Bull, and Wilson (2004b) suggest that the developing organization increase the potential diffusion of a program by forming a partnership with an organization that has a ready-made network for implementation. They give the example of the Cancer Information Service, a network of health education offices funded by the National Cancer Institute at cancer centers that are well positioned to develop programs in partnership and then implement them broadly.

The resource system is the agency or organization supporting and developing the health education program. The resource system could be a university group, a community group, a governmental office, a hospital department, an educational agency, a service group, or a coalition of groups. The resource system encompasses the personnel, funding, materials, and services available to support the development of the health education program. The user system includes the individuals or groups that will implement the health education program and might be located in schools, worksites, hospitals, clinics, service agencies, mass media outlets, neighborhoods, or communities. The linkage system consists of representatives from both the resource system and the user system with the addition of any change agents who collaborate or who are in positions that can influence the changes necessary to support the adoption, implementation, and continuation of the health education program. Examples of activities facilitating linkage systems are: advisory groups, training workshops, and consultation. Goodman and colleagues have described a linkage system for translating the findings of research and demonstration programs for cardiovascular disease risk reduction supported by federal public health agencies through the linkage system of state health agencies to communities (Goodman, Steckler, Hoover, & Schwartz, 1993b). The researchers listed technical assistance, quality assurance, training, funding, and on-site coordination as activities that bring together the state health agencies and community program implementers.

For example, a linkage system was created for the Dutch AIDS prevention program for vocational schools (Schaalma, Kok, Poelman, & Reinders, 1994). To

anticipate problems with future adoption and implementation of the program, the program developers formed a linkage board to bridge the gap between the research and development team and the school system. This board was composed of representatives from the research and development team, the school advisory services, the organizations that provide sex and AIDS education to secondary schools, and an association of biology teachers. The role of the board was to provide feedback on the program's performance and change objectives and to give advice on implementation issues. The linkage board gave careful consideration to the secondary school context for the program and to the teachers who would implement the program.

In Minnesota, the American Cancer Society (ACS), Midwest Division served as the linkage system to promote the use of the program to increase breast mammography called Friend to Friend (Slater, Finnegan, & Madigan, 2005). In this case, the University of Minnesota developed the program together with the ACS with the intent that the ACS would serve as the lead agency for dissemination of the program. Three important factors suggested by Diffusion of Innovations Theory (Rogers, 1995) were applied to establish the ACS as a linkage system: (1) selection of an organization with mission, goals, structure, resources, and compatibility with the innovative program; (2) negotiation of an early partnership that involved the ACS in the development phase; and (3) program design in a form that permits the ACS to act as a change agent and modify the program to fit a variety of settings while maintaining core components (Slater et al., 2005).

The linkage system can be organized with varying degrees of formality. In the system's simplest form, health promoters can invite potential implementers of the program to be members of the program-planning group and to participate fully in each step of the Intervention Mapping process. This simple form can be extended by having the user system select members to represent it and by having these representatives report and obtain feedback on the progress of program development. The size or complexity of the project, as well as the goal for sustaining the program, will influence ways of creating and structuring the linkage system. A program that will depend on the hospitality and resources of many agencies should have these community partners present throughout its development in order to foster as much commitment and ownership as possible as well as to foresee barriers and facilitators to implementation.

For a very large project, either in program scope or the number of organizations involved, the linkage system may need to be more formal, and health promoters may need to create a new entity to carry out the linkage function. The structure of a linkage system and the makeup of individuals participating will be unique to each program and situation. An important consideration in

selecting individuals to participate in the linkage system is to ensure representation of different views and receptivity toward the innovative program. Sometimes program planners rely entirely on volunteers who are already committed to the implementation of a new program. If individuals who are reluctant or opposed to using the program are excluded from the planning process, the program may fail to be adopted and implemented—because the planning process has not taken into consideration their divergent views. A mixed representation of potential decision makers for adoption and institutionalization, in addition to those who will implement the program, will ensure that program developers will have a larger organizational perspective. The following examples from two health promotion projects illustrate this more formal approach.

The Partners in School Asthma Program (see Chapter Twelve on the book's instructor Website) is a research and demonstration project to develop and evaluate a multicomponent school-based program to improve the management of childhood asthma (Bartholomew et al., 2000b, 2000c). To help develop the interventions and achieve program adoption and implementation, health promoters created a linkage system with two components. The first was an advisory committee that included the director of school health services, a school nurse, an elementary school principal, the director of risk management, the director of building maintenance and services, and a parent of a child with asthma. This group's primary role was to engage in planning to develop and carry out interventions to ensure program adoption and implementation. The second component consisted of a small group of selected pilot schools to serve as sources of information on the needs, expectations, and limitations of program implementers and to help pretest intervention components. This group's major role was to ensure that the health promotion program was compatible with program implementers and was a good fit for the schools' structure and context. Both of these formal groups functioned as partners in the program-planning process.

Another example of a linkage system is from a project designed to promote the diffusion of an effective program to prevent tobacco use, Smart Choices (Brink et al., 1995; Parcel, 1995; Parcel et al., 1995). The project goal was to influence as many school districts as possible within two educational service regions of the state of Texas to adopt and implement a program to prevent adolescent smoking (Parcel et al., 1989a). The linkage system used for this project also had two components. In the first component, one pilot school served as a model for program adoption and implementation and then shared its experiences with other school districts through video and print communications. The second component of the linkage system comprised the regions' two educational service centers. Each center employed a health educator responsible for working with

schools to help them identify and adopt health education programs. These health educators served as links between the research group and the school districts. They enabled the planners to have more direct contact with potential adopters and implementers, which allowed them to gain a better understanding of how to design the diffusion interventions. The two components also helped implement the diffusion intervention.

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## Program Use Outcomes and Performance Objectives for Adoption, Implementation, and Sustainability

The third task in Step 5 of Intervention Mapping is to state program use outcomes and specify performance objectives for adoption, implementation, and sustainability.

The point of this task is to determine who has to do what for the program to be used across the phases of program use. Over several decades, the work of Rogers (1983a, 1995, 2003) and others has laid the groundwork for how to get programs adopted, implemented, and continued over time. Often this entire process is referred to as diffusion and focuses on program adoption and initial use (see Chapters Two and Three for a discussion of Diffusion of Innovations Theory). However, since the 1980s, researchers have given increasing attention to the processes involved with both program implementation (Dariotis et al., 2008; Durlak & DuPre, 2008; Fixsen, Naoom, Blase, Friedman, & Wallace, 2005; May et al., 2007; Mihalic, Fagan, & Argamaso, 2008; Monahan & Scheirer, 1988; Pentz, 2004; Roberts-Gray, Solomon, Gottlieb, & Kelsey, 1985; Scheirer, 1981, 1990, 1994), and program continuation (Goodman et al., 1993a; Goodman & Steckler, 1989; Goodman, Steckler, & Kegler, 1997; Johnson et al., 2004; Scheirer, Shediak, & Cassady, 1995; Shediak-Rizkallah & Bone, 1998).

Diffusion is a staged process of moving from awareness of a need or an innovation, through decisions to adopt the innovation, to initial use and program continuation. Diffusion Theory conceptualizes the first stage in this process as innovation development; followed by dissemination, adoption, implementation, maintenance, sustainability, and institutionalization (Oldenburg & Glanz, 2008; Oldenburg & Parcel, 2002; Paulussen, Kok, Schaalma, & Parcel, 1995; Rogers, 2003). Within the context of Intervention Mapping, innovation development is the first four steps of the Intervention Mapping planning process, and Step 5 addresses the remaining stages of diffusion. Dissemination is the planned efforts to make a program more available for use and is addressed in Step 5 of Intervention Mapping as part of the intervention planning to achieve program use outcomes.

Program use outcomes cover the final stages of diffusion and can be grouped into three stages:

1. *Adoption* is a decision to use a program, depending on knowledge of an innovation, awareness of an unmet need, and the decision that a certain innovation may meet the perceived need and will be given a trial (adoption can depend on active dissemination of a program)
2. *Implementation* is the use of the program to a fair trial point.
3. *Sustainability* is the maintenance and institutionalization of a program or its outcomes.

The program planner will need to state program use outcomes and write performance objectives for each of these phases. Program use outcomes are similar in concept to the program outcomes stated in Step 2. Instead of stating behavioral outcomes and environmental outcomes, the planners state the expected outcomes for interventions to achieve program adoption, implementation, and sustainability. Examples for each are given in the following section.

## Adoption

An innovation is an idea, practice, or product that is new to the adopter. The adopter may be an individual or an organization. New behaviors, such as being physically active, stopping smoking, and using contraceptives, are innovations for individuals; environmental changes in communities or organizations are also innovations (Dearing, 2008; Fleuren, Wiefferink, & Paulussen, 2004; Wejnert, 2002). The program that health promoters plan with Intervention Mapping Steps 1 to 4, developed to promote behavior and environmental change, can also be thought of as an innovation. The program will be new and will require changes in what individuals and environmental agents do and how they do it. It will also require changes for implementers to deliver it. This, however, does not happen automatically. In order for the health promotion program to be put into use, a person or a group of people must first decide to adopt the program.

Program adoption by organizations is a more complex event than is adoption by individuals and it often involves key agents. Mendel (2008) presents a framework that depicts multiple levels of health care and community settings that could influence program adoption, implementation, and maintenance. The authors describe multiple stakeholders in health care and community settings, including regulatory agencies, insurers, purchasers, and providers (Mendel et al., 2008). These should be considered when planning for adoption. The planning group should then ask themselves, “What do representatives of these agencies

have to do in order to adopt this program?” For example, a teacher team leader may hear about a program at a professional meeting and discuss it with other teachers and staff. The team leader may then request the curriculum coordinator or superintendent (depending on the school district’s size and personnel structure) to adopt the program. In a clinic setting, a clinic director may need to seek the approval of board members or garner support from clinic managers before adopting a program.

## Implementation

Program adoption does not guarantee program implementation. Program implementers are often asked to implement a program without having a clear understanding of what program implementation means, and especially of what a well-implemented program should be (Scheirer, 1981, 1994). Often, there is no description of the tasks that must be completed to implement a program nor sufficient training or preparation to enable them to do so. This failure of programs to include implementation plans greatly diminishes the probability that programs will be implemented as planned—either with high fidelity or guided adaptation to ensure delivery of the program’s essential elements to produce change (Lee, Altschul, & Mowbray, 2008). Program developers and evaluators are often concerned about three dimensions of implementation: fidelity, completeness, and dose (Baranowski & Stables, 2000; Linnan & Steckler, 2002; Rossi, Lipsey, & Freeman, 2004; Scheirer, 1981). *Fidelity* is the degree to which the program is implemented with its methods and strategies intact; *completeness* indicates the proportion of program activities and components that are delivered; and *dose* indicates the number of units or amount of the program that participants receive. For example, in the Cystic Fibrosis Family Education Program CF FEP, some cystic fibrosis centers taught all of the program modules (good completeness), but neglected to perform goal setting with the families (inadequate fidelity) (Bartholomew, Czyzewski, Swank, McCormick, & Parcel, 2000a).

Carroll et al. (2007) presents a conceptual framework for implementation fidelity that includes elements of adherence, such as content, coverage, frequency, and duration, and also considers moderators of implementation fidelity, including intervention complexity, facilitation strategies, quality of delivery, and participant responsiveness. The ability to identify the “essential components” of a program is also a critical factor that determines the implementation fidelity (Carroll, Patterson, Wood, Booth, Rick, & Balain, 2007). While debate continues about the importance of fidelity versus the necessity to adapt programs to fit community needs, authors agree that maintaining core elements of programs is essential when adaptation does occur (Elliott & Mihalic, 2004; Lee et al., 2008). To do

this, however, planners must have developed a clear implementation plan that describes core components and details the steps in delivering the program.

An important process in developing performance objectives for implementation is to answer these questions: What exactly is the program? What would constitute a level of fidelity and a level of completeness consistent with program effectiveness? Another important issue to consider during planning is to find ways to build in implementation options to make the program more flexible for easy adaptation. This can improve fit in different settings while maintaining the effective elements or “active ingredients” of the program. Program developers must know what constitutes a well-implemented program; however, some authors argue that program implementation is most successful when it allows for mutual adaptation (Hall & Loucks, 1978; MacDonald & Green, 2001; Ringwalt, Vincus, Ennett, Johnson, & Rohrbach, 2004; Weiner, Lewis, & Linnan, 2009). Both the innovation and the organization must adapt to each other’s objectives, processes, and structures. Mutual adaptation is so ubiquitous that Rogers (1995) described it as a stage in organizational innovation, calling it *reinvention*. Actually, quite a bit of reinvention from insignificant changes to major revision usually takes place. From the perspective of the adopting institution, reinvention is a positive process that fosters program ownership and commitment. In the diffusion of the CF FEP, we encouraged cystic fibrosis centers to reinvent the program to fit their usual ways of practicing (Bartholomew et al., 2000a). From an intervention perspective, it may be best to anticipate this process and facilitate it within the boundaries of program effectiveness. The resulting ownership is important not just for program implementation but for sustainability, which we discuss next in this chapter.

For the initial implementation and testing of a new health promotion program, emphasis is usually placed on achieving a high level of fidelity and completeness. This is done to ensure that the intervention methods and practical applications are applied as intended. This involves identifying the core or essential elements that are judged necessary to achieve intervention effects. Performance objectives for program implementers should address how to put the core elements into place.

After the program is evaluated for program effectiveness and process indicators, the program developers may need to consider potential program adaptation in preparation for disseminating the program beyond the initial use and testing. For dissemination of an evaluated program, performance objectives for implementation may also include options for how to adapt the program to fit a new or different situation. This could be a different location (neighborhood, community, state), organization, or delivery system (such as mediated or interpersonal). Very strict implementation instructions that are difficult to comply with will likely lead

to low fidelity and completeness. A well-planned program should clearly indicate which elements are considered essential elements and which are optional. High fidelity and completeness of the essential elements is usually desirable to ensure the effectiveness of the disseminated program (Domitrovich & Greenberg, 2000; Dusenbury, Brannigan, Falco, & Hansen, 2003).

Other authors argue that it is simply too difficult to identify the core components of existing programs and that any attempt to do so for the purposes of adaptation could result in program changes that could compromise effectiveness (Elliott & Mihalic, 2004). If, however, a program has been developed using Intervention Mapping, identification of the core elements or active ingredients is more straightforward. The logic model of change specifies how theoretical methods and practical program elements are supposed to influence the change objectives. If the change objectives stay the same in a new setting, then the program methods and applications should be considered core elements and retained even when adapting other program characteristics (graphics, language, delivery approach). Nevertheless, until a program is evaluated in such a way that tests the effectiveness of different elements, we cannot be certain which elements can be considered “core elements.” Because of this, with any adaptation effort we recommend carrying out an evaluation. Chapter Ten presents Intervention Mapping as a framework for planned adaptation to implement evidence-based programs in new populations or settings.

## Sustainability

A final stage of program use is maintenance and then institutionalization, the process of incorporating a program into organizational routines so that it survives beyond the presence of the original program funding, adopters, or program champion (Goodman et al., 1997; Goodman & Steckler, 1989; Kegler & McLeroy, 2003). However, a broader construct, sustainability, can stimulate the health promoter to choose among possible program continuation goals. Shediac-Rizkallah and Bone (1998) theorize that sustainability includes three possible goals: maintenance of health benefits from a program, institutionalization of a program within an organization’s routines, or capacity building in the recipient community. To address all three aspects of sustainability, a program would not only be continued but would continue to produce health benefits, and the community or organization would develop improved capacity to address their health needs and even expand on or improve health promotion programs.

Rogers (1983a) describes institutionalization as routinization, or the progression of an innovation to an indistinguishable part of the individual or organizational host’s practices. However, Goodman and Steckler (1989) pointed

out that health education and promotion interventions can be fragile and expendable innovations—unless health promoters plan for and nurture institutionalization. These authors built on the work of Yin (1979) to define the dimensions of institutionalization as the extensiveness of a program's integration into the subsystems of a host organization and intensiveness, or the depth of program integration into each organization subsystem. Yin identified three degrees of intensiveness:

1. *Passages*: annual anniversaries of the continuation of the intervention
2. *Routines*: operating structures and functions into which program protocols are embedded
3. *Niche saturation*: complete integration into a subsystem's structures and functions

Once a program has achieved a certain level of health effects, the program continuation goal may be to continue the program's effects rather than continue to implement the program itself. Some programs are needed in their original form to continue producing their effects (Hoelscher et al., 2004). Shediak-Rizkallah and Bone (1998) give an example of a measles disease-prevention program that was effective in controlling measles outbreaks only while it was functioning. Two years later the rates were at the preprogram level, and other types of programs were needed to maintain the effects of the initial program. In the World Health Organization, efforts to eradicate smallpox (Fenner, Henderson, Arita, Jezek, & Ladnyi, 1988), an initial program of mass vaccination was followed by one of surveillance and aggressive follow-up of suspected cases. Both these programs were in service of the same health objective and represent program sustainability. As another example, Lichtenstein, Thompson, Nettekoven, and Corbett (1996) describe efforts to continue tobacco control activities, rather than the initial program, after the COMMIT trial.

In a systematic assessment of the institutionalization of an evidence-based asthma control program in three school districts, Wilson and Kurz (2008) describe a breakdown in the process of dissemination to institutionalization. They found problems in two main areas: (1) low levels of program evaluation and (2) organizational structure that failed to change in ways to support program institutionalization. The authors propose a continuous quality improvement (CQI) approach to increase program institutionalization by addressing four principles of CQI. These include: (1) customer needs and expectations are met, (2) quality improvements cause process changes, (3) facts (data) are required to create modifications in the process, and (4) continuous improvement is a requisite of quality. The authors argue, for example, that it is not enough to

measure whether or not institutionalization is occurring; rather, it is necessary to measure the organizational processes in various subsystems that influence institutionalization. Further, without continuous evidence of program benefit, the program loses relevance even if it was considered “evidence-based” at the time of adoption and initial implementation. Lack of evaluation may also affect the organization’s ability to secure funding to continue the program. Considering these issues may help planners identify key agents who will contribute to program sustainability and can provide some insight during the selection of performance objectives for sustainability (described in the section on Sustainability Outcomes and Performance Objectives).

Sometimes the best way to diffuse and sustain a program is to go beyond organizational boundaries. Programs intended to guard health effects may be adopted and implemented by organizations but may need multiple community agencies to sustain them. Bracht and colleagues (1994) describe how community agencies made efforts to sustain components of the Minnesota Heart Health Program, a program begun by university-based researchers. Agencies and their networks may need training, technical assistance, and developmental support to expand their capacity to house new programs. A review of the gap between prevention research and practice described the importance of organizational capacity needed for both implementation and sustainability (Wandersman et al., 2008). Flaspohler and colleagues developed a taxonomy of capacity and described a community centered perspective that emphasizes general organizational infrastructure and capacity as well as a “research to practice” perspective that emphasizes innovation specific capacity, including the knowledge, motivation, and skills necessary to implement and maintain the specific intervention (2008). In diffusion interventions the specific areas of capacity enhancement that may be needed to continue programs are: skills, structures, and functions to encourage participation, leadership, group process, conflict resolution, leverage of resources, and network maintenance (Flaspohler et al., 2008).

### Stating Program Use Outcomes and Performance Objectives

Looking at the phases of program use, the planning group can think about the potential decision makers and implementers and write performance objectives. The performance objectives for Step 5 are similar to those in Step 2 for health-related behavior and environmental outcomes—except that the outcomes in Step 5 are program adoption, implementation, and sustainability. The performance objectives make clear who has to do what for the program to be adopted, implemented, and continued with acceptable fidelity and completeness.

In Step 2, we wrote performance objectives for the behavioral outcomes (that later appeared in the behavioral matrices) and performance objectives for environmental outcomes (that appeared in the environmental matrices). In Step 5, we only have one set of matrices for each phase of dissemination (adoption, implementation, and sustainability). Environmental matrices are not typically used in Step 5. Potential environmental influences of program adoption, implementation, and sustainability are addressed as performance objectives within each of the three matrices stating *who* will do *what* to address an environmental influence. For example, for implementation of a new health promotion program to prevent teen pregnancy and sexually transmitted infections it may be necessary for the school board of a school district to allocate funds to provide teacher training. To address the influence of the school board for program implementation, the performance objective can be stated as: “School board approves funds to pay teachers for extra work days to participate in training for sex education program.” Thus, this performance objective becomes one of the necessary objectives to achieve program implementation.

**Adoption Outcomes and Performance Objectives.** The adoption of a health education program by an organization or a practitioner means that someone decides to use the program. That someone could be an individual, such as a practitioner, or an administrator, making an independent decision; or it could be a group, such as a committee or governing board, making a collective decision. Program adoption within an organization can also be decided sequentially, or concurrently at multiple levels of responsibility. For example, the school board and the superintendent may decide to adopt an innovative health promotion program for a district; a principal may make the decision for a school; and a teacher may decide for a classroom. Knowing ahead of time who will make the adoption decision and how will greatly assist the program planners in specifying the performance objectives for adoption.

Program adoption outcomes can be specified in this way: [someone] adopts the [innovative program] as indicated by [the evidence or document to indicate adoption]. For example: the curriculum committee of the Star Independent School District decides to adopt the Smart Choices smoking prevention program as indicated by the superintendent signing the program adoption form. The answer to the following question specifies the performance objectives for adoption: What do the potential program adopters need to do to constitute adoption of the health education program?

The example just given can be used to state the general question more specifically: What does the curriculum committee of the Star Independent School District need to do to perform an adoption of the Smart Choices

program? Answers to this question furnish possible performance objectives. For example, the curriculum committee will do the following:

- Review the Smart Choices program materials
- Note the program's objectives, methods, and relative advantages
- Obtain parent, administrator, and teacher reaction to the program
- Obtain information on the experiences of other school districts using the Smart Choices program
- Identify barriers for implementation as perceived by potential program implementers
- Seek information and consultation from the linkage system or resource system for addressing barriers and concerns
- Gain support for program adoption from teachers (implementers) and key administrators (principals, director of curriculum, and superintendent)
- Prepare a statement of recommendation for adoption of the Smart Choices program
- Complete the adoption form for the Smart Choices program, have it signed by the superintendent, and return it to the resource system for processing

Performance objectives for program adoption may also focus on contextual factors necessary for program adoption. For example, in a study of the dissemination of physical activity programs by state health departments, four contextual factors were associated with adoption of physical activity interventions by communities: available funding for physical activity programs, physical activity being a high priority with adequate staffing at the state level, and a supportive legislature at the policy level (Brownson et al., 2007a). If program planners decide that these factors are critical and can be addressed as part of their planning for program use, they should state performance objectives to address the factors. For example:

- The state legislature will pass legislation that will provide funding for physical activity programs.
- The director of the state health department will allocate staff to support communities in implementing physical activity programs
- The executive committee for the health department will make physical activity programs a high priority.

**Implementation Outcomes and Performance Objectives.** Implementation of a health education program can also be stated in behavioral outcome terms. However, to a greater extent than for adoption, implementation often includes multiple tasks performed by a variety of individual roles. For the CATCH

program, for example, implementation is performed by classroom academic teachers, physical education teachers, food service staff, and administrators (Perry et al., 1997). Parallel to the statement on adoption outcomes, implementation outcomes can be stated in this way: the [organization or individual] will implement [innovative program] including use of [program components]. For example: The Star Independent School District will implement the Smart Choices tobacco prevention program including use of the classroom curriculum and the tobacco-free policy guidelines. The statement must answer the question: What do the program implementers need to do to implement the essential program components with acceptable completeness, fidelity and adaptation?

To determine the performance objectives, the planners of Smart Choices asked what teachers and principals need to do to implement the program and stated the following:

- Health teachers will participate in training to prepare for implementing the Smart Choices curriculum.
- Health teachers will schedule and incorporate the Smart Choices curriculum into the lesson plans for all health classes for each semester.
- Health teachers will teach all six lessons in the Smart Choices curriculum using the teaching methods specified in the lesson plans.
- The principal at each middle school will form a policy committee that includes teacher, student, staff, and parent representation to establish policies for tobacco control at the school.
- The policy committee will follow the Smart Choices Tobacco-Free Policy Guidelines to review current tobacco control policies and will revise or form new policies to establish a tobacco-free school.

***Sustainability Outcomes and Performance Objectives.*** Before specifying performance objectives for sustaining a program, the planner will decide on the type of outcome to be achieved: maintenance of the program, institutionalization, continuation of health effects, or some combination of these. The example given here is for institutionalization. The Star Independent School District will incorporate the Smart Choices program into school organizational routines. Institutionalization performance objectives answer the question: What do the organizational decision makers need to do to incorporate the program into the organization's routines for the long term? Below are the performance objectives for institutionalization of the Smart Choices program within a school district:

- District coordinators will include training of new health teachers to implement the Smart Choices curriculum in their yearly plans.

- Book and curriculum warehouse managers will order and maintain inventory of the curriculum.
- Principals will include implementation of the Smart Choices curriculum in teacher job descriptions and evaluations.
- The principal at each middle school will include the Smart Choices program as a line item in the budget.
- The school district curriculum committee will write Smart Choices into the district curriculum guide for middle school science.
- The policy committee will report the results of the program to the parent-teacher association each year.

If multiple organizations in the community are interested in the continuation of the program after the initial cycle of funding, the objectives should be written to include what those organization decision makers must do to continue the program in their organizations. For example, at the conclusion of the Stanford Five-City project, the project group first attempted institutionalization through a nonprofit community health promotion center. When this approach encountered barriers related to continued funding and program development, the focus shifted to capacity building among health educators employed by local organizations, with leadership provided by the local health department (Jackson et al., 1994).

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## Determinants of Program Use

The fourth task in this step is to specify determinants of program adoption, implementation, and sustainability.

As with the performance objectives of health-related behaviors and environmental conditions, the performance objectives for program use will have a set of determinants, that is, factors that are likely to influence their performance. These determinants are associated with the individuals responsible for adoption, implementation, and continuation of the program. Examples of determinants are knowledge of the program components, perceived benefits, self-efficacy and skills for implementation, and values supportive of program goals. The accomplishment of performance objectives for program use may also be influenced by social or structural factors that might serve as barriers or facilitators. Examples are time, resources, social support, and reinforcement. Some models have identified other factors such as leadership and vision, absorptive capacity and receptive contexts as system antecedents for innovation (Greenhalgh et al., 2004).

These factors are part of the environment but rather than dealing with them as environmental conditions as we did in Step 2 of Intervention Mapping, in Step 5, environmental influences necessary for program adoption, implementation, and continuation are identified as performance objectives that state *who* will need to do *what* to make the changes or create the conditions necessary to accomplish the program use outcomes. These influences can be anticipated when stating performance objects in the previous task or they can be added to the performance objectives when identified as part of the task of selecting determinants of program use performance objectives.

The processes for selecting determinants are the same as those recommended for selecting determinants of health-related behavior and environmental conditions. The team should begin by brainstorming a list of factors that will facilitate or serve as barriers to accomplishing the performance objectives for adoption, implementation, and sustainability. To refine or add to this list, the group should review the literature and the information available from potential program adopters and implementers. A review of the literature begins with studies that report findings of determinants of use of similar programs in similar settings. Several authors have identified determinants of adoption and implementation behaviors (Fixsen et al., 2005; Nanney et al., 2007; Owen et al., 2006). These include perceptions of the intervention itself (as described by Rogers) such as perceived relative advantage, compatibility, risk, and low complexity (Rogers, 2003). Other factors may include adopter or implementer needs, motivations, values and goals, skills, and social support (Greenhalgh et al., 2004; Wejnert, 2002). If there is not a large body of literature on comparable program use in health education and health promotion programs, the team may need to search in other fields (Oldenburg, Sallis, French, & Owen, 1999).

Next, the team can review the literature on theories that have been used to explain the adoption, implementation, and continuation of innovations and the literature from general theories that includes some of the identified determinants. For example, if the preceding review of the literature identifies relative advantage as a possible determinant of the adoption of an innovation, it would be useful to go to the literature on Diffusion of Innovations Theory (DIT), for which relative advantage is a central construct. A review of DIT may suggest other constructs that the team might consider as important determinants of the program adoption and implementation. However, a review of theory should not be limited to theories of diffusion. For example, in the Smart Choices diffusion project, the planning team used Social Cognitive Theory (SCT) (Bandura, 1986) to hypothesize determinants of adoption and implementation such as outcome expectations, expectancies, reinforcement for adoption, and behavioral capability and self-efficacy for implementation (Parcel et al., 1989a, 1989b).

Best and colleagues (2003) suggest the use of systems theory to conceptualize determinants and methods to enhance health promotion program adoption and implementation. Greenhalgh (2004) presents a conceptual model for considering the determinants of diffusion.

Rogers (1995, 2003) describes three types of knowledge of an innovation that can be important to a decision to adopt; awareness or knowing that the innovation exists, procedural knowledge about how to use the innovation, and principles knowledge or the underlying mechanism of the innovation or how it works. SCT provides explanations of the psychological mechanisms by which adoption decisions are made (Bandura, 1986). Before potential program adopters can adopt an innovation, they must be aware of the innovation, hold positive outcome expectations and expectancies for it, and have sufficient self-efficacy and behavioral capability for both adoption and implementation. For example, positive outcome expectations by the potential adopters of self-management programs might include beliefs that the program will lead to better self-care and increased health and quality-of-life outcomes among patients and to increased job satisfaction and career enhancement for health care providers. Negative outcome expectations could include beliefs that the program will disrupt patient-provider relationships, lead to inappropriate or detrimental self-care based on faulty self-management decisions, and result in a decline in health status. Expectancies are how much each of the outcomes is valued. Intervention messages would seek to increase positive outcome expectations and values and to decrease negative ones. Self-efficacy, or confidence in implementing the innovation, is also important for adoption. However, it increases in importance as a person or organization tries to implement the new program.

Another important set of factors often related to the decision to adopt a program are the characteristics of the innovation (Berwick, 2003; Mihalic et al., 2008; Oldenburg et al., 1997; Rogers, 1995). These characteristics are the potential adopters' perceptions of what the program is like. They include the relative advantage of the innovation compared to what is being used, compatibility with the intended implementers' current practice, complexity, observability of the results, impact on social relations, reversibility or ease of discontinuation, communicability, required time, risk and uncertainty, required commitment, and ability to be modified. In a study to determine the factors influencing the adoption of the Canadian Heart Health Kit, relative advantage and the observability of the program benefits were associated with intentions to adopt the program (Scott, Plotnikoff, Karunamuni, Bize, & Rodgers, 2008). The planning team must consider characteristics of an innovation as either a facilitator of or a barrier to adoption, both in program design and in the creation of an intervention to

influence program adoption. During the development phase, the planner should make decisions about program elements while considering such characteristics of diffusible innovations as required time, complexity, compatibility, and ability to be modified. During dissemination planning, the planner may consider characteristics such as communicability, relative advantage, and required commitment to help identify both performance objectives and determinants. An adoption performance objective related to these characteristics may be: the school principal describes the compatibility of the program with school goals to the parent teacher organization.

As attention shifts from adoption to the implementation of a health promotion program, the determinants also shift to an emphasis on behavioral capability, skills, self-efficacy, and reinforcement. An important challenge in planning interventions to promote program implementation is to correctly estimate the level of skills and related self-efficacy. For example, the CF FEP required many different types of skills for putting this complex program into clinical practice. For the clinic coordinators who had to direct its use, skills were an important determinant of implementation, and the diffusion intervention emphasized skill building. By comparison, necessary skills were sometimes underestimated in the program diffusion in spite of careful planning. The planners seriously underestimated the training intensity required to develop skills in communication domains such as mutual goal setting. Skill requirements are also often neglected or taken for granted in community interventions based on activities such as coalitions. Some researchers have suggested that coalition members receive training on how to participate in an effective coalition as a part of the implementation of a coalition-based health promotion program (Holmes, Neville, Donovan, & MacDonald, 2001).

An extensive review of 483 studies included in five meta-analyses on the effect of implementation on program outcomes and factors influencing implementation concluded that the level of implementation achieved is important to achieving program outcomes (Durlak & DuPre, 2008). The study identified 23 factors affecting program implementation organized into five categories: innovation characteristics, provider characteristics, community factors, organizational capacity, and training and technical assistance. In comparing their review to three other reviews, the authors noted agreement on 11 factors that affect implementation: funding, a positive work climate, shared decision making, co-ordination with other agencies, formulation of tasks, leadership, program champions, administrative support, providers' skills, training, and technical assistance (Durlak & DuPre, 2008; Fixsen et al., 2005; Greenhalgh, Robert, Macfarlane, Bate, & Kyriakidou, 2005; Stith et al., 2006). From the Intervention Mapping perspective, these

factors are a mixture of program characteristics, performance objectives for program implementation, determinants of implementation performance objectives, and interventions for program implementation.

Application of the Theory of Planned Behavior (TPB) (Ajzen, 1991) to the identification of determinants for program adoption and implementation is illustrated in Figure 13.1 in case study Chapter Thirteen (on the book's instructor Website), which describes a Dutch AIDS-prevention program in schools. Paulussen and colleagues (1994, 1995) hypothesized both endogenous and background variables to influence teacher adoption of an AIDS curriculum. The background variables are thought to influence adoption and implementation through their effects on the TPB variables in the top half of Figure 13.1. Instrumentality refers to the teachers' perceptions of whether the curriculum meets their planning concerns and includes clarity of instructions, anticipated student reactions, time required, and ease of teaching. The authors found that subjective norms, instrumentality, and descriptive norms (perceived colleague behavior) explained a considerable amount of the variability in teachers' adoption of AIDS curricula.

Because program adoption and implementation often involve organizations and community groups making decisions and changing practices to make use of an innovation, the application of organizational change and community development models is critical to identifying performance objectives and determinants of program adoption and implementation (Hogan et al., 2003). The brainstorming and the literature review provide informed, but hypothesized, relationships of determinants to the adoption and implementation performance objectives. If there is a long list of determinants at this stage, the planner may need to test the hypothesized relationships of determinants in order to select the most important determinants to guide intervention development. If the list of determinants is small, the planner may need to collect data from the potential program adopters and implementers to identify additional determinants. In either case, the planner can use both qualitative and quantitative methods.

Qualitative methods, such as focus groups or interviews, can be helpful in generating new ideas for determinants or in verifying some of the findings from the research literature. Quantitative data collection using questionnaires that measure the determinants and interest or intentions to adopt and implement a program can be especially helpful in judging the strength of the association between determinants and potential adoption and implementation (Mihalic et al., 2008). With both types of data collection, planners can obtain some estimate of the presence or absence of the determinant in the user system.

In the Smart Choices diffusion project, for example, the program developers had assumed that teachers and school administrators would need to be convinced

that it is important for the schools to conduct programs to prevent student tobacco use. Therefore, to influence teachers to place a higher value on the schools' conducting smoking prevention programs, planners used modeling and messages in the adoption intervention. However, the baseline data collected for program evaluation showed that the teachers and administrators already placed high value on smoking prevention and, therefore, the determinant could be reinforced rather than introduced in the intervention (Parcel et al., 1989a, 1989b).

Eventually, the planning team must refine the list of determinants. A long list of determinants is not practical for program development. Planners should rate each determinant in terms of importance (that is, strength of association with program adoption and implementation) and changeability (that is, how likely it is that a dissemination intervention influences a change in the determinant). The planners should prioritize determinants that have both high importance and high changeability. However, planners may want to retain some determinants with high importance and low changeability because the determinant is likely to be a critical factor in successful program adoption or implementation. For example, the cost of adopting a health promotion program may be a strong determinant, but there may be little that planners can do to lower the cost. Because cost may be a major barrier to adoption, it needs to be addressed in the intervention so that the planner can find ways to compensate (such as find additional funding sources) or demonstrate that the program costs are worth the benefit.

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## Matrices for Promoting Program Use

**Create a matrix of change objectives for program adoption, implementation, and sustainability.**

This task links performance objectives and determinants for adoption, implementation, and sustainability to create change objectives. Basically, the planner is now repeating the task from Step 2, but instead of focusing on behavioral and environmental outcomes, the focus is on outcomes for adoption, implementation, and sustainability of the health promotion program. Planners should create separate matrices for each phase of dissemination (adoption, implementation, and sustainability).

We present a matrix for the diffusion of the CF FEP in Table 8.1. This planning was conducted to effectively disseminate the program to the approximately 120 cystic fibrosis comprehensive care centers in the United States, Canada, and Australia (Bartholomew et al., 2000a). The matrix in Table 8.1 was created, like the matrices developed for planning the intervention, by entering performance objectives on the left side of the matrix and determinants across the top of

**Table 8.1 Cystic Fibrosis Family Education Program (CF FEP) Matrix**

Personal Determinants				
Performance Objectives	Knowledge	Skills and Self-Efficacy	Outcome Expectations	Attitudes
<i>Adoption</i>				
PO.1. Staff members evaluate patient education needs in CF center.	K.1.a. Describe ways to evaluate patient education needs K.1.b. Summarize needs K.1.c. Prioritize needs	SSE.1. Express confidence in performing a needs assessment	OE.1. Expect that by becoming more aware of patient education needs will be able to choose programs to better meet needs	
PO.2. Center directors and staff members decide whether CF FEP will meet needs.	K.2.a. Increase awareness of CF FEP K.2.b. Explain the advantages of the CF FEP to meet patient education needs		OE.2. Expect that using the CF FEP will improve patient health outcomes and quality of life	A.2. Review characteristics of CF FEP and react favorably (relative advantage and so on)
PO.3. Center directors and staff members decide to adopt CF FEP.	K.3. Describe how CF FEP compares to other available programs		OE.3. Expect that using the CF FEP will be accepted by center staff	A.3. Review characteristics of CF FEP and react favorably (relative advantage and so on)
PO.4. Center directors and staff members identify program champion.	K.4. List characteristics of a good program champion			
PO.5. Center directors support and reinforce selection of program champion.	K.5. Explain the role and importance of a program champion for successful adoption and implementation of the program		OE.5. Expect that the right program champion will enhance effective use of the program in the center	A.5. Express favorable comments toward the value and importance of a program champion

**Implementation**

<p>PO.6. Staff members work with families using the CF FEP with completeness and fidelity.</p>	<p>K.6.a. Describe the units of the CF FEP by developmental stage K.6.b. Describe how the CF FEP is supposed to be used</p>	<p>SSE.6.a. Demonstrate working on various models with families depending on staff role SSE.6.b. Express confidence at being able to work with families on the models in a goal-setting and counseling mode</p>	<p>OE.6.a. Expect to be successful in working with families OE.6.b. Expect that when families and children work on the program, they will learn to perform better self-care OE.6.c. Expect that better self-care as a result of the program will result in better health and quality of life</p>	<p>A.6. Describe the added work of doing the program as being "worth it"</p>
<p>PO.7. Program champions work with staff to develop implementation plan.</p>	<p>K.7. Describe components of implementation plan, such as who will teach which modules</p>	<p>SSE.7. Express confidence in being able to organize a plan with staff</p>		
<p>PO.8. Center administrators make documentation forms for patient education available in medical record or special file.</p>	<p>K.8. Review sample form from program and make adaptations to meet needs of the center</p>			<p>A.8. View documentation forms as a useful tool to monitor patient education for self-management</p>
<p>PO.9. Staff members document program use.</p>	<p>K.9. Describe documentation form and where to find it</p>		<p>OE.9. Expect that by documenting progress, team members will be able to reinforce increases in families' self-management</p>	<p>A.9. Judge documentation forms to be useful, not too complex</p>

(Continued)

**Table 8.1 (Continued)**

Personal Determinants				
Performance Objectives	Knowledge	Skills and Self-Efficacy	Outcome Expectations	Attitudes
PO.10. Staff members review patient CF FEP progress in rounds.			OE.10. Expect that discussion of patient education progress during rounds will elevate importance of the self-management process	
<i>Maintenance and Institutionalization</i>				
PO.11. Program champions and supervisors use CF FEP in orientation of new staff.	K.11. Recognize the importance of finding ways to integrate the CF FEP into center routines		OE.11. Describe how integrating the CF FEP into training will contribute to its continued use	
PO.12. Program champions work with supervisors to write CF FEP into care paths or continuous quality improvement plans.	K.12. Recognize the importance of finding ways to integrate the CF FEP into center routines		OE.12. Describe how integrating CF FEP into continuous quality improvement (CCQ) will contribute to its continued use	
PO.13. Program champion and supervisors integrate CF FEP into staff training protocols.	K.13. Outline basic knowledge and skills needed for new staff to implement the CF FEP		OE.13. Training of new staff in use of CF FEP will ensure continuation of effective patient self-management care for CF	

the matrix. Then the program planners assessed each cell to decide whether the determinant was likely to be important to the achievement of the performance objective. Next, the planner wrote change objectives for the appropriate cells. The process for writing change objectives is the same for adoption and implementation matrices as for the health education matrices (see Chapter Five).

Using a quasi-experimental evaluation design, the program was tested in one cystic fibrosis center over a period of two years and was shown to be effective in improving self-management skills and clinical outcomes (Bartholomew et al., 1997). More than 100 multidisciplinary cystic fibrosis centers care for approximately 20,000 cystic fibrosis patients in the United States (Cystic Fibrosis Foundation, 1995). For the program to have a meaningful impact on helping patients and families self-manage cystic fibrosis, the next phase of program development had to address the program's adoption, implementation, and institutionalization in the cystic fibrosis centers. To accomplish the outcomes of program adoption, implementation, and institutionalization, the planning team designed a diffusion intervention to address both personal and external determinants.

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## Methods and Practical Applications for Program Use

The sixth task in Intervention Mapping Step 5 is to select methods and practical applications for program adoption, implementation, and sustainability.

Program use within organizations is complex and requires consideration of a variety of organizational-level factors (Beyer & Trice, 1978; Goodman et al., 1997; Riley et al., 2003). Planning interventions to promote use of a health promotion program should consider the organization's goals, authority structure, roles, rules and regulations, and informal norms and relationships (Rogers, 1983a). The decision to adopt an innovation within an organization can be made by an individual independent of others, collectively by consensus among the members of the organization or a subsystem within it, or by a person or persons with authority in the organization. An intervention to influence an adoption decision must be clearly oriented toward how that decision is being made. Implementation success will depend on the degree of ownership that those required to perform the tasks feel and the degree of support they give. These attributes may depend partly on how the adoption decision is made.

Program champions can exert a powerful influence toward the adoption of new programs in organizations (Riley, 2003). Program champions are likely

to be sophisticated, analytical individuals with strategic linking locations in organizations. They often possess intuitive skills in discovering the goals of the program adopters and implementers, and the interpersonal and negotiating skills to troubleshoot both adoption and implementation (Goodman & Steckler, 1989). A champion can be a force to facilitate adoption of programs and to prevent discontinuation (Monahan & Scheirer, 1988). Compared to their colleagues, program champions typically take more risks, are more innovative, and initiate more attempts to influence others (Howell & Higgins, 1990). Program champions must be credible to their colleagues, and when an innovation is costly or represents a radical new direction for the organization, the champion must be in a powerful organizational role (see discussion on organization theory in Chapter Three). The same core processes used in other Intervention Mapping steps can be applied here. The program planners start with the list of change objectives for determinants and performance objectives and brainstorm methods that they think can influence a change. Next, they review the relevant research and practice literature to confirm, refute, or modify the provisional list of methods. The best approach is for planners to start with the literature on the diffusion of health promotion programs and then review diffusion literature related to other innovations that may have some common elements with the adoption and implementation of health promotion programs.

Planners also need to explore the literature on theories of change particularly related to specific theoretical constructs on the final list of determinants. For example, we may consider self-efficacy an important determinant of program implementation, but it may not be specifically addressed in the literature on diffusion. However, a review of the theoretical literature on self-efficacy would lead to SCT, which discusses methods shown to be effective in changing self-efficacy (Bandura, 1986). Finally, it may be useful and necessary to collect additional data from potential adopters and program implementers to determine the acceptability of methods identified provisionally and their appropriateness for use in an intervention.

The planning team then can use the revised list of methods to design practical applications to influence program adoption and implementation. As we discussed in Chapter Six, the selection of methods and practical applications may be a back-and-forth process. In reviewing the adoption and implementation objectives, planners may find that ideas for application occur to them before their ideas for methods. They can then assess the practical application and link it to a theoretical method. For example, planners are brainstorming methods and practical applications to influence families to adopt a program to find and correct household hazards for childhood injuries. One of the applications they think would be effective is to communicate through mass media the stories of

parents who have successfully adopted the program and discovered hazards that might have been very harmful to their children. This practical application of role-model stories (Pulley, McAlister, Kay, & O'Reilly, 1996; Ramirez et al., 1995; Suarez, Nichols, Pulley, Brady, & McAlister, 1993) can be linked to the theoretical method of modeling from SCT (Bandura, 1986). The planners can then review the theoretical principles that guide the use of modeling in order to influence possible determinants of program adoption such as perceived norms, outcome expectations, and self-efficacy. They can then design interventions that take advantage of what others have learned about the method of modeling and how it can be applied to their idea for using role-model stories as a practical application.

The methods discussed in Chapters Two, Three, and Six can be applied to interventions to accomplish program adoption, implementation, and continuation. Planners can address personal determinants such as knowledge of program compatibility and relative advantage, attitudes toward the program, outcome expectations for the program, self-efficacy, and behavioral capability for doing the program activities with methods based in social psychology, such as persuasive communication, modeling, skills training, incentives, reinforcement, and social comparison (Bandura, 1986; McGuire, 1985). Implementation almost always involves organizational change. Organizational theory can be used to understand the determinants of effective implementation and to select methods for organizational change that will support program implementation (Rutten, Roger, Abu-Omar, & Frahsa, 2009; Weiner et al., 2009). Methods to address performance objectives for contextual factors, such as social support, program advocacy, resources, organizational structures and practices, and policies can also be found in Chapters Two and Three. Table 8.2 presents methods and practical applications for the CF Family Education Program; Table 8.3 presents methods and applications for the Smart Choices diffusion program.

The importance of approaching health promotion and prevention program adoption, implementation, and sustainability with a planned, systematic effort based on theoretical models and tested applications is gaining recognition and increasing documentation in the research and practice literature (Dearing, 2008; Durlak & DuPre, 2008; Rohrbach, Grana, Sussman, & Valente, 2006). Significant literature is surfacing that reports on the methods and practical applications used to influence and promote the use of health promotion programs. Many of these studies report on strategies for program diffusion, which typically include a combination of theoretical methods and practical applications. For example, one systematic review reported on studies that evaluated diffusion and dissemination of cancer control interventions and identified 15 different categories of strategies used to influence the adoption and implementation of cancer control interventions

**Table 8.2 Cystic Fibrosis Family Education Program (CF FEP) Diffusion Intervention Plan**

<b>Diffusion Stage</b>	<b>Change Objectives (see Table 8.1)</b>	<b>Theoretical Methods</b>	<b>Practical Applications</b>
<p><i>Adoption Performance Objectives</i></p> <p>PO.1. Staff members evaluate patient education needs in CF center.</p> <p>PO.2. Center directors and staff members decide whether the CF FEP will meet needs.</p> <p>PO.3. Center directors and staff members decide to adopt the CF FEP.</p> <p>PO.4. Center directors and staff members identify program champion.</p>	<ul style="list-style-type: none"> <li>• Knowledge</li> <li>• Skills and self-efficacy</li> <li>• Outcome expectations</li> <li>• Attitude</li> <li>• Team functioning</li> </ul>	<ul style="list-style-type: none"> <li>• Persuasion</li> <li>• Modeling</li> <li>• Cues to participate in training</li> <li>• Information</li> </ul>	<p><i>Pharmaceutical-Style Product Detailing of Program to CF Centers</i></p> <ul style="list-style-type: none"> <li>• Contact person recruitment of workshop registrants</li> <li>• Distribution of color program guide charts</li> <li>• Workshop invitation and conformation</li> <li>• Scientific presentations and exhibits at CF medical meeting</li> </ul>
<p><i>Implementation with Families in CF Centers Performance Objectives</i></p> <p>PO.5. Staff members work with families using the CF FEP with completeness and fidelity.</p> <p>PO.6. Program champions work with staff to develop implementation plan.</p> <p>PO.7. Staff members document program use.</p> <p>PO.8. Staff members review patient CF FEP progress in rounds.</p>	<ul style="list-style-type: none"> <li>• Knowledge</li> <li>• Skills and self-efficacy</li> <li>• Outcome expectations</li> <li>• Attitude</li> <li>• Team functioning</li> <li>• Logistics</li> </ul>	<ul style="list-style-type: none"> <li>• Modeling</li> <li>• Skill training</li> <li>• Reinforcement</li> <li>• Persuasion</li> <li>• Skill building with guided practice</li> <li>• Information</li> </ul>	<p><i>Regional Workshops</i></p> <ul style="list-style-type: none"> <li>• Discussion</li> <li>• Problem analysis</li> <li>• Role-playing</li> <li>• Lecture</li> <li>• Videotape modeling and information to use in center</li> <li>• Team meeting to plan implementation</li> <li>• Print implementation guides</li> </ul> <p><i>Newsletters</i></p> <ul style="list-style-type: none"> <li>• Role model stories</li> <li>• Resources</li> <li>• Information</li> </ul>

Table 8.2 (Continued)

Diffusion Stage	Change Objectives (see Table 8.1)	Theoretical Methods	Practical Applications
			<i>Regional Coordinators</i>
			<ul style="list-style-type: none"> <li>• Technical and Social support</li> <li>• Social reinforcement</li> <li>• Role modeling</li> </ul>
<i>Institutionalization Performance Objectives</i>	<ul style="list-style-type: none"> <li>• Knowledge</li> <li>• Skills and self-efficacy</li> <li>• Outcome expectations</li> <li>• Attitude</li> <li>• Team functioning</li> </ul>	<ul style="list-style-type: none"> <li>• Problem-solving</li> <li>• Reinforcement</li> <li>• Social support</li> <li>• Skill training</li> </ul>	<i>Regional Coordinators</i>
PO.9. Program champions and supervisors use the CF FEP in new staff orientation and write CF FEP into job descriptions.			<ul style="list-style-type: none"> <li>• Technical support</li> <li>• Social support</li> <li>• Social reinforcement</li> <li>• Role modeling</li> </ul>
PO.10. Program champions and supervisors will write CF FEP into care paths or continuous quality improvement plans.			<i>Newsletters</i>
			<ul style="list-style-type: none"> <li>• Role model stories</li> <li>• Resources</li> <li>• Information</li> </ul>

(Ellis et al., 2005). The authors of this study concluded that there was no strong evidence that any one dissemination strategy is effective in promoting the adoption and implementation of cancer control interventions. However, the studies do provide useful information that can be used by others planning dissemination interventions. In another review of studies to disseminate dietary interventions for cancer prevention, similar results were reported but the authors did conclude that the use of peer educators in the worksite seemed promising (Ciliska et al., 2005).

One of the weaknesses reported in the literature regarding some of the health promotion dissemination efforts is the failure to apply theoretical methods to the intervention practical applications. Owen and colleagues (2006) report on the successful dissemination of several health promotion programs including SPARK (Sports, Play, and Active Recreation for Kids), CATCH (Coordinated Approach to School Health), Pool Cool sun safety program, and Body and Soul (dietary intervention to increase fruit and vegetable intake). In designing the dissemination interventions, these studies made use of theoretical methods from Diffusion of Innovations Theory, Social Cognitive Theory, social marketing, and organizational change. The Pool Cool dissemination study

**Table 8.3 Smart Choices Diffusion**

<b>Diffusion</b>	<b>Target Outcome</b>	<b>Variables to Be Addressed</b>	<b>Social Cognitive Theory Methods</b>	<b>Practical Applications</b>
<i>Dissemination</i>	<ul style="list-style-type: none"> <li>• Teachers and administrators indicate awareness of the Smart Choices program.</li> <li>• Teachers and administrators view the Smart Choices program favorably.</li> <li>• Teachers and administrators discuss the Smart Choices program.</li> </ul>	<ul style="list-style-type: none"> <li>• Preconditions: knowledge and awareness</li> <li>• Outcome expectations</li> <li>• Attitudes</li> <li>• Expectancies</li> </ul>	<ul style="list-style-type: none"> <li>• Symbolic modeling</li> <li>• Direct modeling</li> <li>• Dual-channel communication</li> </ul>	<ul style="list-style-type: none"> <li>• Dissemination videotape</li> <li>• Workshop for school personnel</li> <li>• Diffusion network</li> <li>• Newsletter</li> </ul>
<i>Adoption</i>	<ul style="list-style-type: none"> <li>• School districts adopt the Smart Choices program.</li> </ul>	<ul style="list-style-type: none"> <li>• Outcome expectations</li> <li>• Expectancies</li> <li>• Vicarious reinforcement</li> </ul>	<ul style="list-style-type: none"> <li>• Symbolic modeling</li> <li>• Incentives</li> <li>• Contracting</li> </ul>	<ul style="list-style-type: none"> <li>• Newsletter</li> <li>• Adoption form</li> </ul>
<i>Implementation</i>	<ul style="list-style-type: none"> <li>• Teachers use the Smart Choices program with acceptable completeness, fidelity, and proficiency.</li> </ul>	<ul style="list-style-type: none"> <li>• Behavioral capability</li> <li>• Self-efficacy</li> </ul>	<ul style="list-style-type: none"> <li>• Direct modeling</li> <li>• Symbolic modeling</li> <li>• Guided enactment</li> <li>• Self-directed application of acquired skills</li> </ul>	<ul style="list-style-type: none"> <li>• Training workshop</li> <li>• Training videotape</li> </ul>
<i>Maintenance</i>	<ul style="list-style-type: none"> <li>• After one year, teachers continue to use the Smart Choices program with acceptable completeness, fidelity, and proficiency.</li> </ul>	<ul style="list-style-type: none"> <li>• Self-efficacy</li> <li>• Outcome expectations</li> <li>• Expectancies</li> <li>• Reinforcement</li> </ul>	<ul style="list-style-type: none"> <li>• Feedback and reinforcement</li> </ul>	<ul style="list-style-type: none"> <li>• Recognition</li> <li>• Material rewards</li> <li>• Special status for school district</li> <li>• Feedback on performance</li> </ul>

Source: Reprinted with permission from Parcel, G. S., Taylor, W. C., Brink, S. G., Gottlieb, N., Engquist, K., O'Hara, N. M., & Eriksen, M. P. (1989). Translating theory into practice: Intervention strategies for the diffusion of a health promotion innovation. *Family and Community Health, 12*(3), 1–13.

reported on specific constructs taken from Social Cognitive Theory, Diffusion of Innovation Theory, and theories of organizational change and linked them to intervention methods and practical application (Glanz et al., 2005). One of the few studies on sustainability examined the continuation of tobacco treatment services in Massachusetts and concluded that two key approaches determined sustained program services: (1) redefining the scope of services and (2) creative use of resources (LaPelle, Zapka, & Ockene, 2006). Two recent articles in the literature make a good case for applying organizational theory to designing interventions methods for program implementation by the adopting organizations (Rutten et al., 2009; Weiner et al., 2009).

In summary, there is now a body of literature that can be used to seek and identify methods and practical applications for influencing program use. The key points are to look for evidence that a practical application has been shown to be effective and to link practical applications to theoretical methods to ensure that appropriate parameters for use are considered.

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## Interventions to Influence Program Use

The last task in Step 5 of Intervention Mapping is to design interventions for program use, implementation, and sustainability.

The final task in Step 5 is to design a plan for an intervention to influence program adoption, implementation, and sustainability outcomes. The plan for getting a program adopted and implemented is as important as the intervention plans discussed in Chapter Seven. The plan should include a scope and sequence of activities, staffing, and budget. Any materials that are needed for the adoption or implementation of the program, such as training manuals or newsletters, should be described in the design documents and produced with the same care described in Chapter Seven for the program materials. As an example, the scope and sequence for the CF FEP diffusion is included in Table 8.4. Program planners can refer back to the task in Step 4 (Chapter Seven) and use these tasks to guide the design and production of interventions to accomplish the outcomes for adoption, implantation, and continuation of the health promotion program.

## Initial Program Use and Program Dissemination

There are two distinct situations in which intervention planning can be done to influence program use. One is for the initial use of a program. In some

**Table 8.4 Scope and Sequence of the Cystic Fibrosis Family Education Program Diffusion Intervention**

Months 1–2	Months 2–4	Months 4–6	Months 6+
<i>Pharmaceutical Style Detailing</i>	<i>Regional Training Meetings</i>	<i>Newsletters</i>	<i>Newsletters</i>
<ul style="list-style-type: none"> <li>• Contact person recruitment of workshop registrants</li> <li>• Distribution of color program guide charts</li> <li>• Workshop invitation and confirmation</li> </ul>	<ul style="list-style-type: none"> <li>• Discussion</li> <li>• Problem analysis</li> <li>• Role-playing</li> <li>• Lecture</li> <li>• Team meeting to plan implementation</li> <li>• Print implementation guides</li> <li>• Problem solving</li> </ul>	<ul style="list-style-type: none"> <li>• Information on the program</li> <li>• Information on how to do implementation</li> </ul>	<ul style="list-style-type: none"> <li>• Role model stories on successful adoption and implementation</li> </ul>
<i>Scientific presentation CF conference</i>	<i>Use of Videotape Orientations in Centers</i>	<i>Regional Coordinator Contact</i>	<i>Regional Coordinator Contact</i>
	<ul style="list-style-type: none"> <li>• Orientation to the materials</li> <li>• How to get the program adopted in the CF center</li> <li>• How to organize implementation</li> <li>• How to work with families</li> </ul>	<ul style="list-style-type: none"> <li>• Calls to encourage implementation</li> <li>• Technical support</li> <li>• Social support</li> <li>• Social reinforcement</li> <li>• Role modeling</li> </ul>	<ul style="list-style-type: none"> <li>• Sharing role model success stories</li> <li>• Technical and social support, social reinforcement</li> <li>• Role modeling</li> </ul>
	<i>Newsletters</i>		
	<ul style="list-style-type: none"> <li>• Information on the program</li> <li>• Information on how to do implementation</li> </ul>		

cases, the same agency that is planning the program will also be adopting and implementing the program. This might be referred to as an “in-house” program. In other cases, the planning group is developing a program that will be used by outside agencies or organizations. In both cases, the planning for program use will be one of the six Intervention Mapping steps used to plan the health promotion program. Steps 1 through 4 of Intervention Mapping will be used to plan an intervention to achieve outcomes for changes in behavior and environmental conditions to achieve health and quality-of-life outcome goals. In Step 5, the tasks

are used to plan an intervention to achieve program use outcomes for adoption, implementation, and continuation of the health promotion program.

In general practice, it is considered unacceptable to encourage widespread use of a health promotion program unless there is evidence that the program works—that it is able to accomplish stated objectives and achieve expected outcomes. The initial use of a health promotion program is usually intended to determine whether the program is effective. Once effectiveness of the program is established, the sponsoring agency or planning group may use evaluation findings to improve the program, or use effectiveness findings to justify a broader implementation of the program to reach a greater proportion of the population at risk for the health problem. If a health promotion program is effective and made ready for wider use, then Step 5 of Intervention Mapping is used to plan a dissemination intervention to encourage greater adoption and implementation of the program. The dissemination plan may be different from the plan developed for initial use if the adopters and implementers are different, if the agencies or communities are different, or if there are differences in determinants of program use outcomes for adoption, implementation, and continuation. In this situation, Step 5 of Intervention Mapping becomes the planning tool for designing an intervention for the diffusion of a health promotion program with demonstrated effectiveness.

### Diffusion of Evidence-Based Programs

Health promotion programs that have been evaluated and shown to be effective in accomplishing stated objectives and achieving the expected outcomes are referred to as “evidence-based programs.” There is a strong push in the field to encourage community groups to consider evidence-based programs for adoption and implementation when planning a program to address an identified health problem (Brownson et al., 2007b; Collins, Harshbarger, Sawyer, & Hamdallah, 2006; Glasgow et al., 2004b). The rationale is that programs with evidence of effectiveness may have a better chance of improving the health problem and will save community groups time and resources, as compared with developing a new program on their own. The advantage for an organization or community group using an evidence-based program is in not having to start from scratch to develop a new program and instead making use of the work that the original program developers had already invested in developing the program. The main disadvantage of using a program developed by other groups is that the program may not represent a good fit for the new situation and therefore may not produce the same results. A poor fit may result from differences in populations (such as age, race, gender, SES), degree of risk for the health problem, behavioral

and environmental causes, and determinants of behavior and environmental conditions. Planners also note other reasons for their reluctance to adopt and implement existing programs, including difficulty finding evidence-based programs, little direction in how to implement the programs, and the belief that a program developed by others may not be appropriate for their community (Hannon et al., 2010).

A suggested approach for addressing the issues of using an evidence-based program in a new situation that does not exactly match the circumstances in which the original program was evaluated is the use of “planned adaptation” (Lee et al., 2008). To use this approach, however, it is critical to understand what the core elements of the program are so that while other pieces of the program are modified, these essential components are not. To facilitate this process, program planners in Step 5 of Intervention Mapping should identify the core elements of the program that must be maintained to ensure program effectiveness. The core elements may include intervention components, methods, and practical applications or delivery channels. Implementation guides then identify ways in which the program can be modified to fit the new situation but retain the core elements. For example, role modeling as a core method using role model stories as the practical application can be modified by using models that are more like the new population and make use of real stories that come from members of the new population. The implementation guidelines developed in Step 5 would provide instructions on how to create and substitute new role model stories into the adopted health promotion program. For a more extensive adaptation of an evidence-based program, we recommend that all of the steps of Intervention Mapping be used to assess differences between the assumptions made for planning the original program and the needs assessment and program planning steps for the new situation. The use of Intervention Mapping for adaptation of an existing health promotion program is described and illustrated in Chapter Ten.

A substantial body of work has been collected to make available health promotion programs and prevention interventions that have been evaluated and have some evidence of effectiveness. *The Guide to Community Preventive Services* (or *Community Guide*) Web site summarizes what is known about the effectiveness, economic efficiency, and feasibility of interventions to promote community health: [www.thecommunityguide.org](http://www.thecommunityguide.org) (Task Force on Community Preventive Services, 2010). This guide can be used to identify intervention programs that could be adopted and implemented in communities to address a range of health issues or problems including:

- Adolescent health
- Alcohol

- Asthma
- Birth defects
- Cancer
- Diabetes
- HIV/AIDS, STIs, and pregnancy
- Mental health
- Motor vehicle injuries
- Nutrition
- Obesity
- Oral health
- Physical activity
- Social environment
- Tobacco
- Vaccines
- Violence
- Worksite health promotion

Another resource that can be used specifically for HIV prevention programs is the Web site [www.effectiveinterventions.org/](http://www.effectiveinterventions.org/) (Diffusion of Effective Behavioral Interventions, n.d.). In the search for programs that are a good match for the targeted risk behavior, environmental conditions, and population, it is unlikely that a perfect match exists between programs and new situations and populations. Thus a careful assessment should be made of these programs in terms of how well they match the behavioral and environmental outcomes, performance objectives, determinants, and change objectives. In addition, a careful analysis should be done on intervention materials and resources available for accomplishing program adoption, implementation, and sustainability. These issues are often overlooked in the dissemination of effective health promotion programs, and Step 5 of Intervention Mapping may be necessary to apply to existing programs to accomplish the successful program implementation.

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## Implications for Program Evaluation

The tasks completed in Step 5 are useful for completing the tasks in Step 6, whose products include plans for both process and effectiveness or efficacy evaluations. The development and evaluation studies of health promotion programs have tended to focus on efficacy and effectiveness without addressing the other dimensions needed to more fully evaluate a program and determine its potential for affecting population health (Bull Gillette, Glasgow, & Estabrooks, 2003).

**BOX 8.2****STROKE PROJECT****Task 1 was to identify potential users of the health promotion program.**

The T.L.L. Temple Foundation Stroke Project was a demonstration project in East Texas. The program components were designed to be implemented by the project health educator; therefore, it was not necessary to consider who would adopt and use this program—at least in this initial study to test the program effectiveness. Task 2 was to revisit the planning group and linkage system to ensure representation of potential program adopters and implementers.

We knew that we would have to place the mass media intervention components and would need good relationships with media representatives. Representatives of media outlets had participated in our planning group from the beginning of the project.

**The third task was to state program use outcomes and specify performance objectives for adoption, implementation, and sustainability.**

We developed outcomes for implementation by the health educator including implementing the program at all worksites in the target community; placing billboard, television, and radio messages; placing newspaper stories; and conducting a mock stroke incident. Other implementation required members of the resource team to work with hospitals and EMS to develop stroke transport and treatment protocols. The implementation performance objectives for the health educator included the following:

- Train a person at each worksite to train employees in all major community worksites on symptom recognition and response
- Work with the local newspaper feature and health writers to place newspaper stories
- Work with local media representatives to place public service announcements and billboards
- Coordinate the mock stroke drill

The performance objectives for the resource team included the following:

- Meet with hospital critical care teams at each hospital to plan needed protocols for stroke care

- Meet with medical staff at each hospital to review current evidence and guidelines for stroke care
- Meet with EMS teams at each community to discuss needed changes in stroke triage protocol

Task 4 is to specify determinants for the performance objectives; Task 5 is preparation of a matrix; Task 6 is preparing program elements to influence change objectives on the matrix.

In this project we continued to meet with our advisory committee and review implementation as it occurred. We worked particularly with the committee to ensure good placement of our community media. The other members of the committee also contributed to setting the context for cooperation of worksites for the one-to-one messages and to hospitals and emergency medical services for the training and organizational development components. However, because all implementation was conducted by resource team staff, we did not formally complete Tasks 4–6.

Glasgow and colleagues (Glasgow, Lichtenstein, & Marcus, 2003; Glasgow et al., 2004a; Glasgow, Klesges, Dzewaltowski, Estabrooks, & Vogt, 2006) have developed the Reach, Efficacy or Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) model, in which they emphasize expanding program evaluation to five dimensions that should be planned for and evaluated in the process of translating health promotion research into practice.

These processes are the focus of process evaluation, which we discuss further in Chapter Nine. A logical starting point for process evaluation is to determine whether the program was adopted for use. The performance and change objectives for adoption stated as part of Step 5 can be used to guide the formation of questions to evaluate the evidence for program adoption. Reach refers to the extent to which the intended priority population for the program is exposed to the program. Knowing who was exposed to the various components of the program can help to interpret the findings related to the impact of the program. Program implementation is concerned with completeness, how much of the program was delivered, and with fidelity, whether the program was delivered as designed. In addition, a tested program disseminated for implementation may include adaptation options to meet the needs of new situations. The performance and change objectives stated for program implementation can help guide the formation of questions to measure implementation completeness, fidelity, and adaptation. Finally, questions to evaluate the sustainability of the program can

be based on the performance and change objectives to address maintenance, institutionalization, and capacity building (Lytle, Ward, Nader, Pedersen, & Williston, 2003). As we discussed in Chapter Five, the matrices prepared in Step 2 are used to develop measures for impact evaluation; similarly, the matrices prepared in Step 5 are used to form questions and measures for process evaluation.

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## Summary

The impact of a health promotion program on health and quality of life in a population depends on the effectiveness of the program, exposure of the people at risk for the health problem and influential environmental agents to the program. The previous steps of Intervention Mapping have focused on ensuring the effectiveness of the program. Step 5 of Intervention Mapping is focused on ensuring that the program reaches the intended population. Planning for program use consists of designing interventions for program adoption, implementation, and continuation. Planning for program use is included as one of the steps of Intervention Mapping because it is so critical to achieving an effect on a health problem and so often overlooked in program planning.

Essentially, Step 5 incorporates the tasks of the previous three steps but instead of the outcome being focused on the behavior and environmental conditions to improve health and quality of life, it focuses on the outcomes of program adoption, implementation, and sustainability of the health promotion program. The planning begins by identifying who will use the program: who will adopt it, who will implement it, and who will be responsible for sustaining the program over time. A reassessment of the planning group is necessary to ensure representation of potential program adopters and implementers. The tasks that follow are the same as Intervention Mapping Steps 2, 3, and 4: create a matrix of change objectives for interventions to achieve program adoption, implementation, and continuation; select theoretical methods and practical applications; and organize methods and applications into interventions to ensure program use.

Step 5 of Intervention Mapping can be used to achieve program use outcomes for newly developed programs being used for the first time as well as for established programs that have been tested and shown through evaluations to be effective. To increase the public health impact of health promotion, interventions to disseminate effective programs are necessary because they ensure that a greater proportion of populations at risk for health problems are exposed to effective programs. The detailed and focused planning process necessary to develop effective health promotion programs can also be used to design interventions to disseminate programs for expanded use.

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## Discussion Questions and Learning Activities

1. Compare and contrast the tasks in Step 5 of Intervention Mapping with Steps 2, 3 and 4. What do they have in common? How are they different?
2. Explain why it is important to plan for program use as part of health promotion program planning.
3. What is meant by a linkage system for program adoption and implementation? Give examples of different ways in which a linkage system can be used.
4. What theories can be used to identify determinants of program adoption, implementation, and sustainability? Give an example of determinants that have been shown through research and theory to be important determinants of program adoption, implementation, and sustainability.
5. Describe how the matrices created in Step 5 can be used to help guide process evaluation of the health promotion program.
6. Refer back to the planning group you have written about in Chapter Four. Do you need to bring any new people to the planning group to begin planning for program adoption and implementation? Who are they and what will they contribute to planning for program adoption and implementation?
7. Continuing with the health promotion program you are proposing, state adoption, implementation, and sustainability outcomes and write performance objectives for each outcome.
8. Create a matrix for adoption and implementation of the program by linking performance objectives with determinants.
9. Describe methods and practical applications you propose to effect the change and performance objectives in the matrices to achieve program adoption and implementation.



# INTERVENTION MAPPING STEP 6 PLANNING FOR EVALUATION

**with Patricia Dolan Mullen**

## LEARNING OBJECTIVES

- Review the program logic model and describe program outcomes for quality of life, health, behavior, and environment, and write objectives and evaluation questions
- Write evaluation questions about performance objectives and determinants as expressed in the matrix of change objectives
- Write process evaluation questions based on the descriptions of methods, conditions, practical applications, program, and implementation
- Develop indicators and measures
- Specify evaluation design and write an evaluation plan

The product of Intervention Mapping Step 6 is a plan for an evaluation of the process and outcomes of a health education program based on the products from the previous Intervention Mapping steps. In this chapter we do not describe in detail the general techniques of evaluation. A wealth of literature is available for that purpose (Patton, 2008; Rossi, Lipsey, & Freeman, 2004; Shadish, Cook, & Campbell, 2002; Wholey, Hatry, & Newcomer, 1994; Windsor, Clark, Boyd, & Goodman, 2003). The purpose of this chapter is to help planners (also called evaluators in this chapter) use the previous steps of Intervention Mapping to facilitate program evaluation. Therefore, the chapter is organized following the steps of intervention development.

## Perspectives

We attempt in this section to clarify evaluation terms, underscore the importance of evaluating programs, and remind planners to involve stakeholders.

### Evaluation Terms

The development of an evaluation plan is the final step of Intervention Mapping. Thinking about the evaluation is a parallel process with program planning, however, and it begins with the needs assessment. As a matter of fact, most evaluation texts (see Rossi et al., 2004; Wholey et al., 2004; Windsor et al., 2003) include program planning or understanding the program as the first part of evaluation. They ask questions about the program's conceptualization and design such as the following: Is there a need for the program? Have the right priority groups been identified? Do stakeholders agree on the program objectives? Is the program theory flawed? Have appropriate delivery channels been selected? Such questions are suggested to avoid wasting resources on programs with insufficient planning. Programs that have been developed using Steps 1–5 are likely to stand up well to this scrutiny; at the very least, their logic will be transparent.

In other parts of the evaluation, planners determine whether the intervention was successful in meeting program goals and objectives and why the intervention was or was not successful. Process evaluation is necessary to understand the results from an evaluation of program outcomes. Process evaluation also enables program management and accountability, which are essential to effective implementation.

Effect evaluation (sometimes referred to as outcome or impact evaluation) describes the differences in outcomes with and without the program. Possible outcomes of interest include quality of life, health indicators, behaviors, environmental conditions, and program objectives (determinants, performance objectives, and change objectives). Effect evaluation involves determining whether these factors change as a result of the intervention, which usually means comparing the group that had the opportunity to participate in the program to one that did not. An evaluator does not usually propose to measure all intended program outcomes in an evaluation plan. Proposed measurement will depend on the logic model for the intervention as well as on evaluation resources, stakeholders' interests, and purposes. Evaluation in health promotion often concerns multiple outcomes, and evaluators have to decide what their primary outcome is. In case there are multiple primary outcomes, corrections for multi-testing are necessary, for example the Bonferroni correction (Abdi, 2007).

Effect evaluation can be described as *efficacy*, meaning a program evaluated under optimal conditions (for instance, with motivated volunteers who will take part in the program no matter how much time and effort is required) and *effectiveness*, meaning a program evaluated under real-world circumstances (for instance, with representatives of the at-risk group, some of whom will not take part or will drop out) (Cochrane, 1971; Flay, 1986; Sackett, 1980; Williamson, 1978; Windsor et al., 2003). The difference between effectiveness and efficacy stems from, for example, noncompliance, imperfect implementation, or participant drop-out. Mediation analysis is one way to determine if the observed effect of the intervention condition compared to a control condition is mediated by any of these “real-world” conditions (for mediation techniques see Emsley, Dunn, & White, 2009; Judd, Kenny, & McClelland, 2001; Mackinnon, Lockwood, Hoffman, West, & Sheets, 2002). Sometimes artificial incentives, such as cash or other rewards for participating in the program, or highly selected samples, such as only those who have demonstrated compliance, are used to test the efficacy of the program. In such cases, effectiveness may need to be demonstrated without the incentives or selectivity. Not surprisingly, the effect sizes from effectiveness evaluations are typically smaller than those from efficacy evaluations.

Process evaluation seeks to describe program implementation and explanations for implementation status (Rossi et al., 2004; Scheirer, 1994; Steckler & Linnan, 2002). Feedback from process measures during a program implementation is essential to assuring effective delivery, while process evaluation findings enable interpretation of outcome data and reflection on program design and future implementation. Program implementation questions include the following: Is the program being delivered to the persons for whom it was intended? Is the program being delivered in a form that maintains fidelity to its original design? Further, this aspect of process evaluation includes whether theoretical methods have been appropriately operationalized in the program applications. Process evaluation also attempts to describe the program, organizational, and implementation factors related to why an intervention is being implemented in a certain way. For example, an intervention can be well designed but not well implemented because the planners misjudged the needs of the at-risk group (Glasgow, Lando, Hollis, McRae, & La Chance, 1993). Alternatively, it can be poorly implemented because the implementers lack certain skills or because there is no one to champion the program in an organization (Bartholomew, Czyzewski, Swank, McCormick, & Parcel, 2000a). A program can be poorly implemented at a more basic level if the program designers have not adhered to assumptions inherent in the use of the proposed theoretical change methods, a problem that Rossi and colleagues (2004) consider part of the evaluation of the program logic model.

In contrast to outcome evaluation, which often makes comparisons between groups, process evaluation is primarily concerned with the group that was supposed to receive the intervention. Some process indicators, for example, judgments by the participants about the intervention, can be elicited only from the intervention group. However, researchers may also collect process data in the control group, but they do this primarily to find out whether any unplanned intervention may have contaminated the evaluation (Shadish, Cook, & Campbell, 2002).

Planners may evaluate a program's efficiency in terms of its costs and effects. A cost-benefit analysis monetizes both the inputs and the outputs of a program, whereas cost-effectiveness describes only program inputs in terms of money. Cost-effectiveness avoids controversy that may arise from computing a monetary value for a program's health or social effect by describing the program outputs in programmatic units rather than money. For example, a cost-effectiveness evaluation of a health program that seeks to prevent cases of measles might report the cost of a case of measles averted rather than determining the monetary value (possibly by determining the productivity loss averted). Knowing how program outcomes compare in terms of their cost is important when deciding whether to expand, continue, or terminate an innovative program. The program plan includes a budget and a description of all other program inputs that should provide a basis for an efficiency analysis. This chapter does not present the methodology for efficiency analyses; for these, we refer the reader to other works (Drummond, Sculpher, Torrance, O'Brien, & Stoddart, 2005; Gold, Siegel, Russell, Weinstein, & Weinstein, 1996; Green & Kreuter, 2005; Rossi et al., 2004; Windsor et al., 2003; Yates, 1996).

*Formative* and *summative* are terms used to describe the purpose of an evaluation rather than to refer to specific evaluation questions. A formative evaluation is done to obtain information to guide program development or improvement, whereas the primary purpose of a summative evaluation is to make a judgment on whether a program met its goals and objectives.

## Reasons for an Evaluation

Evaluation may commonly be thought of within the context of determining efficacy and effectiveness, or it may be thought of as formative pretesting or pilot testing of programs and support materials. However, it is equally important to conduct evaluation as part of program management in order to provide feedback to improve programs and enable the greatest benefit from scarce program resources (Preskill, 1994). One key to establishing accountability and improving the health promotion program is first to frame the performance and change

objectives for both behavioral and environmental outcomes and for program implementation and then to assess whether the program has met these objectives. Our experience is that successful health promotion practitioners tightly monitor the implementation and outcome of their programs in order to improve them as they are being conducted, to ensure their ongoing quality, and to justify them for continued allocation of resources.

Perhaps the most exciting reason to perform program evaluation is to generate knowledge. Knowledge about effective programs, good implementation, and useful evaluation methods enriches the field of health education and promotion by contributing to the evidence base. A program planner who has used a systematic planning framework such as Intervention Mapping should be able to express in the scientific literature the theory of change as well as the intervention theoretical methods, practical applications, and implementation. If so, a contribution will be much more likely because it will provide readers with a clear idea of what did or did not bring about the observed change. The problem of poorly described interventions that cause systematic reviewers to group together theoretically different interventions and thereby draw misleading conclusions is increasingly recognized as a major barrier to evidence-based public health and health education and promotion (Armstrong, Waters, Moore, Riggs, Cuervo, Lumbiganon et al., 2008; Bartholomew & Mullen, in press; Michie, Johnston, Francis, Hardeman, & Eccles, 2008).

## Involving Evaluation Stakeholders

An important goal of an evaluation is that someone uses the results (Patton, 2008; Torres, Preskill, & Piontek, 2004). To ensure that evaluation results are used, the evaluator must engage the attention and participation of the evaluation stakeholders, including the program consumers, funders, planners, and implementers. The process of stakeholder recruitment for the needs assessment was described in Chapter Four (See Table 4.1). Many of the stakeholders selected at that point will be stakeholders for the evaluation. Table 9.1 describes possible evaluation stakeholders. Not all types of stakeholders will be relevant for every evaluation, but most programs have multiple stakeholders (Preskill & Jones, 2009). The steps in ensuring stakeholder participation (Reineke, 1991) are the following:

- Identify stakeholders and involve them early
- Plan structures for involving stakeholders in the ongoing evaluation process
- Help stakeholders plan how to use evaluation data
- Present evaluation results in multiple forms

Table 9.1 Evaluation Stakeholders

<b>Policymakers and Decision Makers</b>	Persons responsible for deciding whether the program is to be started, continued, discontinued, expanded, restructured, or curtailed
<b>Program Sponsors</b>	Organizations that initiate and fund the program (can overlap with policymakers and decision makers)
<b>Evaluation Sponsors</b>	Organizations that initiate and fund the evaluation (sometimes program sponsors and evaluation sponsors are the same)
<b>Target Participants</b>	Persons, households, or other units that receive the intervention or services being evaluated
<b>Program Managers</b>	Personnel responsible for overseeing and administering the intervention program
<b>Program Staff</b>	Personnel responsible for delivering the program services or playing supporting roles
<b>Program Competitors</b>	Organizations or groups that compete with the programs for available resources
<b>Contextual Stakeholders</b>	Organizations, groups, and individuals in the immediate environment of a program with interests in what the program is doing or what happens to it
<b>Evaluation and Research Community</b>	Evaluation professionals who read evaluations and pass judgment on their technical quality and credibility and researchers who work in areas related to the program

Source: Adapted with permission from Rossi, P. H., Lipsey, M. W., & Freeman, H. E. (2004). *Evaluation: A systematic approach* (7th ed.). Thousand Oaks, CA: Sage, pp. 48–49.

Some evaluators would argue that the most important stakeholders from an ethical point of view are a program's intended beneficiaries. These persons stand to be most affected by both formative and summative evaluations. Even when program planners have sought their opinions regarding the program, they often leave program beneficiaries out of the evaluation process. Participatory evaluation should involve the program's stakeholders, including the at-risk group, and many evaluators are beginning to consider an empowerment approach that includes enhancing the capacity of program stakeholders to perform and use evaluations (Fetterman, Kaftarian, & Wandersman, 1996; Greene, 1988; Mark & Shotland, 1985; Papineau & Kiely, 1996; Torres et al., 1996; 2004).

Although all stakeholders are interested in program impact and outcomes, some have a specific interest in process evaluation or economic evaluation results. For example, among other things, program managers will be especially interested in the proportion of the intended audience who participate, how much of the

program the participants receive, whether staff members have the credentials described in the plan, and whether there is participant satisfaction with the program. Policy makers and decision makers, including funders, will want to know the cost-benefit analysis of the program. How much does the program cost for each unit of benefit? How does this compare to other programs addressing the problem? Reports to the various stakeholders should be tailored to the interests of each group.

## Evaluation of Programs as Systems

Intervention programs are systems, with structure and function that evolve. The program context, its social and physical environments, includes both the environmental outcomes sought and other interrelated environmental conditions. As discussed in Chapter One, an intervention is but one influence on the environmental outcomes. Many program evaluators have done well at measuring structure, function, and immediate program outcomes. The examination of program context remains a challenge to evaluators. Systems thinking, interdisciplinary approaches, and qualitative inquiry allow the evaluator to understand how the program and its parts are embedded in a larger, interactive whole (Patton, 2008; Potvin, Haddad, & Frohlich, 2001; Schorr, 2006). We encourage intervention developers, implementers, and evaluators to keep the larger whole in mind. Careful consideration of environmental conditions in the program and its implementation, using Intervention Mapping, provides the basis for this assessment.

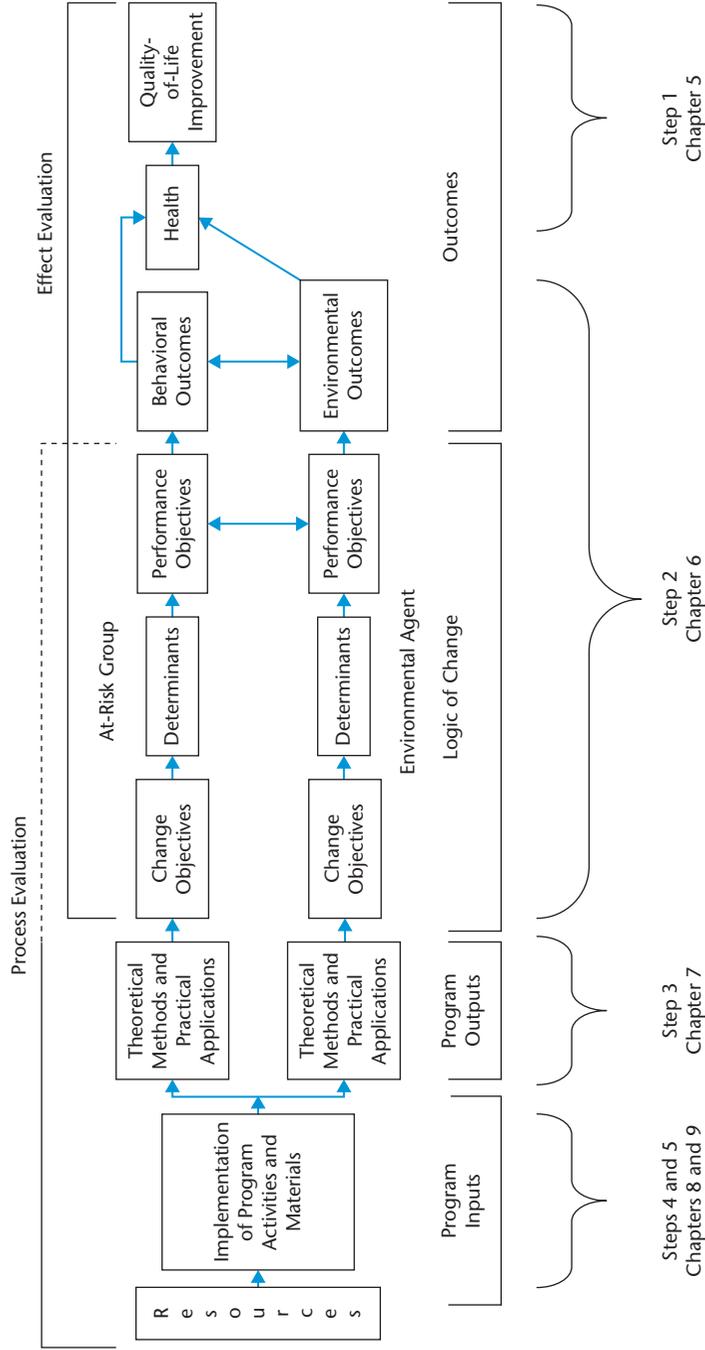
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## Reviewing the Program Logic Model

Throughout the Intervention Mapping process, a planning group will have developed logic models in order to understand how a program is supposed to work to produce change. We reintroduced the logic model in Step 2 (Chapter Five) and review it here with types of evaluation added (Figure 9.1). Reviewing the program logic model (the first task of this step) will enable evaluators to perform the next three tasks of evaluation planning:

- Describe program outcomes for quality of life, health, behavior, and environment and write objectives and evaluation questions
- Write evaluation questions based on the matrix; address performance objectives and determinants as expressed in the change objectives
- Write process evaluation questions based on the descriptions of methods, conditions, practical applications, program, and implementation

**FIGURE 9.1 Intervention Logic Model**



Program evaluators first need to understand the program they are evaluating and what types of program effects they can expect within the time frame of the program implementation and evaluation. They need to be guided by the theory of the program (Rossi et al., 2004). If the evaluators are part of the program development team and if the team has used a systematic framework to plan the program, then understanding the program is a fairly simple descriptive step, as explained in this section. However, evaluators are sometimes asked to evaluate a program after it has been developed. In this case the evaluator must backtrack and reconstruct the steps in the planning process. Determining implicit program theory is illustrated in the case studies in the next chapter. This step is essential: Rossi and Freeman (1993) stated, “Clearly, it would be a waste of time, effort, and resources to estimate the impact of a program that lacks measurable goals or that has not been properly implemented” (p. 218); their 7th edition expresses the same sentiment (Rossi et al., 2004). The idea that conceptualizing and testing the theory of a program should be a first step in evaluating a program emerged in the 1970s as part of “evaluability assessment” (Wholey, 1994). This refers to a systematic process for describing the program model, assessing how well defined the model is, and identifying stakeholders’ ability to use the evaluation results. An important first finding of an evaluation may be that the needs assessment, formulation of objectives, choice of methods, and translation of methods and practical applications into a program or implementation were not appropriately executed.

Rossi and colleagues (2004) use a logic model to portray the theory of the program and refer to the logic of the pathways for accomplishing program outcomes. Other evaluation experts refer to a theory of action (Patton, 2008) and to causal models (Scheirer, 1994). Program pathways comprise two parts: the impact pathway, how the program is expected to cause change, and the process pathway, how the program is implemented. In addition, the description of the program pathways includes careful specification of the intended participants.

All the information needed to complete the two program pathways in the logic model should be available from the work done throughout Intervention Mapping. Evaluating the logic of the program pathways is a first step in both determining program evaluability and in evaluating a program (Wholey, 1994). To evaluate program pathways, the planner judges the logic in the causation, as well as the evidence and theory used to develop the logic. If planners have carefully used Intervention Mapping core processes to access evidence and theory at each step, then the model should be sound. However, when the evaluator determines that the logic is flawed, the evaluation may stop at that point and the evaluator may recommend that the planners correct the program logic. The evaluator can help program planners and administrators correct the theory of the program, the program’s intent.

## BOX 9.1

### MAYOR'S PROJECT

Our health educator is hard at work finishing up the program plan to present to the city council the next week. She has spread matrices and audiovisuals all across the floor of her office. Just the finishing touches have to be put on the chart that explains the scope and sequence of program activities and the graphic that outlines all of the program partners. Then she can tackle the evaluation plan.

The department head drops in to make sure that everything is progressing for the next week's meeting.

*Department head:* How is everything coming?

*Health educator:* Oh, just great. Sixteen members of the task force will be at the meeting. Here's the agenda for the flow of the presentation. You can see that you are giving the introduction. Then later on I have you slated to hand out certificates of appreciation.

*Department head:* Sounds good. Looks like you are just finishing up here.

*Health educator:* Yes, I just have to write the evaluation plan.

*Department head:* (barely under control) What do you mean, write the evaluation plan? Why did you wait until the last moment?

*Health educator:* (pointing out the folder for the evaluation part of her presentation to the mayor) Look, here's the evaluation model. Of course, I didn't wait until the last minute! You know me better than that! The whole intervention planning process is, in a way, developing the evaluation plan as you go along. See, here are our health and quality-of-life objectives, behavior and environment changes, change objectives, methods and practical applications, program and resources. Here are the pages that show how we are going to measure each outcome, and here is our plan to monitor the process. I just have to wrap some words around it. The plan has been formulating itself for a long time.

Another aspect of evaluating the program pathways is to make sure that the processes being implemented are the ones intended. The program logic model should include enough details to analyze whether the program is being implemented with fidelity to the proposed methods and with the quality and quantity of activities intended.

## Impact on Health, Quality of Life, Behavior, and Environment

The first task in Step 6 is to review the program logic model.

Working from the right side of the model (Figure 9.1), the evaluator looks at the intended impact of the program on health, quality of life, and on the behavioral and environmental causes of the health problem. The planning team will have written program objectives about expected changes in these factors in the needs assessment. These objectives form the basis for evaluation questions:

- How much was the health problem changed in the designated time frame?
- How much was the quality-of-life problem changed in the designated time frame?
- What changes in behavior and environmental conditions were achieved?

### Determining an Evaluation Time Frame

Determining the evaluation questions, especially about outcomes, requires thinking about the time frame for expected effects. For instance, health and quality-of-life outcomes for the school program to prevent HIV infection (see case study in Chapter Thirteen [on the book's instructor Website]; see also Table 9.2) could not be evaluated because of the logic and the timing of expected effects from the program (Schaalma et al., 1996). Because the program was designed to reach students before they began having sexual intercourse, changes in behavior were outside the time frame for an initial program evaluation. The behavior of interest was expected to occur a year or more from the time of the program. Therefore, behavior change was not an appropriate short-term evaluation goal, even though it certainly belonged in the program logic model. The short-term effects that the program developers expected were changes in knowledge, self-efficacy, and skills. They expected the program to have a longer-term impact that would be observable when the students reached an age at which they were beginning to have intercourse (within a year or two).

Having a clear understanding of the time frame for being able to create certain program outcomes is important in ensuring that the expectations for measuring program effects in an evaluation are realistic. Some program funders, planners, and other stakeholders are satisfied with positive outcomes in the process evaluation, such as participation of the at-risk group or change in the determinants of behavior; others will not be satisfied until they see evidence of a relevant reduction in the health problem and improvement in quality of life (Fishbein, 1996). Our position is that the evaluation should be realistic and take into account the complexity of influencing a health problem. First, intervention

Table 9.2 Evaluation of a School HIV Prevention Program

Intervention Mapping Step	Question Focus	Process Evaluation Variable	Effect Evaluation Variable
Step 1 Needs Assessment	Quality of Life*	NA	Quality of life related to worry about AIDS Quality of life related to AIDS
Step 1 Needs Assessment	Health*	NA	HIV Infections AIDS cases Mortality
Step 1 Needs Assessment	Behavior	NA	Condom use
Step 1 Needs Assessment	Environment	NA	Condom availability
Step 2 Matrices of Change Objectives	Components of behavior	Correctness of objective specification	Condom use performance objectives
Step 2 Matrices of Change Objectives	Components of environmental change	Correctness of objective specification	Environmental agent objectives
Step 2 Matrices of Change Objectives	Determinants	That chosen determinants are the correct ones That all important behavioral domains are covered	Knowledge Skills Self-Efficacy
Steps 3 and 4 Methods and Strategies	Choice of methods Use of methods according to parameters Acceptability of program and materials	Evidence that methods can effect expected change (e.g., modeling is effective in stimulating steps of condom use) That practical applications convey methods appropriately (e.g., students attend to and remember modeled material) That materials and program are culturally relevant (e.g., students and teachers find the program salient) That materials and program are acceptable to intended users and implementers (e.g., students and teachers like the program)	NA

Table 9.2 (Continued)

Intervention Mapping Step	Question Focus	Process Evaluation Variable	Effect Evaluation Variable
Step 5 Program Adoption, Implementation, and Sustainability	Interaction of intended intervention group with intervention	<p>Program is delivered to intended recipients.</p> <p>Program is adopted.</p> <p>Program is implemented with fidelity and completeness—teachers do all lessons as designed; students read magazine and do homework.</p> <p>Program is sustained, for example, routinized, institutionalized.</p>	NA

\*Not included in the final evaluation model because of time frame

outcomes require time to develop. Second, health education is often directed at people's future behavior at a time when a risk behavior has not yet emerged. In this case the desired changes may become observable only years after the intervention. An example of this situation is the promotion of condom use by adolescents who have not yet become sexually active. Third, the intervention itself needs time, especially when the intervention is targeted for long-term change, such as empowerment and community development.

Determining the feasibility of achieving evaluation goals may be a challenge. On the one hand, the planner wants to show outcomes that are meaningful in relation to the health problem. On the other hand, the planner may not reasonably expect certain changes in health outcomes or risk factors to occur shortly after an intervention. An essential part of the evaluation plan is to decide in advance on the level of effects that can be expected within a given time frame. In the example of the HIV-prevention program for schools, the final evaluation goals after two years are for behavior change, in this case for consistent condom use, and changes in determinants, that is, knowledge, self-efficacy, and skills. Schaalma, Kok, and colleagues (1996) did not include any health or quality-of-life outcomes in the evaluation plan because they did not expect health changes in that respect from the program within the given time frame.

When health changes are not expected or measured in the evaluation plan, the planner must have strong evidence and logical arguments to justify any assumption of causation that is beyond the evaluation's scope. For instance, the planner must document the relation between skills improvement now and the use of condoms and a reduction in HIV infections later. The epidemiologic or experimental evidence and arguments could include:

- The relation between behavior or environment change and change in the health problem

- The relation between change in determinants and change in behavior or environment
- The relation between methods and change in determinants

The relation between determinants and change in behavior is most likely to be available in studies of mediation. Looking for evidence of effects of specific methods on determinants deserves a word of caution: the relation between methods and change in determinants is often difficult to document because even a careful reading of reviews and primary studies may be misleading. Often the authors draw the conclusion that a general type of program with a laundry list of methods brought about a change in behavior shows that the individual methods influenced their respective targeted determinants. Without evidence that the determinant was changed, however, the conclusion is not valid. For instance, although there may be data that school-based smoking prevention programs influence rates of smoking in adolescents, without information about changes in determinants, we don't have the ability to parse out whether specific methods influence adolescents' perceptions of norms or self-efficacy and enhancement of their refusal skills; and we can't link changes in these determinants to the behavior (Centers for Disease Control and Prevention, 1994; Dobbins, DeCorby, Manske, & Goldblatt, 2008; National Cancer Institute, 2010; Sherman & Primack, 2009; Substance Abuse and Mental Health Services Administration, 2010).

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## Impact on Change Objectives

The second task in this step is to write effect evaluation questions.

The third task is to write evaluation questions for changes in the determinants.

Next, moving to the left in Figure 9.1, the planner specifies expected changes in objectives from the matrices, that is, performance objectives and change objectives (see Chapter Five). The first questions concern behavior or environment and are derived from the performance objectives. For example, questions regarding the behavior of the emergency department physicians in the stroke example included the following: Did the physicians perform workups for stroke more quickly after the intervention than they had before? Did physicians order and read CT scans within the time by which treatment must start more often than they had before the intervention? In the HIV-prevention example, questions about behaviors included the following: Did the teens who received the program follow the preparatory steps for condom use more often than the teens who did not receive the program? Did the teens who received the program follow more of the preparatory steps than other teens?

Change objectives combine hypothesized determinants with expected performance, and both should be well specified and documented from Intervention Mapping Step 2. Planners can write evaluation questions looking at the change objectives by determinants (the columns of the matrices). In the HIV-prevention evaluation, the following evaluation questions were derived from the Intervention Mapping work on change objectives: Did the teens who participated in the program increase their knowledge of condom use as compared to teens who did not receive the program? Did teens who participated in the program increase their skills and self-efficacy as compared to teens who did not participate? The importance of the exploration of mediator and moderator variables to explain intervention effects is being widely discussed and demonstrated in the literature (Baranowski, Anderson, & Carmack, 1998; Baranowski, Klesges, Cullen, & Himes, 2004; Baranowski, Lin, Wetter, Resnicow, & Hearn, 1997; Baron & Kenny, 1986; Holmbeck, 1997; Mackinnon, 1994; Mackinnon et al., 2002). Intervention Mapping guides planners to make an explicit model of these variables throughout planning so that evaluators can analyze their relations to the outcomes in the presence of and without the intervention.

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## Program Process

The fourth task in Step 6 is to write process evaluation questions.

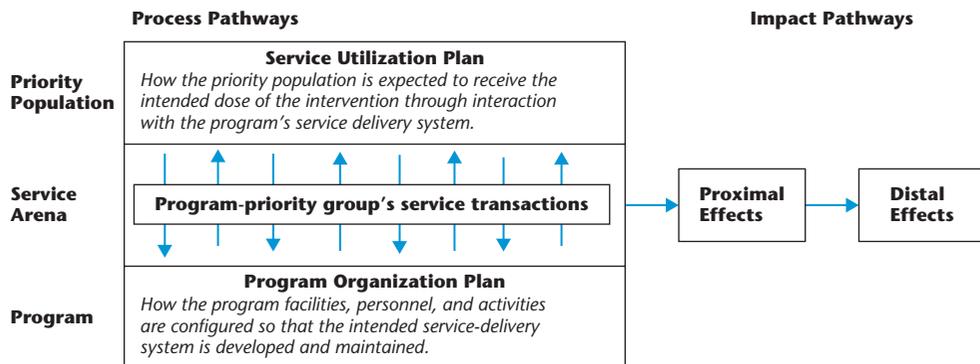
The next part of describing the program pathways is to look at the process components, specifically with a description of the intended interactions of the participants with the program. Measuring and attributing outcomes to a program, without insight into whether a program was delivered, what program was delivered, and how it was delivered, is a “black box evaluation” (Harachi, Abbott, Catalano, Haggerty, & Fleming, 1999; Patton, 2008). A black box evaluation contributes little to any field because the evaluator does not know why a program succeeded or failed. If a program was not successful, the cause could be in the program’s impact pathways (that is, the program’s theoretical methods and practical applications cannot cause the intended effects). Or it can be a problem with the process pathways. Patton (1997) offers one extreme example in which the effect of a parenting program was measured before and after the program and compared with a group that did not receive the program. When the results were presented to policymakers, they ended the program because of its ineffectiveness. Several years later the evaluators found that the program had never been implemented at all because of political sensitivities. This situation is an extreme, but not impossible, example of a black box evaluation. In comparison, an evaluation report that examines factors contributing to the failure to implement

a novel intervention can help make implementation for the next trial succeed (Bullock, Everett, Mullen, Geden, Longo, & Madsen, 2009; Dolan-Mullen, DiClemente, Velasquez, Groff, Timpson, Carbonari, & Nicol, 2000).

Rossi and colleagues (2004) call intended interactions with the delivery system of the program the program's service utilization plan, which are depicted in Figure 9.2. These interactions are the practical program applications in operation. They are the acting out of the methods that the program is intended to deliver to effect change, that is, actualization of the impact pathway. No matter how good the program's utilization plan is, if the interactions with the intended participants do not happen or do not happen according to the parameters necessary to make a method effective, the impact pathway breaks down.

The planner has a description of the intended interactions of the target group members with the program components and should also be able to describe the implementation plan for the program and the program inputs in terms of costs and other resources. Planners should know what theoretical methods they intend to deliver and how those methods were operationalized into deliverable applications with consideration of the important parameters for the methods. A word of caution: evaluators must remember to verify how the program is actually working in addition to knowing how it should be. Rossi, Lipsey, and Freeman (2004) suggest using both interviews and observations to ascertain what is actually happening in a program. For example, in the Cystic Fibrosis Family Education Program (CF FEP), the developers considered goal setting to be an important theoretical method in the program. However, implementers often delivered the program without setting goals with the patients and families (Bartholomew et al., 2000a).

**FIGURE 9.2 Overview of Program Pathways**



Source: Adapted with permission from Rossi, P. H., Lipsey, M. W., & Freeman, H. E. (2004). *Evaluation: A systematic approach* (7th ed., p. 140). Thousand Oaks, CA: Sage.

The process evaluation will carefully check all the decisions and assumptions that the program developers have made within Intervention Mapping Steps 2, 3, and 4. That information is essential for interpreting the findings of the effect evaluation. If the program fails to show an intervention effect, the process evaluation data can help determine why the program failed. A better understanding of why the program does not work can improve decision making about program modifications. It is very important to the field of health education and promotion that planners critically analyze programs that are not effective to learn from these programs and share the learning with other program planners.

Process evaluation has a place in both formative and summative evaluations and a place in both onetime evaluations and ongoing program monitoring. Process questions generally focus on two points: the amount of the program that is going to the intended participants and the fidelity of the program that is being delivered. Process evaluation can also include exploration of why programs are being delivered the way they are (that is, with or without sufficient quantity and fidelity). Because the focus of Intervention Mapping is on program development, health educators are also very concerned in process evaluation with determining if and to what degree the decisions they have made about program methods and practical applications were appropriate. Further, they want to ensure that the necessary parameters have been met as the methods and practical applications are translated into a program.

Looking at the process components of the program logic model in this way, first the planner needs a correctly implemented intervention (as stated in the adoption and implementation objectives in Chapter Eight), in which all the assumptions that were made in the methods and applications steps are realized (Chapters Six and Seven). Then the planner may expect changes first in the determinants and change objectives and then in behavior and environmental conditions. Finally, changes are expected in health outcomes and quality of life (as stated in the measurable objectives related to the health problem and the quality-of-life indicators in Chapter Five).

Linnan and Steckler (2002) describe the following key process evaluation components:

- Context: aspects of the larger social environment that may affect implementation
- Reach: the proportion of the intended audience to whom the program is actually delivered
- Dose delivered: the amount of intended units of each program component that is delivered
- Dose received: the extent to which participants engage with the program
- Fidelity: the extent to which the intervention was delivered as intended

- **Implementation:** an overall score that shows the extent to which the program was implemented and received
- **Recruitment:** a description of the approach used to attract program participants

Table 9.3 shows the plan for a process evaluation based on these dimensions. This is the initial plan for evaluating the process of a program intended to deliver a computerized telephone intervention to increase uptake of colorectal cancer screening in veterans.

### Fidelity and Reach

To formulate process questions, the planner must first fully describe the program that should be delivered. What is each program component? What are the program support materials? What is entailed in complete and acceptable delivery

**Table 9.3 Process Evaluation Indicators and Proposed Measurement**

Components	Indicators	Method
1. Context	Changes in Veterans Administration (VA) colorectal cancer screening (CRCS) guidelines or veterans' access to health care VA's organizational capacity Participant exposure to non-VA CRCS health promotion efforts	Communication with VA staff Tracking CRCS guidelines and reimbursement policies, CRCS demand and VA's ability to meet demand, VA CRCS programs, materials, and policies
2. Reach	Percentage of the intended participants who used the program	Project records during the delivery period
3. Dose delivered	Tailored phone number and length of completed calls and booster sessions	Project records during the delivery period, including phone counselor checklists and telephone counseling system-generated reports
4. Dose received	Percentage calling to request educational materials Attention, remembrance, understanding, and credibility Time and effort spent thinking about the messages	Toll-free phone records Participant recall and reaction to intervention Interviews with random sample of those getting CRCS and those not getting CRCS
5. Fidelity	Degree to which the message is linked to theoretical methods and practical applications and to determinants Match of message to stage of change	Narrative analysis of message concept booklets against Intervention Mapping matrices, intervention scripts and flow-charts, checklists, and transcripts of conversations

of the program? How should the program methods be translated in order to ensure that they produce change? For example, a program might include four meetings with individual families whose children with diabetes were experiencing frequent high blood sugar. A description of the program would include the specifications that the meetings would follow a defined schedule of a meeting every two weeks for two months. Each of the meetings would follow a format in which a self-management problem is delineated and problem-solving steps are used to address the problem.

Process evaluation questions related to the program reach would include the following (Glasgow et al., 1999; Rossi et al., 2004):

- What proportions of the intended groups are participating in the program? Which groups are underrepresented?
- Are any persons who are not members of the intended groups participating in the program? How many? Do any of them suggest new groups that should be included?
- How much of the program are intended participants receiving? What are the patterns of incomplete doses? What are the main causes?

Process evaluation questions related to fidelity could include questions related to both the program utilization plan and the program organization plan. Questions related to the program organization include the following: Are the type of staff delivering the program those specified in the plan? Do the staff have available program materials? Is time scheduled for the program? Questions related to utilization include these: Is the protocol followed in program delivery? How often are the protocol or parts of the protocol omitted? Which parts are omitted?

Inherent in any process evaluation are performance standards, the minimum level of performance described by experts in a special area (Windsor, Baranowski, Clark, & Cutter, 1994). In the diabetes example just discussed, the program manager could express performance standards or acceptable levels of adherence to both the visit schedules and the protocol elements within the visits. Windsor and colleagues suggest creating an implementation index that combines the reach of the program with the performance standard. Using a process evaluation example from Windsor (2003), we added fidelity measures and program maintenance measures and created Table 9.4. In the hypothetical diabetes program, staff selected 75 children with poor blood glucose control for the program. Their parents were notified of the new program and encouraged to enroll. Those who enrolled were invited to counseling sessions every two weeks for two months. The performance standards were that 80% of those invited enrolled and that the proportion completing each session showed no more than a 5 percentage point loss from the session before. The implementation index for program reach was calculated

**Table 9.4 Hypothetical Process Evaluation of Diabetes Counseling Program**

Procedures	Eligible (A)	Exposed (B)	Percent Reached (B/A) = C	Performance Standard for		Implement: Reach Index C/D = E	Percent of Protocol Followed* Cf	Performance Standard for Fidelity Df	Implement: Fidelity Index Cf/Df = Ef
				Reach D	Reach D				
Screening for poor control	200	200	100	80	80	1.20	NA	NA	NA
Enrollment contact	75	75	100	100	100	1	63	80	.79
Counseling session 1	75	70	93	95	95	.98	72	80	.90
Counseling session 2	75	67	89	90	90	.99	80	80	1.
Counseling session 3	75	60	80	85	85	.94	62	80	.78
Counseling session 4	75	59	79	80	80	.99	64	80	.80
Counseling session 5	75	58	77	75	75	1.03	70	80	.88
Counseling session 6	75	55	73	70	70	1.04	62	80	.78
Screening for poor control	125	125	100	100	100	1.20	NA	NA	NA
Enrollment contact	25	25	100	100	100	1	72	80	.90
Counseling session 1	25	18	72	95	95	.76	72	80	.90
Counseling session 2	25	16	64	90	90	.71	80	80	1.
Counseling session 3	25	15	60	85	85	.71	79	80	.99
Counseling session 4	25	14	56	85	85	.66	70	80	.88
Counseling session 5	25	14	56	85	85	.66	70	80	.88
Counseling session 6	25	14	56	85	85	.66	71	80	.89

\*Average percent across all Family sessions initial implementation

by dividing the proportion reached by the performance standard. In addition, the manager set the standard that 80% of the program's intended characteristics should be met in each counseling session. Table 9.5 shows the observation sheet for implementation characteristics that the manager used to judge the implementation. The implementation index for fidelity was calculated by dividing the proportion of implementation guidelines adhered to by the performance standard.

In addition, the manager, concerned that program implementation might change over time, extended the process evaluation table to include implementation beyond the first 75 children (the bottom half of Table 9.4). In the continuing implementation, not as many children were eligible because most of the children who had less than adequate control were recruited and participated initially. However, there were some newly eligible children and also some children whose parents had dropped out of the program in the first phase. As can be seen in Table 9.4, that group was somewhat more difficult to involve, and reach was not as good. On the other hand, the manager had tightened the training requirements for the staff who implemented the protocol, and the fidelity index improved. The performance standard column of Table 9.4 is the average across all families of the proportion of implementation criteria met in each session. Table 9.5 indicates clearly that the checklist represents both implementation

**Table 9.5 Implementation Checklist for Counseling Sessions**

The Counselor:	Present	Absent
1. Asks how the family has been since last session or from intake	<input type="checkbox"/>	<input type="checkbox"/>
2. Establishes or reviews goal statement	<input type="checkbox"/>	<input type="checkbox"/>
3. Reviews progress on each step of the problem-solving framework, or if first session teaches framework	<input type="checkbox"/>	<input type="checkbox"/>
4. Reviews data collected or presents forms for self-monitoring	<input type="checkbox"/>	<input type="checkbox"/>
5. Reinforces approximations to the problem-solving steps	<input type="checkbox"/>	<input type="checkbox"/>
6. Shows video sequence with role-model story	<input type="checkbox"/>	<input type="checkbox"/>
7. Has the family practice appraisal	<input type="checkbox"/>	<input type="checkbox"/>
8. Has the family practice generation of alternative solution strategies	<input type="checkbox"/>	<input type="checkbox"/>
9. Has the family practice evaluation of alternative strategies	<input type="checkbox"/>	<input type="checkbox"/>
10. Elicits the family's thoughts and feelings about the process	<input type="checkbox"/>	<input type="checkbox"/>

Percent of protocol followed equals number from the "Present" column divided by 10.

guidelines and attention to the detail of how the health educator planned that methods such as role modeling would be operationalized.

In the HIV-prevention program evaluation, Paulussen, Kok, Schaalma, and Parcel (1995) asked teachers about program adoption and use (Table 9.2). For instance, they asked about familiarity with the program and whether the teachers used the program in the previous year. In addition to observation, the researchers assessed fidelity with the question, How did you use the program? Teachers could answer with the following choices: “took some ideas,” “took many ideas,” “as a guiding principle,” “followed most of the instructions,” “followed the instructions completely.” The teachers were also asked, “Have you used other materials along with the program materials?”

### Reasons for Fidelity and Reach

In the next part of the process evaluation, the evaluator will want explanatory data for the extent and fidelity of implementation. What barriers were there for implementation? For example, in the CF FEP evaluation of program diffusion and implementation, the evaluators found that the program was implemented with only moderate fidelity. A major reason for the lowered fidelity was the lack of skills of program implementers to engage in the goal-setting process (Bartholomew et al., 2000a). In the HIV-prevention program evaluation (Schaalma et al., 1994, 1996), teachers were also asked questions or presented with statements that could explain implementation failure, such as this: “Is AIDS prevention a structural part of your curriculum?” “The program is sufficiently flexible to be used in classes with substantially different subgroups (ethnicity, sexual experience).” Based on teachers’ responses to the questionnaire, Schaalma and colleagues interviewed them a second time to better understand implementation barriers.

### Methods and Practical Applications

Questions related to the decisions made in program planning, that is, questions about program methods and practical applications and their operationalization, have been addressed to some extent in the pretesting and formative evaluation of the program (see Chapter Seven). The only difference is that now the planner can test the intervention in its final form and its final setting instead of in a provisional form and in a simulated setting. Again, evaluators do not deal with effects here but with judgments, such as satisfaction, positive emotional reaction to the materials, an understanding of the message, self-reported responses to the messages, and opinion about whether the program was of help.

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## Selecting and Developing Measures

The fifth task in Step 6 is to develop indicators and measures.

The development of measures will be guided by the matrices developed in Step 2 (Chapter Five). A planner usually sets program objectives that are stated in terms of health status, functional status, behavior, environment, and determinants. These objectives may specify an amount of change and a time frame, but they usually do not specify an indicator of the change. The first task in determining an indicator is to define the construct being measured. For example, a program objective may be to increase the functional status of elementary school children with asthma by 25% in two years. An evaluation question may be: How much did the functional status of elementary school children with asthma change? Now the problem is, What is an indicator of functional status in children that can be measured in a program evaluation? The construct of functional status can be defined as the ability to conduct normal activities of daily living unlimited by disease. Children are usually not limited by disease if they can attend school, can have achievement congruent with aptitude, and can engage in playtime and physical activity with other children. Thus, indicators of functional status in children with asthma could be number of school days attended, grades, achievement, participation in physical education, and time spent playing after school.

A measure is a device for quantifying or categorizing an indicator. A measure usually entails applying numbers to indicators. For example, an evaluator interested in grades achieved could measure this construct in many different ways. A measure could be a year-end achievement test, an average of numerical grades achieved in all subjects, an average of numerical grades achieved in math and language arts (core subjects), and so forth. Likewise, the other indicators of functional status can be measured in numerous ways. Using the asthma program objective from the previous paragraph, the indicator of participation in physical education could include the number of days the child attended school, the number of days without a doctor- or parent-excused absence, time spent in moderate to vigorous movement, and so forth.

This section presents some guidelines for defining constructs from Intervention Mapping and for developing the measures of the constructs. However, advice on measurement theory and on the ways that other evaluators have measured similar constructs must come from the measurement literature (DeVellis, 1991, 2003) and from the literature on a specific construct.

## Reliability and Validity

Validity in measurement basically means that the evaluators are measuring the construct they think they are measuring. Rossi and colleagues (2004) describe demonstrations of validity as depending on a comparison that shows that the measure “yields the results that would be expected if it were, indeed, valid” (p. 220). Examples of these comparisons are the following:

- When the measure is used with other measures of the same variable, results should be the same.
- When the measure is applied in situations thought to be different on the variable, the results should be different.
- Results on the measure are correlated with other characteristics expected to be related to the outcome.

If planners have used Intervention Mapping carefully, they have clearly specified the health, quality-of-life, behavioral, environmental, and determinant constructs that will eventually be measured and have provided a good basis for beginning to establish validity. Intervention Mapping Steps 3, 4, and 5 also provide the basis for clarity about what the program is and how it is to be implemented, constructs that will be important in process evaluation.

Reliability, on the other hand, is stability in measurement. If evaluators measure the same construct at two points in time, or if two different observers record the same event, will they get the same answer? Reliability concepts include consideration of sources of error. For example, a child may understand questions about asthma symptoms or self-efficacy or any other construct differently at two points in time based on the question’s complexity, a distraction in the environment, or help received. Reliability can also be diminished through procedural problems, such as asking the question in different ways or transcribing data inaccurately.

Intervention Mapping contributes much less to the consideration of reliability of measurement than to validity questions, and again we refer the reader to the evaluation and measurement literature (DeVellis, 2003).

## Selecting Versus Creating Measures

Often health educators request instruments from researchers because they are looking for valid and reliable measures with which to evaluate their interventions. These requests always bring forth the question of how close a match is the instrument under consideration to the specification of the construct they are trying to measure. Certainly, considerable effort goes into the development and

**Table 9.6 Comparison of Domains of Asthma Knowledge**

Published Measure Domains	Domains Underlying the Program to Be Evaluated
<ul style="list-style-type: none"> <li>• Anatomy of the respiratory system</li> <li>• Physiology of asthma</li> <li>• Causes of asthma exacerbations</li> <li>• Rescue and control medicines for asthma</li> </ul>	<ul style="list-style-type: none"> <li>• Monitoring asthma symptoms</li> <li>• Figuring out personal triggers</li> <li>• Using an asthma action plan</li> <li>• Managing an episode</li> <li>• Staying in control</li> </ul>

pilot testing of measures, but even a highly reliable measure will do an evaluator no good if it is not valid for the intended measurement purpose. In a hypothetical example, an evaluation team wanted to assess whether a program has met its goal of increasing asthma knowledge among school-age children; it must decide whether to use an existing measure or to create one. The team looked at a recently published report of a measure of asthma knowledge for children. It has good reported internal consistency and test-retest reliability. It also was found to be sensitive to pretest and posttest program change. Should the team use that measure? Well, that depends. What does it measure? It is possible that an instrument could measure a very broad construct of asthma knowledge without the specification of the construct matching what the asthma team needed. What were the items on the measurement blueprint from which the items for the measure were sampled? What domains of asthma knowledge do they represent? How well do the domains and items match the knowledge that was taught in the program the team is assigned to evaluate? Table 9.6 represents the domains of asthma knowledge in which the evaluators were interested, as compared to the domains reported in the published article. There is not a good match; therefore, the published measure is not appropriate for the new purpose. This point about validity to the purpose will become even clearer as we describe measurement development from Intervention Mapping in the next section.

## Outcome Measures

In the planning for the effect evaluation, evaluators will have stated questions related to program impact on quality-of-life and health problems from the measurable objectives the planners defined in the needs assessment. They also will have stated questions related to change in behavior and environmental conditions that are thought to have an impact on quality-of-life and health problems, and they will have identified questions related to the hypothetical

determinants that must be changed in order to have an impact on behavior and environment. The evaluators' next task is to develop indicators and measures that will enable them to generate answers to each of the questions.

## Determinants

Change objectives are the most specific objectives for program development and for effect evaluation. Using the same principle as in intervention development, the evaluator organizes the change objectives by determinant to create a blueprint for each measure related to evaluation questions concerning change in determinants. For example, if there is an evaluation question about change in knowledge, then the change objectives for knowledge (the knowledge column in a matrix) can be used as a blueprint for measuring knowledge. Looking at the columns of a matrix as blueprints for measuring a construct in the specific way it was used for program development is a good way to begin developing construct validity for the specific evaluation purpose. Thus, the indicators for program evaluation are the determinants specified in Step 2, and the change objectives linked to each of the determinants serve as the basis for items in a scale to measure the determinants. The program evaluator then constructs scales for each of the determinants following the measurement conventions typically applied to the specific type of determinant. For example, if change objectives for adolescents in a program to prevent sexually transmitted infections (STIs) included self-efficacy for performance objectives related to condom acquisition, use, negotiation, disposal, refusal, and so on, then the blueprint includes self-efficacy change objectives for all these behaviors. However, the evaluator must go to the literature on self-efficacy to determine how the construct is typically measured and use this literature as a guide for developing the actual instrument (Basen-Engquist et al., 1999; Forsyth & Carey, 1998; Maibach & Murphy, 1995; Maurer & Pierce, 1998). The evaluator should also consult an original source regarding the construct and its measures, in this case Bandura (1997).

The Familias matrix presented in Chapter Five can be used as another example. To devise measures of determinants of asthma management, the evaluator can look down the columns on the matrix (Table 5.8) for change objectives related to determinants such as knowledge (“Describe possible symptoms of asthma”; “Identify patterns of asthma symptoms over time”) and self-efficacy (“Express confidence in identifying symptoms and environmental conditions”; “Express confidence in being able to notice symptoms”; “Express confidence in being able to link symptoms to exposures”). For every change objective in a column, the evaluator may formulate one or more questions. To measure knowledge,

for example, the evaluator may ask directly, “What are the symptoms of asthma?” and provide people with a list of alternatives or ask an open-ended question.

## Behavior and Environmental Conditions

Most health problems have a combination of behavioral and environmental causes. Sometimes it is easy to choose a behavioral evaluation objective, for instance, the consistent use of a child restraint device to prevent serious injury to the child in case of a car crash. Often the decision is more complex; for example, there are many components to a healthy diet to prevent cardiovascular diseases. One behavior evaluation objective could be a reduction of fat intake by consumers; an environmental condition evaluation objective could be the industry’s reduction of the percentage of fat in some popular foods. The best indicator for behavior is the list of performance objectives for behavior changes in Intervention Mapping Step 2, and the best indicator for environmental conditions is the list of performance objectives for environmental changes, also in Step 2.

From the list of performance objectives, measurement items can be selected based on the objective’s importance, pilot testing of the measure, statistical analyses such as factor analysis, and feasibility of administration. The evaluator should make sure to select items that represent all domains of objectives and that domains are not underrepresented after the planners have tested the measure and deleted poorly performing items.

For example, based on Project SPF’s needs assessment of sun exposure in young children, a number of behaviors for parents and teachers (the child’s interpersonal environment) were identified to reduce sun exposure for the child (Tripp, Herrmann, Parcel, Chamberlain, & Gritz, 2000). The following behaviors were chosen for parents and teachers in the children’s interpersonal environment:

- Apply SPF 15+ to children before their exposure to the sun
- Reapply SPF 15+ sunscreen to children when no longer effective (every 1.5 to 2 hours, or after swimming or profuse sweating)
- Dress children in protective clothing, such as hats, sleeved shirts, long shorts, and sunglasses
- Direct children to play in shaded areas

Measurement of these behaviors might best be conducted by observation. However, they could also be measured by self-report of behavior or intentions, for instance, “I (plan to) apply sunscreen (SPF 15 or higher) to my child at least 30 minutes before going outside” (with answer categories of “always,”

“frequently,” “sometimes,” “rarely,” and “never”), and “I (plan to) reapply sunscreen to my child every 1.5 to 2 hours after the child has been swimming or sweating profusely” (with the same answer categories).

These five behaviors related to sun exposure can be described in more detail that identifies performance objectives. For example, the performance objectives for the first behavior, “Apply sunscreen (SPF 15 or higher) to child at least 30 minutes before child goes outside” are the following:

- Purchase or obtain sunscreen (SPF 15 or higher)
- Spread sunscreen evenly
- Cover all exposed areas from head to toe

In order to measure the behaviors (or intentions) in more detail, questions about these performance objectives could include, “I (plan to) purchase or obtain sunscreen (SPF 15 or higher)” (with answer categories of “always,” “frequently,” “sometimes,” “rarely,” and “never”), and “I (plan to) spread sunscreen evenly over my child” (with the same answer categories).

These questions are examples of a self-report approach to measuring behavior. When evaluators use self-report measures they should, when feasible, validate them against observation. In the sunscreen example, parents may think that they apply the sunscreen correctly, but they do not; or parents may answer the questions in a socially desirable way so that they make a good impression on the researchers, when in fact their behavior is different from what they report. Observing the actual behavior—for example, of the parents in the sunscreen program—may be a necessary additional measure of behavior.

Observation may be necessary for testing the validity of self-report questions in a pilot test. Then, if there is a large discrepancy, either observation should be used or, if that is not feasible, the evaluators can test methods of improving self-report (Aday, 1996). Such methods include the “bogus pipeline” in which those providing self-report are informed that they may be observed or some other source of verification may be used (Roese & Jamieson, 1993). Another option is to include response options that are socially more desirable than the target behavior (Mullen, Carbonari, & Glenday, 1991; Mullen, Carbonari, Tabak, & Glenday, 1991).

For some behaviors the measurement issues and methods are very complex and will require the program evaluator to become knowledgeable about the scientific basis for their measurement. For example, behaviors such as smoking (Prokhorov et al., 1993), nutrition (de Moor, Baranowski, Cullen, & Nicklas, 2003; McPherson, Hoelscher, Alexander, Scanlon, & Serdula, 2000; Thompson & Byers, 1994; Warneke, Davis, De Moor, & Baranowski, 2001), and physical activity (Masse et al., 1998; Pereira et al., 1997; Sidney et al., 1991; Treuth et al., 2004) have established and tested standardized instruments or methods

for measurement. Many government agencies and institutes have developed compendia of measures on their health and behavior issues. The National Institute on Alcohol Abuse and Alcoholism (NIAAA) and the Division of Cancer Control and Population Science at the National Cancer Institute both have good examples (Division of Cancer Control and Population Sciences, National Cancer Institute, 2007; National Institute on Alcohol Abuse and Alcoholism, n.d.). For each of these behaviors, there is extensive scientific literature on measurement. The program evaluators will need to review this literature and decide whether existing measurement tools match well with the stated performance objectives. If several options are available, then the decision will be to choose the one that best fits the performance objectives and program participants. If there is not a good fit with the performance objectives, then the evaluators may find it necessary to develop new questions or instruments to measure the behaviors. The design of reliable and valid instruments to measure the evaluation objectives is beyond the scope of this chapter; however, readers can use several texts to help guide them (DeVellis, 1991; Mahoney, Thombs, & Howe, 1995; Osterlind, 1989; Tryon, 1985; Windsor et al., 2003).

## Health and Quality of Life

The primary source for deciding what to measure to determine whether the health promotion program had an effect on health is the needs assessment (Chapter Four). In the needs assessment, the program planners identified the health conditions that contributed to poor quality-of-life outcomes and were caused by behavior and environmental conditions. The needs assessment led to the statement of measurable objectives for health and quality-of-life outcomes. Choosing measurable evaluation indicators that are related to the health problem, as was done in the needs assessment, can be simple or difficult. In an example of fireworks injuries on New Year's Eve, a reasonable health outcome indicator is injuries caused by fireworks. In an example of patient education for chronic diseases, a health outcome indicator could be a reduction in emergency visits to the hospital, which also can be accomplished in a fairly short time frame (Mesters, van Nunen, Crebolder, & Meertens, 1995). However, in cancer prevention, establishing a health outcome indicator is more difficult. A reduction in cancer morbidity and mortality could only be described over an extended time period (10 to 25 years or more). Therefore, the best short-term indicators for cancer morbidity and mortality are probably to be found in behavior changes, such as smoking and diet, and not in health outcomes.

Sometimes evaluators can identify indicators for the health problem that are measurable at an earlier stage. AIDS diagnoses, for example, follow the infection after about 10 years, but a measurable short-term indicator would be a reduction

of cases of HIV infection after a limited number of years, depending on the intervention. An alternative would be to use STI cases as a proxy indicator. For cardiovascular diseases, indicators could be serum cholesterol levels, blood pressure, and weight. However, the consensus on these indicators is not always strong. Moreover, many health education programs are directed at younger people, anticipating effects on future behavior, which means that the health outcome evaluation objectives are all long-term objectives. Once the indicators are selected, the evaluator develops a protocol for measurement. For example, a typical protocol for the measurement of lung function would include the daily calibration of the spirometer, the performance of three measures, and the use of the best score.

The selection of indicators for the measurement of quality of life is also based on the needs assessment. In the needs assessment, program planners identified specific outcomes that they considered to be the consequences of the health problem or the behavioral factors and environmental conditions (see Chapter Four) (Green & Kreuter, 2005). The indicators may be stated at the individual level, such as days lost from work, levels of happiness, self-esteem, and alienation; or at a societal level, such as crime, crowding, discrimination, and unemployment. Thus, measurement can be made by collecting data from the population to evaluate the program outcomes for individuals as well as by collecting data from organizations or governmental agencies that track potential social indicators of quality of life. The field of quality-of-life measurement is developing at a fast pace, concurrent with the incorporation of this type of measurement into many clinical trials. In the public health field, quality of life has increasingly been considered as an important outcome for health promotion and disease prevention programs (Glasgow et al., 1999; Hennessy, Moriarty, Zack, Scherr, & Brackbill, 1994). Recently, extensive efforts have been directed at developing measures of quality of life that are especially relevant to and sensitive to health-related factors. The CDC has developed indices for health-related quality of life (HRQOL) based on a series of survey questions that are used in the Behavioral Risk Factor Surveillance System (Jiang & Hesser, 2008; National Center for Chronic Disease Prevention and Health Promotion, 2005). The advantage of using a standard measure of quality of life, such as the HRQOL measure, is that results from one study or program evaluation can be compared with data from the Behavioral Risk Factor Surveillance System or to findings from other studies. Such a comparison allows the program evaluators to know how quality-of-life indices for their population compare to those of other populations and allows evaluators to determine whether quality of life improves as a result of the program. The disadvantage of a standardized measure of quality of life is that it may not be specific to the health problem that the program addresses and therefore not sensitive to change even if the health outcomes do improve.

The measurement of quality of life has important time-related factors that need to be considered when developing a program evaluation model. The time needed to detect an improvement in quality-of-life outcomes, as in health outcomes, may be long after the health promotion program takes place, especially for broad societal measures that may require decades of intervention to make a difference. Some of the individual-level indicators, such as happiness or days lost from work, may be more sensitive and therefore measurable within the time frame for evaluating the health promotion program. The point is to select those measures of quality of life that are sensitive to change within the time period allocated to evaluate the program's effectiveness.

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## Design Issues

The final task in this step is to specify evaluation design.

### Qualitative Methods for Process Evaluation

Qualitative research paradigms range from an inductive method (Charmaz, 2006; Strauss & Corbin, 1990) that uses grounded theory, in which theoretical propositions emerge from the empirical research, to a deductive approach (Miles & Huberman, 1994; Yin, 2003), which uses conceptual models of the objective world and pattern matching. Qualitative methods include the case study, focus groups, interviews, observations, document review, and open-ended questions on surveys.

The data obtained using qualitative methods must stand up to scrutiny in terms of reliability and validity. Qualitative study designs must enable the accumulation of valid and reliable observations. Reliability has been defined as the extent to which the same observational procedure in the same context yields the same answer however and whenever the procedure is carried out (Kirk & Miller, 1986). Other approaches to reliability emphasize dependability or auditability, meaning that other researchers can follow the decision trail of the original investigator (Lincoln & Guba, 1985). Validity is viewed as the truth value or credibility of the findings. Credibility is increased through prolonged engagement; through the investment of sufficient time to understand the phenomenon being studied; through persistent observation to understand what aspects of the situation are most relevant; and through triangulation of sources, methods, investigators, and theories. Other techniques include peer debriefing and checks by team members (Lincoln & Guba, 1985). Construct validity can also be viewed as the relation between the conceptual model being studied and

the evidence collected in the field (Yin, 2003). A study of a human experience is credible when people who have had the experience can recognize the description as their own or when those who have not had the experience can recognize it even though they have only read the study (Mullen, 1986; Sandelowski, 1986). Internal validity, which relates to causal relationships in quantitative methods, is closely related to truth value and credibility. Yin suggests the techniques of pattern matching and explanation building to enhance internal validity.

Gottlieb, Lovato, Weinstein, Green, and Eriksen (1992) used focus groups, structured interviews, and written comments of surveys to identify factors associated with the implementation of a restrictive worksite smoking policy. They used a conceptual model in which the smoking policy concept and organizational context produced an implementation process, including communication, administrative procedures, and management support, which resulted in intended and unintended outcomes. A quantitative survey assessed exposure of communication regarding policy, beliefs, policy-related behaviors, and tobacco use among employees. The triangulation of these methods enabled the investigators to gain a clearer understanding of the policy implementation and impact.

### The Purpose of Designs for Effect Evaluation

The purposes of designs for process evaluations and for effect evaluations are different. In an effect evaluation, the purpose of the design is to enable the evaluator to answer two questions:

- How do indicators of desired program effects compare before and after the program?
- Can changes noted be attributed to the intervention being evaluated?

The first question requires a design in which the evaluators measure program outcomes before the program implementation (usually referred to as baseline or pretest measures) as well as after the program has been conducted (follow-up or posttest measures). Sometimes multiple follow-up measures are made to monitor how long it takes for change to take place or how long change is sustained once it does occur (Shadish et al., 2002). Multiple pretest measures can help establish a picture of any trends occurring that might distort conclusions about the effects of the program.

However, change in the outcome measures over time may result from influences other than the health promotion program being evaluated; these call for the second question and the need for designs that include a comparison group. For example, if a smoking-cessation program is implemented and evaluated

during the same period as a national trend in reduced rates of smoking, the possibility exists that the observed evaluation outcomes are the results of secular trends rather than the program interventions. Therefore, the evaluator also needs to know whether there is a difference between people participating in the program and those not participating. This added feature leads to a design containing pre- and postprogram measures in exposed and nonexposed groups. An important methodologic principle in program effect evaluation is ensuring comparability between treatment and control groups on as many factors as possible that may influence the outcomes of interest. This principle is most easily adhered to by using an experimental design with random assignment of participants to the intervention group and a control group. However, it can also be accomplished with several quasi-experimental designs in which the treatment group is compared to itself at more than two time points or is compared to another group that is not defined by random assignment (Shadish et al., 2002).

In health education practice, randomly assigning individuals is often impossible. For instance, students from secondary schools cannot randomly be assigned to a school program or a control program, because the program is schoolwide or at least classwide. In that case it is possible to randomly assign units to the program condition or the control condition. When randomization of individuals or units (that is, schools, clinics, worksites, communities) is not possible, quasi-experimental designs allow the evaluator to compare two or more groups that are as similar as possible. Evaluators have to expect that the groups are not completely equivalent, meaning not completely comparable on a number of relevant characteristics, and evaluators cannot even assume that they know all the relevant characteristics. Statistically, evaluators can control for most of these differences, but only when the differences are measured before the program starts (Schaalma et al., 1996; Shadish et al., 2002, for an example). We encourage the reader to consult texts on program evaluation (Moerbeek, van Breukelen, & Berger, 2003; Rossi et al., 2004; Senn, 2007; Shadish et al., 2002; van Breukelen, 2006; Windsor et al., 2003; Winkens, Schouten, van Breukelen, & Berger, 2006) for more specific guidance on selecting a design for program evaluation.

Whether evaluators use a random assignment or a quasi-experimental design, they sometimes want to find out whether their intervention is more successful than the standard program or practice. In this situation the control or usual care comparison is not a condition without a program but a condition with the usual program. The evaluators are estimating program effects for the new program compared to usual care or practice. This is a main idea behind “comparative effectiveness” studies in medicine (Slutsky & Clancy, 2010). This group is usually called a comparison group rather than a control group. Randomized experimental design using these two groups provides the strongest

basis for straightforward answers to the question: Did the program have an effect? However, an experimental design for program evaluation is not always possible and not always the preferred design for all program evaluations (West, 2008).

## The Evaluation Plan

An evaluation plan includes the evaluation questions, design, indicators and measures, and timing of the measures. The plan should also include a description of how the evaluator will analyze and present the resulting data to the stakeholders. In addition, the evaluation plan contains a study protocol describing the primary outcome, the chosen statistical analyses, sample size calculations, how to handle drop-outs, and so forth (Senn, 2007). Reporting guidelines such as the Consolidated Standards of Reporting Trials (CONSORT) Extension for Non-Pharmacologic Treatment Interventions explanation and elaboration document provides excellent guidance for the evaluation plan from the standpoint of what journals will expect the evaluation report to contain (CONSORT, 2008). Finally, the plan should outline the resources required to conduct the evaluation.

Table 9.7 provides an outline for the evaluation plan and includes examples from the school HIV-prevention program that was presented in the discussion of evaluation models earlier in this chapter (Schaalma et al., 1994, 1996). The evaluation plan should contain details about how the evaluation will be carried out: what data will be collected, who will collect it, what resources will be needed, and how the data will be analyzed and reported. For example, the plan in Table 9.7 suggests that a survey instrument will be developed that includes scales to measure the personal determinants of knowledge and self-efficacy and questions to measure the performance of using a condom. The survey will be administered to subjects in an intervention group and a control group both at baseline before the intervention and at follow-ups six months and one year after the intervention. An observation instrument will be developed and used to measure an increase of condom machines in locations where adolescents have access and to measure the placement of posters that serve as cues for using condoms. Finally, health department reports on STI cases in adolescents will be used as a proxy measure of HIV infections at three, four, and five years following the intervention's implementation. The plan also includes the decisions not to measure quality of life, because the time period would not allow for HIV prevention to have an impact, and not to measure skills, because developing a reliable and valid measure of skills that could be applied to a large number of people would be difficult.

**Table 9.7 Evaluation Plan Summary—School HIV/AIDS Prevention Program**

Evaluation Questions Variables and Proposed Design	Data Collection Timing and Resources			
	Measures	Sources	Data Analysis	Reporting
<b>Process Evaluation Plan</b>				
<i>Adoption</i>				
Awareness	Survey	Teachers	Prior to program, project research assistant (RA)	Frequencies Report to the linkage system
Agreement to conduct program	Record review	Project records	Prior to program, RA	Frequencies Report to the linkage system
Participation in teacher training	Observation	Teacher training	Prior to program, RA	Summary memos on observations Report to the linkage system
<i>Implementation</i>				
Lessons completed	Teacher records	Teachers	During program, RA	Frequencies To the development team, scientific literature, schools, funder (each implementation indicator)
Activities executed	Observation	Research staff	During program, RA	Frequencies
Time/lesson	Surveys	Students	During program, RA	Means
Scheduling of lessons	Interviews	Teachers	During program, RA	Means and summary memos
Use of video	Surveys	Students	After program, RA	

(Continued)

**Table 9.7 (Continued)**

Evaluation Questions Variables and Proposed Design	Measures	Sources	Data Collection Timing and Resources		Data Analysis	Reporting
			Intervention Assumptions	Frequencies		
User evaluation	Surveys	Teachers	1 week following program, RA	Frequencies	To the research team, scientific literature, schools, funders, and participants (all intervention assumption indicators)	
User evaluation	Interviews	Students	1 week following program, RA	Comment summaries		
Participant exposure	Surveys	Students	1 week following program, RA	Means		
Method and strategy assumptions	Content analysis	Materials and lesson review	Before program, project team leaders	Table of content analysis		
<b>Effect Evaluation Plan</b>						
<i>Quality of Life</i>						
QOL Health	Not measured	NA	NA	NA	NA	NA
HIV infection	Not measured	NA	NA	NA	NA	NA
AIDS cases	Not measured	NA	NA	NA	NA	NA
STI cases	Health Department Registry of STIs	Health Department Surveillance	Baseline and years 3, 4, 5	Change in pre- and postintervention incidence rates compared between groups	To research team, schools, funders, scientific literature, and participants	

<i>Behavior</i>				
Condom use	Survey questions	Intervention and control groups	Baseline, 6-month, and 1-year follow-ups	Pre- and postintervention change scores compared between groups  To research team, schools, funders, and scientific literature (behavior and environmental condition)
<i>Environmental Condition</i>				
Availability of condoms (condom machines)	Observations	Businesses	Baseline and 1-year follow-ups	Pre- and postintervention change scores compared between groups
<i>Determinants</i>				
Knowledge and self-efficacy	Knowledge and self-efficacy scales	Intervention and control groups	Baseline, 6-month, and 1-year follow-ups	Pre- and postintervention change scores compared between groups  To research team, schools, funders, scientific literature, and participants
Cues	Observation	Schools	Baseline, 6-month, and 1-year follow-ups	Pre- and postintervention change scores compared between groups
Skills	Not measured	NA	NA	NA

## BOX 9.2

### STROKE PROJECT

Figure 9.3 is the final logic model for the stroke project. It enabled us to review all of the possibilities for asking evaluation questions. Because this was a pilot project with limited funding, we were unable to complete an evaluation of all aspects of the project. In this part of the stroke example, we indicate the evaluation questions we asked and answered, in addition to those that we would have addressed if a more complete evaluation had been possible.

#### Evaluation Questions

- The first task in the evaluation step is to review the logic model.
- The second step is to describe program outcomes for quality of life, health, behavior, and environment and to write objectives and evaluation questions.

We did not ask evaluation questions about health status and quality of life. These questions had been addressed in the trials of the stroke treatment, recombinant tissue plasminogen activator rtPA. Had we asked this level of evaluation questions, they would have concerned decreases in disability and case fatality rates from stroke. However, we asked both process evaluation questions and questions regarding behavior. We present the tasks related to asking and answering these questions together in this section.

- The next task in the evaluation step was to write questions based on the matrix.
- Another task is to write process evaluation questions based on the descriptions of methods, conditions, practical applications, program, and implementation.
- A final task covered in this section is to develop indicators and measures.

We also did not ask evaluation questions based on the change objectives and determinants because the cost was too high. These questions would have concerned change in the determinants of knowledge, skills, self-efficacy, outcome expectations, perceived social norms, and reinforcement.

The major focus of this evaluation was in changes in behavior of community members and the health care environment. See the evaluation plan in Table 9.8. The questions concerned whether the program decreased the time between stroke onset and arrival at the emergency department and whether stroke patients received treatment.

**FIGURE 9.3 Intervention Logic Model for Evaluation: Behavioral and Environmental Outcomes**

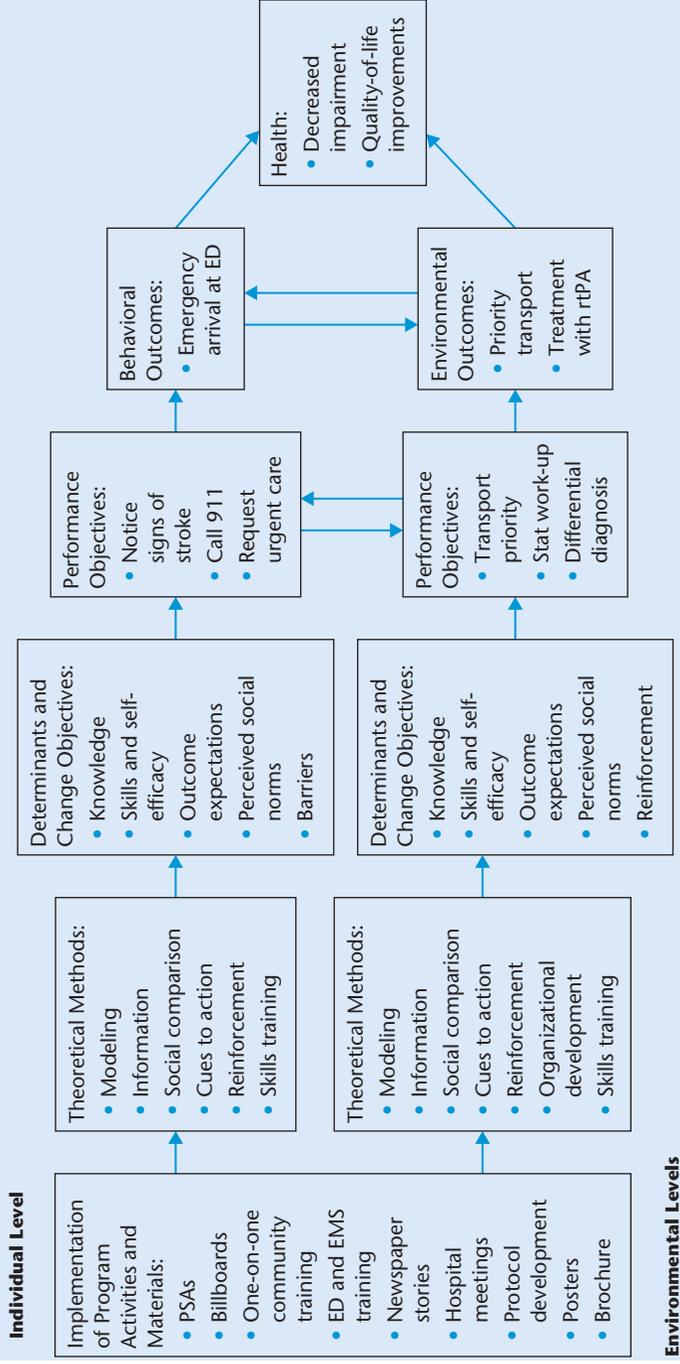


Table 9.8 Evaluation Plan

Variable	Evaluation Question	Indicator	Measure
<b>Effect Evaluation—Behavior of Community</b>			
Time to emergency department (ED)	Did the intervention have an impact on time between stroke onset and arrival at the ED?	Time between last seen as normal to ED arrival	Minutes from medical record
<b>Effect Evaluation—Health Care Environment</b>			
Receipt of stroke treatment	Did the intervention increase the proportion of patients receiving rtPA?	Patients receiving rtPA?	Medical record indication of receipt (as against all stroke and all eligible by time window)
<b>Process Evaluation</b>			
Reach	How many community members were reached with one-on-one intervention, posters, and brochures?	Persons counted in trainings	Sign-in sheet
Fidelity	Did the practical applications and program components contain appropriate role models and role model stories?	Presence or absence of messages from matrix determinants	Analysis of program materials and activities

## Evaluation Design and Plan

- The final evaluation task is to specify evaluation design and write a plan.

The study used a quasi-experimental comparison-group design with two communities. The intervention was located in the community of the sponsoring agency. The comparison community was chosen to provide matched hospitals and similar nonurban demographic characteristics. Both communities were in east Texas, and they did not have overlapping media orbits. Each community was far enough from Houston so that referral to Houston for acute stroke care was prohibitive without an initial stop at a local hospital. The intervention community contained five hospitals in Angelina, Nacogdoches, and Shelby counties, Texas. The comparison community contained five hospitals in Jefferson and Orange counties, Texas.

## Findings

The community with the intervention increased the proportion of eligible patients (those who arrived within the three-hour time window) who received treatment to about 70%, up from about 12%. The comparison community increased from about 5% to about 20%. Among all stroke patients, the treatment community increased treatment from less than 1% to almost 10%, and the comparison community increased from no treatments to about 1%.

We conducted 488 community train-the-trainer workshops resulting in 634 trainers to deliver personal messages to 49,527 persons. The trainers distributed 60,000 brochures. We placed 5,000 posters in worksites, placed five billboards, and produced and aired two rounds of public service announcements on radio and television.

With health care providers, we were able to conduct the organizational change intervention with all five hospitals and five emergency medical services. We held protocol development meetings, trainings, and opportunities to practice called mock stroke codes. We delivered newsletters to emergency departments throughout the implementation and used the community news media to link community and health care environment methods.

## Summary

Chapter Nine describes how to develop a plan for the evaluation of the health education program. In Intervention Mapping, evaluation flows from the selection of health, behavior, and environment outcomes following the needs assessment

(Step 1), the matrices of performance objectives and change objectives based on determinants (Step 2), and the description of methods and applications, program, and implementation (Steps 3–4). The effect evaluation focuses on the differences in outcomes with and without the program, including quality of life, health indicators, behaviors, environmental conditions, and program objectives. Process evaluation, including fidelity and reach of the intervention, addresses program implementation and why the intervention is being delivered in a certain way. It is used for program management and accountability and enables interpretation of outcome data. Involvement and feedback of evaluation results to stakeholders is necessary to ensure that the evaluation results are used to make decisions regarding the program and to improve it.

The development of indicators—the constructs being measured—and measures—the device for quantifying or categorizing the measures—is a major task in developing the evaluation plan. Clear specification of program outcome objectives in the program logic model and the change objectives from the matrices allow the development of indicators and measures that can test the efficacy and effectiveness of the program. Validity, the degree to which evaluators are measuring the construct they think they are measuring, is fostered by the tightness of the program logic in Intervention Mapping. The clarity of what the program is and how it is to be implemented is key to validating the process evaluation constructs. Reliability, stability in measurement, must also be addressed.

The choice of an evaluation design affects the assurance with which the evaluator can say that the indicators have changed from before to after the program and whether these changes can be attributed to the program. Although an experimental design with random assignment of participants or units to the intervention and control groups yields the strongest evidence, this is often not possible in health education. Quasi-experimental designs allow the evaluator to compare two or more groups that are as similar as possible.

The final product of Step 6 is an evaluation plan that includes the evaluation questions, design, indicators and measures, timing of the measures, study protocol, and resources required to conduct the evaluation. It is built on the earlier steps of Intervention Mapping and logic models that have been developed step by step.

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## Discussion Questions and Learning Activities

1. Explain how the products from Steps 1 through 5 of Intervention Mapping can be used to help plan for program evaluation.
2. Explain the difference between effect and process evaluation and between formative and summative evaluation.

3. Continuing with the health promotion program you proposed from the preceding chapters, create an intervention logic model and show where effect evaluation and process evaluation relate to the model for your program.
4. State your effect evaluation questions and briefly describe the measures you will use to evaluate program outcomes.
5. State your process evaluation questions and briefly describe the measures you will use to conduct a process evaluation.
6. Briefly describe the evaluation study design you would propose to evaluate your health promotion program.



# USING INTERVENTION MAPPING TO ADAPT EVIDENCE-BASED PROGRAMS TO NEW SETTINGS AND POPULATIONS

with **Joanne Leerlooijer, Shegs James, Jo Reinders, and Patricia Dolan Mullen**

## LEARNING OBJECTIVES

- Describe what is meant by evidence-based interventions
- Analyze issues related to adaptation, such as whether or not to adapt a program, striking a balance between program fidelity and adapting the program to fit a new population or setting
- Apply the Intervention Mapping steps to the process of adapting evidence-based programs

In this chapter, we suggest Intervention Mapping as a way to adapt evidence-based programs for new populations and settings in situations that require changes in practical applications, delivery strategies, and cultural elements while identifying and retaining essential elements of original programs. We also propose Intervention Mapping as a process for revising a program that has been evaluated and shown to be modestly effective but has room for improvement (see Case

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Study Two). While debate continues over whether or not programs should be adapted, in practice adaptation happens (Elliott & Mihalic, 2004; Lee, Altschul, & Mowbray, 2008). The problem is that programs are often poorly adapted. During the adaptation process, planners often choose pieces of programs that are the most appealing to them or that seem the most feasible, often without much input from the community and without systematically determining what in a program needs to change and what must stay the same. This can lead to programs that are incomplete or are simply a mishmash of components with little chance of maintaining the level of impact demonstrated in the original program.

Although several models of program adaptation have been proposed, they tend to be general theoretical models that do not provide a step-by-step adaptation approach (Lee et al., 2008; Wandersman et al., 2008). Intervention Mapping can provide a systematic approach to program adaptation that can help planners identify and retain the essential elements as programs are translated to new communities and settings.

We present two case studies of programs that have used Intervention Mapping as a systematic approach to conduct or propose adaptation. The first is a cultural adaptation of *The World Starts With Me* youth sexuality education program from a Ugandan context to an Indonesian setting. The second case is the use of Intervention Mapping to propose revisions to the *South African Life-Skills HIV/AIDS Program* for secondary school students following evaluations of the program that showed it required enhancements to improve effectiveness.

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## Choosing, Adopting, and Adapting Evidence-Based Programs

Using health promotion programs beyond the settings for which they were originally developed presents unique challenges. These include the fundamental issues of how evidence is defined and if, when, or whether it is appropriate to adapt the existing program. Other challenges include identifying acceptable programs, addressing the absence of effective programs for certain areas of health promotion, and finding a systematic framework for designing and testing program adaptation.

### Defining Evidence-Based Programs

For the past thirty years, evidence-based medicine has been a focus of clinical practice. More recently, other areas of practice—public health, behavioral medicine, education, health promotion—have also focused on evidence-based

programs and interventions (Teutsch et al., 2009). Authors have described such programs, including evidence-based public health (EBPH), as being based both on a process of scientific reasoning and on consistent scientific evidence (Brownson, Gurney, & Land, 1999; Brownson, Baker, Leet, & Gillespie, 2003; Drake et al., 2001). Brownson and colleagues (1999, 2003) describe EBPH as a decision-making process used to select an intervention strategy, either to develop a new intervention effort or to adapt an existing program. An evidence-based intervention or program is one that has been shown, by sound scientific testing, to be effective. Just how rigorous this testing must be, the numbers of studies needed to establish “evidence,” and definitions of program types vary considerably and can make it difficult for practitioners and researchers to decide how much evidence is enough. Nevertheless, when deciding which program to adopt and replicate, or to adapt, the first criterion is that there be credible evidence that the program is effective.

### Challenges Finding Evidence-Based Programs

Recent developments in program description and evidence summary have eased some of the difficulty in finding evidence-based interventions but have also created new problems. The changes in standards for literature reviews have reduced bias and improved reliability (Mullen & Ramirez, 2006), but questions remain about how to group similar interventions and what ultimate recommendations should be made about effective programs or types of interventions. The *Guide to Community Preventive Services* has provided explicit criteria used to make recommendations (Zaza, Briss, & Harris, 2005). However, confusion over whether the *Guide* and other systematic reviews of behavioral or health promotion interventions recommend a type of theoretical intervention method, a type of practical application, a type of delivery mechanism, or a combination of these makes it a challenge to apply the recommendations in practice (Abraham & Michie, 2008; Bartholomew & Mullen, 2010; Schaalma & Kok, 2009; Workgroup for Intervention Development and Evaluation Research [WIDER group], 2009).

Even when planners can locate information on successful approaches based on systematic reviews, the recommendations lack specific guidance about what to do in a community, what theoretical methods and practical applications to use, and how to incorporate these recommendations into actual planning or adaptation efforts. Online resources, such as Cancer Control PLANET (Cancer Control Plan, Link, Act, Network with Evidence-Based Tools; <http://cancercontrolplanet.cancer.gov>), RTIPs (Research-tested Intervention Programs; <http://rtips.cancer.gov/rtips/index.do>), and DEBI (the Diffusion

of Effective Behavioral Interventions for HIV/AIDS Prevention; [www.effectiveinterventions.org/go/about-debi](http://www.effectiveinterventions.org/go/about-debi)) provide information and access to actual programs, which have been rated according to evidence of effectiveness. However, these and other programs are often large, costly interventions with multiple components that are difficult for practitioners with limited resources to implement in new settings. Even programs that are potentially feasible often fail to include such important details as theoretical underpinnings, performance objectives, determinants, and program methods. These missing elements are critical for either program implementation or program adaptation for communities beyond the test site (Michie, Johnston, Francis, Hardeman, & Eccles, 2008).

### Challenges in Deciding Whether to Adapt Programs

Some researchers suggest that adaptation is essential, and the challenge that planners face is to strike a balance between program replication and adaptation. They propose that once a suitable evidence-based program is chosen, planners should consider a process of adaptation to enhance program fit with the characteristics of their new settings (Bernal & Saez-Santiago, 2006; Castro, Barrera, & Martinez, 2004; Ringwalt et al., 2003; Ringwalt, Vincus, Ennett, Johnson, & Rohrbach, 2004). Backer (2001) outlined four ways that programs are typically adapted: adding or deleting program components; changing program components or content; changing the process or intensity of implementation; and making cultural modifications. However, any of these adaptations must balance program fidelity with the needs of the adopting site (Backer, 2001).

Lee and colleagues (2008) caution planners that when a program is adapted in ways that modify its theory of change, the program is no longer evidence-based and may not be effective either in the original population or in the new one. Changing essential program elements creates a major dilemma in program adaptation. But we often do not know what constitutes essential elements (Botvin, 2004; Norton, Amico, Cornman, Fisher, & Fisher, 2009). Lee, Altschul, and Mowbray (2008) encourage program developers to provide guidance both by describing the program theory of change, including mediators and moderators of program effects, and by suggesting which parts of the program cannot be changed without modifying the program theory of change. They also suggest that program developers include information on ways their program can be modified for new populations.

In arguing against the need for adaptation, Elliot and Mihalic (2004) refute a basic assumption in the fidelity-adaptation balance approach: that settings in which a program will be implemented are unchangeable. They point to examples of needed technical assistance and capacity building in their own research and

demonstrate that environments are indeed changeable. They suggest that instead of asking how a program should be adapted to fit a new setting, planners should ask how the setting needs to change in order to fit the program implementation. This concept of necessary capacity building for implementation and dissemination is consistent with Wandersman's (2008) Interactive Systems Framework, in which both intervention-specific capacity and general organizational capacity-building efforts are proposed for effective program implementation. If planners decide that environments need to change to implement the program, this decision and subsequent development of strategies to enhance implementation represents a key point of program adaptation: planning for adoption, implementation, and maintenance planning (Step 5 of Intervention Mapping).

The debate regarding fidelity and community fit has been vigorous. Some efforts to promote evidence-based programs have been criticized as top-down dissemination that requires strict adherence to the original program and its implementation, and that discounts local innovations and history (Dworkin, Pinto, Hunter, Rapkin, & Remien, 2008). Others have argued that the primary concern should be fidelity, as there is little data to suggest that adaptation improves program effectiveness but there is some evidence that shows that programs without adaptation have worked well in settings beyond the original trial (Elliott & Mihalic, 2004; Jemmott, Jemmott, Fong, & Morales, 2010). A review of over 500 studies demonstrated that implementation affected outcomes of prevention programs with higher levels of fidelity associated with improved program outcomes (Durlak & DuPre, 2008). However, the authors point out that although higher levels of fidelity were closely tied to improved program outcomes, levels of fidelity were well below 100%; therefore, some adaptation occurred and may have also contributed to the programs' success. The questions surrounding the need for adaptation versus the importance of maintaining program fidelity during implementation clearly warrant further investigation. In the meantime, planners must continue to make important decisions about whether or not to adapt a program and, if they do, what is essential and must be maintained and what could change.

## Program Adaptation

Several authors have described processes of disseminating evidence-based programs, including approaches to adaptation ("d-up: Defend Yourself!", 2009; Backer, 2001; Lee et al., 2008; McKleroy et al., 2006; Wandersman et al., 2008). Most describe the tasks involved, such as (1) assessing the new priority population, the evidence-based program to be adopted, and the agency's capacity for implementation; (2) determining whether to adopt a program with or without

adaptation; (3) adapting (when necessary) and pre-testing program materials; (4) developing an implementation protocol and pilot testing the adapted intervention; and (5) implementing the entire intervention (McKleroy et al., 2006).

Other frameworks, such as the Interactive Systems Framework (ISF) by Wandersman and colleagues (2008), suggest processes that must take place at each step of adoption, adaptation, and implementation. The three ISF components are: (1) Synthesis and Translation System in which new interventions are described in ways that assist adopters in choosing and making decisions (for example, explication of core elements and key characteristics); (2) Prevention Support System, which builds both general and innovation-specific capacity in the adopting agency; and (3) Prevention Delivery System, which provides technical support for developing implementation protocols and infrastructure prior to and during program implementation.

There are at least two research teams who have suggested detailed implementation adaptation steps. Lee and colleagues (2008) explicitly propose that their Planned Adaptation approach fits into the IFS Prevention Support System. In Planned Adaptation, program adopters, optimally, in consultation with program developers, first explore the program theory of change in the original program and identify elements that cannot be changed. Next they describe differences between the new population and the original population, execute content adaptation, and plan an evaluation of the adapted programs (Lee et al., 2008). Backer (2001) suggests (1) identifying the program theory—the logic model of change, (2) conducting a core components analysis of the intervention, (3) determining the adopting community’s adaptation concerns, (4) consulting with the intervention developers, (5) consulting with the new implementation site, (6) integrating the previous steps into a plan for adaptation, and (7) including fidelity and adaptation issues in the program evaluation. Intervention Mapping provides a systematic approach that adds detailed *how-tos* to these frameworks. In this chapter we illustrate the use of Intervention Mapping to flesh out the processes of adaptation.

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## Perspectives

Our perspective in this chapter is one of an approach to program adaptation that is informed by evidence and the program theory of change. Backer (2001) notes that the question is not whether things will change but rather how change can be managed in a way that retains core program components. Other authors have suggested that program developers provide explicit direction to adopters about which program elements can be changed and in what ways (Castro et al.,

2004; Lee et al., 2008). The need for at least modest program adaptation may be a given when programs extend their reach beyond the initial research. More than 20 years ago, Ottoson and Green (1987) suggested that every program implementation entails some program modification in response to its context (Ottoson & Green, 1987). However, there are both promises (a better match between problem and program and of not having to start from scratch) and pitfalls (ending up with an ineffective or unevaluated program because of adaptation) inherent in the business of program adaptation.

A major pitfall of adaptation is that even when a planner begins with an evidence-based program and bases adaptation decisions on scientific logic, using findings from formative research and pretesting, the resulting program cannot retain the initial program's claim as evidence based. The new program would require appropriate efficacy or effectiveness evaluation trials. In addition, Lau (2006) has argued that when programs have been adapted there is seldom formative evidence that proposed changes will actually make programs more acceptable to and effective in new populations. She suggests several evidence-generating strategies related to program adaptation: (1) conduct of strong formative research to create evidence-based adaptation, (2) inclusion of diverse populations in initial program evaluation studies so that adaptation may not be needed, and (3) conduct of evaluation research on the impact of adaptation on program effectiveness. However, when all is said and done, we are seldom certain if program adaptations successfully increase fit or even if a program works in its new form.

Because separate elements of programs are not usually tested independently, it is difficult for new users to identify, and therefore protect, core or essential elements of a program (Botvin, 2004). We suggest that the program's core elements are *active ingredients* to promote change. They are, for most programs, a combination of some of the following: (1) theoretical methods that are intended to change determinants of behavior of the at-risk group and the environmental agents, (2) practical applications of the methods, including delivery channels, (3) characteristics of program materials and messages, including cultural elements, and (4) characteristics of program implementation. However, determining which elements might be essential to a program really begins earlier in program planning with the following questions:

1. Does the program under consideration address the correct health problem (needs assessment)?
2. Are the correct behavioral and environmental causes of a health problem addressed for change?
3. Are the intervention determinants the most powerful influences of the behavioral and environmental outcomes?

## Applying Intervention Mapping to Adaptation

We describe the process of applying Intervention Mapping to adapting evidence-based programs for new settings. We also provide an example of this process being used (Case Study Two) to analyze whether a program that has been evaluated might be systematically adapted to increase its potential for effectiveness. We apply each step of Intervention Mapping to program adaptation, suggest the adaptation-related questions posed at each step, and the products that should result from the step (See Table 10.1). Planners who are adapting, rather than building, a program will create a work group and involve stakeholders through every step of the process just as they would if they were building a new program. The critical necessity of fostering participation is discussed in depth in Chapter Four. The steps are applied to both case studies presented here—one in which a program was adapted for implementation with a new population, and the other in which the program was evaluated and the planners made recommendations for changes or adaptation after the evaluation. In both cases, planners must first choose programs for which there is credible evidence of effectiveness, though in the case of post-evaluation recommendations the effectiveness was less than program developers had hoped for.

Perhaps the biggest challenge to systematically adapting an existing program is the necessary post-hoc deconstruction of the intentions of the original program developers. At each step, those considering a program for possible adoption and adaptation will be comparing their own situation and the needs of the adopting community with the characteristics of the program under review. Sometimes, information will be readily available for this comparison, but at other times, the reviewers will have to obtain reports, analyze materials, and interview the original program developers to obtain needed information. The essence of adaptation is comparing what would be optimal in the new situation with what is available in the original program. In the worst case, comparisons are made by reconstructing the intent behind the original program materials with little additional information.

### Step 1. Needs Assessment and Determination of Fit with the Problem

Intervention Mapping describes a planning process that begins with the planning group, which is formed to broadly represent constituents of the program, including potential implementers and program beneficiaries. This group is equally important for program adaptation. The planning group's first step when considering an evidence-based program would be to compare the logic model of the problem for the original program with the logic model of the problem

**Table 10.1 Intervention Mapping Steps and Processes in Program Adaptation**

Intervention Mapping Step and Product	Tasks and Questions for Program Adaptation and Redesign	Sources of Information on the Original Program and its Development	Adaptation or Redesign Product
<p><i>1. Step 1 Needs Assessment:</i> Logic model of the problem—health and quality of life, behavior, environment, and determinants</p>	<p><i>Tasks:</i> Describe the logic model of the problem in the new setting Compare the logic model of the problems in the new and original program situations Describe how the two logic models match and how they differ</p> <p><i>Guiding Questions:</i> Was the original program based on a valid needs assessment? What is the logic model of the problem from the original needs assessment? What is the priority population for the original program development and testing? What is the logic model of the problem for the adopting site? What is the priority population for the adopting site? How do the priority populations compare in terms of demographics, context and the burden of, and factors related to, the health problem?</p>	<p>Published or otherwise available descriptions of the formative research and problem description on which the original program was based Direct communication with the original program developers</p>	<p>Description of discrepancy between logic model of the problem for the original program and for the adopting site (including priority population characteristics)</p>

(Continued)

**Table 10.1 (Continued)**

<b>Intervention Mapping Step and Product</b>	<b>Tasks and Questions for Program Adaptation and Redesign</b>	<b>Sources of Information on the Original Program and its Development</b>	<b>Adaptation or Redesign Product</b>
<p>2. <i>Step 2 Matrices:</i> Logic model of change</p>	<p><i>Tasks:</i> Prepare or obtain a logic model of change for the original program (including the behavioral and environmental outcomes, performance objectives, determinants and matrices of change objectives) Add or delete performance objectives, determinants Prepare a logic model of change for the new setting (desired change in the new setting)</p> <p><i>Guiding Questions:</i> What behaviors and environmental conditions did the original program target for change? What determinants of behavior or environment did the original program target for change? From the logic models of the problem for the adopting site, what change in behavior and environment should be sought by the new program site (or post evaluation)?</p>	<p>Published or otherwise available descriptions of the intervention and its logic model of change Communication with original program developers Review of the original intervention materials and implementation protocol to analyze targets for change and construct a logic model of change and matrices</p>	<p>Description of change objectives that should be added to or removed from the original program to improve validity of the change model or intervention targets in the adopting site</p>

<p>3. <i>Step 3: Program Ideas:</i> Theoretical methods and practical applications matched to the change objectives</p>	<p>What determinants of behavior and environment does the adopting site propose to change (or what should be added or changed postevaluation)?</p> <p><i>Tasks:</i> Review the original program—either development documents or intervention materials and implementation protocol to analyze methods and practical applications Make sure that there are appropriate and sufficient methods for all change objectives in the original program Add methods where needed—either because they were inadequate in the original program or because new change objectives were added in the last step and new methods are needed to influence change Make sure that all methods are adequately addressed with practical applications</p>	<p>Published or otherwise available descriptions of the intervention and its logic model of change (including program development documents) Direct communication with original program developers <i>Note:</i> These sources cannot verify included theoretical methods—verification must be based on review of the actual program materials.</p>	<p>Description of theoretical methods or practical applications that should be added to the original program to meet new objectives or to improve the program (make the methods more effective) Description of theoretical methods or practical applications that should be deleted based on deleted change objectives Description of the program elements that may be essential and must be retained</p>
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(Continued)

**Table 10.1 (Continued)**

Intervention Mapping Step and Product	Tasks and Questions for Program Adaptation and Redesign	Sources of Information on the Original Program and its Development	Adaptation or Redesign Product
	<p><i>Questions:</i></p> <p>What methods (based on theory—active ingredients to promote change) and practical applications did the original program include?</p> <p>If new change objectives were added in Step 2, what additional methods have to be added to the program to improve power to change proposed intervention targets?</p> <p>What are the possibly essential active ingredients in the original program (ingredients that must be retained)?</p> <p>Should any methods or practical applications be deleted because of deleted change objectives?</p>		
4. Step 4: Program Components and Delivery Channels	<p><i>Tasks:</i></p> <p>Review the original program scope and sequence, materials and delivery channels</p> <p>Pretest original materials with local priority population.</p>	<p>Pretesting of the original program materials and methods with the new populations</p> <p>Published or otherwise available descriptions of the program scope and delivery</p>	<p>Description of recommended changes in the program scope and sequence, materials or components and delivery</p> <p>Program materials with changes made and tested</p>

	<p>Plan and produce specific changes to sequence and materials Pretest materials</p> <p><i>Questions:</i> How well did the program components and delivery implement the theoretical methods? How well do the program materials and delivery in the original program match preferences and garner the attention of the new priority populations? What changes in scope and sequence, materials and delivery are necessary to deliver new methods and practical applications or to meet local preferences? With changes incorporated, how well does the program meet local preferences?</p>	Direct communication with original program developers	
5. Step 5: Program Implementation	<p><i>Tasks:</i> Develop performance objectives for adoption, implementation and sustainability</p>	Published or otherwise available descriptions of the program implementation	Description of how program implementation should be changed to obtain fidelity across adoption, implementation and maintenance

(Continued)

**Table 10.1 (Continued)**

Intervention Mapping Step and Product	Tasks and Questions for Program Adaptation and Redesign	Sources of Information on the Original Program and its Development	Adaptation or Redesign Product
	<p>Compare the performance objectives to the implementation protocol for the original program</p> <p>Develop a revised implementation protocol if needed</p> <p><i>Questions:</i></p> <p>How was the original program implemented (roles, performance objectives)?</p> <p>How well was the original program delivered (completeness, fidelity, dose)?</p> <p>What support (training, promotion, technical assistance, or capacity building) was provided for implementation?</p> <p>How complete and feasible was the original implementation protocol?</p> <p>What are the implementation performance objectives in the new setting?</p> <p>Will implementation require additional elements in the new setting?</p>	<p>Direct communication with original program developers</p>	<p>Description of interventions necessary to train, promote, or provide technical assistance or capacity building for implementation</p>

<p>6. Step 6: Evaluation</p>	<p><b>Tasks:</b>  Plan and implement an efficacy or effectiveness evaluation of the adapted program  Plan and implement a process evaluation of the new program  <b>Questions:</b>  What aspects of the program objectives and change objectives was the original program effective in meeting?  What aspects of the program objectives and change objectives was the adapted program effective in meeting?  What was the reach, dose, and dose received of the adapted program?  Was the program acceptable to participants in the new setting?  How did the process characteristics of the adapted program compare to the original program? How did the effectiveness and process of the adapted program compare to the original program? Did it work and was it acceptable?</p>	<p>Publications and other documents describing the evaluation of the original program  Lessons learned from how the evaluation was conducted of the original program (indicators, methods, data collection and analysis)</p>	<p>Program evaluation plan</p>
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in the new setting (or the logic model of the problem prepared as a part of the evaluation). The group would seek to describe any discrepancies that exist between the way the initial developers described the health problem and how they themselves understand the problem (Table 10.1). A planning group considering program adoption should have already performed a needs assessment (see Chapter Four) and would need a clear description of the health problem, including the health and quality-of-life effects, behavioral and environmental causes, and determinants of the behavioral and environmental causes. Only with this clear understanding of the problem to be addressed in the new setting can the planning group know whether the program they are considering is a good match and if it answers these questions: Did the original program address our problem? Are the factors contributing to the health problems the same as ours?

Planners may have to construct a logic model of the problem for the original program, if one does not exist. This can usually be done based on descriptions of the intended program participants, outcomes of interest, and related determinants addressed by the intervention. Adaptation planners could also contact the original program developers after constructing a draft logic model to check assumptions about intervention outcomes and determinants. As outlined in Table 10.1, the main product of adaptation Step 1 is describing discrepancies between the logic model of the problem in the old setting and the new. The planning group would judge whether the extent of the discrepancy is acceptable or not.

## Step 2. Logic Model of Change and Matrices

Assuming that there is an acceptable fit between the needs addressed in the original program needs assessment and the adopting site's needs, the planning group would assess fit between the logic models of change (see Chapter Five). The planners would compare the change model in the original program and the proposed logic model of change for the new site (or following a program evaluation). The planning group for the new site, while not attempting an entire Intervention Mapping process, would create at least a simple logic model of change by reviewing the needs assessment and suggesting what changes should be the focus of their program. The group will ask, "From the logic model of the problem, what needs to change as a result of the program?" The group would look at needed change in the behaviors of the at-risk groups as well as needed change in the environment. They would then assess the probable determinants of that change to form change objectives, which should be compared with the change objectives for the original program.

Sometimes, perhaps even often, the original logic model of change or change objectives for the original program will not have been described or will not be available to the adopters. In this case, the adoption planning group would

have to work backwards from the available program materials to determine what behaviors, environmental factors, and determinants the original program developers were trying to change.

This step is the first time in the adoption/adaptation process that planners might have to suggest modifications to the original program. These modifications take the form of new, expanded, or deleted change objectives (behavioral or environmental performance objectives  $\times$  determinants). Change objectives can be added or deleted to better the match between the two program foundations (logic models of change). If matrices are not available from the original program, we suggest that they should be constructed from the available program description and materials. We acknowledge that this is not an easy undertaking.

### Step 3. Theoretical Methods and Practical Applications

Step 3 is twofold: (1) making sure that in any planned adaptation, all possible essential program elements remain in place, and (2) adding theoretical methods and practical applications to match new change objectives added in Step 2 and deleting objectives that are no longer applicable. As mentioned, the essential elements are likely to be the theoretical methods in a program, that is, those elements hypothesized to produce effects in the change objectives. However, they may also be aspects of practical application or program delivery and implementation. For example, if a program depends on role modeling, the practical application of whether the role models are persons with whom the priority population can identify would be an important aspect of an essential element. This is particularly relevant when adapting a program to a different social or cultural context.

In this step, the program planners analyze the candidate program for its theoretical methods and practical applications. They make sure that none of these elements in their planned implementation is ignored, and they perform at least modest pretesting to make sure the program's practical applications are suited to the new priority population. If the planners added change objectives in Step 2, they would add theoretical methods and practical applications to create change in the determinants of behaviors or environmental conditions (Tortolero et al., 2005).

### Step 4. Producing Programs

The focus of program adaptation begins to move from consideration of whether the program objectives and change methods are sufficient and appropriate for the setting toward consideration of the program scope and sequence, delivery channels, materials and messages (Step 4), and implementation (Step 5). Most of

the adaptation changes recommended in this step address the match between the program presentation and the characteristics of the new population. Issues such as race/ethnicity, age, gender, urban or rural residence should be considered. However, changes should not be made without formative work to verify the necessity of making changes. Elliot and Mihalic (2004) make a strong argument that, with appropriate developmental behavioral and determinant objectives, many programs work with little tailoring of demographic factors. Other important issues related to program delivery include readability, preferred channel, and health literacy. Further, the program must garner attention, be attractive to participants, seem credible, and foster identification with ideas and role models presented. The changes proposed in Step 4 must be based on formative research that pretests the original program and ascertains new host site preferences for modification (Tortolero et al., 2005). Once adaptations are made, they must also be pretested (see Chapter Seven).

### Step 5. Implementation

Program planners consider the original program's implementation protocol and compare it with implementation considerations and constraints of the new site to create a revised protocol. As described in Chapter Seven, the implementation plan should include the performance objectives for implementers as well as a detailed time line for implementation. The determinants of implementation should be carefully considered as well as the ways to influence full and sustained program delivery. As in Step 4, modifications to the original implementation protocol should be pretested and pilot tested in the new site (Tortolero et al., 2005). Wandersman (2008) and Mihalic (2008) underscore the importance of organizational capacity and readiness for implementation. To the extent that the organizations or other implementers in the new setting require additional or different skills, incentives, or conditions for adoption, implementation, or maintenance, planners would reflect these needs in the new implementation plan, based on careful consideration of Intervention Mapping Step 5 tasks applied to the new setting.

### Step 6. Planning Evaluation

An overriding purpose for evaluating an adapted, evidence-based intervention is to determine whether the intervention remains effective in the new setting with the program changes that have been made. Program adapters must know what changes in the original program successfully promoted its objectives and how effective and efficacious the new program is as compared with the old.

The importance of a process evaluation is well known. It must determine whom the program reached, whether it was delivered completely and with fidelity, and how the participants reacted to the program. Evaluation of an adapted program should also explicitly consider how well accepted were the new and old program elements to the priority population. These evaluation findings can provide valuable information to the field and should be shared widely.

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### Case Study One: A Human-Rights Approach to Sexuality Education in Two Cultures.

This case describes adapting the original sexuality education program *The World Starts With Me* (WSWM), created for a priority population in Uganda, to an Indonesian population in 2005. The Indonesian program is titled DAKU!, from the Bahasa statement: *Dunia remajaku seru!*, meaning *My youth time is exciting!*. The adaptation was conducted following an Intervention Mapping manual, created by the World Population Foundation (WPF), with steps describing how to practically adapt and implement WSWM for a specific culture and context (Leerlooijer, Reinders, & Schaalma, 2008; Leerlooijer, 2009). The computer-based WSWM program received the 2004 Global Golden Nica Award in the category Digital Communities by the Prix Ars Electronica. The program is one of the 18 curricula underlying UNESCO's new international guidelines on sexuality education (UNESCO & UNAIDS, 2009).

Between 2005 and 2009, the WSWM program was adapted to new target groups in Uganda (primary school students and young people born with HIV), Kenya (secondary school students), Thailand (secondary school students in Bangkok), Vietnam (secondary school students, teacher college students), and other youth in Indonesia (deaf and blind students in special education schools and youth in correctional institutions).

The WSWM program was originally developed in 2002 by SchoolNet Uganda in collaboration with WPF and Butterfly Works to address the sexual and reproductive health and rights (SRHR) needs of secondary school students in Uganda. A majority of these students do not have the information or skills necessary to cope with the emotional, physical, and social changes of adolescence. Both boys and girls experience sexual harassment and coercion and face health risks due to early onset of sexual intercourse and limited use of condom when having intercourse (Neema, Musisi, & Kibombo, 2004). Youth in Uganda have sexual intercourse at a young age; 14% of both men and women aged 15–24 years reported having sex before age 15, and 63% of women and 47% of young men had sex before the age of 18 (Ministry of Health [Uganda] & ORC Macro International, 2006).

A minority of students in Uganda use condoms to protect themselves against HIV infection, other sexually transmitted infections (STIs), and pregnancy (Neema, et al.,

2004); only 16.6% of 15- to 19-year-old, sexually active, unmarried females reported that their male partners used condoms in the 30 days preceding the survey. In this same group, 49.3% reported that their male partners *ever* used condoms, compared with 64.0% of sexually active unmarried males ages 15–19 years (Uganda Bureau of Statistics & ORC Macro International, 2001).

The WPF work focuses on both needs and rights of young people and women in developing countries. Their work is based on the following principles: openness and acceptance of young people's sexuality, not on taboos; a positive, nonjudgmental approach toward sexuality, not on fear or control; equity in gender and sexual orientation; the right of young people to accurate information, to self-determination, and to protection, so that they feel empowered to make their own responsible choices; active participation of young people, including a perception of young people as the actors and social agents of change instead of mere recipients of messages or programs.

WPF uses multiple approaches in its program development: adolescent development, health promotion, behavior change, and human rights. This combination of disciplinary perspectives provides the foundation of programs with the goal of empowering young people not only to obtain necessary knowledge but also to develop positive attitudes and to learn healthy and responsible behavior, including communication, negotiation, refusal, and assertiveness skills as well as knowing how to obtain and use condoms and contraceptives. The health promotion approach, in particular, emphasizes the need for both individual and environmental change. The organization facilitates an understanding of youth and their context, and helps create environments that support individual change in young people and implementation of SRHR programs. The Ugandan WSWM program was developed using the experiences of the development and implementation of the Dutch program "Long Live Love" (Chapter Thirteen on the book's instructor Website) (Schaalma, Abraham, Gillmore, & Kok, 2004; Schaalma et al., 1996), characteristics of effective sexuality education (Kirby, Laris, & Roller, 2005, 2006), and materials of existing sexuality education programs of UNICEF Namibia and Straight Talk Uganda.

### Step 1. Needs Assessment

Stakeholders were involved well before the needs assessment began, the first step of WSWM adaptation in Indonesia. Kirby and colleagues (2005) suggest that the effectiveness of school-based sexuality education programs requires the involvement of multiple individuals (and sometimes groups) with expertise in curriculum design, including research and behavior change theories. In addition, at least minimal support from governmental and local authorities (such as the Ministry of Education, school management) has to be secured to link the program adaptation and implementation process to existing initiatives, policies, and trends and to facilitate sustainability (Kirby et al., 2005).

Therefore, to guide the adaptation and implementation of WSWM in Indonesia, WPF established an advisory board comprising the Ministry of Education (Physical Health Centre), Fatayat NU (a Muslim women's association), Universitas Indonesia (Centre for Health Research, Faculty of Public Health), the Indonesian Planned Parenthood Association, UNESCO, UNICEF, PLAN Indonesia, Yayasan Pelita Ilmu (YPI) Indonesia, the provincial AIDS commission and school principals.

In addition to the advisory group, a planning group was established that comprised staff of WPF Indonesia, their partner organization YPI, and representatives of primary beneficiaries (six students and six teachers with an equal number of males and females). The planning group and advisory board were both oriented according to the Ugandan WSWM program's principles, structure, strategies, objectives, didactic methods, layout and content.

The planning group began by comparing results from the needs assessment in Uganda to the needs and context in Indonesia, using the PRECEDE-PROCEED framework (Green & Kreuter, 2005). This comparison was informed by a review of publications, reports, and statistical data and by the primary data from focus group discussions and interviews with students and teachers in Indonesia.

### *Health and Rights*

The planning group compared SRHR statistics of Uganda and Indonesia, including prevalence of HIV and STIs, unintended teenage pregnancy, (unsafe) abortion, sexual harassment and abuse, and discrimination and stigma. They also considered information on the availability of education and services for young people.

The estimated adult HIV prevalence rate in Indonesia is low (0.16% in persons 15–49 years, 2007) (UNAIDS, 2008) compared with rates in Uganda (6.4% in persons 15–49 years, 2004–2005) (UNAIDS & World Health Organization, 2006). However, the epidemic, originally confined to injecting drug users (IDU) in Indonesia, has become more generalized through increased sexual transmission, the major route of transmission in Uganda. Statistics on STIs show that 21.3% of Ugandan females and 10.9% of males between 15–24 years who have ever had sexual intercourse reported STIs (including gonorrhoea and chlamydia), genital discharge, sores or ulcers in the 12 months preceding the survey (Uganda Bureau of Statistics & ORC Macro International, 2007). In Indonesia, data were obtained from women who had ever been married and currently married men, of whom 2.7% and 1.0%, respectively, reported similar problems in the 12 months preceding the survey (Badan Pusat Statistik (BPS) & ORC Macro International, 2008).

Girls 15–19 years old in both countries face unintended pregnancies, which were associated with both physical complications and disruption of schooling. The percentage in this age group giving birth to a first child was higher in Uganda (19.2%) than in Indonesia (6.6%) (Badan Pusat Statistik (BPS) & ORC Macro International, 2008; Uganda Bureau of Statistics & ORC Macro International, 2007). In Uganda, about half of pregnancies are unintended, contributing to high rates of often unsafe

abortions (54 per 1,000 in women 15–49 years) and related morbidity and mortality among teenage girls (S. Singh, Prada, Mirembe, & Kiggundu, 2005). Little information about abortion in Indonesia is available.

In Uganda, both boys and girls report experiences of sexual abuse and coercion (Neema et al., 2004). Publications on this sensitive topic are difficult to find in Indonesia, but such experiences were reported in the interviews and focus group discussions with young people and teachers. Teachers and students reported that Indonesian youth experience stress in school, due to the extensive curriculum and assignments, and do not know how to cope with it.

### *Behaviors*

The planning group also compared young people's sexual behavior in Indonesia and Uganda. Although now young people in Uganda begin sexual activity at a later age than had been seen previously, the age at sexual initiation is still early. Fourteen percent of both men and women aged 15–24 years reported having sex before age 15, and 63% of women and 47% of young men had sex before the age of 18 (Ministry of Health [Uganda] & ORC Macro International, 2006). In contrast, the median age of first sexual intercourse among females and males aged 15–24 years in Indonesia was 21.3 and 20.6 years old, respectively (Badan Pusat Statistik (BPS), 2003; Badan Pusat Statistik (BPS) & ORC Macro International, 2008). Other studies in Indonesia also show increasing prevalence of premarital sexual activity (Badan Pusat Statistik (BPS), 2003; Simon & Paxton, 2004). Increasing rates of premarital sexual activity may relate to the rise, since 1994, in the median age at first marriage in Indonesia (19.8 among women in 2006; 18.1 in 1994 and 19.2 in 2003) (Badan Pusat Statistik (BPS), 2003; Badan Pusat Statistik (BPS) & ORC Macro International, 2008; Central Bureau of Statistics et al., 1995). Median age at first marriage in Uganda in 2006 was 17.6 years among women and men ages 25–49 (Ministry of Health [Uganda] & ORC Macro International, 2006).

Uganda has a high prevalence of transactional and cross-generational sex (generally longer-term relationships). Exchange of gifts (transactional sex), particularly from boys to girls, is common among young sexual partners. Seventy-five percent of adolescent women not in steady relationships received gifts or money in exchange for sex from sexual partners, and one-third of adolescent males reported having received gifts or money for sex from their sexual partners (Neema et al., 2004). Cross-generational relationships are common in Uganda, especially between older men and younger women. These relationships are associated with risky sexual behavior including not using condoms and having concurrently multiple sex partners (Kelly et al., 2003b).

A study in Indonesia, Thailand, and Singapore found a large difference between the number of unmarried men and women between 15–19 years who reported having had sexual intercourse. The difference suggests that many unmarried young men may have contact with either sex workers, older women who are already sexually experienced, or a male partner (Caraël, 1995; Utomo, 2008).

Condom use is the most common contraceptive method among people aged 15–19 in Uganda. Young men are more likely than young women to report using condoms during the last sexual encounter, 57.4% and 24.9%, respectively (Neema, Ahmed, Kibombo, & Bankole, 2006). Among Indonesian young men in the same age group, contraceptive use, including condoms, is lower (47%), but it is slightly higher among young women (27%) ages 15–19, using a condom at last sexual encounter (Situmorang, 2003).

In 2003, 48% of the reported AIDS cases in Indonesia had acquired HIV infection through the heterosexual sexual activity whereas 34% were infected by injecting drug use (IDU) (UNAIDS et al., 2004). Most injecting drug users are young, sexually active males at risk of HIV both through heterosexual transmission and IDU. A behavioral survey among high school students in Jakarta shows that 34.2% of males and 6.3% of females have tried drugs, and 2.5% and 0.5%, respectively, have ever injected drugs (Riono & Jazant, 2004). Among this population, multiple risk behaviors are common including sharing syringes and needles (UNAIDS & World Health Organization, 2006), having unprotected sex, using sex to finance drug dependencies, and having multiple sexual partners (Riono & Jazant, 2004). No data on IDU in Uganda was found.

### *Environment*

The planning group also explored environmental factors related to sexual behavior, sexual risk, and program implementation. An important difference between Uganda and Indonesia is religion. Uganda is a predominantly Christian country with Muslims representing only 12% of the population; in Indonesia, Muslims are in the majority (86.1%). However, both religions have similar, strong norms and values related to sexuality and reproduction. Group discussions and interviews suggested that in Indonesia (similar to Uganda) young people have limited access to factual sexual and reproductive health education and services; it is thus difficult for them to make well-informed decisions related to sexuality. The assessments in both countries showed that parents do not often talk openly about sexuality or adolescence with their children (Magnis-Suseno, 1997). An important barrier to comprehensive sexuality education is that many parents, teachers, and religious leaders in Indonesia believe that sexuality education for young people will result in earlier sexual debut, in spite of evidence that providing young people with comprehensive information about sexuality and prevention methods does not increase sexual activity among youth (Grunseit, Kippax, Aggleton, Baldo, & Slutkin, 1997; Kirby, 2007). Young Indonesians must find their own, often biased sources of information (Holzner & Oetomo, 2004).

As a result, youth often depend on teachers in schools to provide them with reliable, factual information about sexuality, adolescence, relationships, and protection from health risks. However, in Indonesia comprehensive sexuality education in secondary schools is not a governmental priority (Smith, Kippax, & Aggleton, 2000). The education that is delivered focuses primarily on the biology of reproduction, firmly discourages sex outside of marriage, and does not present context- and culture-specific information on sexuality. It does, however, mention family planning

methods, including their advantages and disadvantages; however, contraception is not available to unmarried young people, and the educational policy does not allow condom demonstration. In 2004, the government initiated competency-based general education that may facilitate a more skills-based and participatory educational approach overall. The situation in Indonesia is not dissimilar to that in Uganda in that the government does provide sex education in schools. In both countries, the educational policy facilitates participatory education approaches but hinders comprehensive sexuality education. Focus group discussions and interviews with teachers in both countries show, however, that teachers are aware of young people's needs and are willing, despite some discomfort, to teach condom use or to refer students to other educators.

Another barrier to young people's SRHR is the lack of youth-friendly health services. Although the Indonesian Family Welfare Law restricts access to family planning information and services to married couples, Uganda has no such restriction. Most Ugandan adolescents (76% or more across all age groups and both sexes) held the opinion that health workers at government health units would treat them with respect and that the information shared with the health workers would be held in confidence (Neema et al., 2004).

### *Determinants of Sexual Risk Behavior*

Needs assessments in the two settings suggested a small number of important differences in sexual risk exposures and determinants. It was clear that fewer studies on determinants of sexual behavior were available in Indonesia than in Uganda. Safe sex in Indonesia is mainly associated with pregnancy prevention. The risk of contracting an STI is regarded as low, and condoms are not typically used for disease prevention (Simon & Paxton, 2004). In Uganda, young people are concerned about both HIV/STI infections and unintended pregnancy (Innocent, James, Fred, Jonathan, & Natal, 2003). In Uganda and in Indonesia men consider that condom use hampers sexual pleasure. Further, ambiguities in condom provision and circumstances for use are likely to make negotiating condom use in Indonesia difficult.

Rates of knowledge about HIV/AIDS are much higher in Uganda than Indonesia. Almost 100% of Ugandan women and men ages 15–24 have heard of AIDS, compared with approximately 66% of Indonesian women who had ever been married and men who were currently married in this age group (Badan Pusat Statistik (BPS) & ORC Macro International, 2008; Ministry of Health [Uganda] & ORC Macro International, 2006). Data for these respondents also show that Ugandan youth have more knowledge about HIV/AIDS, including prevention methods, than their Indonesian counterparts. In Uganda 72.4% of women and 82.0% of men mentioned condom use, compared with 38.1% of women and 49.5% of men in Indonesia. Abstaining from sexual intercourse as prevention method was mentioned by 86% of Ugandan women and 90.6% of men, and 39.9% of Indonesian women and 39.8% of men.

### *Summary*

Based on the comparison between Ugandan and Indonesian SRHR needs of young people, the planning group decided that there was a close enough match to continue with the adaptation. Even though young people in Uganda generally engage in sexual behavior at a younger age than Indonesian youth, programs on protection against HIV/STI and pregnancy are equally relevant for non–sexually active young people. These programs provide the young people with relevant and up-to-date knowledge and skills that would prepare them for a healthy sexual life. Because of the high prevalence of drug use, the Indonesian DAKU! program would also need to address (1) drug use as an important risk behavior for HIV infection in Indonesia and (2) stress management.

## **Step 2. Matrices of Change Objectives**

The Indonesian planning group and the advisory board considered needed change in the behaviors of the at-risk groups and change in those groups' environment. They compared their assessment with the objectives of the original Ugandan WSWM program. The planning group acknowledged that changes were needed in the environment of young people: a supportive policy for implementation of comprehensive sexuality education, improved communication between youth and parents, improved access to youth-friendly health services, and supportive societal norms. However, the planning groups in both Uganda and Indonesia addressed these issues only by influencing behavior change of teachers and principals (Step 5, Adoption and Implementation). Due to lack of resources and organizational capacity, the changes in other environmental conditions were perceived to be beyond the scope of the project.

### *Behavioral Outcomes*

The needs assessments showed a difference between sexual behavior among youth in Indonesia and in Uganda. Transactional and intergenerational sex is not common among youth in Indonesia, but there is more need to address drug use prevention and stress management. Therefore, a new behavioral outcome was included in the Indonesia program: how to avoid drug use. The Indonesian planning group included alcohol among the substances addressed in the objective on drug use.

How to deal with stress was added to the existing performance objective regarding coping with emotional changes in adolescence. Another major difference was that despite recent increases, there was a smaller proportion of young Indonesian people who are sexually active before their 19th birthday, as compared with Ugandan youth. As a result, the priority group in Indonesia was defined as youth older than 15 years, whereas in Uganda the target group was aged 12–19 years. To a large extent, the behavioral outcomes for the new Indonesian program were the same as those in Uganda because, even though the onset of sexual activities is later in Indonesia,

young people still need to be prepared to protect themselves and their partners before they become sexually active.

For religious reasons, the Indonesian planning group and advisory board had to agree on the message in the program regarding sex before marriage. In spite of evidence from the needs assessment, one teacher and one student (both male) of the planning group strongly insisted on limiting the behavioral outcomes to *postponement of sexual intercourse until marriage*. After careful consideration, the final decision was to include in the lesson about sexuality the message that sexual intercourse preferably takes place within a marriage relationship. In all the other lessons the reality of premarital sexual activities of young people was acknowledged. A side effect of the discussions and consensus was that members of the planning group became more accepting of the fact that young people are concerned with sexuality, start to become sexually active before marriage, and have the right to complete information. Ultimately, the teacher and student changed their views and became very effective trainers of new teachers and convincing advocates for DAKU!

The behavioral outcome for condom use was an important topic of discussion. The final consensus was that the behavioral outcome would stay in the program, but that the practical application of condom demonstration in the Ugandan WSWM would be replaced by referral to an out-of-school organization that provides condom education and condoms. This is a good example of theoretical methods and practical applications from one program not being appropriate to cover change objectives in a new setting, even though the change objectives themselves were the same in both settings.

### *Performance Objectives*

Performance objectives were stated for the behavioral outcomes (Table 10.2). The planning group, with input of the advisory board, kept the existing performance objectives from the Ugandan WSWM, except that they developed new performance objectives for the new outcomes. The performance objectives for condom use were based on evidence from the Netherlands and confirmed by findings in Uganda and Indonesia (Chapter Thirteen on the book's instructor Website). In addition to the new performance objectives for drug use and adding stress management to the "handle emotional changes" objectives, the performance objectives related to transactional and intergenerational sex were not included in Indonesia.

### *Change Objectives*

The planning group added the new behavioral outcomes and performance objectives to the student matrix from the Ugandan project and also deleted irrelevant objectives, such as those related to transactional and intergenerational sex. The planning group reviewed the original determinants in the Ugandan WSWM, including knowledge, attitudes, perceived social influences, skills and self-efficacy and compared these with the needs assessment results. New change objectives were added by crossing the new performance objectives with the determinants. Table 10.3 presents

**Table 10.2 Behavioral Outcomes and Performance Objectives for Students in Uganda and Indonesia**

Behavioral Outcomes—Young People Will:	Performance Objectives
1. Act in a balanced way during adolescence while developing toward adulthood	1.1. Act confidently. 1.2. Handle emotional changes <u>and stress</u> . 1.3. Handle physical changes. 1.4. Handle changes in relationships with significant others. 1.5. Handle sexuality in responsible ways.
2. Stand up for their rights, including gender equity	2.1. Make own health-promoting decisions about sexuality and growing up. 2.2. Stand up for their own rights and respect the rights of others. 2.3. Act in a responsible way regarding rights of others and not discriminate against people on the basis of gender, HIV status, sexual orientation, or drug use. 2.4. Disseminate among peers the lessons learned in the program.
3. Delay the onset of sexual intercourse/abstain from sexual intercourse	3.1. Decide to abstain from sex and not to have sexual intercourse until “ready.” 3.2. Avoid and escape situations that could lead to unintended sexual intercourse. 3.3. Negotiate with partner not to have sex/sexual intercourse. 3.4. Practice safe alternative (non-penetrative) sexual practices. 3.5. <i>Refuse to have sex in exchange for gifts.</i>
4. Use condoms correctly and consistently during sexual intercourse	4.1. Decide to use condoms. 4.2. Obtain/purchase condoms. 4.3. Take condoms along. 4.4. Negotiate condom use with partner. 4.5. Use condoms correctly and consistently when having sexual intercourse.
5. Engage only in consensual (sexual) relationships	5.1. Decide to engage only in consensual (sexual) relationships. 5.2. Interact with (sexual) partners in a respectful way. 5.3. Control sexual urge. 5.4. Avoid and escape situations that are risky for sexual abuse. 5.5. <i>Decide not to engage in sexual relationships with partners in an older generation.</i>
6. Abstain from alcohol and drug use	6.1. <u>Decide to abstain from alcohol and drugs.</u> 6.2. <u>Refuse offers of alcohol and drugs.</u> 6.3. <u>Seek support and health services in case of problems.</u>
7. Seek help and support when needed	7.1. Ask for support from teacher. 7.2. Ask for support from counselor or health care provider.

Uganda only = italics; Indonesia only = underline

**Table 10.3 Selected Cells from Matrix of Change Objectives for Young People**

<i>Personal Determinants</i>					
Performance Objectives (PO) the Young Person Will:	Knowledge (K)	Risk Perception (RP)	Attitude (A)	Perceived Social Influence (PSI)	Skills and Self-Efficacy (SSE)
<i>1. Behavioral Outcome: Act in a balanced way during adolescence while developing toward adulthood</i>					
PO.1.2. Handle emotional changes and <u>stress</u>	<p>K.1.2.a. List four emotional changes during adolescence</p> <p>K.1.2.b. Explain that people experience and express emotions differently</p> <p>K.1.2.c. List three activities that are personally relaxing</p> <p>K.1.2.d. Mention two people who can give support in case of emotional problems or stress</p>	RP.1.2. Describe personal risks related to stress and anxiety	A.1.2. Discuss the pros and cons of quitting or saying <i>no</i> to an activity	<p>PSI.1.2.a. Describe social influences from peers</p> <p>PSI.1.2.b. Describe how parents and teachers exert pressure</p> <p>PSI.1.2.c. Describe how peers and parents would support relaxation activities to reduce stress</p>	<p>SSE.1.2.a. Demonstrate how to select which activities to do and which activities to quit</p> <p>SSE.1.2.b. Express confidence of being able to object to people exerting pressure.</p> <p>SSE.1.2.c. Demonstrate convincing arguments to parents and teachers that it is important to have time to relax</p>

2. Behavioral Outcome: Stand up for their rights, including gender equity

<p>PO.2.2. Stand up for their own rights and respect the rights of others</p>	<p>K.2.2.a. Explain what human rights are, including who has formulated them, where they come from, who is responsible for their implementation            K.2.2.b. Acknowledge that every human being in the world has these rights, young people, too            K.2.2.c. List at least four rights related to young people's sexual and reproductive health            K.2.2.d. Give reasons why human rights have not yet been fully implemented in Uganda/Indonesia            K.2.2.e. Analyze how rights and responsibilities are related, and list two responsibilities</p>	<p>A.2.2.a. Argue the importance of human rights for young people and of standing up for your rights            A.2.2.b. Argue that <i>all</i> people, including young people, have the right to be supported, helped, protected, and cared for by their families, community and government            A.2.2.c. Talk about ways to value and respect one's rights and those of others            A.2.2.d. Recognize how these rights apply to one's own life and community            A.2.2.e. Describe actions to take when rights are violated</p>	<p>PSI.2.2.a. Recognize the role of gender in their lives            PSI.2.2.b. Describe the vulnerable position of girls and women            PSI.2.2.c. Recognize the power of decision makers on young people's lives            PSI.2.2.d. Feel supported by their environment (such as parents) to make one's own well-informed decisions related to sexuality</p>	<p>SSE.2.2.a. Provide a scenario for how to defend one's rights and advocate for them            SSE.2.2.b. Practice advocating</p>
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(Continued)

**Table 10.3 (Continued)**

<i>Personal Determinants</i>					
Performance Objectives (PO) the Young Person Will:	Knowledge (K)	Risk Perception (RP)	Attitude (A)	Perceived Social Influence (PSI)	Skills and Self-Efficacy (SSE)
<b>3. Behavioral Outcome: Delay the onset of sexual intercourse or abstain from sexual intercourse</b>					
<p>PO.3.1. Decide to abstain from sex and not to have sexual intercourse until "ready"</p>	<p>K.3.1.a. Explain that abstinence can mean sexual contacts or it can mean abstaining from only sexual intercourse while engaging in other sexual behaviors (e.g., kissing, mutual masturbation)</p> <p>K.3.1.b. List three potential consequences of sexual intercourse</p> <p>K.3.1.c. Identify the factors that influence one's ability to resist partner pressure to have sexual intercourse (e.g., financial independence, self-esteem, communication skills)</p>	<p>PR.3.1. Describe themselves as vulnerable to pregnancy, abortion, STIs, and HIV when having unprotected sexual intercourse</p>	<p>A.3.1.a. Explain a positive attitude toward sex</p> <p>A.3.1.b. Explain a positive attitude toward abstinence from sexual intercourse</p> <p>A.3.1.c. List four perceived benefits of abstinence and four benefits of sexual intercourse</p> <p>A.3.1.d. Express a positive attitude toward abstinence of sexual intercourse</p> <p>A.3.1.e. Explain that, besides sexual intercourse, one can practice other sexual behaviors</p>	<p>PSI.3.1.a. Describe their perception of the norms of significant others (peers, parents) related to sex and abstinence</p> <p>PSI.3.1.b. Discuss the norms that enable or make it difficult for one to say no to sex</p> <p>PSI.3.3. Identify two peers at school who support abstinence from sexual intercourse</p>	<p>SSE.3.1.a. Express confidence in own skills to resist sexual intercourse</p> <p>SSE.3.1.b. Express confidence that they can abstain from sexual intercourse</p> <p>SSE.3.1.c. Identify the factors that influence one's confidence to be able to resist partner pressure to have sexual intercourse</p>

	<p>K.3.1.d. Explain the difference between sex and sexual intercourse</p> <p>K.3.1.e. List the criteria for being "ready" to have a sexual relationship</p>				
<p>PO3.2. Avoid and escape situations that could lead to unintended sexual intercourse</p>	<p>K.3.2.a. List two ways to escape a situation that may lead to unintended sexual intercourse</p> <p>K.3.2.b. Explain what would make it difficult to escape risky situations and how one could overcome this</p>	<p>RP.3.2. Explain that boys and girls may have different expectations of being private with someone of the other sex</p>	<p>A.3.2. Express a positive attitude toward escaping risky situations (e.g., violence, substance use, being alone with boy- or girlfriend)</p>	<p>PSI.3.2. Write down the norms of significant others (peers, parents, teachers) about escaping situations that could lead to unintended and/or unprotected sexual intercourse</p>	<p>SSE.3.2.a. Explain step by step how to get out of a situation that could lead to sexual intercourse</p> <p>SSE.3.2.b. Express confidence that they can successfully escape risky situations</p> <p>SSE.3.2.c. Explain step by step how to refuse and persuade the partner not to have sexual intercourse</p>
<p>PO3.4 Practice safe alternative (nonpenetrative) sexual practices</p>	<p>K.3.4.a. Define kissing, petting, masturbation, pornography</p>	<p>RP.3.4.a. Explain that alternative sexual practices can reduce or eliminate health risks</p>	<p>A.3.4.a. List and explain uncomfortable or comfortable sexual practices</p>	<p>PSI.3.4.a. Explain the norms of peers about negotiating alternative safer sexual practices</p>	<p>SSE.3.4.a. Demonstrate skills of talking about sexuality and abstinence</p>

(Continued)

**Table 10.3 (Continued)**

<i>Personal Determinants</i>					
<b>Performance Objectives (PO) the Young Person Will:</b>	<b>Knowledge (K)</b>	<b>Risk Perception (RP)</b>	<b>Attitude (A)</b>	<b>Perceived Social Influence (PSI)</b>	<b>Skills and Self-Efficacy (SSE)</b>
	<p>K.3.4.b. List five ways of being intimate or of having sex with a loving partner without having sexual intercourse</p> <p>K.3.4.c. Explain that sexuality is more than sexual intercourse</p> <p>K.3.4.d. Compare and contrast the concepts of sexuality, sex, sexual practices, sexual intercourse, sexual feelings, and sexual attraction</p>		<p>A.3.4.b. Recognize that sexuality can be a positive force in one's own life and in other people's lives</p> <p>A.3.4.c. Convince others that sexual partners should communicate with each other about sexuality</p> <p>A.3.4.d. Explain their own attitudes toward masturbation and other sexual practices</p>	<p>PSI.3.4.b. List four arguments often used by young boys or young girls to pressure another person into having sexual intercourse</p> <p>PSI.3.4.c. Explain the influences of peers, media, and community on sexuality-related decision making</p>	<p>SSE.3.4.b. Explain why they believe they have mastered the ability to successfully negotiate alternative safer sexual practices</p> <p>SSE.3.4.c. Demonstrate skills to negotiate alternative sexual practices</p> <p>SSE.3.4.d. Express confidence in negotiating alternative sexual practices</p> <p>SSE.3.4.e. Explain step-by-step negotiation, assertiveness, and refusal skills</p>

6. Behavioral Outcome: Abstain from alcohol and drug use (Indonesia only)

<p>PO.6.1 Decide to abstain from alcohol and drugs</p>	<p>K.6.1.a. Explain the definition of drugs, their classifications and types, and their effects (alcohol, tobacco, cannabis, dextro, inhalants, and typical injecting drugs) K.6.1.b. Explain myths and facts about alcohol and drug use among adolescents K.6.1.c. Explain reasons for beginning alcohol or drug use (positive effects) K.6.1.d. Explain the meaning of the terms alcohol or drug use, drug abuse, and drug addiction K.6.1.e. Describe stages of drug use (for various drugs)</p>	<p>PR.6.1.a. Express personal perception of risk to get HIV through use of unclean needles in IDU PR.6.1.b. Express awareness of own risk to become drug user PR.6.1.c. Express risk of engaging in unwanted sexual behavior under the influence of alcohol or drugs</p>	<p>A.6.1.a. Explain they are convinced living without alcohol or drugs is the best way of living A.6.1.b. Explain they are convinced there are plenty of healthy opportunities to cope with risk factors instead of using alcohol or drugs A.6.1.c. Argue that alcohol or drugs can impair performance of socially important roles, responsibilities, and personal goals</p>	<p>PSI.6.1.a. Show they are convinced that there are better ways than using alcohol or drugs to enhance social image PSI.6.1.b. Describe Indonesian alcohol and drug-related laws, rules and norms in school, religion, and society PSI.6.1.c. Show positive support to significant others for not starting or for quitting alcohol or drug use PSI.6.1.d. Explain the influences from peers, media, and significant others on personal behavior</p>	<p>SSE.6.1.a. Express confidence that they can abstain from alcohol or drug use SSE.6.1.b. Demonstrate communicating, refusal, negotiation, and assertive communication skills and how to cope with the consequences in a confident way, verbally and nonverbally SSE.6.1.c. Demonstrate the skills to share information about alcohol or drugs with peers in a convincing way</p>
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(Continued)

**Table 10.3 (Continued)**

<i>Personal Determinants</i>					
Performance Objectives (PO) the Young Person Will:	Knowledge (K)	Risk Perception (RP)	Attitude (A)	Perceived Social Influence (PSI)	Skills and Self-Efficacy (SSE)
	<p>K.6.1.f. List protective and risk factors in the environment related to drug abuse</p> <p>K.6.1.g. List three signs of people under the influence of drugs</p>			<p>PSI.6.1.e. Recognize that parents, teachers, and other caring people want them not to use drugs</p>	<p>SSE.6.1.d. Discuss how to quit drugs, including explicit strategies</p>
<p>PO.6.2. Refuse offers of <u>alcohol and drugs</u></p>	<p>K.6.2.a. Describe tricks used by drug dealers</p> <p>K.6.2.b. Describe the difficulties to resist the pressure of dealers</p>	<p>RP.6.2. Perceive oneself as being vulnerable for starting to use drugs</p>	<p>A.6.2.a. Show motivation to reject drug offers in spite of the consequences of refusing</p> <p>A.6.2.b. Describe the possible consequences refusing drugs can have</p>	<p>PSI.6.3. Recognize that others in one's peer group refuse to use drugs</p>	<p>SSE.6.3. Explain step by step how one refuses when they are offered drugs</p>

<p>PO.6.3. <u>Seek support and health services in case of problems</u></p>	<p>K.6.3.a. Describe the relation between conflicts, stress, insecurity, and drug use. K.6.3.b. List drug-related information sources and services in school (such as school health services, guidance counselors, teachers, school psychologist) K.6.3.c. List drug-related information and services outside of school (such as health service providers)</p>		<p>A.6.3. Express a positive attitude toward seeking help</p>	<p>PSI.6.3. Recognize that others their age seek help</p>	<p>PSN.6.3. Demonstrate problem-solving and coping skills that include seeking help and resources</p>
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selected performance and change objectives from the original program and all of the performance objectives and change objectives that were added for the Indonesia program.

### Step 3. Program: Theory-Based Methods and Practical Applications

Each WSWM/DAKU! lesson includes practical applications to increase knowledge, develop attitudes, help youth recognize and cope with social influence, and to teach skills, all of which have been shown to be characteristics of effective sexuality education programs (Kirby, Korpi, Barth, & Cagampang, 1997; Kirby et al., 2005). The practical applications vary for each lesson and include computer-based presentations with easy-to-access information and quizzes (knowledge), small-group discussions and teacher-led class discussions (attitude), and role-play assignments (perceived social influence, skills, and self-efficacy). Each lesson includes a homework assignment that encourages students to recognize, apply, and internalize what was learned in the lesson. WSWM/DAKU!'s practical applications represent a participatory, active learning approach, a characteristic of effective sexuality education programs (Kirby et al., 1997, 2005). The characteristics of the theoretical methods and practical applications for any program are likely to be important mediators of the program's demonstrated effectiveness and therefore would usually not be changed in an adapted program. After reviewing the program, the planning group decided to retain most of the practical applications from the Ugandan WSWM. For the new change objectives, the planning group selected new practical applications that also represented a participatory approach. The practical applications were a combination of computer-based and teacher-led applications.

After identifying the practical applications, the planning group described why these practical applications were selected. These justifications described the processes that take place within the young person during exposure to the application. For example, participation in a role play helps the young person exercise certain skills and get feedback from others, in order to be able to improve his or her own skills. This is justified by the theory that practicing the skill is more likely to enhance learning than being told what to do by a teacher (Bandura, 1986). Youth are therefore more likely to remember what they have learned and to apply the practiced skills in real-life situations.

The underpinnings of practical applications are the theoretical methods. Protection-Motivation Theory (Rogers, 1983b) suggests that when one increases risk awareness, simultaneous efforts should be made to improve self-efficacy by providing skills and practice. In another example, methods from the Persuasion Communication Matrix (McGuire, 1985) were applied to change students' attitudes by providing convincing arguments and using *digital* peer educators to provide the messages. Applications on learning skills are justified by using theory-based methods, including modeling, skills training, and feedback, all elements of Social Cognitive Theory (Bandura, 1986).

One of the most important practical applications, the condom demonstration, was not adopted from the original Ugandan program because the planning group and the advisory board expected too much resistance from teachers, increasing the chance that DAKU! would not be adopted at all. To be able to support students who need these skills, the DAKU! planning group replaced the condom demonstration with referral to an organization that specializes in providing education and contraceptives, including condoms, to young people.

#### **Step 4. Program Production (Content and Delivery)**

After agreeing on the theoretical methods and practical applications, the planning group reviewed the Ugandan program materials and used pretests among Indonesian youth and teachers to ensure acceptability, attractiveness, and persuasiveness. Based on these responses, the planning group changed the title into DAKU! and adapted the content and appearance of the applications to Indonesian examples, names, colors, drawings, and stories in role plays. For example, the appearance and names of the two digital peer educators, who are the main sources of information for students, was designed based on students' input. For the new practical applications, new content was developed based on the relevant change objectives, methods, and practical applications identified in Steps 2 and 3.

##### *Delivery Channels*

Both the Ugandan WSWM and Indonesian DAKU! are implemented by teachers; in some schools for some activities, implementation is supported by students trained as peer educators. WSWM in Uganda and DAKU! in Indonesia are typically implemented in voluntary after-school clubs rather than during the school day. Like the Ugandan program, the Indonesian program is a computer-based intervention, supplemented with teacher-led practical applications in each of the lessons. The needs assessment in both Uganda and Indonesia showed that students like to learn with computers, increasing the attractiveness of the program. Computers are increasingly used in schools in both countries. In addition, computer assignments have made WSWM/DAKU! a student-driven program, relieving teachers of the burden of initiating discussions about sensitive issues. Computer-based programs are also attractive because they can provide a wide range of visual, textual, and sound delivery mechanisms for messages.

##### *Content of the Program*

The Ugandan text and narrative were translated into Bahasa, and materials were adapted and pretested for language correctness, relevance, and attractiveness and whether the messages were understandable and convincing. All characters and other visuals were adapted to modern, attractive, Indonesian versions. A challenge faced in translating from English was that the Bahasa language does not have some of the words for sensitive and taboo sexuality-related topics. The most essential change is adding the message that it is preferable that sexual activity takes place within

marriage, whereas other sections and messages related to sensitive topics, including masturbation, oral and anal sex, and sexual orientation, remained unchanged. Students and teachers provided feedback on the digital peer educators and materials' layout, while the planning group together with the advisory board decided the final layout of the program. As a result, the Indonesian program was more interactive than the Ugandan version, including animation and audio for the digital peer educators.

### *Scope and Sequence*

In Uganda, WSWM is implemented in one school year, whereas implementation in Indonesia takes two years due to time restrictions in the schools. One lesson can be implemented in one or more sessions, depending on the time required for answering questions that the program raises among young people. The lessons are implemented in a logical sequence of topics that has been described as a characteristic of effective sexuality education programs (Kirby, 2007). The sequence is similar for WSWM and DAKU!. However, DAKU! added the lesson about alcohol and drugs and integrated stress management into the activities of the lesson on emotional changes during adolescence. After an introductory computer skills lesson, the program starts with three lessons: young people's personalities; emotional ups and downs and stress; and physical changes during adolescence. These three lessons include the influence of rights, norms, and values on adolescent development and are intended to help the participant increase self-awareness and build self-esteem as a foundation for decision making. The program continues with three more lessons: social influences on personal decision making and behavior, including relationships with parents, friends, and peers; gender; and young people's rights. The next lesson addresses sexuality and love as positive and enjoyable parts of life and becoming sexually active as a big decision for which young people and their partners have to be mentally, physically, and economically ready. The next four lessons address the possible negative consequences of being sexually active, including HIV/AIDS, STIs, pregnancy, sexual abuse, and harassment, and ways to prevent those outcomes. There is a lesson on the impact of using drugs and ways to avoid drug use. The final lessons help students reflect on what they have learned, how the learning could help them to plan a healthy future, and how to disseminate what they learned among their peers. Finally, the young people present the lessons they learned at an "exhibition" with a broader audience, such as other students and teachers in the school, parents, health service providers and the wider community to advocate for the rights of young people and encourage commitment for the program from schools and community.

### *Final Pre- and Pilot Testing*

A small number of students and teachers pretested the adapted materials and provided feedback. Teachers in the planning group then pilot tested the DAKU! program in three schools, with 20–25 students in each school. The planning group closely monitored the pilot program, with school observations, focus group discussions and

written lesson evaluations, to obtain clear insight into the implementation process. Based on the pilot results, the final version of DAKU! was prepared.

## Step 5. Adoption and Implementation

Between 2005 and 2009, DAKU! has been implemented in 88 secondary schools in Indonesia (18 in Jakarta, 34 in Jambi, 21 in Lampung, and 15 in Bali). The Intervention Mapping steps were also used to adapt the Ugandan adoption and implementation strategies to the Indonesian context.

### *Adopters and Implementers*

The needs assessment in Indonesia (similar to findings in Uganda) showed that the most important stakeholders in the adoption and implementation of DAKU! included the Ministry of Education, school principals, and teachers. DAKU! fits with the country's current educational policy of competence-based learning, which provided a facilitative context for acceptance and adoption of the program by the Ministry. During adoption and implementation of WSWM in Uganda, the program fit well with the extant policy on HIV/AIDS education in school clubs. However, in Uganda, the Ministry of Education was not involved in the program's pilot test and was later deemed to be essential for motivating school principals to adopt and implement WSWM. The Indonesian planning group, therefore, involved the Ministry more intensively, resulting in a positive effect on adoption and implementation.

Interviews and group discussions in both countries showed that school principals are crucial for adoption and implementation of a program of this type. They can provide teachers with time, support, and facilities for training and implementation, including computers, communication with parents and community members, and access or referral to counseling and health care. Teachers in both Uganda and Indonesia required skill-building training in participatory, interactive ways of teaching and talking in the classroom about sensitive topics related to sexuality. Teachers also needed to be convinced to implement the program with fidelity, one of the conditions for effectiveness (Kirby, 2007).

### *Performance Objectives*

The Indonesian planning group adopted, from the Ugandan program, the performance objectives related to adoption and implementation among school principals and teachers and added objectives for Ministry of Education staff (Table 10.4).

### *Matrix for Adoption and Implementation*

The planning group adopted the implementation determinants from the Ugandan program. They combined the new performance objectives with determinants to create a modest number of change objectives that are specific to Indonesia (Table 10.5).

**Table 10.4 Performance Objectives for Program Adoption and Implementation: Ministry of Education Staff, School Administrators, and Teachers**

Adoption and Implementation Outcomes	Performance Objectives
<p>1. <u>Ministry of Education (MoE) staff will support program adoption and implementation by teachers.</u></p>	<p>1.1. <u>Create commitment within their own organizations</u>            1.2. <u>Show their commitment for the program to school principals and teachers</u></p>
<p>2. School principals will support implementation of the program.</p>	<p>2.1 Encourage teachers to implement the program            2.2 Provide conditions and resources (time, venue, funds, computers) for implementation of the program            2.3 Encourage and facilitate teacher training and support meetings            2.4 Create a supportive environment in the school            2.5 Provide back up for teachers in case of difficulties with implementation            2.6 Involve parents and school staff            2.7 Facilitate access to counseling and health service providers</p>
<p>3. Teachers will involve young people in the learning process to support them to make and act out healthy decisions about sexuality and growing up.</p>	<p>3.1 Create and maintain a safe implementation setting            3.2 Comply with the need for and objectives of the program            3.3 Facilitate the program in a non-moralizing manner            3.4 Apply participatory learning principles and didactic methods in classroom            3.5 Provide counseling or refer students to health care providers and counselors</p>
<p>4. Teachers will facilitate the program according to principles and guidelines provided by the planning group.</p>	<p>4.1 Comply with the principles and guidelines in the teacher manual            4.2 Discuss sexuality in a positive, open, and explicit way            4.3 Facilitate the complete set of activities, including the difficult activities            4.4 Seek support when they find particular activities difficult to facilitate</p>

Uganda only = italics; Indonesia only = underline

**Table 10.5 Matrix of Change Objectives for Adoption and Implementation**

<i>Personal Determinants</i>				
<b>Performance Objectives (PO)</b>	<b>Knowledge (K)</b>	<b>Attitude (A)</b>	<b>Perceived Social Influence (PSI)</b>	<b>Skills and Self-Efficacy (SSE)</b>
<i>Behavioral Outcome 1: Ministry of Education (MoE) staff will support program adoption and implementation by teachers.</i>				
<u>PO.1.1. Create commitment within their own organizations</u>	<u>K.1.1. Describe the content, teaching methods, and messages of the program</u>	<u>A.1.1. Express they are convinced of the need and added value of the program</u>	<u>PSI.1.1. Express they feel supported by important decision makers in their own organization in supporting comprehensive sexuality education</u>	<u>SSE.1.1. Explain step-by-step how they convince decision makers and other staff of the need for the program</u>
<u>PO.1.2. Show their commitment for the program to school principals and teachers</u>	<u>K.1.2. Explain the added value of the program for school principals and teachers</u>	<u>A.1.2. Express positive attitude toward the program and the benefits for teachers and school principals</u>		<u>SSE.1.2.a. Describe how to resist pressure of others who are not in favor of the program</u> <u>SSE.1.2.b. Demonstrate confidence to resist this pressure</u>
<i>Behavioral Outcome 2: School principals will support implementation of the program.</i>				
<u>PO.2.1. Encourage teachers to implement the program</u>	<u>K.2.1.a. Explain the content and approaches of the program.</u> <u>K.1.2.b. List the selection criteria for teachers (e.g., equal number male/female; youth friendly)</u>	<u>A.2.1.a. Express the need for a comprehensive sexuality education program</u> <u>A.2.1.b. Explain benefits of the program to teachers</u>	<u>PSI.2.1. Express they feel supported by MoE staff for implementation</u>	<u>SSE.2.1. Explain step-by-step how to convince teachers to implement the program in the school</u>

(Continued)

**Table 10.5 (Continued)**

<i>Personal Determinants</i>				
<b>Performance Objectives (PO)</b>	<b>Knowledge (K)</b>	<b>Attitude (A)</b>	<b>Perceived Social Influence (PSI)</b>	<b>Skills and Self-Efficacy (SSE)</b>
PO.2.2. Provide conditions and resources (time, venue, funds, computers) for implementation of the program	K.2.2. Explain required conditions for a school to implement the program	A.2.2. Express that program implementation is a priority for them	PSI.2.2. List other schools that have successfully implemented the program	
PO.2.3. Encourage and facilitate teacher training and support meetings	K.2.3. Describe what is needed to organize support for teachers to implement the program in an effective way	A.2.3. Describe the need for training and regular support of teachers	PSI.2.3. Express that they experience support of other schools and the Ministry of Education to implement the program	
PO.2.4. Create a supportive environment in the school	K.2.4. Describe the factors in their school that can support SRHR of young people (e.g., school policy, facilities, regulations)	A.2.4.a. Express the importance of removing barriers of SRHR for young people	PSI.2.4.a. Express they experience support from MoE staff PSI.2.4.b. Describe experiences of other schools that successfully created a supportive environment	SSE.2.4. Explain step-by-step how they would create a supportive environment for SRHR of young people
PO.2.5 Provide back up for teachers in case of difficulties with implementation	K.2.5. List three issues that could be difficult for teachers during implementation	A.2.5. Express they have a role in providing support of and empowerment by implementing teachers		SSE.2.5. Explain step-by-step when and how they will support teachers

<p>PO.2.6 Involve parents and school staff</p>	<p>K.2.6.a. Describe the possible arguments of parents and school staff against comprehensive sexuality education K.2.6.b. Describe counterarguments</p>	<p>A.2.6. Explain the benefits of the program to parents and school staff</p>	<p>PSI.2.6.a. Discuss that they experience support of parents and community members PSI.2.6.b. Describe that they experience support of other school staff</p>	<p>SSE.2.6. Demonstrate how they interact with parents in a way that supports the program</p>
<p>PO.2.7 Facilitate access to counseling and health service providers</p>	<p>K.2.7.a. Explain the criteria for youth-friendly services K.2.7.b. List three places where youth can go for youth-friendly counseling and health services K.2.7.c. Explain which problems can be addressed by school counselors and when youth need to be referred to specialized services</p>	<p>A.2.7. Express they find it important that youth are well referred</p>		<p>SSE.2.7. Explain how they establish linkages between health services and counselors and the school/teachers</p>

(Continued)

**Table 10.5 (Continued)**

<i>Personal Determinants</i>				
Performance Objectives (PO)	Knowledge (K)	Attitude (A)	Perceived Social Influence (PSI)	Skills and Self-Efficacy (SSE)
<i>Behavioral Outcome 3: Teachers will involve young people in the learning process to support them to make and act out healthy decisions about sexuality and growing up.</i>				
PO 3.1. Create and maintain a safe implementation setting	K.3.1.a. Explain what a safe environment means (respect, confidentiality, boundaries) K.3.1.b. Describe strategies of how to create and maintain a safe environment for learners K.3.1.c. Explain that confidentiality and adhering to personal boundaries are necessary to ensure a safe environment in which to engage in sexual matters for both learner and teacher.	A.3.1.a. Demonstrate ways that they value engagement with learners A.3.1.b. Describe they have an attitude of respect toward learners A.3.1.c. Describe they have an attitude of acceptance of learners' individuality A.3.1.d. Verbally justify the importance of creating a safe environment for learners	PSI.3.1. Describe the norms of others (teachers, principal, parents) toward a safe environment for learners	SSE.3.1.a. Describe how they use listening skills so that all learners feel included SSE.3.1.b. Explain how they manage learners' emotional fallout SSE.3.1.c. Explain how they set and enforce boundaries in a respectful manner SSE.3.1.d. Recognize threats to a safe environment and have skills to mobilize resources to correct the situation
	PO 3.2. Comply with the need for and objectives of the program	K.3.2.a. Describe the content, assumptions, values, and teaching methods of the program	A.3.2.a. Explain that they have an attitude of acceptance toward the program	PSI.3.2. Describe the norms of other colleagues toward the program and how these fit with or depart from their own norms toward the program

	K.3.2.b. Describe the goals and objectives, principles and key values and content in the program and explain how those meet the needs and rights of students	A.3.2.b. Justify the usefulness of the program		
PO.3.3. Facilitate the program in a nonmoralizing manner	K.3.3.a. Explain how easily personal values, feelings, and beliefs about sexuality can be transferred during teaching K.3.3.b. Describe the diverse value positions that learners may represent	A.3.3.a. Display willingness to explore own values A.3.3.b. Display willingness to explore discomforts around sexuality issues that may affect teaching A.3.3.c. Express an accepting and open attitude toward teenage sexuality A.3.3.d. Display willingness to explore own vulnerability toward sexual health problems		SSE.3.3.a. Demonstrate ability to explore own values and to discuss these objectively SSE.3.3.b. Engage and discuss the tensions between own and others' value positions regarding sexuality and teenage sexuality SSE.3.3.c. Acknowledge own values that may have an impact on teaching situation and explain how they would deal with this
PO.3.4. Apply participatory learning principles and didactic methods in classroom	K.3.4.a. Describe that teaching in a participatory style presupposes a sense of comfort with own sexuality	A.3.4.a. Express open attitude toward learners and toward sexuality		SSE.3.4.a. Demonstrate conflict management, facilitation, and group dynamics skills

(Continued)

**Table 10.5 (Continued)**

<i>Personal Determinants</i>				
<b>Performance Objectives (PO)</b>	<b>Knowledge (K)</b>	<b>Attitude (A)</b>	<b>Perceived Social Influence (PSI)</b>	<b>Skills and Self-Efficacy (SSE)</b>
	<p>K.3.4.b. Explain what participatory learning is and list different kinds of participatory learning approaches</p> <p>K.3.4.c. Explain how roles shift in participatory learning</p> <p>K.3.4.d. Explain the importance and role of group dynamics in participatory learning</p>	<p>A.3.4.b. Express flexible attitude (can accommodate differences)</p> <p>A.3.4.c. Explain that they take the contributions of young people seriously</p> <p>A.3.4.d. Express awareness of own sexuality and how own values might impact on program delivery</p>		<p>SSE.3.4.b. Describe how they can empower young people and encourage them to participate</p> <p>SSE.3.4.c. Demonstrate how to use and apply participatory learning strategies</p> <p>SSE.3.4.d. Explain how to practice flexibility in teaching (that is, switching strategies, roles where necessary)</p>
<p>PO.3.5. Provide counseling or refer students to health care providers and counselors</p>	<p>K.3.5.a. List three places to refer young people to for health care or counseling</p> <p>K.3.5.b. Explain basic criteria and basic principles of counseling and reference</p>	<p>A.3.5. Express open attitude toward and acceptance of young people</p>		<p>SSE.3.5.a. Demonstrate being aware of own limitations concerning counseling of young people</p> <p>SSE.3.5.b. Demonstrate counseling skills (listening, summarizing)</p>

	K.3.5.c. Describe basic signs of individual students regarding common problems in the area of adolescent development, sexual and reproductive health			
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***Behavioral Outcome 4: Teachers will facilitate the program according to principles and guidelines provided by the planning group.***

PO.4.1. Comply with the principles and guidelines in the teacher manual	K.4.1. Describe the three most important principles of the program	A.4.1. Express a positive attitude toward use of the teacher manual		SSE.4.1. Describe how they will use the teacher manual and other materials in the implementation of the program
PO.4.2 Discuss sexuality in a positive, open, and explicit way	K.4.2.a. Describe the personal, emotional, and sociocultural issues that make it difficult to deal openly with sex K.4.2.b. Describe the sexual needs and rights as well as the sexual practice of today's adolescents K.4.2.c. Explain how sexuality and sexual and reproductive health can be communicated in an age-appropriate and culturally sensitive manner	A.4.2.a. Describe aspects of own sexuality that would hinder open discussions A.4.2.b. Demonstrate an attitude of openness toward discussing sexual matters	PSI.4.2. Describe the potential negative norms of others (teachers, principal, parents) toward the open discussion of sexuality	SSE.4.2.a. Describe how they would verbally respond to the potentially negative norms toward open discussion of sexuality SSE.4.2.b. Describe step by step how they deal with learners' behavioral and emotional manifestations that arise from discussions about sex SSE.4.2.c. Describe how they can overcome learners' resistance to speaking comfortably about sex

*(Continued)*

**Table 10.5 (Continued)**

<i>Personal Determinants</i>				
<b>Performance Objectives (PO)</b>	<b>Knowledge (K)</b>	<b>Attitude (A)</b>	<b>Perceived Social Influence (PSI)</b>	<b>Skills and Self-Efficacy (SSE)</b>
PO 4.3. Facilitate the complete set of activities, including the difficult activities	K. 4.3.a. Describe the activities in the program they find more difficult to teach K. 4.3.b. Describe the need for each activity in each session	A. 4.3.a. Convince others that exact implementation according the teacher manual is critical for creating change among their students A. 4.3.b. Express awareness of their own barriers to implementing particular activities in the program	PSI. 4.3. Explain who can help in case of difficulties	SSE. 4.3. Explain how they would deal with difficult activities in the program and think of creative alternatives
PO 4.4. Seek support when they find particular activities difficult to facilitate	K. 4.4.a. Explain whom to report to and ask for support for different problems K. 4.4.b. List professionals (that is, trainers, peer teachers, SRHR experts) who could provide support	A. 4.4.a. Explain that it is important to seek help with activities they find difficult to teach A. 4.4.b. Explain that asking for help is not a sign of failure but of strength A. 4.4.c. Express awareness of their own barriers in implementing particular activities in the program	PSI. 4.4.a. List three people who could assist when they have questions with the program activities PSI. 4.4.b. Express that they feel supported by other teachers who also implement the same program	SSE. 4.4.a. Demonstrate skills in analyzing problems and problem solving SSE. 4.4.b. Demonstrate that asking for help is a sign of strength SSE. 4.4.c. Provide a scenario of how to get support in case of resistance from school administration

### *Theoretical Methods, Practical Applications and Program for Adoption and Implementation*

The planning group reviewed the Ugandan practical applications and theoretical methods to determine whether they were sufficient for the Indonesian adoption and implementation change objectives. For the school principals and teachers, these remained, to a large extent, the same. New applications and theoretical methods were selected to use with Ministry of Education staff.

The planning group involved Ministry of Education staff in Indonesia from the beginning of the project and maintained frequent contact with key stakeholders within the Ministry to update them on the project's progress. In advisory board meetings Ministry staff provided feedback on each Intervention Mapping step; therefore, they were quite positive about adoption and implementation of the adapted program. The planning group also involved school principals in an early stage of the project by organizing a one-day orientation meeting to enhance the principals' knowledge about the program, change their attitudes regarding youth sexuality, and generate commitment to the project. Other practical applications for school principals considering adopting DAKU! included twice-yearly evaluation meetings with the participating principals to tackle barriers to adoption and implementation and an annual exhibition meeting, the last lesson in WSWM/DAKU!, wherein young people shared what they learned with principals and teachers from schools considering the program. The school principals were responsible for selecting teachers according to criteria established by the planning group, a process not initially done in Uganda. After monitoring and evaluating the pilot tests, this practical application developed in Indonesia was added to the adoption and implementation interventions in Uganda.

The third level in adoption and implementation concerns the teachers as facilitators of DAKU!. The teacher section in the WSWM/DAKU! software includes specific instructions (including time and materials needed), tips and objectives, background, and instructions for each lesson. It also provides teachers a version of the program and alternatives for each practical application to allow implementation without computers. To help teachers meet the objective of seeking support, the program provided an interactive Web site where they can share experiences with other teachers, and ask for their advice.

To be able to implement the lessons in the WSWM/DAKU! program, each teacher attends an initial, intensive, five-day training. In Indonesia, a separate weeklong training on facilitation skills was added as a result of discussions and interviews with teachers who indicated the need for skills to transition from didactic instruction to a more participatory, facilitative approach for DAKU!. WPF staff facilitated the initial training sessions and focused on building capacity in teachers to conduct training workshops for future DAKU! teachers. The young people in the planning group contributed to the training by representing the views and needs of youth. This was a successful intervention in both Uganda and Indonesia. The six teachers in the Indonesian planning group participated in training, implemented the draft version of DAKU! in the three pilot schools, and became the trainers and role models for

new teachers. Because they participated intensively in the adaptation process, these teacher-trainers knew the program very well and were able to use their experiences in teacher attitude change toward sexuality in the training of new teachers.

Sessions include practical applications such as lectures and discussions to increase knowledge and to stimulate acceptance and ownership of the program. Trainers worked to help teachers develop positive attitudes toward young people's rights and sexuality. Teachers participated in role playing to learn and practice skills and to develop self-efficacy in how to openly and non-moralistically discuss sexuality with students. They also applied participatory teaching techniques and processes to identify students with individual problems in order to counsel or refer them to resources. The training also included a session to discuss with teachers how they can contribute to a supportive environment in the school, including norms of confidentiality, school rules and policy, and connection with community, parents, and health providers. During program implementation, teacher-trainers and experts in SRHR provided individual support to teachers and principals.

## Step 6. Evaluation Planning

In each of the Uganda and Indonesia pilot tests, teams of teacher-trainers and SRHR experts assessed quality and fidelity of implementation in the schools through classroom observations, forms for teachers and students to evaluate each lesson's implementation, and focus group discussions with teachers and students to exchange experiences and document the lessons learned. Based on these data, the project team helped individual teachers to improve implementation.

Since 2008, WPF and its partner organizations in Uganda, Indonesia, Thailand, and Kenya are working with Maastricht University and Windesheim University of Applied Sciences (both in the Netherlands) to conduct both outcome and process evaluations. The process evaluation aims to assess quality and fidelity of implementation. Preliminary results show that teachers in particular may need more or different training and support than is currently provided to implement the program with fidelity.

The outcome evaluation is a non-randomized trial with baseline and posttest measurement using a questionnaire to measure change in determinants of condom use, delay of onset sexual intercourse/ abstinence, consensual sex, and practicing other sexual activities instead of sexual intercourse. The questionnaire was completed by a sample of approximately 800 intervention respondents (exposed to the program) and 800 matched comparison respondents (not exposed to the program) in each country.

Preliminary results of the outcome evaluation in Uganda (Rijsdijk et al., 2010) suggest that students who participated in WSWM had significantly improved between baseline and post-measurement after participation on various factors that influence sexual behaviors, compared to the comparison group. They were better able than the comparison group to clarify myths on pregnancies, such as "If a girl washes herself

thoroughly immediately after sexual intercourse, she can NOT get pregnant”; more convinced that young people should decide for themselves when and with whom to practice different sexual activities; reported more positive intentions to delay sex; and felt more confident to deal with sexual violence, for example, to avoid situations in which unwanted sex could occur or to manage to get out of it, than before they were exposed to WSWM.

Regarding condom use, the students who followed WSWM remained stable on their judgment on whether it is wise to use condoms during sexual intercourse and indicated that, after having followed the program, they perceive it to be less difficult to consistently use condoms during sexual intercourse. The students who did not follow WSWM, however, became less convinced that it is wise to use condoms and found it more difficult to consistently use them.

**Lessons Learned from Adapting WSWM**

The WSWM and DAKU! curricula in Uganda and Indonesia are based on similar principles and theoretical methods. There are limited differences in objectives, practical applications, content, and messages (see Table 10.6). In spite of the difference between Indonesia and Uganda in HIV prevalence, low and high respectively, transmission route, and the differences in sexual behavior, youth in both countries express to a large extent the same needs, concerns, fears, and solutions. This has resulted in similar sexuality education programs in the two countries. However, the small changes made in the program, based on evidence and formative research (for example, adding stress objectives, referring condom demonstration to providers outside schools) were critical to program acceptability to an Indonesian population.

**Table 10.6 Differences Between Programs for Uganda and Indonesia**

Ugandan Program (Original)	Indonesian Program (Adapted)
<i>Objectives</i>	
Objectives covering transactional sex No objectives for drug and alcohol use No objectives for stress management	No objectives for transactional sex Objectives added for drug and alcohol use Objectives added for stress management
<i>Determinants and Theoretical Methods</i>	
Determinants were Knowledge, Attitude, Risk Perception, Perceived Social Influence, Skills, and Self-Efficacy  Methods included active learning/ participation, role modeling, skill training, persuasion, information dissemination	The determinants were unchanged Theoretical methods were unchanged

(Continued)

Table 10.6 (Continued)

Ugandan Program (Original)	Indonesian Program (Adapted)
<i>Practical Applications</i>	
The computer-based delivery and teacher-led discussions included informational presentations with quizzes, small group and class discussions, role plays, condom demonstration and homework assignment encouraging application	The condom demonstration was referred to an outside-of-school venue The characters of the animated role model were adapted for Indonesian culture and situations Culturally sensitive translation was conducted
<i>Adoption and Implementation</i>	
Objectives and intervention for teachers and principals Did not originally include Ministry of Education Staff	Added extra week of teacher training to further develop skills in participatory teaching Included Ministry of Education staff from the beginning of program adaption to encourage ownership and buy-in

The process of stakeholder participation in a committed advisory board significantly contributed to program ownership and quality and its implementation. Active participation of students in curriculum development and implementation and in teacher training effectively bridged the gap between youth cultures and adult social norms regarding sexuality and social and cultural norms in both countries.

## Case Study Two: South African Life Skills HIV and AIDS Prevention Program.

This case study describes the process of making recommendations for the post-evaluation program redesign of the South African HIV and AIDS risk-reduction program for secondary school students (James, Reddy, Ruiters, McCauley, & van den Borne, 2006; Magnani et al., 2005; Visser, Schoeman, & Perold, 2004). This type of situation often occurs when a carefully developed program is only partially effective but could be more effective if adapted based on findings from the evaluation. In this case study, the post-evaluation recommendation group was led by James and comprised some individuals who had been involved in both the original program implementation with consulting faculty from the University of Maastricht. Acting on the recommendations presented in this chapter would require a planning group with representation from the original program development group and school communities.

Preventing HIV infection by adopting safer sexual behaviors (abstinence or condom use) remains the key strategy to decreasing HIV/AIDS prevalence in South Africa. One strategy of the South African Department of Education has been to implement a South African teacher-led program, the Life Skills HIV/AIDS Prevention Program (LHAP), among secondary school learners. The program has been evaluated in several studies and found to have modest effects on some determinants of sexual risk taking (James et al., 2006; Magnani et al., 2005). Process evaluations have suggested some deficits in implementation (Reddy, James, & McCauley, 2005; Visser et al., 2004). We used the Intervention Mapping framework to develop a set of post-evaluation recommendations to improve this program.

### Step 1. Needs Assessment

To assess the problem of HIV risk taking among South African adolescents, the post-evaluation recommendation group reviewed studies of adolescent sexual risk and local and national data from South Africa. They then created a logic model of the problem, including its behavioral and environmental causes using the PRECEDE model as an organizing framework (Green & Kreuter, 2005).

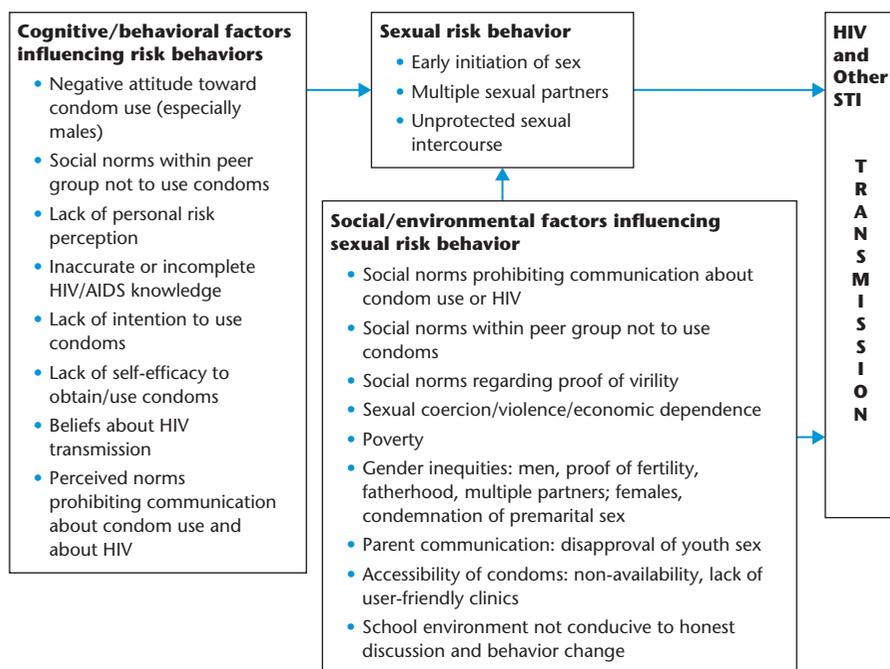
The incidence of HIV/AIDS is an unabated problem through sub-Saharan Africa (SSA) and South Africa in particular. In 2005 UNAIDS estimated that in South Africa 5.5 million people were HIV positive (UNAIDS 2006). Estimates from a national household study showed prevalence rates for adults (15–49 years) of 15.6% and for youth (15–24 years) of 9.3% with a distinct difference between female (12%) and male (6%) youth (Shisana, Mandela, & Simbayi, 2002).

Several studies report that youth have improved their understanding of HIV/AIDS (over 80% correct responses) and ways of protecting themselves from sexually transmitted infections (STIs), including HIV (76–86% correct responses) (James et al., 2005; Simbayi et al., 2005). However, despite youth awareness of HIV/AIDS and ways to prevent transmission, there remain high rates of sexual risk behavior (Reddy et al., 2003).

The priority population for our program recommendations is secondary school students, of whom there are 4,186,882, representing a wide range of ethnic groups, distributed among the nine provinces in South Africa. The Department of Education reports that Kwazulu Natal (KZN), where two of the evaluation studies on the LHAP were conducted, has the largest school-going population of any province, with 960,996 secondary school students.

No logic model of the problem was available from the original program. The recommendation group created a logic model (Figure 10.1) to facilitate development of recommendations from the evaluation findings. This figure is a modified PRECEDE risk model of the factors related to the practice of HIV sexual risk behaviors by South African adolescents (Green & Kreuter, 2005). The middle column gives the behaviors that place South African adolescents at particular risk. Several studies have been crucial in confirming the risk behaviors for contracting STIs, including HIV (Abdool Karim, Abdool Karim, Preston-Whyte, & Sankar, 1992; Flisher, Reddy, Muller, & Lombard, 2003; Flisher, Roberts, & Blignaut, 1992; Pettifor et al., 2005;

**FIGURE 10.1** Logic Model of the Problem: HIV Risk Among South African Adolescents



Reddy et al., 2003; Simbayi et al., 2004; Taylor, Dlamini, Kagoro, Jinabhai, & De Vries, 2003). These behaviors may be broadly categorized as the early initiation of sex, multiple sexual partners, and unprotected sexual intercourse. For example, according to the South African Youth Risk Behavior Survey (YRBS), for KZN province, the prevalence of adolescents ever having had sex, consistent condom use, and initiation of sex before 14 years old was 37%, 15%, and 16%, respectively (S. P. Reddy et al., 2003). Among grade 11 students in KZN, 42.6% reported being sexually active in the previous six months, with 33.3% not having used condoms at all. Of those reporting condom use, 42.6% said sometimes and 41.8% said every time (James et al., 2004). A review by Eaton, Flisher, and Aar (2003) concluded that at least 50% of youth in South Africa are sexually active by age 16 years, with between 1–5% of females and 10–25% of males reporting more than four partners per year. Recent findings from a community-based study conducted in South Africa show that participants reporting more than one lifetime partner were almost twice as likely to be HIV infected as participants reporting one lifetime partner (Pettifor et al., 2005).

This model includes the social environmental factors that may influence adolescent behavior and the cognitive determinants. Theoretical determinants of condom use in the model are based on two meta-analyses of international studies of the psychosocial correlates for heterosexual male condom use (Albarracin, Johnson, Fishbein, & Muellerleile, 2001; Sheeran, Abraham, & Orbell, 1999).

Empirical studies of determinants of HIV risk behavior in South African youth suggest several important factors. Simbayi et al. (2005) reported some important remaining deficits in HIV/AIDS-related knowledge, including the beliefs that washing one's genitals after sex reduces the risk of HIV infection and that AIDS is caused by spiritual forces (Simbayi et al., 2005). Other problems include social norms prohibiting direct discussion of condom use and HIV/AIDS (Reddy Meyer-Weitz, van den Borne, & Kok, 2000; Varga, 1997); the association of negative attitude to condoms and high-risk sexual behavior in males (Meyer-Weitz, Reddy, van den Borne, Kok, & Pietersen, 2003); the association of failure to feel personally at risk (including perceived abstinence, monogamy, or condom use); and participation in risky sexual behavior (Macintyre, Rutenberg, Brown, & Karim, 2004; MacPhail & Campbell, 2001). The feeling of personal vulnerability and belief in the existence of HIV may be enhanced by knowing someone with HIV (Taylor et al., 2007).

Several qualitative studies focus on social-environmental influences on adolescent sexual behavior in South Africa and highlight factors such as cultural background, gender, sexuality, and socioeconomic status (Rivers & Aggleton, 2005). For example, a sexual relation may add status for men, whereas women were concerned that refusal invites physical coercion, abandonment, and economic consequences (Campbell, Foulis, Maimane, & Sibiya, 2005; MacPhail & Campbell, 2001; Pettifor, Measham, Rees, & Padian, 2004; Varga, 1997). In general, youth sexuality and sexual behavior carry intense social disapproval by adults in most South African cultures and may result in youth having little opportunity to use condoms (MacPhail & Campbell, 2001; Varga, 1997). At the same time, abstinence and condom use may garner disapproval among young men (MacPhail & Campbell, 2001).

## Step 2. Logic Model of Change

Because there was no logic model of change in the original program development, we worked from the logic model of the problem we created in Step 1 to develop a proposed logic model of change for this program (Figure 10.2). First, we considered 11 learning objectives from the original program. Some are what Intervention Mapping calls performance objectives and others are closer to determinants or to change objectives. The learning objectives for the original program were

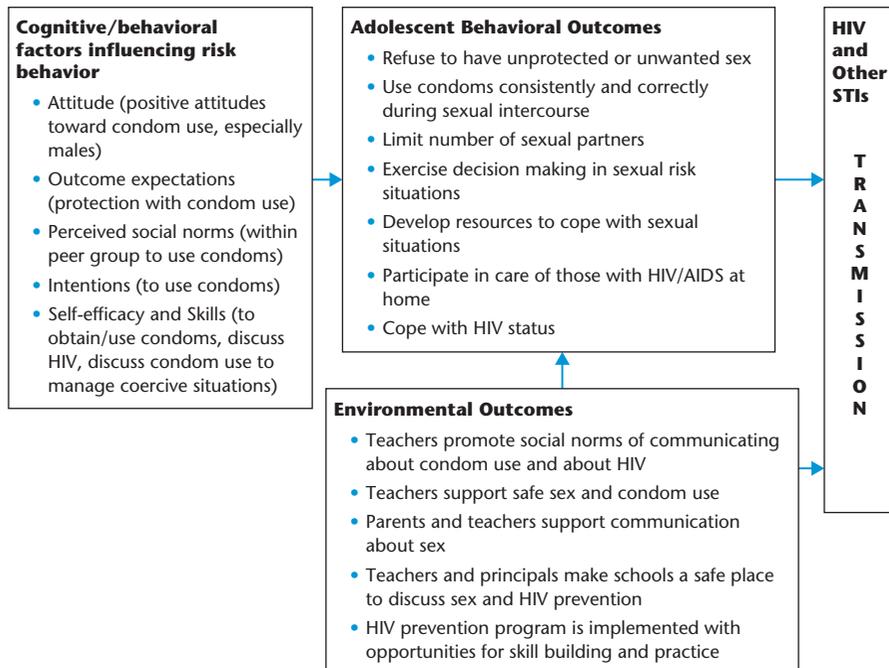
1. Demonstrate a clear and accurate understanding of sex, sexuality, gender, and STIs
2. Identify ways HIV/STIs can and cannot be transmitted
3. Identify and evaluate the effectiveness of HIV/STI prevention methods

4. Identify, access, and mobilize sources of assistance within a community
5. Critically evaluate reasons for delaying sexual intercourse or practicing abstinence
6. Respond assertively to pressures to have sexual intercourse and unprotected sex
7. Critically evaluate reasons and methods for having protected sex, if sexually active
8. Accept, cope, and live positively with the knowledge of being HIV positive
9. Show compassion and solidarity toward persons with HIV/AIDS and their friends and relatives
10. Provide basic care for persons living with HIV/AIDS in the family and community
11. Understand and cope with the grieving process. (Magnani et al., 2005)

The logic model of change includes behavioral outcomes, performance objectives, and determinants deduced from the original 11 program objectives as well as new ones added after we analyzed the problem and asked what [else] in addition to the previous program objectives needed to change.

A set of detailed recommended behavioral outcomes and performance objectives are presented in Table 10.7. A selected set of these are combined with determinants from the theory used in the original program and presented in Table 10.8. The

**FIGURE 10.2 Proposed Logic Model of Change**



**Table 10.7 Behavioral Outcomes and Performance Objectives for Adolescents in South Africa**

Behavioral Outcomes	Performance Objectives
1. Abstain from sexual intercourse or delay sexual intercourse	1.1. Make a decision in sexual risk situations 1.2. Work with parents and community members to find ways to avoid economic dependence on sex 1.3. Manage coercive situations
2. When having sexual intercourse, use condoms for protection	2.1 Decide to use condoms 2.2 Refuse to have sex without a condom 2.3 Prepare to use a condom by acquiring and carrying a condom 2.4 Use condoms routinely during sexual intercourse 2.5 Maintain condom use
3. Provide basic care-taking for family and community members with AIDS	3.1 Take protective measures when caring for someone with AIDS 3.2 Plan home-based care for someone with AIDS 3.3 Provide a supportive environment for family and community members with AIDS 3.4 Access and make arrangements for medical care 3.5 Interact with local social and nursing services to enhance care of family and community members.
4. Identify, access, and mobilize sources of assistance for providing HIV/AIDS care in the community	4.1 Make a list of community resources available 4.2 Get to know where to find the possible sources of help 4.3 Approach possible sources to assist with care of community members 4.4 Make a list of the community needs, and communicate it to the community resources
5. Cope with and live positively with the knowledge of being HIV positive	5.1 Accept personal HIV-positive status 5.2 Decide to retain a positive attitude to deal with stress 5.3 Communicate with people in a similar situation 5.4 Learn ways to keep yourself healthy 5.5 Practice safe sex, condom use to prevent coinfection and transmission 5.6 Develop coping strategies for possible discrimination or stigma

only environmental factors addressed in this program are limited to the school and are dealt with in the teacher and administrator objectives (below). The performance and change objectives added for the adolescent emphasize sexual decision making, using protection when having intercourse, and handling pressure to have sex. The

**Table 10.8 Matrix of Change Objectives for Adolescents**

Personal Determinants					
Performance Objectives (PO)	Behavioral Capability (BC)	Outcome Expectations and Attitude (OEA)	Self-Efficacy and Skills (SSE)	Perceived Social Norms (PSN)	Intentions (I)
<i>Behavioral Outcome 1: Abstain from sexual intercourse or delay sexual intercourse</i>					
PO.1.1. Make decisions in sexual risk situations (SRS).	BC.1.1.a. List the steps of decision making and problem solving BC.1.1.b. List the steps of decision making that apply to sexual risk situations BC.1.1.c. Describe how the decision-making process can apply to considering and postponing sexual activity BC.1.1.d. Critically evaluate reasons to delay or abstain from sexual intercourse	OEA.1.1. Argue that students who use decision making can make risk-reducing decisions in SRS	SSE.1.1.a. Demonstrate decision-making steps SSE.1.1.b. Discuss personal confidence in decision making as it relates to sexual behavior SSE.1.1.c. Demonstrate how to refuse sex using general decision-making skills and assertiveness SSE.1.1.d. Express confidence in using refusal skills	PSN.1.1.a. Discuss that other students think it is important to take responsibility for HIV risk reduction PSN.1.1.b. Describe how other students explicitly use decision making regarding sexual risk taking	I.1.1.a. Publicly state intentions to use decision making for SRS I.1.1.b. Publicly state intention about using decision-making skills to abstain or delay intercourse when not ready to be sexually active

<p>PO.1.2. Work with parents and community members to avoid economic dependence on sex</p>	<p>BC1.2.a. Describe reasons why youth exchange sex for money or other goods and services BC1.2.b. List ways that parents and community members can help youth to avoid economic dependence on sex</p>	<p>OEA.1.1. Expect that if parents and community members provide alternative economic opportunities for youth, they will be able to avoid economic dependence on sex</p>	<p>SSE.1.2.a. Express confidence in ability to get parental and community support SSE.1.2.b. Demonstrate ways to elicit parental and community support</p>	<p>PSN.1.2. State that other teens work with parents and community members to provide other economic opportunities for youth</p>	<p>I.1.2. Publicly state intentions to avoid economic dependence on sex</p>
<p>PO.1.3. Manage coercive situations</p>	<p>BC.1.3.a. Describe risky situations that relate to power and age differences BC.1.3.b. List plans for escaping coercive situations</p>	<p>OEA.1.3.a. Expect that being able to recognize potentially coercive situations will help to avoid them OEA.1.3.b. Expect that having a plan to escape coercive situations will reduce the risk of engaging in unwanted sex</p>	<p>SSE.1.3.a. Feel confident in being able to identify and manage coercive situations SSE.1.3.b. Demonstrate ability to escape a coercive situation</p>	<p>PSN.1.3. Describe that other students successfully avoid or escape coercive situations</p>	<p>I.1.3. Discuss intention to avoid or manage coercive situations</p>

(Continued)

**Table 10.8 (Continued)**

<i>Personal Determinants</i>					
Performance Objectives (PO)	Behavioral Capability (BC)	Outcome Expectations and Attitude (OEA)	Self-Efficacy and Skills (SSE)	Perceived Social Norms (PSN)	Intentions (I)
<i>Behavioral Outcome 2: When having sexual intercourse, use condoms for protection</i>					
PO.2.1. Decide to use condoms	BC.2.1.a. Describe transmission and symptoms of HIV/STIs BC.2.1.b. State that using condoms will reduce the risk of getting HIV or STIs, or becoming pregnant	OEA.2.1. Recognize that making the decision to use condoms reduces the risk of getting HIV or STIs, or becoming pregnant	SSE.2.1. Feel confident in being able to make the decision to use condoms	PSN.2.1. Describe that other students make the decision to use condoms	I.2.1. Discuss intention to use condoms every time when having sex
PO.2.2. Refuse to have sex without a condom	BC.2.2. List the steps of condom negotiation	OEA.2.2. Describe explicitly how using condom negotiation skills can result in greater likelihood of safer sex	SSE.2.2.a. Express confidence to use the steps of condom negotiation SSE.2.2.b. Demonstrate the steps of condom use negotiation	PSN.2.2. Describe the methods that other students use to negotiate condom use	I.2.2. Discuss the explicit intention to use condom negotiating skills
PO.2.3. Prepare to use a condom by acquiring and carrying a condom	BC.2.3.a. Describe in detail the practical aspects to condom use. BC.2.3.b. Describe all steps for each of the listed activities that enable successful condom use	OEA.2.3. Explain that advance preparation will increase successful condom use and disease prevention	SSE.2.3. Describe personal plan for preparing to use condoms	PSN.2.3. Describe other students as being prepared to use condoms	I.2.3. Talk about being prepared to use condoms

<p>PO.2.4. Use condoms routinely during sexual intercourse</p>	<p>BC.2.4.a. Describe steps involved in condom use (acquiring, carrying, using, disposing)  BC.2.4.b. Identify ways in which HIV/STIs can and cannot be transmitted  BC.2.4.c. Identify and evaluate the effectiveness of HIV/STI prevention methods</p>	<p>OEA.2.4. Argue that correct condom use will protect against HIV, pregnancy, and STIs</p>	<p>SSE.2.4.a. Express confidence in using condoms  SSE.2.4.b. Describe step-by-step process of using condoms</p>	<p>PSN.2.4.a. Recognize that other students support that condom use is effective in reducing HIV risk.  PSN.2.4.b. Recognize that valued peers think that using condoms is a good thing to do (especially male peers)</p>	<p>I.2.4. Publicly express intentions to use condoms</p>
<p>PO.2.5 Maintain condom use</p>	<p>BC.2.5. Explain why condom use is important every time you have sex, with casual or regular partners</p>	<p>OEA.2.5. State that using a condom every time with every partner will reduce the risk of getting HIV or STIs, or becoming pregnant</p>	<p>SSE.2.5.a. Express confidence in ability to use a condom every time you have sex  SSE.2.5.b. Demonstrate the ability to use a condom or not to have sex with every partner, every time</p>	<p>PSN.2.5. State that other students use condoms each time they have sex, with casual and regular partners</p>	<p>I.2.5. Publicly state intention to use condoms every time, with every partner</p>

recommendation group also included performance objectives for HIV/AIDS care based on the importance of this topic in the original program, but did not develop the related determinants and matrices for these objectives. The home care objectives would require significant training for adolescents who are in the position of caring for a parent or other close relative at home. This might require a separate program targeted to these individuals.

### **Step 3. Program: Theory-Based Methods and Practical Applications**

### **Step 4. Program Production**

### **Step 5. Adoption and Implementation**

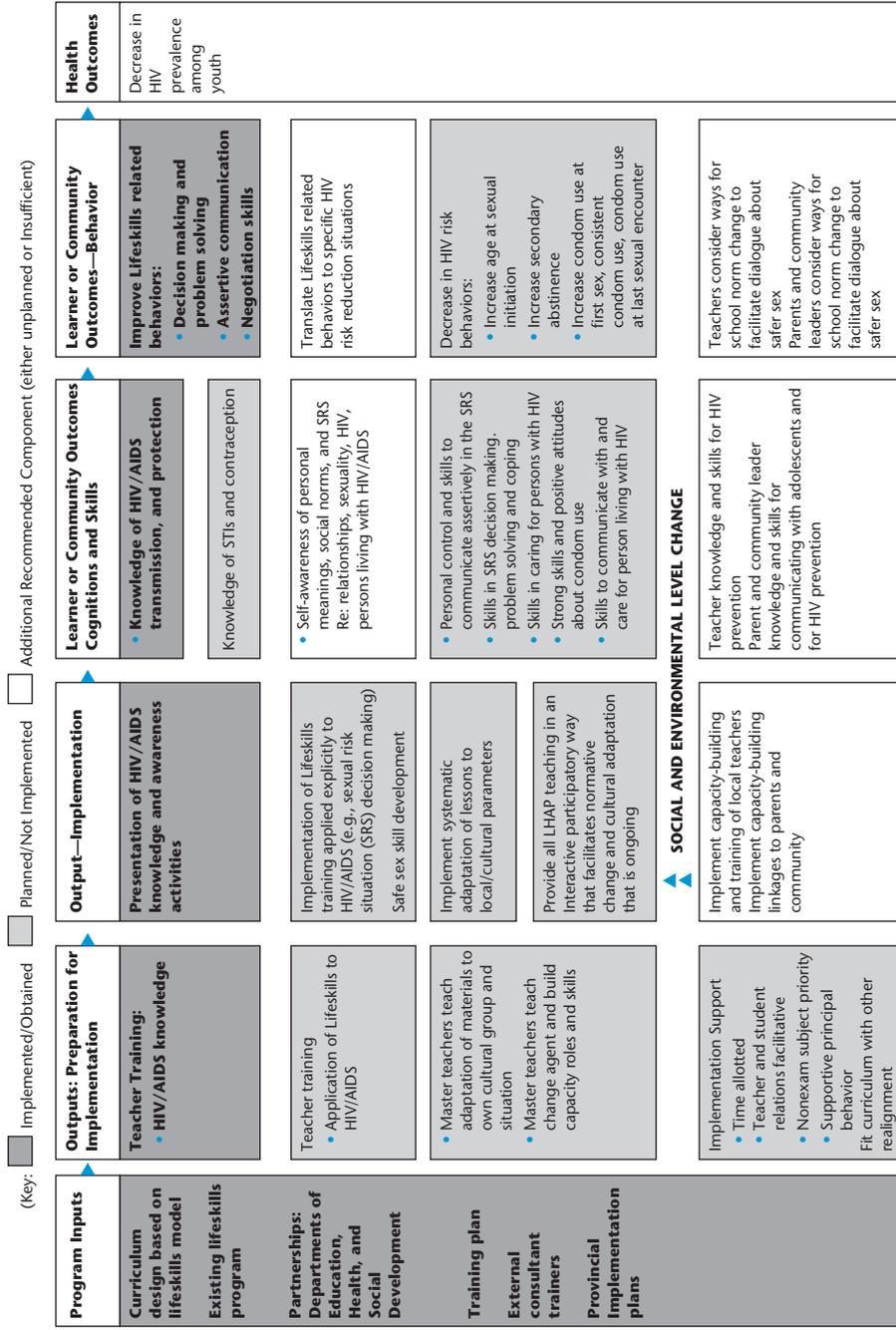
We combined the adaptation processes from Intervention Mapping Steps 3, 4, and 5, described above, to develop a full logic model of the program that includes the logic of change as well as information on the program methods and practical applications (Step 3), components (step 4), and the intended versus the actual program implementation (Step 5). Working from the curriculum materials and the evaluation reports (James et al., 2006; Magnani et al., 2005; Visser et al., 2004), we developed the logic model of the program (Figure 10.3). The model includes intended program inputs and activities, possible determinants of behavior, and program outcomes. Beginning on the left side of the model, we have listed the components that contributed to the design and implementation of the LHAP. Moving to the right across the columns, all program components and outcomes have been coded as either implemented or obtained, planned but not implemented, or not included in the original program plan but that might help the program better address the factors depicted in this logic model of change.

#### ***Description of the Original Program and Process Evaluation***

The original LHAP intervention is a 16-hour curriculum that was intended to be taught by schoolteachers each week over two school semesters. The content covers a range of topics related to the learning objectives above. These sessions are intended to be implemented using both didactic and interactive teaching, group work, and role-play methods.

Eight hundred forty trainers in nine provinces trained 13,609 teachers to implement the program locally. The teachers were expected to adapt the program for their schools based on local needs and community values and to act as change agents in schools to integrate the LHAP into the school's instructional program (Visser et al., 2004).

**FIGURE 10.3 LHAP Logic Model of the Program**



One process evaluation found that implementation tended to focus on information about HIV and AIDS and neglect the life skills components and the objectives regarding caring for people living with HIV and AIDS (S. P. Reddy et al., 2003). Visser et al. (2004) found that barriers to teaching the program included lack of time on the schedule, lack of support from the principal, not enough personnel to implement the program, not accepting HIV prevention as part of the teacher's role, lack of facilitative relationships with students, and schools' exclusive focus on examinable subjects.

### *Adaptation Recommendations for Methods and Practical Applications*

The original learning objectives of the program emphasized cognitive processes and few skills to apply knowledge of sexual decision making and protection. The performance and change objectives suggested above in Step 2 of the adaptation require new lessons to actively teach and reinforce skills. The lessons should include sufficient opportunity for students to practice new sexual decision-making skills and to develop social support and solidarity around sexual issues.

### *Implementation*

From considering the process evaluation of the original program and the logic model of change, the group recommends that the original program be adapted to enhance the capacity of teachers and administrators to make the school environment hospitable to an HIV risk reduction and life skills program. We propose specific implementation performance objectives for teachers and principals to enable them to deliver the original program with the new proposed student change objectives. The teacher and principal behavioral outcomes and performance objectives are listed in Table 10.9, and selected cells from matrices depicting the implementation change objectives are presented in Table 10.10.

## **Step 6. Evaluation Planning**

This case study presents only recommendations for adaptation following a program evaluation. Should these recommendations be implemented, the resulting program should have a full effectiveness evaluation as well as a process evaluation with particular emphasis on activities related to the new objectives.

## **Summary and Recommendations for Program Change**

Based on the logic model of the problem (Figure 10.1), the logic model of change, and the process evaluation findings regarding components and implementation of the

**Table 10.9 Implementation Outcomes and Performance Objectives for Teachers and Administrators**

Implementation Outcomes	Performance Objectives
1. Teach decision making for sexual risk situations (SRS)	1.1. Teachers enable students to discuss sexual behavior and community and peer norms that make it difficult to make SRS decisions. 1.2. Teachers arrange practice for students in decision making and problem solving applied to SRS.
2. Explicitly teach condom negotiation skills	2.1 Teachers provide instructions on the steps of negotiation. 2.2 Facilitate adolescent discussion of views on condom use, barriers to use, origins of beliefs, gender differences, and consequences of changing beliefs and actions. 2.3 Teachers arrange for students to practice negotiation. 2.4 Principals and other school management promote inclusion of teaching condom negotiating skills in the curriculum.
3. Explicitly teach condom use	3.1. Teachers teach performance objectives related to condom use (for example, acquiring, carrying, using consistently, putting on and removing safely, maintaining use with all partners). 3.2. Teachers arrange for students to practice condom use on anatomical model. 3.3. Principals and other school management review teaching plans for condom use skills, topics covered, and methodology. 3.4. Principals and other management demonstrate support for condom use simulation. 3.5. Principals and other management ensure that anatomical models are available for demonstration and practice.
4. Change norms in school regarding HIV prevention and discussion	4.1. Teachers develop classroom and school projects to change social peer norms that lead to HIV risk. 4.2. Teachers develop classroom and school projects to change norms about talking about sex. 4.3. Teachers develop classroom and school projects to change norms about condom use and refusing sex. 4.4. Principals and other school management approve of norm change project in curriculum plan.

(Continued)

Table 10.9 (Continued)

Implementation Outcomes	Performance Objectives
5. Teach skills to postpone sexual intercourse	<p>5.1. Teachers teach adolescents how to assertively postpone sexual intercourse when they are not ready (either initiation or continuation).</p> <p>5.2. Teachers encourage open discussion of the pros and cons of refusing sex when the adolescents are not ready.</p> <p>5.3. Teachers arrange for adolescents to discuss the difficulties involved in refusing sex (that is, fear of rejection, abandonment, belittling).</p> <p>5.4. Arrange for practice in assertively refusing sex.</p>
6. Develop resources for coping with sexual matters	6.1. Teachers help students develop resources to manage difficult sexual and relationship problems.
7. Develop community and school environments receptive to LHAP	<p>7.1. Principals develop a school policy to integrate LHAP into the school curriculum and fit curriculum with other realignment.</p> <p>7.2. Principals stimulate staff buy-in through a policy development workshop with school staff (or alternative strategy).</p> <p>7.3. Principals stimulate parent and community leadership to support the LHAP.</p>
8. Adequately train teachers to implement LHAP	<p>8.1. Principals facilitate a skills-development LHAP training workshop of staff members (including teacher time for participation) by trained teachers to ensure skills of teachers and sustainability of LHAP objectives.</p> <p>8.2. Principals develop and implement a plan to monitor and evaluate the process and outcomes of the LHAP program.</p> <p>8.3. Principals provide materials to support interactive facilitation of LHAP (including recommending budgets to the Department of Education).</p> <p>8.4. Principals obtain support from the wider school community (parents, religious and traditional leaders, school governing body) for the LHAP implementation.</p>

**Table 10.10 Planning Matrix 1: Implementation Related to Teacher Development of Student Life Skills Applied to HIV Risk**

Personal Determinants					
Performance Objectives (PO)	Behavioral Capability (BC)	Outcome Expectations and Attitude (OEA)	Skills and Self-Efficacy (SSE)	Perceptions of Social Norms (PSN)	Intentions (I)
PO.1.1. Teachers enable students to discuss sexual behavior and community and peer norms that make it difficult to make SRS decisions	BC.1.1.a. Describe nature of SRS for adolescents BC.1.1.b. Provide role models of decision-making steps applied to SRS BC.1.1.c. Describe the process of stimulating discussion of difficult topics BC.1.1.d. Explore personal values and attitudes toward adolescent sexual behavior BC.1.1.e. Describe methods for stimulating open and honest discussion	OEA.1.1.a. Recognize that knowing the factors that determine sexual behavior will make it possible for students to consider behavior change OEA.1.1.b. Argue that if teachers do a good job of teaching decision making, students can make risk-reducing decisions in SRS	SSE.1.1.a. Demonstrate discussing sexual behavior and norms SSE.1.1.b. Demonstrate leading a discussion of sexual behavior and norms SSE.1.1.c. Express confidence in managing open discussion about SRS SSE.1.1.d. Demonstrate making decisions in SRS SSE.1.1.e. Demonstrate modeling decision making in SRS	PSN.1.1.a. Describe the methods that other teachers use to lead discussions of sexual behavior and norms PSN.1.1.b. Discuss that other teachers think it is important to have a major role in HIV risk reduction PSN.1.1.c. Describe how other teachers explicitly teach decision making regarding sexual risk taking	I.1.1.a. Publicly state intention to stimulate honest and open communication I.1.1.b. Publicly state intentions to teach decision making for SRS
<i>Behavioral Outcome: Teach decision making for sexual risk situations (SRS)</i>					

(Continued)

**Table 10.10 (Continued)**

Personal Determinants					
Performance Objectives (PO)	Behavioral Capability (BC)	Outcome Expectations and Attitude (OEA)	Skills and Self-Efficacy (SSE)	Perceptions of Social Norms (PSN)	Intentions (I)
<i>Behavioral Outcome: Teach decision making for sexual risk situations (SRS)</i>					
PO.1.2. Teachers arrange practice for students in decision making and problem solving as applied to SRS	BC.1.1.f. Describe methods for maintaining confidentiality and safety for students  BC.1.2.a. Describe the importance of practicing skills including decision making and other cognitive processes to gain proficiency  BC.1.2.b. Describe the importance of explicitly helping students generalize life skills from one domain to another	OEA.1.2. Describe how practicing decision making can lead to greater likelihood of following the process in actual situations.	SSE.1.1.f. Discuss personal confidence in teaching decision making as it relates to sexual behavior  SSE.1.2.a. Demonstrate using scenarios and simulations that enable students to practice life skills applied to the SRS domain.  SSE.1.2.b. Express confidence in managing use of scenarios and simulations.	PSN.1.2. Relate that other teachers lead practice sessions in applying decision-making and problem-solving skills to SRS.	I.1.2. Talk with other teachers about intention to arrange for practice in decision making and problem solving as applied to SRS

<p>PO.1.3. Principals explicitly reinforce teachers for applying life skills education to sexual risk</p>	<p>BC.1.3. Describe that reinforcement should be individual, specific to a behavior, immediate and valuable to the receiver</p>	<p>OEA.1.3. Explain that teachers who are reinforced will be more likely to continue the activity</p>	<p>SSE.1.3.a. Strategize ways to reinforce teachers SSE.1.3.b. Express confidence in reinforcing teacher behavior related to life-skills education for SRS</p>	<p>PSN.1.3. See reinforcement for HIV prevention as an important and appropriate role for school principals</p>	<p>I.1.3. State publicly that teachers who apply life skills education to sexual risk will receive recognition</p>
<p><b>Behavioral Outcome: Explicitly teach condom negotiation skills</b></p>					
<p>PO.2.1. Teachers provide instructions on the steps of negotiation</p>	<p>BC.2.1.a. List the steps of condom negotiation BC.2.1.b. Describe the importance of using credible role models to demonstrate condom use negotiation</p>	<p>OEA.2.1. Describe how explicitly teaching condom negotiation skills can result in greater likelihood of safer sex</p>	<p>SSE.2.1.a. Express confidence to teach the steps of condom negotiation SSE.2.1.b. Demonstrate teaching the steps of condom use negotiation</p>	<p>PSN.2.1. Describe the methods that other teachers use to teach condom negotiation skills</p>	<p>I.2.1. Discuss intention to explicitly teach condom negotiating skills</p>
<p>PO.2.2. Facilitate adolescent discussion of views on condom use, barriers to use, origins of beliefs, gender differences, and consequences of changing beliefs and actions</p>	<p>BC.2.2.a. List the possible barriers for adolescents to negotiate condom use</p>	<p>OEA.2.2.a. Describe how openness about the complexity of negotiating condom use may lead to improving learners' motivation to learn and practice condom negotiating skills</p>	<p>SSE.2.2.a. Demonstrate facilitating discussion about barriers to negotiating condom use SSE.2.2.b. Describe confidence in eliciting discussion of barriers and planning to deal with barriers</p>	<p>PSN.2.2.a. Describe the support of faculty for open discussion among students PSN.2.2.b. Explore personal and community values about adolescent condom use</p>	<p>I.2.2. Express intention to develop teaching plan for open discussion about condom use</p>

(Continued)

**Table 10.10 (Continued)**

Personal Determinants					
Performance Objectives (PO)	Behavioral Capability (BC)	Outcome Expectations and Attitude (OEA)	Skills and Self-Efficacy (SSE)	Perceptions of Social Norms (PSN)	Intentions (I)
	BC.2.2.c. Describe methods for stimulating open and honest communication BC.2.2.d. Describe methods for maintaining confidentiality and safety for students	OEA.2.2.b. Analyze how exploring gender differences about negotiating condom use may enhance learners' skills to initiate negotiation of condom use.			
PO.2.3. Teachers arrange for students to practice negotiation	BC.2.3. Argue that to fully learn skills and to be able to apply them in real situations, students need practice with guided feedback	OEA.2.2. Expect that students will be more likely to obtain cooperation for safe sex from their partners	SSE.2.3. Express self-confidence in overseeing practice and providing feedback	PSN.2.3. Describe that other teachers facilitate practice and feedback	I.2.3. Speak publicly about the importance of enabling students to obtain skills to avoid sexual risk taking
PO.2.4. Principals and other school management promote inclusion of teaching condom negotiating skills in the curriculum	BC.2.4. Discuss the various pressures on students to have unprotected sex	OEA. 2.4. Describe the effectiveness of negotiation in various contexts	SSE.2.4. Express confidence in garnering support for various curricula elements	PSN.2.4. Argue that ensuring that the curriculum is taught thoroughly is a role for all school administrators	I.2.4. Speak publicly about the principal's role in HIV prevention

*Behavioral Outcome: Explicitly teach condom use skills*

<p>PO.3.1. Teachers teach performance objectives related to condom use (i.e., acquiring, carrying, using consistently, putting on and removing safely, maintaining use with all partners)</p>	<p>BC.3.1.a. Describe steps involved in condom use—acquiring, carrying, using, disposing            B.C.3.1.b. Describe in detail the practical aspects to condom use            BC.3.1.c. Describe all steps for each of the listed activities that enable successful condom use</p>	<p>OEA.3.1.a. Argue that correct teaching of condom use skills will increase learners' confidence to use condoms correctly and consistently            OEA.3.1.b. Recognize that adequate skill training about condom use will increase learners' desire and confidence to use condoms correctly and consistently            OEA.3.1.c. Explain that actual practice enhances learners' capability by allowing for correction of mistakes in a safe environment</p>	<p>SSE.3.1.a. Express confidence in teaching condom use skills            SSE.3.1.b. Demonstrate condom use on a model            SSE.3.1.c. Describe adequate protocol for teaching performance objectives related to condom use</p>	<p>PSN.3.1.a. Describe other teachers as explicitly teaching all aspects of condom use            PSN.3.1.b. Recognize that other teachers support that condom use is effective in reducing HIV risk            PSN.3.1.c. Recognize that valued peers think that teaching condom use is an appropriate role.</p>	<p>I.3.1.a. Write protocol for intended teaching of condom use skills            I.3.1.b. Publicly express intentions to teach condom use</p>
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(Continued)

**Table 10.10 (Continued)**

Personal Determinants					
Performance Objectives (PO)	Behavioral Capability (BC)	Outcome Expectations and Attitude (OEA)	Skills and Self-Efficacy (SSE)	Perceptions of Social Norms (PSN)	Intentions (I)
PO.3.2. Teachers arrange for students to practice condom use on anatomical model	BC.3.2. Describe how to manage class in potentially embarrassing lessons	OEA.3.2. Expect that adolescents are more likely to protect themselves when they have experience with condom use simulation	SSE.3.2.a. Conduct appropriate, low-anxiety demonstration of condom use on anatomical model. SSE.3.2.b. Express confidence in handling class during demonstration	PSN.3.2. Believe other teachers support teaching methodology	I.3.2. Express intention to intensify skill development through demonstration using an anatomical model
<i>Behavioral Outcome: Change norms in school regarding HIV prevention and discussion</i>					
PO.4.1. Teachers develop classroom and school projects to change social peer norms that lead to HIV risk	BC.4.1.a. Describe how norms can be changed BC.4.1.b. Describe the components of teaching plans that include elements of norm-changing projects	OE.4.1. Explain how approval of active involvement of learners in school projects may lead to change in the social norms that lead to HIV risk	SSE.4.1. Demonstrate developing norm change projects	PSN.4.1. Describe how other teachers develop norm change projects	I.4.1. Write development of norm change project in curriculum plan

<p>PO.4.3. Teachers develop classroom and school projects to change norms about condom use and refusing sex</p>	<p>BC.4.3.a. Encourage demonstration of activities that reflect refusal of sex as normative BC.4.3.b. Dedicate time for activities that portray refusal of sex as an acceptable decision</p>	<p>OEA.4.3. Express enthusiasm toward classroom activities enabling learners to articulate their skills to refuse sex assertively</p>	<p>SSE.4.3. Express confidence in diffusing classroom activities to the rest of the school to encourage normative attitudes and behavior about refusing sex</p>		<p>I.4.3. Inform school management about intention to arrange school activities to encourage a norm of acceptability about decision to refuse se.</p>
<b>Behavioral Outcome: Teach skills to postpone sexual intercourse</b>					
<p>PO.5.1. Teachers teach adolescents how to assertively postpone sexual intercourse when they are not ready (either initiation or continuation)</p>	<p>BC.5.1. Describe how the decision-making process can be applied to considering postponement of sexual activity</p>	<p>OEA.5.1. Expect that adolescents who are taught explicitly about the possibility of delaying sexual activity will be more likely to protect themselves</p>	<p>SSE.5.1.a. Demonstrate how to refuse sex with general decision-making skills and assertiveness SSE.5.1.b. Express confidence in teaching refusal skills</p>	<p>PSN.5.1.1. Reflect that other teachers support teaching and skills for facilitating assertiveness among adolescents to refuse sex</p>	<p>I.5.1. Write intention to facilitate lessons on refusal skills among learners who are not ready to have sex</p>
<p>PO.5.2. Teachers encourage open discussion of the pros and cons of refusing sex when the adolescents are not ready</p>	<p>BC.5.2. Describe how to facilitate discussion about a difficult topic</p>	<p>OEA.5.2. Expect that considering both pros and cons will increase probability of adolescents successfully dealing with barriers to refusing sex</p>	<p>SSE.5.2. Demonstrate how to facilitate discussion of pros and cons</p>	<p>PSN.5.2. Reflect that other teachers model listening to both pros and cons</p>	<p>I.5.2. Describe intentions to use powerful teaching methods such as discussion and role modeling to encourage consideration of refusing sex</p>

(Continued)

**Table 10.10 (Continued)**

Personal Determinants					
Performance Objectives (PO)	Behavioral Capability (BC)	Outcome Expectations and Attitude (OEA)	Skills and Self-Efficacy (SSE)	Perceptions of Social Norms (PSN)	Intentions (I)
<p>PO.5.3. Teachers arrange for adolescents to discuss the difficulties involved in refusing sex (that is, fear of rejection, abandonment, belittling)</p>	<p>BC.5.3. Reflect with adolescents the emotions associated with refusing sex and the meaning it holds for them</p>	<p>OEA.5.3.a. Openly portray an understanding of the difficulties associated with sexual decision making to encourage adolescents to verbalize their true feelings</p> <p>OEA.5.3.b. Accept open discussion knowing that additional support may be needed by some learners to cope with the SRS</p>	<p>SSE.5.3. Demonstrate conducting group work that evokes sensitive emotions</p>		

PO.5.4. Arrange for practice in assertively refusing sex	BC.5.4.a. Describe how to conduct role play of SRS related to refusing sex BC.5.4.b. Demonstrate how to encourage active participation from learners to enable internalization of assertive response to refusing sex	OEA.5.4. Display acceptance of expanded teaching role that enables learners to express themselves freely	SES.5.4. Organize activities for learners to skillfully maximize role-play efforts	
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**Behavioral Outcome: Develop resources for coping with sexual matters**

PO.6.1. Teachers help students develop resources to manage difficult sexual and relationship problems	BC.6.1. List the available resources that learners can access to manage difficult sexual and relationship problems	OEA.6.1. Relate positive outcomes of counseling to encourage learners to feel comfortable accessing such resources	SSE.6.1. Demonstrate efficiency at developing a list of resources for appropriate problems	PSN.6.1. Experience other teachers as involved in similar activities	I.6.1.a. State plan to develop resource list for sexual and relationship problems
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**Behavioral Outcome: Develop school and community environments receptive to LHAP**

PO.7.1. Principals develop a school policy to integrate LHAP into the school curriculum and fit curriculum with other realignment	BC.7.1.a. Describe the components of an effective policy that articulates the place of the LHAP in the curriculum including time allocation	OEA.7.1.a. Discuss the importance of the principal's role in stimulating an HIV risk reduction program in the school	SSE.7.1.a. Demonstrate writing an effective policy	PSN.7.1.a. Describe that other principals consider HIV prevention programs to be an important school role	I.7.1. State plan to develop policy
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**Table 10.10 (Continued)**

Personal Determinants					
Performance Objectives (PO)	Behavioral Capability (BC)	Outcome Expectations and Attitude (OEA)	Skills and Self-Efficacy (SSE)	Perceptions of Social Norms (PSN)	Intentions (I)
	BC.7.1.b. Describe the Department of Education's requirements for time allocation for the Life Orientation Learning area (allows for LHAP education)	OEA.7.1.b. Give examples of how development of policies can facilitate integration of innovative curriculum	SSE.7.1.b. Describe level of confidence in own ability to develop a LHAP policy SSE.7.c. Demonstrate management skills required to facilitate curriculum adjustment to accommodate LHAP	PSN.7.1.b. Recognize that other schools support the LHAP through policy implementation PSN.7.1.c. Argue that other schools and the community will support time allocated to LHAP in the policy	
PO.7.2. Principals stimulate staff buy-in through a policy development workshop with school staff (or alternative strategy)	BC.7.2. Describe the steps of working with staff to develop a school policy for implementation of LHAP	OEA.7.2. Expect that staff buy-in to policy development will lead to more fidelity and thoroughness in LHAP implementation	SSE.7.2. Demonstrate facilitation related to participatory policy development workshops	PSN.7.2. Describe how other schools and principals stimulate staff buy-in for policy development	I.7.2. Set date and advertise plan to hold workshop

**Behavioral Outcome: Adequately train teachers**

<p>PO.8.1. Principals facilitate a skill development LHAP training workshop of staff members (including teacher time for participation) by trained teachers to ensure skills of teachers and sustainability of LHAP objectives</p>	<p>BC.8.1.a. Describe needed teacher skills to implement LHAP effectively BC.8.1.b. Describe importance of active learning strategies in sexuality education and HIV prevention BC.8.1.c. Strategize LHAP training workshop for teachers within paid teacher time</p>	<p>OEA.8.1.a. Describe how a well-planned training will enable teachers to implement a program capable of changing student risk behavior OEA.8.1.b. Justify time allocation to implement LHAP training that will enable teachers to implement HIV risk reduction program</p>	<p>SSE.8.1.a. Demonstrate workshop facilitation to adequately meet the objectives of the LHAP SSE.8.1.b. Demonstrate planning, organizing, and facilitating the LHAP training workshop for staff SSE.8.1.c. Express confidence in facilitating skill-building workshops</p>	<p>PSN.8.1.a. Discuss that other schools consider development to be a prerequisite for adequate implementation of SRS life skills PSN.8.1.b. Expect that other principals facilitate LHAP training workshop at their schools</p>	
<p>PO.8.2. Principals develop and implement a plan to monitor and evaluate the process and outcomes of the LHAP program</p>	<p>BC.8.2. Outline in detail the monitoring and evaluation plan</p>	<p>OEA.8.2. Appreciate that monitoring and evaluation of the LHAP will allow for changes to be made as needed</p>	<p>SSE.8.2.a. Develop a monitoring and evaluation tool for LHAP that can be used to facilitate ongoing adjustment to the program for maximum effective delivery SSE.8.2.b. Express self-confidence in skills related to evaluation and monitoring</p>	<p>PSN.8.2. Relate that other schools carry out monitoring and evaluation procedures for the LHAP</p>	

(Continued)

**Table 10.10 (Continued)**

Personal Determinants					
Performance Objectives (PO)	Behavioral Capability (BC)	Outcome Expectations and Attitude (OEA)	Skills and Self-Efficacy (SSE)	Perceptions of Social Norms (PSN)	Intentions (I)
PO.8.3. Principals provide materials to support interactive facilitation of LHAP (including recommending budgets to the Department of Education)	BC.8.3. Describe the type of material that is needed to support active learning strategies	OEA.8.3. Describe how the provision of needed materials demonstrates support for the program		PSN.8.3. Confirm that other schools are contributing to the material needs of LHAP	
PO.8.4. Principals obtain support from the wider school community (parents, religious, and traditional leaders, school governing body) for the LHAP implementation	BC.8.4.a. Outline the meeting for the wider community BC.8.4.b. Describe how to represent LHAP correctly to the community and respond to questions sincerely BC.8.4.c. Explain the process of developing support for value-laden curriculum issues	OEA.8.4.a. Argue that it is possible to work with the school community and secure implementation of the LHAP OEA.8.4.b. Expect that personal enthusiasm will encourage teachers in extended teaching role	SSE.8.4.a. Demonstrate appropriate interpersonal skills in working with the community SSE.8.4.b. Express confidence in working with the community	PSN.8.4. Describe similar process at other schools	I.8.4. Describe plan to meet with the community

original program (Figure 10.3), we offer several recommendations for reconsidering the LHAP and keeping the forward momentum of activities intact:

- Help school principals and teachers collaborate to make the school a hospitable social environment in which teachers can teach about sex and students can learn.
- Increase the program instructional emphasis on developing skills and self-efficacy for life skills and applying them to sexual situations.
- Include an emphasis on teachers as role models of decision making and problem solving.
- Enable students to analyze the social and cultural context of their sexual decision making by encouraging active discussion in a safe social environment.
- Expect principals and other administrators to actively facilitate teacher participation in LHAP.
- Implement active learning, including guided practice for skill development.

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## Lessons Learned from Adaptation Cases

The health promotion planners who worked on the case studies in this chapter applied Intervention Mapping to real-world program situations. In both cases, the application of the process met the following criteria for careful adaptation:

- Conducting a problem analysis or needs assessment in the new program site (or, as in the second case study, following a program evaluation) so that the problem in the adopting site can be compared with the original problem for which the program was developed.
- Developing a logic model change for the new situation and adding to or changing the original program based on the model.
- Considering the population and context of the adopting site throughout.

In addition, the first case study presented a good example of involving community members to guide the adaptation in the same way that they would be involved in the original program development.

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## Summary

Chapter Ten describes the application of Intervention Mapping concepts to the adaptation of evidence-based health promotion programs to new settings. Although debate continues about whether or not programs should be adapted, in practice, adaptation happens. The problem is that programs are often poorly adapted. Planners often choose pieces of programs that are the most appealing

to them or that seem the most feasible, often without much input from the community and without systematically determining what in a program needs to change and what must stay the same. This chapter lays the groundwork for applying Intervention Mapping to adaptation by discussing the debate of whether or not programs should be adapted, how to strike a balance between program fidelity and adapting the program to fit a new population or setting, and how to identify essential program components or “active ingredients” that should not be changed.

The authors’ approach to program adaptation in this chapter is informed by evidence and program theory of change. This chapter (see particularly Table 10.1) takes each step of Intervention Mapping and translates the underlying questions and processes to choosing and adapting a program.

Although some other models of program adaptation have been proposed, they tend to be general theoretical models that do not provide a step-by-step adaptation approach. Intervention Mapping can provide a systematic approach to program adaptation that can help planners identify and retain the essential elements as programs are translated to new communities and settings.

In illustration, this chapter presents two case studies of programs that have used Intervention Mapping as a systematic approach to conduct or propose adaptation. The first is a cultural adaptation of the *World Starts With Me* youth sexuality program from a Ugandan context to an Indonesian setting. The second case is the use of Intervention Mapping to propose revisions to the *South African Life-Skills HIV/AIDS Program* for secondary school students following evaluations of the program that showed it to require enhancements to improve effectiveness.

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## Discussion Questions and Learning Activities

1. Explain the dilemma in the decision regarding adapting a program for a new setting and retaining complete fidelity to the original program plan and implementation.
2. What is meant by the term active ingredients when used to describe components of an evidence-based program?
3. Look at Table 10.1 and describe the main processes that you would use to choose and adapt an evidence-based program.
4. Describe the strengths and weaknesses of the adaptation of the Ugandan sexual and reproductive rights program to an Indonesian setting.
5. Describe the strengths and weaknesses of using Intervention Mapping to suggest program modifications after the evaluation of a program’s effectiveness.

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