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# *Integrating Multiple Health Behavior Theories Into Program Planning: The PER Worksheet*

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*The foundation of a logic model or any theory-based planning model is the identification of the behavioral antecedents and the relationship of these variables to the target behavior. Applying theoretical concepts to specific behaviors and populations is often challenging for practitioners and program planning students. The challenge comes from the abstract definition of theoretical constructs, the duplication of similar constructs in multiple theories, and the need to combine multiple theories. To simplify the planning process when utilizing logic models and health behavior theory, we recommend the use of the PER Worksheet. The PER Worksheet is a planning tool that provides layman-term prompts for identifying health behavior antecedents. It encompasses five common health behavior theories—health belief model, theory of planned behavior, social cognitive theory, an ecological perspective, and transtheoretical model. The PER Worksheet is organized into three columns: **P**redisposing, **E**nabling, and **R**einforcing factors, terms of the PRECEDE/PROCEED model.*

**Keywords:** program planning; theory; PER Worksheet; logic model; intervention

**T**heory-based health promotions interventions are more effective in altering risk factors than are atheoretical applications (National Cancer Institute, 2005). Theory-based programs show increases in fruit and vegetable intake, increases in physical activity rates, improvements in condom use, increases in smoking cessation rates, increases in participation in preventive health screenings, and decreases in adolescent smoking

(Botvin & Kantor, 2000; Coyle et al. 1999; Hallam & Petosa, 2004; O'Neil & Nicklas, 2002; Pierce, Chadiha, Vargas, & Mosley, 2003; Ranney, Melvin, Lux, McClain, & Lohr, 2006). Theories seek to clarify a phenomenon by systematically explaining the relationship among a set of variables. With an understanding of *why* behaviors occur, program planners can target specific behavioral antecedents and in turn design more effective and efficient interventions. The purpose of this document is to describe an effective tool to simplify the planning process for practitioners and program planning students.

No single theory explains the broad scope of all health behaviors. Given the behavior, the environmental conditions, and the target audience, one theory may be more applicable than other theories. For example, the theory of planned behavior tends to predict intention to complete the target behavior. In this decision-making theory, all the constructs reflect the cognitive domain. The health belief model (HBM) explains the likelihood of single-act behaviors such as health screenings and immunizations, where the likelihood of the behavior is driven by perceived threat for the illness. The social cognitive theory (SCT) explains health behavior in a social context over a period of time; it includes constructs from the cognitive domain, but it also includes the learning of target behavior-related skills and access to resources. For additional information on the referenced theories, see *Theory at a Glance: A Guide for Health Promotion Practice* (National Cancer Institute, 2005).

Furthermore, a combination of theories may be necessary to explain variations in behavior. For example, the literature shows a relationship between a key construct of the HBM—perceived threat—and intention to use condoms consistently and correctly (Kirby, 2002); however, behavioral capabilities, a construct of the SCT, has a relationship with actual condom use (Tortolero, et al. 2005). Similarly, smoking cessation programs that demonstrate at least a 20% cessation rate are often stage-matched interventions (transtheoretical model),

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where intentions are built (theory of planned behavior) and behavioral and environmental strategies (SCT and ecological model) are designed (Ranney et al., 2006; Spencer, Pagell, Hallion, & Adams, 2002).

In addition to theory, the use of logic models is also recommended to increase and document program effectiveness (Centers for Disease Control and Prevention, 1999; W. K. Kellogg Foundation, 2004). A logic model is a visual picture of how program planners expect a program to work. It includes the program resources, program activities, activity outputs, participant outcomes, and the long-term impact. One specific type of logic model, a theory approach, depicts a detailed explanation of the target behavior or environmental condition (W. K. Kellogg Foundation, 2004). This type of map outlines the behavioral antecedents and the hypothesized relationship of the antecedents. This “visual explanation” helps planners map out the conceptual ideas, communicate the rationale for program activities, and identify participant outcomes to be changed.

The foundation of a logic model or any theory-based planning model is the identification of the behavioral antecedents and the relationship of these variables to the target behavior. Applying theoretical concepts to specific behaviors and populations is often challenging to practitioners and program planning students. The challenge comes from the abstract definition of theoretical constructs, the duplication of similar constructs in multiple theories, and the need to combine multiple theories. Developing an accurate model without the identification of behavioral antecedents is difficult and ineffective. The logic model provides a visual picture of the antecedents and their hypothesized relationship to the target behavior. To simplify the planning process when utilizing logic models and theory, we recommend the use of the PER Worksheet.

The PER Worksheet is a planning tool that provides layman-term prompts for identifying health behavior antecedents. It encompasses five common health behavior theories: HBM, theory of planned behavior,

SCT, an ecological perspective, and transtheoretical model. The PER Worksheet is organized into three columns: **P**redisposing, **E**nabling, and **R**einforcing factors (see Table 1), terms of the PRECEDE/PROCEED model (Green & Kreuter, 2005). After identifying a specific target behavior, such as 30 minutes of physical activity per day, program planners identify antecedents and record the possible antecedent on the PER Worksheet. The worksheet helps program planners cluster similar concepts. In some instances, the target behavior may be an environmental condition such as the adoption of a mosquito control program.

### **Column 1: Predisposing Factors**

Predisposing factors represent cognitive and affective antecedents related to motivation or rationale for the target behavior (Green & Kreuter, 2005). The category prompts include *know*, *believe*, and *intention*. In terms of the behavioral theories, predisposing factors encompass the HBM, Theory of Planned Behavior, SCT, and the ecological perspective. Beliefs about perceived susceptibility, perceived severity, and perceived threat are core to the HBM. This column also captures all of the theory of planned behavior constructs: subjective norms, perceived behavioral control, attitude toward the behavior, and intention. Outcome expectations, outcome expectancies, self-efficacy, and behavioral capabilities (knowledge and skills to engage in a specific behavior) are constructs of the SCT. Individual characteristics, such as knowledge and beliefs, represent the intrapersonal level of the ecological perspective. Knowledge is a part of most theories. For example, it is captured as a “modifying factor” or individual differences in the HBM.

Column 1 represents the precontemplation and contemplation stages of change of the transtheoretical model (stage of change is a construct of the transtheoretical model). In these first two stages of the transtheoretical model, an individual is in the cognitive decision-making process. The individual must decide that the target behavior is “a good idea” (precontemplation) and then progress to “I can do this” (contemplation).

In the physical activity example (Table 2), knowledge of what constitutes physical activity, how much activity, and activity opportunities are documented antecedents to middle school physical activity levels (Sallis, Prochaska, & Taylor, 2000; Trost, Saunders, & Ward, 2002; Welk & Schaben, 2004). Beliefs about positive outcomes from the activity, such as fun and making friends, as well as negative outcomes, such as embarrassment, are specific activity antecedents. Other beliefs include the confidence (efficacy) for completing the activity and the specific skills and

**TABLE 1**  
**Theoretical constructs within the PER Worksheet**

| <i>PREDISPOSING</i>                                                                                                                                                                                                                                                                                                                                                                               | <i>ENABLING</i>                                                                                                                                                                                                                    | <i>REINFORCING</i>                                                                                                                                                                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>KNOW</b><br>Health Belief Model<br>Knowledge<br><br>Social Cognitive Theory<br>Skill-related knowledge<br><br>Ecological Perspective<br>Intrapersonal level                                                                                                                                                                                                                                    | <b>BE ABLE TO DO (skills)</b><br>Social Cognitive Theory<br>Behavioral capability<br>Self-regulation<br>Emotional coping response                                                                                                  | <b>REMINDED</b><br>Health Belief Model<br>Cues to act<br><br>Social Cognitive Theory<br>Observational learning<br><br>Ecological Perspective<br>Interpersonal and community level |
| <b>BELIEVE / VALUE</b><br>Health Belief Model<br>Perceived susceptibility<br>Perceived severity<br>Perceived threat<br>Perceived benefits<br>Perceived barriers<br><br>Theory of Planned Behavior<br>Attitude toward the behavior<br>Subjective norm<br>Perceived behavioral control<br><br>Social Cognitive Theory<br>Self-efficacy<br>Outcome expectations<br>Outcome expectancies<br>Situation | <b>ACCESS TO</b><br>Health Belief Model<br>Actual Benefits<br><br>Social Cognitive Theory<br>Environment<br>Observational learning<br><br>Ecological Perspective<br>Community level: institutional<br>factors & public policy      | <b>POSITIVE REINFORCEMENT</b><br>Social Cognitive Theory<br>Reinforcements<br><br>Ecological Perspective<br>Interpersonal and community level                                     |
| <b>INTENTION</b><br>Theory of Planned Behavior<br>Behavioral intention                                                                                                                                                                                                                                                                                                                            | <b>ACCESS REMOVED</b><br>Health Belief Model<br>Actual barriers<br><br>Social Cognitive Theory<br>Environment<br>Observational learning<br><br>Ecological Perspective<br>Community level: institutional<br>factors & public policy | <b>NEGATIVE REINFORCEMENT</b><br>Social Cognitive Theory<br>Reinforcements<br><br>Ecological Perspective<br>Interpersonal and community level                                     |
| <b>OTHER</b><br>Health Belief Model<br>Modifying factors of age, sex,<br>ethnicity, socioeconomic status<br><br>Stage of: Precontemplation &<br>Contemplation                                                                                                                                                                                                                                     | <b>SOCIAL SUPPORT</b><br>Social Cognitive Theory<br>Environment<br><br>Ecological Perspective<br>Interpersonal and community level<br><br>Stage of: Preparation & Action                                                           | <b>SOCIAL SUPPORT</b><br>Social Cognitive Theory<br>Environment<br><br>Ecological Perspective<br>Interpersonal and community level<br><br>Stage of: Maintenance                   |

the belief that activity is the social norm. Finally, students may have various levels of intentions: to be active daily, to be active after school, and/or to try new activities.

### **Column 2: Enabling Factors**

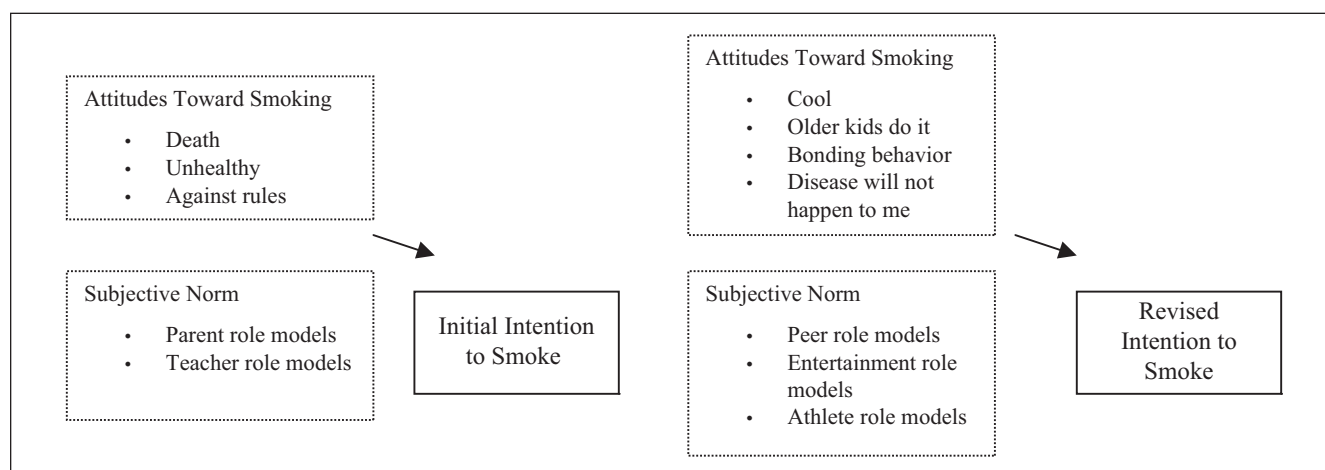
Enabling factors represent environmental and skill antecedents that enable a person to accomplish the target

**TABLE 2**  
**PER Worksheet With Daily Physical Activity of Middle School Students as an Example**

|                                                                           |                                                                    |                                             |
|---------------------------------------------------------------------------|--------------------------------------------------------------------|---------------------------------------------|
| <b>TARGET BEHAVIOR</b>                                                    | 60 minutes of daily physical activity (PA)                         |                                             |
| <b>TARGET AUDIENCE</b>                                                    | Middle school children                                             |                                             |
| <b>OTHER KEY INDIVIDUALS</b>                                              | Parents, teachers, and peers                                       |                                             |
| <b>PREDISPOSING</b>                                                       | <b>ENABLING</b>                                                    | <b>REINFORCING</b>                          |
| <b>KNOW</b>                                                               | <b>BE ABLE TO DO (skills)</b>                                      | <b>REMINDED</b>                             |
| What is PA?                                                               | Identify activities of interest                                    | Scheduled times                             |
| How much PA a day?                                                        | Motor skills                                                       | Prompts by media                            |
| PA opportunities: school, community, clubs                                | Sport and recreation skills                                        | Prompts by peers                            |
|                                                                           | Self regulation: goal setting, decision making & tracking          | Prompts by family                           |
| <b>BELIEVE / VALUE</b>                                                    | <b>ACCESS TO</b>                                                   | <b>POSITIVE REINFORCEMENT</b>               |
| PA positive outcomes: fun, friends, strength, weight control, exciting    | Quality physical education                                         | Fun                                         |
| Negative outcomes: embarrassment, sweat, boring                           | Gyms and playing fields                                            | Make friends                                |
| PA efficacy: I can do 60 minutes                                          | Sidewalks                                                          | Feel good                                   |
| Skill efficacy: I can ____ (walk on the treadmill, catch a Frisbee, etc.) | Sport equipment: balls, bats, racquets, clubs                      | Praise from: parents, teachers, peers       |
| Believe others expect you to be active: parents, peers, teachers          | Play equipment: bikes, skates, balls, skateboards, Frisbee, kites, | Success                                     |
| Social norm: see peers, teachers, older students, peers engaging          | Scheduled activities                                               | Goal attainment                             |
| Positive outcomes from skills                                             | Recreation leagues                                                 | Attention from peer groups & older students |
|                                                                           | Play partners                                                      | New equipment                               |
| <b>INTENTION</b>                                                          | <b>ACCESS REMOVED</b>                                              | <b>NEGATIVE REINFORCEMENT</b>               |
| To be active daily                                                        | Television                                                         | Embarrassment                               |
| To be active after school                                                 | Computer and video games                                           | Discomfort                                  |
| Try new activities                                                        |                                                                    |                                             |
| Parents intention for activity                                            |                                                                    | <b>SOCIAL SUPPORT</b>                       |
|                                                                           |                                                                    | Teams                                       |
|                                                                           |                                                                    | Clubs                                       |
|                                                                           |                                                                    | Parents                                     |
| <b>OTHER</b>                                                              |                                                                    |                                             |

behavior (Green & Kreuter, 2005). The category prompts include *be able to do (skills)*, *access to*, and *access removed*. In terms of the behavioral theories, Column 2 encompasses the HBM, the SCT, and the ecological perspective. Actual barriers and benefits (access issues) are constructs of the HBM. Of note, *perceived* benefits and barriers are predisposing (cognitive) factors. For example, a perceived barrier may be lack of time; however, time may not be an actual barrier. This distinction is important from a programming perspective. Perceived barriers are often corrected through

awareness strategies, whereas, actual barriers are addressed through environmental or skill strategies. Behavioral capability, observational learning, and the environment are the related constructs of the SCT. Behavioral capability reflects specific skills needed to complete the target behavior; for example, keeping a food diary is a skill related to many nutrition-related behaviors. Observational learning is related to both skills and access. Individuals are capable of watching others and learning the skills to engage in a specific behavior and gain access. Environmental factors such



**FIGURE 1** Select Building Blocks of Adolescent Smoking Logic Model

as policy, regulations, and structures represent the community level of the ecological perspective as well the environment of the SCT.

Column 2 represents the preparation and action stages of change in the transtheoretical model. In these two stages, an individual is actively preparing to or actually performing the target behavior.

Referring to the physical activity example (Table 2), activity-related skills include motor and leisure skills, the ability to identify activities of interest, and goal setting and decision-making skills (self-regulation) (Sallis et al. 2000; Trost et al., 2002; Welk & Schaben, 2004). Students need access to various activity opportunities and play partners as well as limited access to television and electronic games (Crespo et al., 2001; Kahn et al., 2002).

### **Column 3: Reinforcing Factors**

Reinforcing factors come from others or the environment and promote the continuation of the target behavior (Green & Kreuter, 2005). Some reinforcements and cues to act may be internal, though, such as “a feeling of accomplishment” or “disease symptoms.” The category prompts include *reminders*, *positive reinforcement*, *negative reinforcement*, and *social support*. In terms of the behavioral theories, Column 3 encompasses the HBM, the SCT, and the ecological perspective. Cues to act is a core construct of the HBM, whereas behavioral reinforcements and social support are constructs the SCT. These reinforcing factors come from two environmental levels of ecological perspective, interpersonal and the community. Column 3 represents the maintenance stage of change in the transtheoretical model. This last stage

involves the sustainability of the behavior and the integration into one’s lifestyle.

In the physical activity example (Table 2), activity reminders include schedules and prompts by media, parents, and friends. Positive outcomes from the activity, such as making friends and praise from others, increase the likelihood of activity maintenance, whereas negative outcomes from attempting the behavior, such as embarrassment and discomfort, decrease the likelihood of activity maintenance. Receiving social support from a variety of sources is also important for activity maintenance.

### **Building a Logic Model**

After the PER Worksheet is completed, program planners organize the antecedents into a visual logic model. To make this transition from the PER Worksheet to the logic model, program planners begin by answering three questions: (a) What are the key antecedents? (b) What are the milestones? and (c) Who are the key individuals? Answers to these questions become the building blocks of the logic map.

Key antecedents are variables that have a consistent and strong relationship with the target behavior. In the case of adolescent fruit and vegetable consumption, access to fruit and vegetables at home and at school are two key antecedents. The next step is to identify milestones. Milestones reflect stage transitions. For example, in explaining smoking abstinence in young people, intention to refrain from smoking is a key antecedent. As children mature, their intention to refrain from smoking appears to change. In this instance, research shows that

young children consistently have high intentions to refrain from smoking. As children mature, their intention to refrain from smoking decreases (Côté, Godin, & Gagné, 2004). Thus, the children reach a milestone as a function of maturation. On the logic map, the program planner positions the initial intention (greater intention to refrain from smoking) on the left-hand side of the model. The second intention is positioned toward the middle of the model.

The program planner then uses these building blocks to work backward and incorporate other antecedents from the PER Worksheet (see Figure 1). For instance, in the context of integrating the logic model with theory, according to the Theory of Planned Behavior, intention is influenced by attitudes toward the behavior and the subjective norm. Attitudes toward smoking in young children are influenced by health-related outcomes; thus, young children have a negative attitude toward smoking. However, the attitudes toward smoking of adolescents are often related to the perceived social outcomes; thus, their attitudes are more favorable and the intentions to smoke are more favorable. The program planner integrates these specific attitudes to the logic model. Subjective norm is mapped in a similar manner. The subjective norm for young children is based on parents and teachers as models, whereas the subjective norm for adolescents is peer and media based.

Key individuals may also represent building blocks for the logic model. For example, in explaining the physical activity of children, there are three significant individuals who influence children's physical activity: parents, teachers, and peers. These groups of individuals become building blocks of the logic model. The physical activity behavior of classroom teachers is an important antecedent. Working backward from this building block, other related antecedents are integrated into the model. The antecedents may include the teacher's skills for leading and managing activity, access to equipment and activities, and a high level of efficacy to lead physical activity.

After the building blocks are placed on the logic model, program planners work through the PER Worksheet by placing the other identified antecedents. Often, the remaining antecedents have a relationship to the building blocks.

## ► SUMMARY

The successful role of theory-based interventions in public health settings is well documented. The challenge lies with successfully integrating theory into the planning process and then translating the intervention into practice. Often, practitioners and program planning students tend to see health behavior theories as independent planning tools; the PER Worksheet pulls five health

behavior theories and one planning model together. By using one planning sheet with nontechnical term prompts, the program planner is able to integrate theory into practice while communicating in terms understood by lay participants involved the planning process.

The use of theory and a planning tool such as the PER Worksheet is particularly valuable in emerging health promotion topic areas, such as emergency preparedness, where published studies about antecedents are limited. The health behaviors theories, and thus the PER prompts, can suggest categories of potential antecedents such as beliefs about perceived susceptibility and severity, and reminders such as cues to act. The PER Worksheet identifies questions to be answered. It is a valuable asset to health promotion practice and health promotion training programs.

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