

Chapter 2

Cognitive Determinants of Health Behavior

Mark Conner

1 Introduction

The prevalence of health behaviors varies across social groups. For example, in the Western World smoking is generally more prevalent among those from economically disadvantaged backgrounds. This might suggest such socio-demographic factors as the focus of interventions to change health behaviors. However, such factors are frequently impossible to change or require political intervention at national or international levels (e.g., change in income distribution). This is one reason why a considerable body of research has focused on more modifiable factors assumed to mediate the relationship between socio-demographic factors and health-related behaviors. One important set of such factors is the thoughts and feelings the individual associates with the particular health-related behavior. These are often referred to as health cognitions and are the focus of this chapter. Although research does examine the role of individual health cognitions (e.g., outcome expectancies), most of the research in this area uses models that include sets of health cognitions that are assumed to combine in different ways to determine behavior. These models are collectively known as social cognition models (SCMs; Conner and Norman, 2005). They prominently

include the Health Belief Model (HBM; e.g., Abraham and Sheeran, 2005; Janz and Becker, 1984), Protection Motivation Theory (PMT; e.g., Maddux and Rogers, 1983; Norman et al, 2005), Theory of Reasoned Action/Theory of Planned Behavior (TRA/TPB; e.g., Ajzen, 1991; Conner and Sparks, 2005), and Social Cognitive Theory (SCT; e.g., Bandura, 2000; Luszczynska and Schwarzer, 2005). Stage models represent a different form of SCM which does not assume behavior change to be linear, but rather to occur in discrete stages. Prochaska and DiClemente's (1984) Transtheoretical Model of Change (TTM) is the most commonly applied stage model. Below these SCMs are described and research using each is reviewed. There is considerable overlap between the models and the key health cognitions they identify. Building on this overlap some work has attempted to integrate SCMs into a unified theory of the determinants of health behaviors (Fishbein et al, 2001). This integrated model will also be described. Finally, this chapter overviews recent work in this area on intention stability as an important mediator of cognitive effects, affective expectancies as a highly predictive yet insufficiently considered variable, and implementation intentions as an important volitional technique to promote action.

2 Social Cognition Models

Social cognition models (SCMs) detail the important cognitions that distinguish between

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those performing and not performing behaviors. The focus is on the cognitions or thought processes that intervene between observable stimuli and behavior in real-world situations (Fiske and Taylor, 1991). This approach is founded on the assumption that behavior is best understood as a function of people's perceptions of reality, rather than objective characterizations of the stimulus environment. SCMs can be seen as one part of *self-regulation* research. Self-regulation processes are defined as those "... mental and behavioral processes by which people enact their self-conceptions, revise their behavior, or alter the environment so as to bring about outcomes in it in line with their self-perceptions and personal goals" (Fiske and Taylor, 1991, p. 181). Self-regulation research has emerged from a clinical tradition in psychology which views the individual as striving to eliminate dysfunctional patterns of thinking or behavior and engage in adaptive patterns of thinking or behavior (Bandura, 1982; Turk and Salovey, 1986). Self-regulation involves cognitive re-evaluation of beliefs, goal setting, and ongoing monitoring and evaluating of goal-directed behavior. Two phases of self-regulation activities have been defined: motivational and volitional (Gollwitzer, 1990). In the motivational phase costs and benefits are considered in order to choose between goals and behaviors. This phase is assumed to conclude with a decision (or intention) concerning which goals and actions to pursue at a particular time. In the subsequent volitional phase, planning and action directed toward achieving the set goal predominate. The majority of SCMs focus on the motivational phase, although work with implementation intentions focuses on the volitional phase of action.

2.1 The Health Belief Model

The Health Belief Model (HBM) is the oldest and most widely used SCM (see Abraham and Sheeran, 2005, for a recent review). In one of the earliest studies, Hochbaum (1958) reported that perceived susceptibility to tuberculosis and

the belief that people with the disease could be asymptomatic (so that screening would be beneficial) distinguished between attendees and non-attendees for chest x-rays. Haefner and Kirscht (1970) extended this research by demonstrating that an intervention designed to increase participants' perceived susceptibility, perceived severity, and anticipated benefits resulted in a greater number of checkup visits to the doctor over an 8-month period compared to a control condition.

The HBM posits that health behavior is determined by two cognitions: perceptions of illness threat and evaluation of behaviors to counteract this threat (see Fig. 2.1). Threat perceptions are based on two beliefs: the perceived susceptibility of the individual to the illness ("How likely am I to get ill?") and the perceived severity of the consequences of the illness for the individual ("How serious would the illness be?"). Similarly, evaluation of possible responses involves consideration of both the potential benefits of and barriers/costs to action. Together these four beliefs are believed to determine the likelihood of the individual performing a health behavior. The specific action taken is determined by the evaluation of the available alternatives, focusing on the benefits or efficacy of the health behavior and the perceived costs or barriers of performing the behavior. Hence individuals are most likely to follow a particular health action if they believe themselves to be susceptible to a particular condition which they also consider to be serious and believe that the benefits outweigh the costs of the action taken to counteract the health threat.

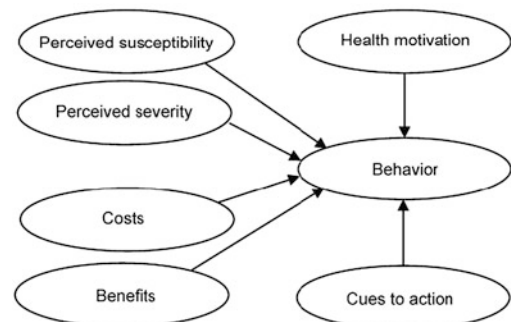


Fig. 2.1 The Health Belief Model

Two further cognitions usually included in the model are cues to action and health motivation. Cues to action are assumed to include a diverse range of triggers to the individual taking action which may be internal (e.g., physical symptom) or external (e.g., mass media campaign, advice from others) to the individual (Janz and Becker, 1984). An individual's perception of the presence of cues to action would be expected to prompt adoption of the health behavior if he/she already holds other key beliefs favoring action. Health motivation refers to more stable differences between individuals in the value they attach to their health and their propensity to be motivated to look after their health. Individuals with a high motivation to look after their health should be more likely to adopt relevant health behaviors.

The HBM has provided a useful framework for investigating health behaviors and has been widely used. It has been found to successfully predict a range of behaviors. For example, Janz and Becker (1984) found that across 18 prospective studies, the 4 core beliefs were nearly always significant predictors of health behavior (82, 65, 81, and 100% of studies report significant effects for susceptibility, severity, benefits, and barriers, respectively). Harrison et al (1992), in a review with more stringent inclusion criteria, reported that susceptibility and barriers were the strongest predictors of behavior. Some studies have found that these health beliefs mediate the effects of demographic

correlates of health behavior. For example, Orbell et al (1995) reported perceived susceptibility and barriers to entirely mediate the effects of social class upon uptake of cervical screening. The HBM has also inspired a range of successful behavior change interventions (e.g., Jones et al, 1987).

The main strength of the HBM is the common-sense operationalization it uses including key beliefs related to decisions about health behaviors. However, further research has identified other cognitions that are stronger predictors of health behavior than those identified by the HBM, suggesting that the model is incomplete. This prompted a proposal to add self-efficacy and intention to the model to produce an "extended health belief model" (Rosenstock et al, 1988) which has generally improved the predictive power of the model (e.g., Hay et al, 2003).

2.2 Protection Motivation Theory

Protection Motivation Theory (PMT; Maddox and Rodgers, 1983; see Norman et al, 2005 for a review) is a revision and extension of the HBM which incorporates various appraisal processes identified by research into coping with stress. In PMT, the primary determinant of performing a health behavior is protection motivation or intention to perform a health behavior (see Fig. 2.2). Protection motivation is determined

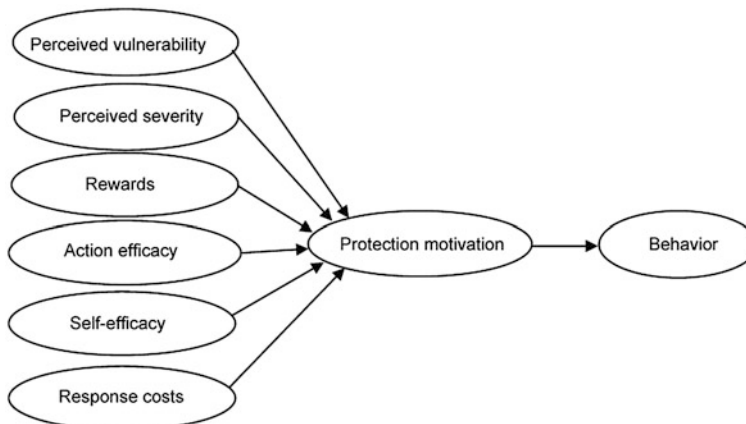


Fig. 2.2 Protection Motivation Theory

by two appraisal processes: threat appraisal and coping appraisal. Threat appraisal is based on a consideration of perceptions of susceptibility to the illness and severity of the health threat in a very similar way to the HBM. Coping appraisal involves the process of assessing the behavioral alternatives which might diminish the threat. This coping process is itself assumed to be based on two components: the individual's expectancy that carrying out a behavior can remove the threat (action-outcome efficacy) and a belief in one's capability to successfully execute the recommended courses of action (self-efficacy).

Together these two appraisal processes result in either adaptive or maladaptive responses. Adaptive responses are those in which the individual engages in behaviors likely to reduce the risk (e.g., adopting a health behavior) whereas maladaptive responses are those that do not directly tackle the threat (e.g., denial of the health threat). Adaptive responses are held to be more likely if the individual perceives himself or herself to be facing a health threat to which he/she is susceptible and which is perceived to be severe and where the individual perceives such responses to be effective in reducing the threat and believes that he/she can successfully perform the adaptive response. The PMT has been successfully applied to the prediction of a number of health behaviors (for a recent review see Norman et al, 2005). Meta-analytic reviews of PMT (Floyd et al, 2000; Milne et al, 2000) indicate protection motivation (i.e., intentions) and self-efficacy to be the most powerful

predictors of behavior, while self-efficacy and response costs were most strongly associated with intentions.

2.3 Theory of Planned Behavior

The Theory of Planned Behavior (TPB; Ajzen, 1991) was developed by social psychologists and has been widely applied to understanding health behaviors (see Conner and Sparks, 2005, for a review). It specifies the factors that determine that individual's decision to perform a particular behavior (see Fig. 2.3). Importantly this theory added "perceived behavioral control" to the earlier Theory of Reasoned Action (TRA; Ajzen and Fishbein, 1980). The TPB proposes that the key determinants of behavior are intention to engage in that behavior and perceived behavioral control over that behavior. As in the PMT, intentions in the TPB represent a person's motivation or conscious plan or decision to exert effort to perform the behavior. Perceived behavioral control (PBC) is a person's expectancy that performance of the behavior is within his/her control and confidence that he/she can perform the behavior and is similar to Bandura's (1982) concept of self-efficacy.

In the TPB, intention is assumed to be determined by three factors: attitudes, subjective norms, and PBC. Attitudes are the overall evaluations of the behavior by the individual as positive or negative. Subjective norms are a person's

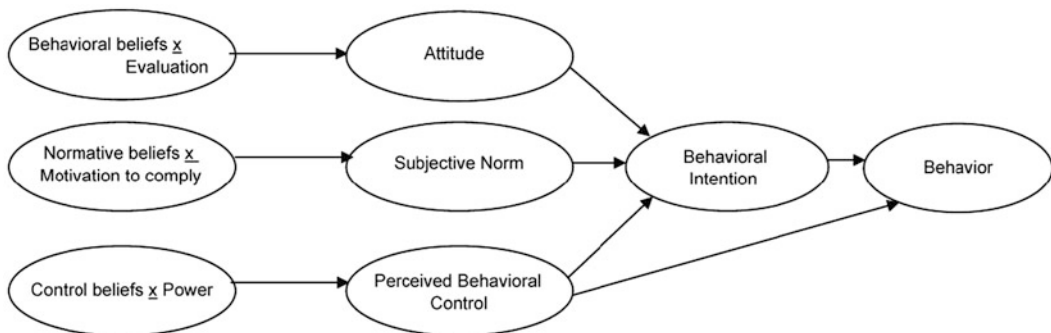


Fig. 2.3 Theory of Planned Behavior

beliefs about whether significant others think he/she should engage in the behavior. PBC is assumed to influence both intentions and behavior because we rarely intend to do things we know we cannot and because believing that we can succeed enhances effort and persistence and so makes successful performance more likely.

Attitudes are based on behavioral beliefs (or outcome expectancies), that is, beliefs about the perceived outcomes of a behavior. In particular, they are a function of the likelihood of the outcome occurring as a result of performing the behavior (e.g., “How likely is this outcome?”) and the evaluation of that outcome (e.g., “How good or bad will this outcome be for me?”). It is assumed that an individual will have a limited number of consequences in mind when considering a behavior. This expectancy-value framework is based on Fishbein’s (1967) earlier summative model of attitudes. Subjective norm is based on beliefs about salient others’ approval or disapproval of whether one should engage in a behavior (e.g., “Would my best friend want me to do this?”) weighted by the *motivation to comply* with each salient other on this issue (e.g., “Do I want to do what my best friend wants me to do?”). Again it is assumed that an individual will only have a limited number of referents in mind when considering a behavior. PBC is based on control beliefs concerning whether one has access to the necessary resources and opportunities to perform the behavior successfully (e.g., “How often does this facilitator/inhibitor occur?”), weighted by the perceived power, or importance, of each factor to facilitate or inhibit the action (e.g., “How much does this facilitator/inhibitor make it easier or more difficult to perform this behavior?”). These factors include both internal control factors (information, personal deficiencies, skills, abilities, emotions) and external control factors (opportunities, dependence on others, barriers). As for the other types of beliefs it is assumed that an individual will only consider a limited number of control factors when considering a behavior.

The TPB has been widely tested and successfully applied to the understanding of a

variety of behaviors (for reviews see Ajzen, 1991; Conner and Sparks, 2005). For example, in a meta-analysis of the TPB, Armitage and Conner (2001) reported that across 154 applications, attitude, subjective norms, and PBC accounted for 39% of the variance in intention, while intentions and PBC accounted for 27% of the variance in behavior across 63 applications. Intentions emerged as the strongest predictors of behavior, while attitudes were the strongest predictors of intentions.

The TPB has also informed a number of interventions designed to change behavior. For example, Hill et al (2007) employed a randomized control trial to test the effectiveness of a TPB-based leaflet compared to a control condition in promoting physical exercise in a sample of school children. The leaflet condition compared to the control condition significantly increased not only reported exercise but also intentions, attitudes, subjective norms, and PBC. Additional analyses indicated that the impact on exercise was mediated by the increases the leaflet had produced (compared to the control group) in intentions and PBC.

2.4 Social Cognitive Theory

In Social Cognitive Theory (SCT; Bandura, 1982) behavior is held to be determined by three factors: goals, outcome expectancies, and self-efficacy (see Fig. 2.4). Goals are plans to act and can be conceived of as intentions to perform the behavior (see Luszczynska and Schwarzer, 2005). Outcome expectancies are similar to behavioral beliefs in the TPB but here are split into physical, social, and self-evaluative depending on the nature of the outcomes considered. Self-efficacy is the belief that a behavior is or is not within an individual’s control and is usually assessed as the degree of confidence the individual has that he/she could still perform the behavior in the face of various obstacles (and is similar to PBC in the TPB). Bandura (2000) recently added socio-structural factors to

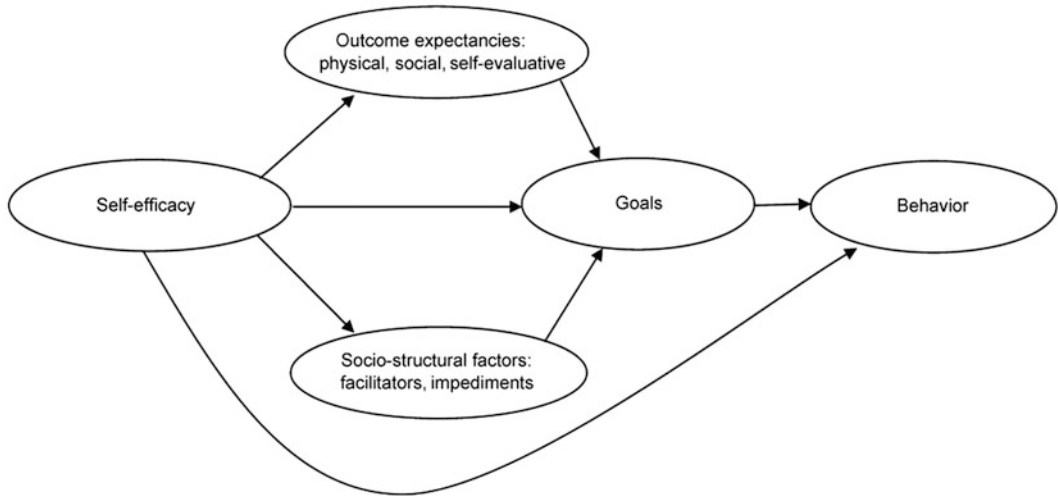


Fig. 2.4 Social Cognitive Theory

his theory. These are factors assumed to facilitate or inhibit the performance of a behavior and affect behavior via changing goals. Socio-structural factors refer to the impediments or opportunities associated with particular living conditions, health systems, political, economic, or environmental systems. They are assumed to inform goal setting and be influenced by self-efficacy. The latter relationship arises because self-efficacy influences the degree to which individuals pay attention to opportunities or impediments in their life circumstances. This component of the model incorporates perceptions of the environment as an important influence on health behaviors.

SCT has been successfully applied to predicting and changing various health behaviors. However, unlike a number of the other models considered above, many of the applications of SCT only assess one or two components of the model (usually self-efficacy) rather than all components. Self-efficacy and action-outcome expectancies along with intentions have been found to be the most important predictors of a range of health behaviors in a diverse range of studies (for reviews see Bandura, 2000; Luszczynska and Schwarzer, 2005).

2.5 Stage Models of Health Behavior

The SCMs considered above assume that the cognitive determinants of health behaviors act in a similar way during initiation (e.g., quitting smoking for the first time) and maintenance of action (e.g., trying to stay quit). In contrast, in stage models psychological determinants may change across such stages of behavior change (see Sutton, 2005, for a review). An important implication of the *stages* view is that different cognitions may be important determinants at different stages in promoting health behavior. The most widely used stage model is Prochaska and DiClemente's (1984) Transtheoretical Model of change (TTM). Their model has been widely applied to analyze the process of change in alcoholism treatment and smoking cessation. DiClemente et al (1991) identify five stages of change: pre-contemplation (not thinking about change), contemplation (aware of the need to change), preparation (intending to change in the near future and taking action in preparation for change), action (acting to change), and maintenance (of the new behavior). Individuals are seen to progress sequentially from one stage to the next, with maintenance the end stage of successful change. For example, in the case of

smoking cessation, it is argued that in the pre-contemplation stage the smoker is unaware that his/her behavior constitutes a problem and has no intention to quit. In the contemplation stage, the smoker starts to think about changing his/her behavior, but is not committed to try to quit. In the preparation stage, the smoker has an intention to quit and starts to make plans to quit. The action stage is characterized by active attempts to quit, and after 6 months of successful abstinence the individual moves into the maintenance stage. This stage is characterized by attempts to prevent relapse and to consolidate the newly acquired non-smoking status.

Although widely applied, the evidence in support of stage models and different stages is modest (see Sutton, 2000, 2005). Sutton (2000) concludes that the distinctions between TTM stages are “logically flawed” and based on “arbitrary time periods.” The sequential movement through stages has not generally been supported (Sutton, 2005). In addition, it has proved difficult to support the key prediction that there are different determinants of behavior change in different stages. Evidence from stage-matched versus stage-mismatched intervention studies does not generally provide support for the TTM (see Littell and Girvin, 2002, for a systematic review of the effectiveness of interventions applying the TTM to health-related behaviors). Thus, at present, research findings do not support the added complexity and increased cost of stage-tailored interventions compared to the linear approach advocated in other SCMs. West (2005) in reviewing stage models in relation to smoking has recently suggested that work on the TTM should be abandoned.

3 Integration of Social Cognition Models

The overlap between SCMs has prompted attempts to integrate them. This may be valuable, especially since they include some of the same cognitive determinants. For example, intention, self-efficacy, and outcome

expectancies appear in several models. One important attempt to integrate these models was that by Bandura (SCT), Becker (HBM), Fishbein (TRA), Kaufen (self-regulation), and Triandis (Theory of Interpersonal Behavior) as part of a workshop organized by the US National Institute of Mental Health in response to the need to promote HIV-preventive behaviors. The workshop sought to “identify a finite set of variables to be considered in any behavioral analysis” (Fishbein et al, 2001, p. 3). They identified eight variables which, they argued, should account for most of the variance in any (deliberative) behavior. These were organized into two groups. First, those variables which were viewed as necessary and sufficient determinants of behavior. Thus, for behavior to occur an individual must (i) have a strong intention, (ii) have the necessary skills to perform the behavior, and (iii) experience an absence of environmental constraints that could prevent behavior. Second were those variables that were seen primarily to influence intention (although a direct effect on behavior was noted as possible). Thus, a strong intention is likely to occur when an individual (i) perceives the advantages (or benefits) of performing the behavior to outweigh the perceived disadvantages (or costs, i.e., outcome expectancies), (ii) perceives the social (normative) pressure to perform the behavior to be greater than that not to perform the behavior, (iii) believes that the behavior is consistent with his/her self-image, (iv) anticipates the emotional reaction to performing the behavior to be more positive than negative, and (v) has high levels of self-efficacy. Figure 2.5 illustrates this integrated model. This approach has been further developed by Fishbein (2008) in his integrative model (IM) of behavioral prediction although this has not, as yet, been widely tested.

4 Current Directions

A clear contribution of work with SCMs has been their ability to identify key correlates of health behavior that can be targeted

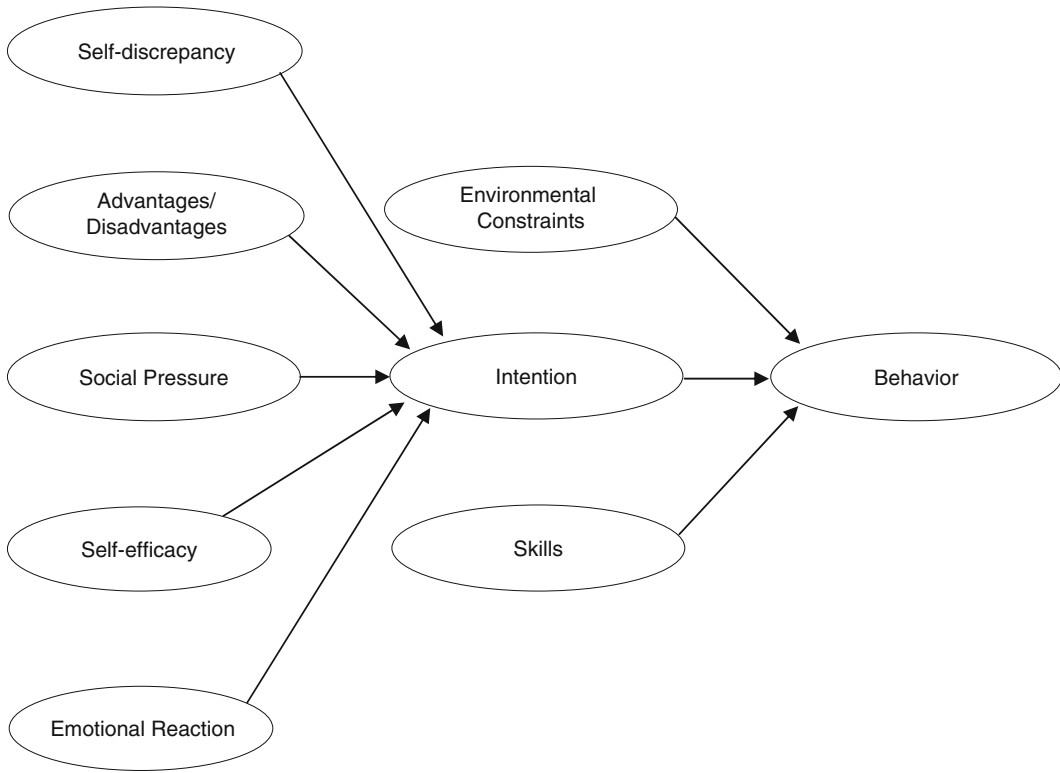


Fig. 2.5 The “major theorists” integrated social cognition model

in interventions to change behavior. Across studies the strongest relationships with behavior emerge for intentions, self-efficacy, and outcomes expectancies (Conner and Norman, 2005). However, in focusing on correlates of health behavior rather than examining causal relationships research may have overestimated the size of relationships. For example, while correlational research indicates intentions to have a strong effect size on behavior (Armitage and Conner, 2001), studies looking at manipulations of intentions indicate that a medium to large change in intentions is associated with only a small to medium effect sized change in behavior (Webb and Sheeran, 2006). A further important limitation with much work on SCMs is that while they usefully identify cognition change targets, they commonly do not specify the best means to change such cognitions (work on self-efficacy is an exception to this trend; Bandura, 2000). Recent work on classifying behavior change

interventions (e.g., Abraham and Michie, 2008) and the more widespread assessment of mediating cognitions in intervention studies may provide the basis for further insights into how best to change cognitions and assessing their causal impact on behavior change for health behaviors. In the remainder of this section three directions of current research on cognitive determinants of health behavior are briefly reviewed.

4.1 Intention Stability

In the vast majority of quality applications of SCMs to predicting health behavior, a prospective design is employed where the predictors of behavior are measured by questionnaire (at time 1) and then behavior is measured at a second time point (in stronger designs behavior change is the focus of interest). An important

assumption of such a design is that the measured cognitions (e.g., attitudes) remain unchanged between their measurement and the opportunity to act. So, for example, the assumption is that intentions do not change in between when the (time 1) questionnaire is completed and the time points at which the respondent has the opportunity to act. This is an explicit limiting condition of the TRA/TPB (Ajzen and Fishbein, 1980). However, cognitions including intentions may indeed change in this time period and such change provides one important limitation on their power to predict behavior. Several studies have now demonstrated the power of intention stability to moderate the intention-behavior relationship (see Conner and Godin, 2007, for a review). For example, Conner et al (2002) found that intentions were strong predictors of healthy eating up to 6 years later, but only among those whose intentions had remained stable over an initial period of 6 months.

A number of factors have been found to influence the intention-behavior relationship. For example, anticipating feeling regret if one does not perform a behavior or perceiving a strong moral norm to act have both been found to significantly increase the intention-behavior relationship (see Cooke and Sheeran, 2004, for a review). Sheeran and Abraham (2003) showed intention stability to moderate the intention-behavior relationship for exercising and that intention stability mediated the effect of other moderators of the intention-behavior relationship (e.g., anticipated regret, certainty). This suggests that the mechanism by which a number of these other moderators may have their effect on intention-behavior relationships is through changing the temporal stability of intentions. Hence, factors that might be expected to make individual intentions more stable over time would be expected to increase the impact that these intentions have on behavior and so increase the intention-behavior relationship. Thus intention stability might be a useful focus of attention as a key mediating variable in intervention studies attempting to change health behavior.

4.2 Affective Influences

One criticism of work with SCMs has been the failure to explicitly consider affective influences on behavior (Conner and Armitage, 1998). Outcome expectancies included in PMT, TPB, and SCT do not preclude consideration of affective outcomes, although the outcomes typically considered do not focus on affective states. Over the last few years a number of studies have examined the impact of expectations of affect associated with performance of a behavior. For example, studies have examined anticipated regret as a determinant of behavior within the context of the TPB (see Sandberg and Conner, 2008, for a review). Regret is a negative affective state that can be anticipated pre-behaviorally and so influence subsequent behavior. Studies generally report that such anticipated affective states add significant variance to predictions of intentions but not behavior and may be particularly important in relation to certain *affective* behaviors (e.g., condom use; Glasman and Albarracin, 2006). Other studies have shown affective outcomes to be better predictors of behavior than more instrumental outcomes (e.g., Lawton et al, 2007). Work has also examined the affect that accompanies performance of the behavior (sometimes referred to as anticipatory affect or affective attitudes; Loewenstein, 1996) rather than following performance of the behavior. Such affective attitudes have been explicitly added to the TPB (Conner and Sparks, 2005) and been reported to be stronger predictors of intentions and behavior than instrumental attitudes (Ajzen, 2001; Lawton et al, 2009). In addition, some studies indicate affective attitudes to directly predict behavior independent of intentions (e.g., Lawton et al, 2009). Affective expectations and their influence on health behavior would appear to be an important and growing focus for research in this area.

4.3 Implementation Intentions

The majority of research reviewed thus far has focused on motivational influences of cognitive

variables on behavior (i.e., impacting on intention formation). However, other research has begun to focus on the volitional phase of action (Bagozzi, 1993). One volitional variable that has been widely tested in relation to health behavior is implementation intentions. Gollwitzer (1993) makes the distinction between goal intentions and implementation intentions. While the former is concerned with intentions to perform a behavior or achieve a goal (i.e., “I intend to do x”), the latter is concerned with if-then plans which specify an environmental prompt or context that will determine when the action should be taken (i.e., “I intend to initiate the goal-directed behavior x when situation y is encountered”). Importantly, the if-then plan in an implementation intention commits the individual to a specific course of action when certain environmental conditions are met. Sheeran et al (2005) note that “to form an implementation intention, the person must first identify a response that will lead to goal attainment and, second, anticipate a suitable occasion to initiate that response. For example, the person might specify the behavior ‘go jogging for 20 minutes’ and specify a suitable opportunity ‘tomorrow morning before work’” (p. 280). Gollwitzer (1993) argues that by forming implementation intentions individuals pass control of intention enactment to the environment. The specified environmental cue prompts the action so that the person does not have to remember the goal intention or decide when to act.

Sheeran et al (2005) provide an in-depth review of both basic and applied research with implementation intentions. For example, Milne et al (2002) found that an intervention using persuasive text based on PMT prompted positive pro-exercise cognition change but did not increase exercise. However, when this intervention was combined with encouragement to form implementation intentions, significant behavior change was observed (see Gollwitzer and Sheeran, 2006, for a meta-analysis of such studies). Thus implementation intention formation moderates the intention-behavior relationship demonstrating that two people with equally strong goal intentions may differ in their

volitional readiness depending on whether they have taken the additional step of forming an implementation intention. Implementation intention formation has been shown to increase the performance of a range of health behaviors with, on average, a medium effect size. Implementation intentions appear to be particularly effective for those with strong goal intentions and in overcoming forgetting that appears to be a common problem in enacting intentions. Provided effective cues are identified in the implementation intention (i.e., ones that will be commonly encountered and are sufficiently distinctive) forgetting appears to be much less likely.

5 Conclusions

A number of social cognition models have been developed to describe the key cognitive determinants and their relationship to behavior. These key cognitions include intentions, self-efficacy, and outcome expectancies. Recent research has sought to integrate such models (Fishbein et al, 2001). Current research has focused on intention stability as an important mediating variable explaining the impact of health cognitions on behavior. Other work is examining affective influences on health behaviors and how the formation of implementation intentions promotes the performance of behavior.

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