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Conceptualization and Operationalization of Perceived Control

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Personal control is being increasingly recognized as a central concept in the understanding of the relationships between stressful experience, behaviours and health. Experimental investigations indicate that control over aversive stimulation has profound effects on autonomic, endocrine and immunological responses, and may influence the pathological processes implicated in the development of cardiovascular disease, tumour rejection and proliferation, and the acquisition of gastrointestinal lesions. Clinically, control and lack of control have been identified as relevant to the experience of pain, anxiety and depression. In the field of psychosocial epidemiology, interesting observations are emerging that relate health to control over job parameters and other aspects of people's lives. (Steptoe & Appels, 1989, p. ix)

The construct of personal (or perceived) control plays an important, central role in health psychology. As exemplified by the previous quotation, it is relevant to stress-related situations and contributes to health-related behavior in individuals who are not experiencing stress. What is less clear is the way the construct of perceived control should be conceptualized and operationalized in health psychology research. This chapter first defines the construct conceptually. After pointing out a number of issues in the study of perceived control, the various ways in which health psychologists have operationalized the construct in their research are reviewed. The final section covers moderators of perceived control, thus illustrating the complex nature of the mechanisms by which perceived control operates to influence health behavior and health status.

CONCEPTUAL DEFINITIONS OF PERCEIVED CONTROL

Thompson (1981) defined personal control as "the belief that one has at one's disposal a response that can influence the aversiveness of an event" (p. 89). Perceived control (used synonymously in this chapter with *personal* control) has been defined as "the belief that one can determine one's own internal states and behavior, influence one's environment, and/or bring about desired outcomes" (K. A. Wallston, B. S. Wallston, S. Smith, & Dobbins, 1987, p. 5). "Most authors ... view control as a belief or cognition, reflecting the extent to which people think they can influence the situation, either by altering it, by changing its meaning or by regulating their own behavioral or emotional reactions" (Ormel & Sanderman, 1992, p. 196).

The fact that perceived control is a *belief* is critical. The perception may, or may not, be based on reality (Averill, 1973). When perceived control is based on reality, it is referred to as veridical or actual control; when it is patently not based on reality, it is sometimes referred to as illusory control (see Langer, 1975; Taylor, 1989). In most instances, the truth lies somewhere in between. Veridicality is not necessary or sufficient to bring about the perception of control, although the perception of control, however illusory, may have a profound effect on the individual.

Primary Versus Secondary Control

There are are least two separate ways by which a perception or feeling of control can be accomplished (Rothbaum, Weisz, & Snyder, 1982). In primary control, individuals enhance their rewards or achieve their objectives by influencing existing realities (e.g., other people, circumstances, symptoms, or behavior problems). In secondary control, individuals enhance their outcomes by accommodating to existing realities and maximizing satisfaction or goodness of fit with things as they are.

Targets of Control

Control is almost always directed at one or more *targets.* These targets include internal states, behavior, the environment (including behaviors of other people), and outcomes. The likelihood of multiple targets suggests that any conceptualization (and operationalization) of perceived control must be multifaceted. For example, individuals may perceive control over their own behaviors but not over others' behavior. They also may believe they have control over one aspect of their behavior (e.g., the ability to understand the words in a sentence) but not over other aspects of their behavior (e.g., the ability to understand the meaning of a sentence). Not only do targets differ, but control perceptions for targets differ over time. As a result, any attempt to treat the construct of perceived control simplistically is misguided.

In health psychology, the three most prevalent targets of control are health status, health behavior, and health care treatment. These are not the only targets of interest to health psychologists, however. For instance, Baum, Cohen, and Hall (1993) discussed control over environmental stressors such as hurricanes, earthquakes, tornados, explosions, and technological support services. Brownell (1991), on the other hand, focused on control over individuals' bodies. Anything that may impact on the individual is a potential target for control.

Appraisal

In Lazarus and Folkman's (1984) theory of stress and coping, primary appraisal refers to a judgment of the threat value of a stressor, whereas secondary appraisal refers to a judgment of available resources to deal with the threat. Perceptions of control affect and are affected by the process of secondary appraisal; the more resources available, the greater the perception of control and the better the ability to cope with the stressor. Some theoreticians in this area equate perceived control with "coping potential" (Craig Smith, personal communication, 1993); the greater the perceived control, the more likely the individual will cope successfully. Perceptions of control, therefore, can be thought of as personal coping resources.

ISSUES IN THE STUDY OF PERCEIVED CONTROL

Manipulated Versus Measured Control

The overwhelming majority of research on perceived control treats it as an individual difference construct that can be assessed by self-reports, usually with a paper-and-pencil instrument and sometimes by interview. In a smaller body of experimental research (e.g., Langer & Rodin, 1976; Mills & Krantz; 1979; Schulz, 1976), perceived control over some aspect of the environment, such as the health care delivery system, is manipulated in order to study the effects of perceived control on outcomes. For example, Langer and Rodin (1976) gave residents in a nursing home choice over which night they viewed a movie and whether the residents or the nursing staff had responsibility for watering plants. The investigators offered these choices to determine the effects that even a minimal amount of control has on mental and physical health.

The experimental research approach, rooted in social psychology, treats perceived control as an intervening variable. In these studies, some aspect of the situation is manipulated by the experimenter. Theoretically, the manipulation affects the subject's perception of control, which in turn helps determine the person's response to the situation (i.e., the outcome). An assumption in this type of research is that perceptions of control can be influenced by experiences.

In a series of field experiments conducted in the 1980s, Wallston and colleagues (see B. S. Wallston et al., 1987; K. A. Wallston, 1989; K. A. Wallston et al., 1991, for details) attempted to manipulate patients' perceptions of control over their health care situations by giving them enhanced choices and/or information to increase the predictability within the situations. The researchers expected that the patients' increased sense of control would lead to reduced feelings of distress and greater compliance with their medical regimens. No main effects for the control enhancing manipulations were found. Instead, the outcomes were determined by a complex interaction of the experimental conditions and patients' desire for control in those situations. The importance of taking into account individual differences such as desire for control are addressed later in this chapter.

In the aforementioned Wallston et al. studies, measures of perceived control administered after the experimental manipulations served both as an "outcome" of the manipulated independent variable (choice and/or predictability information) and as an "indicator" of the psychological process that intervened between the independent and the dependent variables. A separate set of questions served as the manipulation check in these studies. Among other things, these latter questions asked if the subject remembered being given a choice and/or predictability information. It is critical when conducting experimental manipulations of control to include both explicit manipulation checks as well as measures of perceived control as an outcome (or intervening) variable.

Levels of Specificity/Generalizability

In psychology in general, and health psychology in particular, perceived control has been assessed at three levels: *general,* cutting across many behaviors and situations faced by individuals; *midlevel,* pertaining to a given domain in people's lives (e.g., work, health, interpersonal relationships) but cutting across behaviors and situations within that domain; and *specific* to a given behavior and/or situation. Assessments at a

general level are usually treated as stable personality traits, not easily amenable to change.

Caution should be exercised in assuming that mid- or specific-level assessments of perceived control remain stable over time because beliefs can change with each new experience. Investigators must choose a level of measurement that best suits their purposes. For example, the administration of a measure designed to assess perceived control over life in general should not be used to evaluate the effectiveness of a communication designed to convince diabetics they are in control of their own condition. Instead, a measure specific to health, or even one specific to diabetes, would be a better choice. When measuring perceived control after a deliberate manipulation of control, the instrument needs to be sensitive to change over time. Situation-specific measures are preferable in this instance.

Perceived Control as an Independent Versus Dependent Variable

In most of the work done to date, perceived control beliefs are treated as independent variables or causal agents, having some effect on an outcome or criterion variable. Work also has been done on the determinants of perceived control beliefs. In those instances, perceived control is treated as a dependent variable. The more perceived control is viewed as a stable attribute of the person or situation, the more likely it would be treated as an independent variable. In experiments in which the investigator manipulates the level of perceived control, the construct is treated as an independent variable. However, in doing a check of the manipulation, perceived control is typically analyzed as a dependent variable. Investigators need to be clear about whether control is an independent or dependent variable (or both) in their analyses.

The following section presents a number of ways in which perceived control has been operationalized in health psychology research. Almost all of these involve some sort of paper-and-pencil measures of beliefs, utilizing either single-item scales or, more usually, multi-item summated belief scales.

OPERATIONALIZATIONS OF PERCEIVED CONTROL

Locus of Control

Historically, most of the work linking perceived control and health evolved from Rotter's (1966) construct of *locus of control,* a generalized expectancy within his version of social learning theory (Rotter, 1954; 1982; Rotter, Chance, & Phares, 1972). *Locus,* the Latin word for "place," was dichotomized by Rotter into *internal* and *external.* A person with an internal locus of control orientation was conceptualized as someone who believes that valued reinforcements (or outcomes) occur as a direct consequence of personal actions or, perhaps, as a result of who or what the person is. An internal locus of control orientation is generally equated with perceived personal control. In contrast, an external orientation signifies a belief that reinforcements or outcomes are the result of other people's behaviors or, perhaps, random occurrences, not influenced by anything other than fate, luck, or chance. An external orientation typically is thought to signify a lack of perceived personal control.

Rotter (1966) developed the I–E scale as a means for assessing where along the internal–external continuum people's belief systems lay. The I–E scale is an example of assessment of perceived control at a general level. Generalized expectancies are developed through multiple experiences in varied situations (Rotter, 1954). By the time a person reaches adulthood and has experienced a wide range of situations, generalized expectancies have usually stabilized. Therefore, most investigators (e.g., Phares, 1976) have treated locus of control orientation as a personality trait. High I–E scores are reflective of externality and low I–E scores signify internality. I–E scale scores in late adolescents or adults are thought to be indicative of a relatively enduring characteristic of the individual, only changeable given profound new experiences or deliberate psychotherapy.

Health Locus of Control and Its Measurement

The I–E scale quickly became one of the most frequently used individual difference measures in psychology (cf. Rotter, 1975). Scores from Rotter's scale were applied to a wide variety of phenomena, including health. (See Strickland, 1978, and B. S. Wallston & K. A. Wallston, 1978, for reviews of early research linking I–E scores to health-related behaviors.) In 1973, the Wallstons became interested in applying the locus of control construct to health-related phenomena. Rotter (1975) stipulated that the predictability of behavior in a specific domain was more a function of expectancies related to that domain than generalized. Consequently, the Wallstons developed a midlevel, health domain-related locus of control scale, reasoning that such a measure would be general enough to cover a wide range of health-related behaviors and health-related circumstances while, at the same time, being specific enough to increase the predictability of health-related phenomena.

The first health locus of control (HLC) scale developed by B. S. Wallston, K. A. Wallston, Kaplan, and Maides (1976) was loosely modeled after Rotter's measure. Like the I–E scale, the original HLC scale was considered unidimensional, with high scores signifying increased externality. However, the HLC used a Likert response format rather than the forced-choice format employed by Rotter. The initial studies with the new scale (B. S. Wallston et al., 1976; K. A. Wallston, Maides, & B. S. Wallston, 1976) demonstrated its discriminant validity when compared to the I–E scale. The HLC scale predicted health outcomes and health-related information seeking better than the I–E scale, particularly among people for whom good health held high reinforcement value.

Multidimensionality of Locus of Control

A few investigators (e.g., Collins, 1974) used factor analysis to demonstrate that the I–E scale was multidimensional rather

than unidimensional. Levenson (1973, 1974) posited that internality and externality were different dimensions rather than opposite ends of the same dimension. Levenson also suggested that externality itself was multidimensional. She developed the I, P, and C scales (Levenson, 1973, 1974, 1981) in which "powerful others externality" (P) was assessed separately from "chance externality" (C), and both of these were separate from "internality" (I).

Multidimensional Health Locus of Control

The separateness of internality and externality was supported by further investigation by the Wallstons, who noted that the internal consistency reliability of the HLC scale was considerably lower in subsequent samples than it had been in the sample used to develop the instrument. The correlations between the five internally worded HLC items and the six externally worded items was essentially zero, confirming the multidimensional nature of the measure. They agreed with Levenson's decision to split externality into two distinct dimensions, while recognizing that the relatively high correlation between Levenson's P and C scales ($r \sim .60$) was not ideal.

The multidimensional health locus of control (MHLC) scales (K. A. Wallston, B. S. Wallston, & DeVellis, 1978) were developed to more fully capture the different dimensions of locus of control. Modeled explicitly after Levenson's generalized I, P, and C scales, the MHLC scales consist of two "equivalent" forms (A & B), each of which have three six-item subscales: *internal health locus of control* (IHLC), or the belief that personal behavior influences health status; *powerful others health locus of control* (PHLC), or the belief that health status is influenced by the actions of powerful others, such as family, friends, and health professionals; and *chance health locus of control* (CHLC), or the belief that health status is strictly a function of fate, luck, or chance. The two alternative forms were developed for researchers who wanted to administer a measure of health locus of control beliefs before and after an intervention designed to alter such beliefs.[1]

The three subscales of the MHLC typically are orthogonal to (uncorrelated with) one another (K. A. Wallston et al., 1978; Wallston & Wallston, 1981). In most populations, IHLC and PHLC scores are uncorrelated. On occasion, however, a small positive association is found between IHLC and PHLC, particularly among older, less well-educated, or chronically ill samples. In most samples, IHLC and CHLC are usually somewhat negatively correlated, although the correlation seldom exceeds $r = -.25$. The two external dimensions, PHLC and CHLC, often correlate as high as $r = .30$. Nevertheless, this means that less than 10% of the variance in one external dimension is explained by its association with the other. This is in contrast to Levenson's P and C scales, which shared over 35% common variance. Because the MHLC subscales are orthogonal to one another, it is inappropriate to combine the subscales to compute a total MHLC scale score.

Form A or Form B of the MHLC have been administered in over 1,000 studies in the United States and other countries. The scales have been used to examine every conceivable health-related phenomenon (see Wallston & Wallston, 1981; K. A. Wallston & B. S. Wallston, 1982, for reviews of some of the early work with the MHLC), but in no way do the results of these studies present a coherent pattern. Once the MHLC scales were developed, the Wallstons withdrew their support of the original HLC scale; the new measure did everything the old measure did—and then some.

Because the MHLC was modeled after Levenson's I, P, and C scales, no attempt was made to include "negatively" worded items. This was criticized by Lau and Ware (1981), who indicated that having all the items keyed in the same "positive" direction (i.e., agreement on each item contributes to a high subscale score) diminishes the validity of the scales for those respondents with a "yea-saying" or "nay-saying" response set (Campbell, Siegman, & Rees, 1967). Lau and Ware (1981) subsequently developed a multidimensional health locus of control scale in which negatively worded items were included. Three of the four dimensions in the Lau and Ware instrument mimicked the three MHLC dimensions. Lau and Ware's fourth dimension, labeled "general health threat," assesses motivation to control health, a distinctly different construct from locus of control beliefs.[2]

Condition-Specific Control: A New Approach

In the years since the MHLC was published, several other researchers developed disease-specific or health-relat- ed-domain specific versions of the measure (see K. A. Wallston, Stein, & C. A. Smith, 1994, for references). Each time someone developed a version of the instrument, however, they chose a different set of items from the MHLC. As a result, scores from one scale were not equivalent to scores from another, thus making it impossible to compare scale scores across studies.

Part of the rationale for developing these more specific instruments paralleled the original reason for constructing the HLC scale: to increase predictability within a specific domain. Another reason was that some patients with an existing

[1] If the pretest and posttest were to be done in relatively close temporal proximity to one another, then having equivalent forms would minimize the chance that subjects taking the posttest would answer exactly as they had on the pretest. However, Forms A and B of the MHLC are only somewhat equivalent; they are not identical and do not yield identical normative scores (see K. A. Wallston et al., 1978). Therefore, when these measures are used in this fashion, a random half of the sample should be pretested with Form A and the other half with Form B, and then the alternative form should be given as a posttest. Otherwise, it might spuriously be concluded that the intervention affected HLC beliefs when, in actuality, the change in mean scores might only be due to a change in the form of the measuring instrument.

[2] Subsequently, there have been a couple of studies (e.g., Marshall, Collins, & Crooks, 1990) that have used statistical modeling techniques to pit the Lau and Ware scales against the MHLC scales. These studies have generally supported the three dimensions used in the MHLC rather than the four dimensions in the Lau and Ware (1981) measure.

medical diagnosis had difficulties responding to certain items such as, "I can pretty much stay healthy by taking good care of myself." It is difficult to respond to this item when you do not think of yourself as "healthy." The solution to the proliferation of nonequivalent disease-specific measures was to develop a generic version of the MHLC, labeled Form C (K. A. Wallston et al., 1994). Form C contains four, rather than three, dimensions. Factor analyses (K. A. Wallston et al., 1994) demonstrated that the "powerful others" items in Form C break down into two orthogonal dimensions, "control by doctors" (what Lau & Ware, 1981, called "provider control") and "control by others" (e.g., family or friends). Form C can be made specific to any medical condition by changing one word ("condition") in each item.

Form C appeals to many researchers investigating perceived control in persons with chronic diseases or other medical conditions. However, it must be remembered that Form C assesses beliefs in control over a particular condition (e.g., cancer or arthritis), not health locus of control, per se. These two types of beliefs (i.e., domain-specific and situation-specific) seldom intercorrelate higher than .60 (cf. K. A. Wallston et al., 1994). Just because individuals perceive control over their diagnosed condition does not necessarily mean they perceive control over their health in general, and vice versa. Thus, researchers using Form C may also wish to use Form A or Form B, if adding 18 items does not substantially increase subjects' burden. The advantage of administering both Form A/B and Form C is that this provides both a midlevel and a condition-specific assessment of locus of control beliefs, increasing the likelihood of discovering important relations with other constructs.

Limitations of the Locus of Control Construct

A limitation of the construct *locus of control* is its relation to only one of the targets of control: outcomes (or, in social learning terms, reinforcements). This is a problem because locus of control is an *outcome expectancy*. For instance, high scores on the IHLC scale signify individuals believe there is a relation between their behavior and their health status. What is not known, however, is the person's *behavioral expectancies*: Does the person feel capable of producing the behavior when it is called for? An outcome expectancy without a concomitant behavioral expectancy may not indicate much about perceptions of control. For example, a woman might feel the food she eats influences her weight and she might also think that her weight influences her health, but unless she also believes she is capable of limiting her caloric intake, she will not perceive much control over her weight or her health. Feeling "responsible" for an outcome is not exactly the same thing as being in control of that outcome.

Another shortcoming of locus of control as a means of conceptualizing perceived control is that just because a person believes other people play a role in determining outcomes does not necessary imply a lack of perceived control. This is especially true in the context of health outcomes, particularly when the "powerful others" are highly skilled health professionals. Many patients truly believe that transferring control to a benevolent, competent health care provider is, in fact, a means of gaining control over health. Similarly, individuals who blame themselves for their poor health but do not feel responsible for their good health could score highly on a measure of internal health locus of control without feeling in control of their health.

Marshall (1991) used covariance structure modeling with a sample of medical outpatients to conduct a multidimensional analysis of health-related personal control perceptions. As Marshall hypothesized, the structure of personal health control included four dimensions: response-outcome expectancies about illness prevention; response-outcome expectancies about illness management; self-blame for negative health outcomes; and perceived self-mastery over health outcomes. Only the latter dimension, perceived self-mastery over health outcomes, was uniquely associated with physical well-being. The constructs and measures to be described—specifically, self-efficacy, mastery, and competence—relate directly to Marshall's finding.

Self-Efficacy. Bandura, whose version of social learning theory (now called social cognitive theory) has eclipsed Rotter's, led the way in distinguishing between outcome and behavioral expectancies (Bandura, 1977, 1982). The most salient behavioral expectancy, labeled by Bandura (1977) as *self-efficacy,* is the individuals' confidence in their ability to carry out a specific behavior in a specific situation. Measures of self-efficacy have proven to be much better predictors of health behavior than measures of health locus of control beliefs (Bandura, 1997; O'Leary, 1992; Schwarzer, 1992; Wallston, 1992).

Self-efficacy relates to control of a different target—behavior—than locus of control that targets outcomes or reinforcements (K. A. Wallston et al., 1987). Most current social psychological theories of health behavior incorporate self-efficacy beliefs as a major explanatory construct. For example, Ajzen's Theory of Planned Behavior (Ajzen, 1985) has a construct labeled "perceived behavioral control," which is closely akin to self-efficacy. Even the venerable Health Belief Model (Rosenstock, 1966) has been reformulated to include self-efficacy as a separate mediator of health behavior (Rosenstock, Strecher, & Becker, 1988).

The difficulty for health researchers wanting to measure self-efficacy is that Bandura initially conceived of these beliefs as being highly behavior and situation specific. Thus, each new health behavior or health-related situation calls for a new and different measure of self-efficacy. Fortunately, there are now enough examples of self-efficacy measures in the literature (e.g., Condiotte & Lichtenstein, 1982; Schwarzer, 1993) that researchers can adapt to fit their own particular needs. This latter strategy is commonplace, although it is not without peril. Any new or adapted instrument should be thoroughly pilot tested before use, and a psychometric analysis should be done once the data have been collected to assess the reliability and validity of the new measure (DeVellis, 1991).

Generalized Self-Efficacy, Mastery, and Competence. Some psychologists take exception to Bandura's original notion of strict situational specificity. They believe self-efficacy can be generalized across behaviors and situations and thus can be assessed as a stable individual difference. For example, Schwarzer and colleagues developed measures of *generalized self-efficacy* and applied them successfully to health-related phenomena (Schwarzer, 1992, 1993). Sherer and Maddux (1985) also developed a generalized self-efficacy scale, and others used Pearlin and Schooler's (1978) Mastery scale to assess individual differences in personal control over the environment and the future (Hobfoll & Lerman, 1989; Hobfoll, Shoham, & Ritter, 1991).

Wallston and colleagues developed a similar generalized measure, the Perceived Competence (PC) scale, which has been applied to health-related situations. For example, C. A. Smith, Dobbins, and K. A. Wallston (1991) showed that perceived competence mediates depression and life satisfaction in persons with rheumatoid arthritis. Pender, Walker, Sechrist, and Frank-Stromborg (1990) used this same instrument (which they referred to as the Personal Competence Rating scale) in a study of health behavior in six employer-sponsored health promotion programs. In the Pender et al. study, the PC scale predicted more variance in the measurement of health-promoting lifestyle behavior than any other measure, including the MHLC. It also contributed significant variance after controlling for all other constructs in their model.

There now exists a midlevel instrument for health researchers who do not want or need to assess self-efficacy at highly specific levels, but who also do not want to operate at a general level. The Perceived Health Competence scale (PHCS; M. S. Smith, K. A. Wallston, & C. A. Smith, 1995) measures essentially the same construct as Marshall's (1991) perceived self-mastery over health outcomes, and can easily be made even more outcome specific (e.g., pain, weight loss). This eight-item, psychometrically sound measure of perceived control of health is unidimensional, and combines behavioral and outcome expectancies in a single measure.

Situation-Specific Perceived Control Scales. In addition to utilizing already established measures of perceived control of health (e.g., locus of control, self-efficacy, mastery, and competence), many health psychologists ask just one or two questions about perceptions of control, often making those questions relevant to the situation under investigation. For example, Affleck, Tennen, Pfeiffer, and Fifield (1987) assessed rheumatoid arthritis patients' beliefs about personal control over daily symptoms, course of disease, medical care, and treatment. For all patients, regardless of severity of condition, the belief in personal control over medical care and treatment was associated with positive psychological outcomes. For patients with mild symptoms, perceiving personal control over symptoms was unrelated to outcomes. For those with moderate or severe symptoms, however, the more they perceived control over their symptoms, the more positive was their mood. Perceiving personal control over the course of their arthritis was marginally associated with positive mood in patients with mild disease, but was negatively associated with positive mood in patients with more severe disease.[3]

Taylor, Helgeson, Reed, and Skokan (1991) conducted a longitudinal study of control and adjustment among a group of patients with severe coronary heart disease. At three points in time, participants were asked to respond to two control-related questions using 7-point rating scales: (a) "Regarding your heart problem, how much in control do you feel?" and (b) "Regarding your heart problem, how helpless do you feel?" Because the questions were highly correlated at each point in time, the investigators chose to combine them into an index (after reversing the second item) rather than to treat them separately. This strategy enhances the reliability of the measure.

In a study of gay men with AIDS, Taylor and colleagues (Reed, Taylor, & Kemeny, 1993) used a different measurement approach. In interviews in the subjects' homes, ratings (on 5-point scales) of personal control were obtained through three questions: (a) "How much control do you feel you have over the amount of fatigue, pain, or other symptoms you may experience on a daily basis?"; (b) "How much control do you feel you have over maintaining or improving your health, for example by influencing your immune system or by preventing AIDS-related conditions from occurring, getting worse, or coming back?"; and (3) "How much control do you feel you have over the medical care and treatment of your illness?" Like the study by Affleck et al. (1987), this study illustrates ways to assess the multiple targets of control.

In the series of field experiments by Wallston and colleagues, referred to earlier, in which patients' perceptions of control were manipulated in specific health care settings by providing choices and/or enhanced information (see K. A. Wallston, 1989, for a synopsis of these studies), the PCON scale (for perceived control) was used to assess the key intervening variable. PCON assesses control over actual health care delivery situations, not control over outcomes or behaviors. Although the general form of the PCON scale remained the same from situation to situation (e.g., outpatients receiving a barium enema or cancer chemotherapy; hospitalized patients postsurgery), the wording of the instructions and items were altered to fit the specifics of the situation. This type of easily adaptable measure is useful for health services researchers interested in patients' perceptions or those wishing to assess the effectiveness of control-enhancing interventions.

Learned Helplessness

When individuals learn over repeated trials that the things that happen to them are not contingent on their own actions, they develop learned helplessness (cf. Seligman, 1975). Learned helplessness is the obverse of perceived control; the greater the learned helplessness, the less the perceived control. Because of this, health psychologists can assess perceived con-

[3]Not only does this study by Affleck et al. (1987) illustrate the value of assessing multiple targets of control, it also reinforces the importance of including disease severity as a moderator variable in one's analyses.

trol at a mid- or specific-level by measuring the extent to which patients hold beliefs consistent with learned helplessness and/or exhibit behavioral/motivational deficits indicative of helplessness. A good example of this is the helplessness subscale from the Arthritis Helplessness Index (AHI; DeVellis & Callahan, 1994; Stein, K. A. Wallston, & Nicassio, 1989).

MODERATORS OF PERCEIVED CONTROL: THE ACTION IS IN THE INTERACTION

The major outcome measure in Rotter's (1954) social learning theory is "behavior potential"—the likelihood of a particular behavior (or set of functionally related behaviors) occurring in a given situation. According to Rotter's theory, measures of expectancy (such as locus of control beliefs) are supposed to work in conjunction with measures of reinforcement value to predict behavior potential in specific situations (Rotter, 1954).[4] In other words, reinforcement value moderates the relation between locus of control beliefs and behavior. For high levels of reinforcement value, internal locus of control beliefs should be predictive of behavior; for low levels, locus of control should be uncorrelated with behavior.

Within the health domain, the most relevant reinforcer of health behavior is good health. Consequently, researchers attempting to predict health behavior using measures of health locus of control beliefs (or any expectancy measure) should also assess the reinforcement value of health (K. A. Wallston, 1991; K. A. Wallston et al., 1976), especially among relatively healthy populations. Although considerably less attention has been paid to the assessment of health value, there are a number of techniques that have been developed to do so (M. S. Smith & K. A. Wallston, 1992). When studying populations whose health statuses are already compromised by illness or disease, or when health value cannot be assessed directly, an alternative approach is to use a measure of disease severity as a proxy. In general, when health is threatened, its value is higher than when it is not (M. S. Smith & K. A. Wallston, 1992).

Behavioral expectancies (such as self-efficacy beliefs—the individuals' confidence in thier ability to carry out the behaviors) have been suggested as the primary predictors of health behavior. These specific expectancies, in turn, are moderated by locus of control orientation and health value (K. A. Wallston, 1992). In other words, health behavior can be predicted by self-efficacy expectations only among individuals who value their health and who have an internal orientation toward their health. This calls for examining the three-way interactions among behavioral expectancies, outcome expectancies, and outcome value when attempting to predict health behavior.

[4]The phrase "in conjunction with" is best interpreted as "in interaction with" rather than "in addition to." Thus, measures of locus of control need to be multiplied by or crossed with reinforcement value to predict behavior (cf. B. S. Wallston & K. A. Wallston, 1984; K. A. Wallston, 1991).

Health psychologists, however, are interested in more than predicting health behavior. For many researchers, health status is the outcome they are attempting to explain. Theoretically, at least, expectancies about control (e.g., health locus of control or self-efficacy beliefs) should be related only to health status when the control expectancy predicts health behavior and the health behavior predicts health status. Conceptually, the relation between perceived control and subsequent health status is mediated by health behavior. This relation (between perceived control and health status) is also subject to moderation by individual and situational variables.

A good example of how perceived control beliefs interact with personal and situational variables can be found in a study of end-stage renal disease patients (Christensen, Turner, T. W. Smith, Holman, & Gregory, 1991). In this study, depressive symptomatology was the outcome and whether or not the patient had previously experienced a failed liver transplant was the situational factor. Christensen et al. predicted that the negative psychological effects of a transplant failure would be greater for those who had strong beliefs in the controllability of their illness, whether through their own efforts or through those of their health care providers. It was also predicted that among those patients who had not experienced a transplant failure, those with stronger beliefs in control would have more favorable psychological outcomes. Christensen et al. also predicted that disease severity would moderate the interaction, such that the more severe the disease, the stronger the interaction.

The results of the study were as predicted. Within the group of patients with lower disease severity, the two-way interaction between perceived control and transplant outcome was not significant. The predicted interaction was seen for those with higher disease severity, however. In the failed transplant group, the greater the perception of control, the more depressed the patient. Among the patients who never experienced a failed transplant, the results were just the opposite (Christensen et al., 1991).

The study of rheumatoid arthritis patients by Affleck et al. (1987) provides another example of the importance of examining interactions of perceived control with disease severity when predicting health status outcomes. Another study by the same team of investigators (Tennen, Affleck, Urrows, Higgens, & Mendola, 1992) found an even more complicated, but clinically important, set of interactional effects. Those patients who believed at the outset of the study that they had more control over their pain experienced less daily pain. With increased levels of pain, however, greater control was associated with less positive mood.

Indicators of disease severity are not the only potential moderators of the relation between control beliefs and health outcomes. For example, Kaplan and associates (Strawbridge et al., 1993; Wallhagen et al., 1994) found that internal health locus of control strongly predicted 6-year change in physical functioning for elderly women. Elderly men, on the other hand, were affected only if they had lower functioning at baseline. In these analyses, both gender and level of baseline functioning were treated as moderator variables. Other potential moderators (of the relation between perceived control and

health outcomes) are age, social class, social support, and availability of medical treatments. The important message from these studies is that variance in health status is poorly explained by direct (main) effects of perceived control. The action is in the interaction, and the challenge is to find the right moderators for each situation.

FUTURE DIRECTIONS

Other than predicting that perceived control will remain a central and important construct in health psychology well into the 21st century, it is not easy to speculate about the way the construct will be operationalized and utilized in the future. One thing is for certain: New and improved methods of measurement will be developed. These will probably occur in two diametrically opposite directions: a focus on perceived control of health as a unitary dimension; and an attempt to discover other important dimensions or loci of control, such as the influence of the environment and/or a "higher power" on one's health status.[5] As health psychologists become more aware of and comfortable with alternative ways of assessment —such as using computers or qualitative methods—less and less reliance will be placed on traditional paper-and-pencil measures. Method triangulation, such as combining quantitative and qualitative assessments, will become the norm rather than the exception.

K. A. Wallston (1992) pointed out that "the focus isn't strictly on locus," which did not stem the tide of research using the MHLC scale, but slowed it down some. The challenge for health psychologists is to select the most appropriate ways of measuring perceived control and to develop analytic strategies that examine interactions amoung these methods as well as with other constructs.

CONCLUSIONS

This chapter described the development of measures of perceived control of health as well as the ways in which the construct of perceived personal control has been conceptualized and operationalized by health psychologists. The complexity and the multidimensionality of the construct has been emphasized. Different levels of specificity in operationalizing the construct were presented, concentrating on the mid- and situationally specific levels. It was stressed that although measures of health locus of control may play a role in explaining variance in health behaviors and health status, these measures should optimally be used in conjunction with other indicators of perceived control of health (e.g., perceived health competence or other efficacy measures). Also stressed was the notion that the action is in the interaction. Perceptions of control moderate, or are moderated by, many other constructs, among them individual differences in demographic characteristics, background experiences, situational factors, and value orientations. Without adopting an interactionist perspective, health psychologists and other investigators in behavioral medicine will fail to discover the full explanatory power of perceived control.

[5]In fact, a God Locus of Health Control (GLHC) subscale has been developed that can be used by itself or in conjunction with the MHLC to assess the belief that God is the locus of control of a person's health (see K. A. Wallston, Malcarne, Flores, et al., 1999).

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