Perceived Control and Health

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Perceived control (PC) is 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. Two important dimensions of PC are delineated: (1) whether the object of control is located in the past or the future and (2) whether the object of control is over outcome, behavior, or process. A variety of constructs and measures of PC (e.g., efficacy, attribution, and locus of control) are discussed in relation to these dimensions and selected studies are reviewed. The issues, controversies, and limits of the research on perceived control and health are addressed in terms of the antecedents and consequences of perceived control. Investigations should clearly conceptualize the object of perceived control, use measures that match the conceptualization, and when attempting to manipulate control, directly measure perceived control. The relation between PC and health outcomes is complex, and different aspects of PC may interact to affect health outcomes.

Peterson (1980) reviewed the experimental and correlational literature on the consequences of having a sense of control over one's life. In that review he listed 36 consequences from some 80 investigations carried out between 1962 and 1980. Only a relatively small percentage of those studies were health-related. Since that time, much has been written about control generally and the importance of control with respect to health. However, control is often poorly defined, especially in empirical studies, or more narrowly defined than the focus we take in this article. For example, Thompson (1981) defines control "as the belief that one has at one's disposal a response that can influence the aversiveness of an event" (p. 89). Our focus is also on *perceived* control but we do not limit ourselves to control over aversive or noxious events nor focus strictly on the relationship between behavior and outcomes.

Furthermore, the variety of labels and definitions used to discuss issues of control muddies the water. Perceived control may be used in a generic sense or go under the construct labels of "locus of control" or "self-efficacy." It can be in reference to control over behavior, outcomes, reinforcements, the situation, process, or some combination of these.

In this article, we utilize a broad and encompassing definition—*perceived control* is the *belief* that one can determine one's own internal states and behavior, influence one's environment, and/or bring about desired outcomes. Our definition is broader than in our previous work where we sometimes focused on perceived control over health care processes (e.g., Smith, Wallston, Wallston, Forsberg, & King, 1984) and other times on perceived control over health behaviors or outcomes (e.g., Wallston &

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Wallston, 1981, 1982, 1984). We see our broad definition as encompassing behavioral, cognitive, and decisional control as discussed by Averill (1973), danger vs. emotional control as set forth by Leventhal (1970), as well as including Thompson's (1981) more restrictive definition. It also speaks to notions about primary and secondary control as conceptualized by Rothbaum, Weisz, and Synder (1982). There is a whole area within clinical psychology dealing with the construct of *self-control* (e.g., Kanfer, 1970; Rehm, 1977) that is beyond the scope of this review but which is nevertheless pertinent to what we discuss in this article.

In our focus on perceived control, we are taking a phenomenological and cognitive perspective. Thus, we feel that it is largely irrelevant to deal with veridical control (as if "the truth" can ever really be known), since the actual contingencies in a given situation are less important than the perceptions of those contingencies, especially to a psychologist trying to predict a person's behavior in that situation. Of course, the consequences of perceived control will likely vary depending on the actual control present in the situation. Our discussion of perceived control also needs to be distinguished from issues of motivation for control (see Smith, et al., 1984; Wallston, Smith, King, Forsberg, Wallston, & Nagy, 1983). Too often in the literature, beliefs about control are equated with desire or preference for control, as if people who felt that they had control always unquestionably want it. Just because, for example, a person feels she is responsible for her own health does not necessarily mean that she wants that responsibility. While desire for control in health is an interesting topic in its own right, it is not dealt with further here.

In this article we distinguish between several aspects of the construct of perceived control. For instance, the notions of "control" and "responsibility" have often been equated, but it is possible that one can feel responsible for one's health behavior or health status and yet not perceive that one can control it. Responsibility, as used in this context, connotes beliefs about what one *should* do, while control is more related to what one is able to do.

Our goal is to place in perspective existing conceptions of perceived control. To do this we distinguish two major dimensions of control. One dimension specifies the object of control—we must ask, "control over what?" The major objects of control are: (1) our behavior or internal states; (2) the process, situation, or environment; and (3) outcomes. The second important dimension is time. Is the focus on control over future events, present events, or past events?

The distinction we are making between control over behavior, process, and outcome is not at all parallel to other control typologies. Thompson's (1981) behavioral, cognitive, informational, and retrospective control, Averill's (1973) decisional, cognitive, and behavioral control, and even Rothbaum et al.'s (1982) distinction between primary and secondary control are typologies of the nature of the *actions* taken to attain control. For the most part, these theorists have focused on attaining perceived control over the outcome and to some extent the process. Perceived control over behavior has been ignored, for the most part. Thus, when Rothbaum et al. argue that control can be attained by aligning oneself with the environment, while the method

of attaining control involves behavior or cognition, the perceived control of interest is nonetheless over the outcome.

In this article we first explicate further the distinctions implied by the two dimensions: object and time. Then we illustrate the utility of this conceptualization of perceived control. We discuss the antecedents of perceived control with respect to health and the consequences for health status and health behavior. In each section we cover control over behavior, process, and outcome. While some general conclusions are drawn in these sections, we do not comprehensively review the literature. Instead, literature is selectively discussed to illustrate research on antecedents and consequences of perceived control.

DIMENSIONS OF PERCEIVED CONTROL

Time

Two major traditions have been implicit in conceptions of perceived control (PC). Attribution theory (Harvey & Weary, 1984; Kelley & Michela, 1980) deals with causes that individuals infer for outcomes that have occurred in the past. Social learning theory (Bandura, 1977a; Rotter, 1954) deals with expectancies about the future. Although interest in PC lies in its utility as a predictor of future health behavior and status, the distinction between attributions and PC over the future may be moot in some research.

The Attributional Style Questionnaire (ASQ; Peterson, Semmel, von Baeyer, Abramson, Metalsky, & Seligman, 1982), developed to assess individual differences in characteristic attributional tendencies, presents hypothetical events to which respondents are asked to attribute causes. Responses to the ASQ may therefore be quite similar to expectancies for future perceived control. In fact, although some studies have measured both attributions and control expectancies (e.g., Taylor, Lichtman, & Wood, 1984), the relationship between these variables has not been reported. Further investigation of this relationship is warranted.

Thompson (1981) accounted for the time dimension by adding the category of retrospective control—beliefs about the causes of a past event—to her control typology. The distinction between attributions of causes of past events and perceived control over a future situation has also been made by Brickman and his colleagues (Brickman, Rabinowitz, Karuza, Coates, Cohn, & Kidder, 1982). They treat attributions of responsibility for the onset of a problem (such as a mental or physical health condition) as a separate and orthogonal dimension from attributions of responsibility for solutions to the problem in their explication of four prototypical models of helping and coping. The distinction between control over the cause of the problem and its solution seems particularly relevant to health issues. For example, individuals can believe that they are not responsible for getting a disease such as cancer, but believe that they can control how they respond to the disease. Much literature on

perceived control related to health has failed to give sufficient consideration to this distinction between the cause of the problem and control over its solution.

PC over Outcomes

Both Bandura's and Rotter's social learning theories include the concept of perceived control in the form of expectancies about reinforcements or outcomes. Locus of control (LOC) is the generalized outcome expectancy construct from Rotter's social learning theory. Those with an internal LOC orientation believe their own behavior determines their reinforcements or outcomes while those with an external LOC orientation believe their reinforcements are controlled by powerful other people or random occurrences such as fate, luck, or chance.

Rotter's I-E scale (Rotter, 1966) is the standard measure for assessing generalized LOC beliefs, while the Health Locus of Control (HLC) scale (Wallston, Wallston, Kaplan, & Maides, 1976) was developed to be a health-specific measure of the same construct. Both instruments were based on the notion that LOC was a unidimensional construct—that is, high scores reflected externality while low scores reflected internality. The more one believed one's own behavior or enduring characteristics led to one's being reinforced, the more control one was assumed to perceive over those reinforcements (and, by extension, the entire situation in which one found oneself). It was also assumed that the more internal one was, the better-off one would be, ignoring Rotter's (1966) admonition that either extreme was pathological. People were dichotomized into "internals" or "externals" (based on median splits on some summative scale) and literally hundreds of studies were done comparing the two. Almost always, the "internals" came out on top. (See Strickland, 1978, and Wallston & Wallston, 1978, for reviews of this early work applied to health.)

The arguments that have been made by locus of control investigators suggesting that internal versus external control is not really a unidimensional construct (e.g., Collins, 1974; Mirels, 1970) called for a new approach in measuring individual differences on this construct. A big step forward, both psychometrically and theoretically, was taken when Levenson (1974) developed the I, P, and C scales. Based upon Levenson's work, Wallston, Wallston, and DeVellis (1978) developed the Multidimensional Health Locus of Control (MHLC) Scales. (Lau & Ware, 1979, independently developed a multidimensional health locus of control scale quite similar to the MHLC. See Lau, in press, for a review of the work with their scale.)

The MHLC consists of three more-or-less orthogonal subscales: IHLC measures internality or the extent to which one believes one's health is influenced by one's own actions; PHLC assesses powerful other health externality or the belief that powerful other people control one's health status; and CHLC gets at chance health externality which is the perception that one's health is only controlled by fate or luck. Endorsing this latter subscale has typically been equated with perceived *non*control of health, since fate, luck, or chance are usually thought of as beyond anyone's control. (See Wallston & Wallston, 1981, 1982 for reviews of work with these scales.)

Three dimensions of causal attributions are included in the ASQ: internal vs.

external locus (due to me vs. due to others or circumstances); stable vs. unstable (likely vs. unlikely to be there in the future); and global vs. specific (having to do with my whole life vs. just this one part of my life). Weiner (1974), however, had previously suggested controllability as an important attribution dimension, and Wortman and Dinzer (1978) echoed that suggestion. The internality-externality dimension parallels unidimensional locus of control conceptualizations (e.g., Rotter, 1966; Wallston, B.S. et al., 1976), but its viability is called into question by the discovery that the construct is really multidimensional. Additionally, globality and stability assess the extent to which similar attributions would likely be made in other circumstances. Thus, one would expect less perceived control when attributions are made to uncontrollable causes that are also seen as global and stable.

The importance of the internality dimension, as related to controllability, is somewhat unclear. The relationship between these two attribution dimensions seems dependent upon extraneous variables in need of further investigation. Some studies support a near perfect positive correlation between internality and controllability (e.g., DuCette & Keane, 1984), but logic suggests that this need not always be the case. Imagine, for example, the person who believes her "arthritis" is internally caused (by, perhaps, her genetic makeup or the kind of life she has led) but feels no control over the comings and goings of the painful flair-ups which are so much a part of her condition. In one of our studies, we asked a large sample of patients with rheumatoid arthritis to rate the causes of a flare-up on four attribution dimensions. The correlation between internality and controllability of the stated causes was only .22 (Dobbins, Brown, & Wallston, 1986). The chance HLC dimension should, in fact, parallel the controllability attribution dimension to a greater extent than the internality dimension.

A distinction made in attribution research that is often neglected by locus of control investigators may also be important in health research. Most work on attribution suggests that people have different general responses to positive vs. negative outcomes (e.g., Miller & Ross, 1975). Thus, perceived control over health (or wellness) may be quite different than perceived control over illness. Measures of locus of control (including the MHLC scales) tend to blur this distinction by including positive and negative outcomes within the same scale, often within the same item. Wallston and O'Connor (1987) recently attempted to develop a smoking cessation locus of control scale that separates beliefs about success in quitting smoking from failure to do so. They found, however, that the internal/external distinction was more important than success/failure and that separate scales for the different outcomes might not be necessary.

PC over Behavior

Bandura (1977b, 1982) has pointed to the distinction between outcome expectancies such as LOC beliefs and behavioral expectancies. He labeled his major behavioral expectancy construct, self-efficacy. Self-efficacy is the person's belief that he/she can engage in a specific behavior (analogous to perceived control of the behavior). This is

quite different than an internal LOC belief, or the person feeling somehow responsible for his/her outcomes. Heretofore, many researchers mistakenly assumed that internals were high in the belief that they *could* control their reinforcements. The distinction between these constructs and a review of the relationship between self-efficacy and health behavior are thoroughly presented in a recent article by Strecher, DeVellis, Becker, and Rosenstock (1986).

Most investigators, however, still appear ignorant of the fact that self-efficacy and LOC are different constructs and that they address different aspects of perceived control. Self-efficacy is concerned with control of behavior; locus of control is in reference to outcomes and/or reinforcements. Persons with internal LOC orientations do not necessarily believe they can do the behavior(s) necessary to achieve valued reinforcements. Separate measures of the two constructs are usually positively correlated, but the correlations rarely exceed .50, thus providing empirical support that these are similar but different aspects of PC. The distinction between personal and universal helplessness parallels this efficacy/LOC distinction (Garber & Hollon, 1980).

Attributions are the parallel label to self-efficacy when the interest in in past rather than future behavior. While general attribution research has focused on the attributions people make for their own and other's behavior (e.g., Hansen & O'Leary, 1985; Jones & Nisbett, 1972; Kelley & Michela, 1980), only a little work has been done on attributions regarding health behaviors (e.g., Croog & Richards, 1977). Attributions about engaging or not engaging in previous health behavior could mediate continued persistence of the behavior. For example, preventive behavior that is attributed internally and is viewed as stable and controllable should be more likely to be continued. Research on attributions regarding preventive health behavior, adherence behavior, and early diagnosis-related behavior could prove valuable in behavior change efforts. The relationship between such attributions and self-efficacy is also worthy of investigation. Beliefs in self-efficacy should relate to internal, controllable attributions.

PC over Process

Control over the environment encompasses control over the situation and the processes (or means) by which the situation gets enacted. The majority of the work in this area has been by investigators interested in the effects of stress (e.g., Cohen, 1980; Miller, 1979; Thompson, 1981). Much of the early experimental work in this area (e.g., Glass, Reim, & Singer, 1971; Langer & Rodin, 1976; Mills & Krantz, 1979; Schulz, 1976) claimed to manipulate perceived control and, indeed, obtained findings consistent with the hypothesis that greater perceived control led to reduced stress responses and increased well-being. It was assumed that various manipulations including, for example, the potential to press a button and escape shock, cognitive reappraisal, selective attention, distraction, and sensitization all increase perceived control.

It is important to recognize that these early studies which attempted to manipulate control did not include sufficient measures of PC to check whether the effect of the

experimental manipulation was, in fact, mediated by increased PC. A number of subsequent investigations (e.g., Padilla, Grant, Rains, Hansen, Bergstrom, Wong, Hanson, & Kubo, 1981) including a series which we conducted (Smith, Wallston, King, Wallston, & Zylstra 1986; Wallston, Smith, Wallston, King, Rye, & Heim, in press; Wallston, Smith, Burish, Wallston, Rye, King, Smith, & O'Connell, 1986) have attempted to measure PC. Unfortunately, they either failed to find support for the stress-reducing effects of manipulated PC, or failed to demonstrate that PC was increased by the manipulations, or both.

Stability of Perceived Control

The issue of whether individual differences in PC are state-like or trait-like is one which has divided investigators for over 20 years. We, as personality and social psychologists, see such individual differences as *both* state-like and trait-like. Beliefs and systems of beliefs are amenable to change, given differing experiences in a particular situation. Also, people do, certainly, hold different beliefs for different situations. This is partly why experimenters attempt to manipulate PC in field settings such as a nursing home by, for example, allowing residents to know and/or determine when a college student is scheduled to visit (Schulz, 1976). That is also why Bandura (1977b) insists that self-efficacy be assessed in reference to a particular behavior (e.g., walking up one flight of stairs without becoming out of breath) and why Wallston and O'Connor (1987) would attempt to develop a measure as specific as a smoking cessation LOC scale.

On the other hand, there is undoubtedly a fair degree of stability across time and situations to measures of PC. As our experiments have unfortunately shown (e.g., Smith et al., 1986; Wallston, B.S., et al., in press; Wallston, K.A., et al., 1986), it is not easy to manipulate PC in health care settings—at least not by giving patients choices over certain aspects of their treatment or by providing predictability information relevant to their treatment. In fact, in a study of patients hospitalized for surgery, we found that the only thing which predicted PC over their postsurgical hospitalization experiences was how much control they *expected* to have over the process. These expectations were assessed prior to surgery, before the control manipulations were even presented to the subjects (Smith et al., 1986). It was almost as if certain patients were predisposed to perceive (or report) control no matter what was done to them in the situation.

Locus of control scales, such as those developed by Rotter (1966) and Levenson (1974) were conceived of as measures of *generalized* outcome expectancies and, thus, were expected to be relatively stable over time and applicable to a wide variety of situations. Even the health LOC scales (e.g., Lau & Ware, 1979; Wallston, B.S., et al., 1976; Wallston et al., 1978) were developed to be generalizable across a wide range of health behaviors, outcomes, and settings. There is, in fact, evidence of their stability over time (Lau, in press; Wallston & Wallston, 1981). The ASQ (Peterson et al., 1982), a measure of attributional style, has also shown moderate stability. Thus, there is

value to both state (i.e., situation-specific) and trait (i.e., personality-like) approaches in research on PC.

We have discussed the various conceptualizations of PC and their interrelationship. We have also shown that there is value in treating PC as both a trait and as a state. We now address the issue of antecedents of PC.

ANTECEDENTS OF PERCEIVED CONTROL

Antecedents of perceived control can be considered in terms of proximal (i.e., close in time) or distal (i.e., far in the past) variables. From a social learning perspective, the distal causes of PC beliefs constitute the individual's prior learning history. Most of the work on the distal development of PC has taken a cognitive-developmental perspective. Reviews of the general literature (Weisz & Stipek, 1982) and of beliefs related to health (Burbach & Peterson, 1986) are available; therefore, we do not duplicate them in this article. Although there is some work on the familial and social antecedents of generalized LOC (see Lefcourt, 1982, for a discussion), until recently little has been written on familial and social antecedents of health beliefs (but see Lau, in press, for some recent data on this issue). Our focus in this paper is on proximal variables present in the situation or environment, and in the person (in terms of generalized beliefs that are brought into the situation), rather than on distal variables.

PC over Outcome

Non-contingency between behavior and outcome does not necessarily lead to less perceived control (Nelson & Cohen, 1983). The perception of control over outcomes in chance situations is called the "illusion of control" by Langer (1983). She did a series of studies investigating various antecedents that would lead to the illusion of control. She found that when a chance situation resembles a skill situation (e.g., during competition) people perceived control even when none was actually present. Other variables increasing the illusion of control that might be more related to the health care situation were choice, familiarity with the situation, and involvement (Langer, 1983). All of these factors led to behavior that was theoretically related to greater perceptions of control over the outcome. Unfortunately, there was no direct measure of the individual's perception of control. Therefore, we do not know for sure whether these manipulations of the illusion of control did, in fact, manipulate control instead of some other unmeasured construct.

Generalized beliefs about control have frequently been hypothesized to be related to perceptions of control over all possible outcomes. However, the empirical literature does not support this hypothesis. In general, it seems that the nature of the outcome itself has more of an impact than individual differences in locus of control beliefs. Several studies dealing with people's perceptions of control over major life events that have occurred have found that positive events are related to greater perceptions of control than negative events (Dohrenwend & Martin, 1979; Nelson &

Cohen, 1983; Sandler & Lakey, 1982). Similarly, attributions about causes of success are generally seen as more internal, stable, and controllable than causal attributions of failure (e.g., Lau, 1984; Schoeneman, vanUchelen, Stonebrink, & Cheek, 1986).

Tennan and Sharp (1983) investigated whether externals recognized the true non-contingency between behavior and outcome better than did internals. They found that both internals and externals experienced an illusion of control. Both associated control with higher reinforcement rates in situations with no response-outcome contingency. Similarly, depressed and nondepressed individuals, who have been shown to differ in general attributional style (Peterson & Seligman, 1984), were equally able to distinguish between skill and chance tasks (Garber & Hollon, 1980).

The lack of relationship between locus of control and perceived control in the Tennan and Sharp (1983) study may be due to the fact that the outcome was known at the time that perceived control was measured. It is theoretically possible that in ambiguous or novel situations where the outcome is not known and it is not obvious that control is or is not possible, general control beliefs may have more of an influence than specific expectancies (Rotter, 1966, 1975). These conditions are frequently the case in the health care situations.

The nature of the outcome is also related to the perception of choice, which has been related to perceived control as mentioned earlier. Positive outcomes lead to greater perceptions of choice and control even when outcomes are equally good in nonchoice conditions (Skowronski & Carlston, 1982). When subjects made choices for someone else and found out whether the outcome was positive or negative, more choice and control was perceived when the outcome was positive (Harris & Harvey, 1975).

Health history is a factor contributing to the development of generalized beliefs about control. Nagy and Wolfe (1983) examined the relationship between illness-related experiences and HLC beliefs in chronically ill patients. Internal HLC beliefs were correlated with an index of the extent to which the patients' illnesses interfered with daily activities. DeVellis, DeVellis, Wallston, and Wallston (1980) had found earlier that HLC beliefs of persons with epilepsy were correlated with measures of seizure severity and predictability. Both studies (DeVellis et al., 1980; Nagy & Wolfe, 1983) found that their chronically ill subjects had higher chance HLC beliefs than normative samples, suggesting that chronic illness predisposes to low PC. However, the results from both the studies should be viewed with caution since they are based on cross-sectional rather than longitudinal data.

Factors influencing attributions include age (e.g., Peters, 1978); education (e.g., Pill & Stott, 1982, 1985); socioeconomic status (e.g., Elder, 1973); personality (e.g., Rhodewalt, 1984; Rhodewalt & Davison, 1983; Strube, 1985); and the nature of the illness (e.g., Mumma & McCorkle, 1982-83). The research that has been done has rarely examined simultaneously and cleanly both the antecedents and consequences (e.g., affect, adjustment) of attributions. Nonetheless, PC is a clear and salient factor in the studies done to date. Type A personality, for example, in conjunction with a greater need to exert control, might lead to more internal attributions and a subse-

quent loss of self-esteem (e.g., Weidner, 1980). This pattern might then increase susceptibility to coronary heart disease (Dobbins, 1986).

PC over Behavior

Beliefs in self-efficacy are perceptions of control of one's performance of a particular behavior. Strecher et al. (1986) describe four sources leading to efficacy expectations: (1) performance accomplishments; (2) vicarious experience, (3) verbal persuasion, and (4) physiological state. The first two represent distal variables leading to self-efficacy beliefs. The second two sources may be considered as more proximal variables, particularly physiological state. The experimental manipulations of self-efficacy beliefs in the studies reviewed by Strecher et al. (1986) tend to use methods of verbal persuasion or methods related to physiological state. For example, teaching self-talk strategies (Nicki, Remington, & MacDonald, 1985) and telling smoking subjects in a cessation program that their psychological tests indicated that they would be better able to quit (Blittner, Goldberg, & Merbaum, 1978) are two methods using verbal persuasion. A physiological manipulation could consist of administering placebo pills and indicating that the pill will aid the individual in performing the behavior (e.g., Chambliss & Murray, 1979).

Verbal persuasion is frequently used by health educators; however, its success in producing self-efficacy beliefs needs to be investigated. Schulman (1979) has found in a study of hypertensives that medical care that is characterized as having an active patient orientation is significantly correlated with higher efficacy beliefs. An active patient orientation includes communicating positive attitudes and expectations toward the patients' abilities to perform treatment recommendations. Active participation by the patient is encouraged. In her study, however, the efficacy measure is a one-item question regarding whether patients agree whether they can do certain things to lower their blood pressure. A substantial portion of the literature on the interaction between health care providers or educators and patients deals with its relationship to satisfaction and compliance and not with self-efficacy per se. With respect to physiological state, Strecher et al. (1986) cite Bandura's (1977b, 1982) work as indicating that high physiological arousal or fatigue and aches and pains may lead to lower self-efficacy beliefs.

In the section on consequences we discuss the complex interaction of different aspects of PC. There are complexities as well in considering antecedents. For example, Strecher et al. (1986) suggest that the effects of information on efficacy beliefs depend on attributions. Success feedback enhances the sense of efficacy only to the extent that the attribution for the success is internal. Thus, PC over outcome can influence PC over behavior.

PC over Process

Perceptions of one's control over the *process* of a situation or event are influenced by certain characteristics of the situation. Researchers have attempted to manipulate

such things as choice (Wallston, B.S., et al., in press; Wallston, K.A., et al., 1986; Langer, 1983; Langer & Rodin, 1976), the amount of available information (Mills & Krantz, 1979), and familiarity (Langer, 1983) in order to manipulate or examine the level of perceived control.

The influence of choice on perceived control is of particular interest because choice alone does not necessarily increase the level of perceived control (Wallston, B.S., et al., in press). The nature of the choices is particularly important. Steiner (1979) says that the degree of perceived control is related to the congruence between the best available option and the individual's comparison level. Kruglanski and Cohen (1974) have found that two negative alternatives are not perceived as choice, whereas two positive alternatives or a positive and a negative alternative are considered sufficient to provide a choice. In our study of barium enema patients (Wallston, B.S., et al., in press), we offered some patients a choice of three modes of preparation for the barium enema examination and found that there was no difference in perceived control between the group offered choice and those who were not offered a choice. The explanation for this finding might be that the options were all negative. Harvey and Harris (1975) found that more choice was perceived when the options were positive rather than negative. They also found that the *degree* of difference between the positive choices was an important factor to consider. The relationship between degree of difference and perceived choice was curvilinear. The most perceived choice occurs in the condition of small differences between the choices with less perceived choice in the conditions of no difference and large differences. The relationship between perceived choice and perceived control was .38. They also found that self-efficacy beliefs and an internal locus of control led to a greater perception of choice, which later led to a greater perception of control (Harvey & Harris, 1975). This illustrates the constant interplay between choice and control beliefs and between perceived control over behavior, process, and outcome.

There are other determinants of perceived control over process that are less frequently studied than choice. For example, the occurrence or nonoccurrence of an event is important (Jenkins & Ward, 1965; Smedslund, 1963). People pay more attention to events that happen than those that do not happen. Another determinant of what Averill (1973) calls decisional control is the degree to which external constraints agree with personal beliefs. In other words, if there is a match between the environment and the individual's beliefs about how the world should be, then more control is perceived (Chein, 1972; Kelly, 1955). A fourth antecedent is information about what will be experienced and what the process will be like, which leads to greater predictability and consequently greater perceived control (e.g., Johnson, 1975; Mills & Krantz, 1979). However, in some studies information has not been found to increase perceived control (e.g., Padilla et al., 1981; Smith et al., 1986; Wallston et al., 1986; Wallston et al., in press).

Health Implications

Most of the research reported here has dealt with situations not necessarily health-related. There are, however, important implications for studying antecedents of con-

trol in health. Perceptions of control throughout the process of health care may vary depending upon whether outcomes are already known or not. The presence of choices may not always lead to greater perceptions of control. If patients are offered choices in their health care, it is not a given that more control will be perceived. Choices should be examined for their positive and negative qualities and the degree of discrepancy between the choices. The relevance of choices may also be an issue. The importance to the patient of the domain in which the choices are offered may be a very significant factor in whether it has an impact on perceived control (Folkman, 1984).

The antecedents of perceived control have been less well studied than the consequences of holding these beliefs. A discussion of the consequences of perceived control follows.

HEALTH-RELATED CONSEQUENCES OF PERCEIVED CONTROL

Health-related consequences of PC are of two forms. PC may influence health behavior (e.g., dieting and exercising) and/or health status (e.g., weight loss or obesity). For the most part, our theoretical framework suggests that effects of PC on health status are mediated by changes in health behavior. Therefore, throughout this section we discuss both behavior and outcomes simultaneously. However, PC may directly influence health status through physiological processes rather than through conscious behavior. We deal briefly with such effects at the outset. Our discussion is then organized to cover the consequences of PC over outcomes, behavior, and process. We need to note, however, the complexity of drawing such conclusions.

To illustrate the difficulty in making blanket statements about the consequences of PC, let us look at the case of a person who feels responsible for his health behavior or health status (a "health-internal") and yet does not perceive that he has the ability to keep himself healthy (i.e., low self-efficacy.) In such an instance, the consequences may be negative emotional states such as shame, guilt, anxiety, and depression, or defensive behaviors such as denial, avoidance, or undue reliance on unproven "quick fixes." The person with a strong sense of responsibility for his/her health coupled with an adequate sense of self-efficacy might be expected to behave in a very conservative manner—that is, carry out most (if not all) of the health practices advocated by "experts" including high levels of information-seeking, and avoidance of high risk behaviors and potentially harmful treatments. This is especially true of the individual who highly values his/her health and who is what the Wallstons have referred to in the past as a "responsible internal." But what of the person who, perhaps, values health less highly (or, more likely, values other things more than health), somewhat believes that he/she can influence his/her health status, but does not feel particularly responsible for his/her health? Would not that person's health behavior be more unpredictable, engaging in some recommended behaviors but not others, maybe even experimenting with unorthodox treatments or taking risks that the "responsible internal" would not even dream of? For the purposes of this discus-

sion, however, we will assume that we are dealing with persons who place a high value on being healthy.

Effects of PC on Physiological Processes

An emerging area of study involves physiological reactions to alterations in control (see Rodin, 1986, for a discussion and references). A strong relationship between control and plasma corticosteroid levels is evident in animals and humans. Situations involving a lack of control seem to precipitate a rise in corticosteroids suggesting corticosteroid mediation of the control-disease relation. It is clear, according to studies cited by Rodin, that stress, loss/lack of control, and unpredictability, all of which are intrinsic in aversive events, are associated with various catecholamine, neurohormonal, and immune changes. Countless experimental manipulations (e.g., uncontrollable or inescapable shock, noise) in animal studies seem to lead to an unhealthy state. Tumor growth, gastric ulceration, and weight loss have been used as outcome measures.

Out of these pioneer efforts, several points become obvious: (1) we know little about the "pyschoneuroimmune" interrelationship; (2) some sort of guidelines by which to pursue this area of research would be helpful; and (3) the presence of multidisciplinary questions increases the complexity of research designs. We, as psychologists, do not often know whether cholesterol or electrolyte balance or both is important in atherosclerosis and/or arthritis. In a multidisciplinary arena, we are at the mercy of experts outside our field while they, too, struggle with complexities that we face on the psychosocial level. We obviously cannot do jusice to this complex area in this paper. It is important, however, to realize that environmental and psychosocial stressors can influence nervous, endocrine, and immune function (Rodin, 1986) and that PC may play a crucial role in this process.

PC over Outcome

With the advent of the MHLC scale (Wallston et al., 1978) it was no longer easy to make simple statements or predictions about perceived control of one's health. For instance, just because someone was low on the IHLC (i.e., a "non health internal") did not mean s/he perceived his/her health was uncontrolled. It could be that the person agreed with the PHLC items and felt that other people's actions were more determinate than his/her own. As long as the person trusted the motives and skills of the other person(s), there is no reason to think that perceived control is absent or diminished. Also, the orthogonality of the subscales meant that a sizeable proportion of persons endorsed *both* IHLC and PHLC beliefs. These folks could not easily be labeled as "internals" or "externals"; instead, if they also disavowed CHLC beliefs, they could be rightly labeled "believers in control." (See Wallston & Wallston, 1981, for a full explication of this multidimensional typology.) Where previously there was just one scale score and/or two types of individuals to contend with, now there were three scores and eight "types" of persons with which to investigate one's notions.

To make matters even more complex—but is that not the nature of human behavior—one cannot really deal with consequences of holding certain MHLC beliefs without taking into account the circumstances of the individual, particularly the condition of his/her health at the time. Is the person healthy and trying to stay healthy? Is the person acutely ill and trying to recover, or does s/he have a chronic illness with which one is coping/adapting? Not only do the pertinent health behaviors change as a function of health status (e.g., healthy persons engage in preventive behaviors while ill ones engage in restorative behavior), but the reinforcers themselves differ according to the person's circumstances. A healthy person might be seeking (and only reinforced by) "high-level wellness," while someone with a chronic condition such as rheumatoid arthritis might just want to avoid the onset of a painful flare-up. Also, if the "objective" situation is one where, in fact, nothing can be done to obtain positive outcomes, then persons might be better off *not* perceiving control (Wortman & Dunkle-Schetter, 1979).

Roskam (1986) recently completed a dissertation using a modification of the MHLC typology approach with a sample of patients with rheumatoid arthritis who were participating in a longitudinal study. Patients were classified as "pure internals," "pure powerful others," "pure chance," "double externals," or "believers in control" based on their initial MHLC scores. Their subsequent compliance behavior and level of depressive symptomatology over the next 12 months was examined as a function of how active their arthritis was during that period. For the first six-month period, "pure internals" reporting a high frequency of flare-ups demonstrated greater increases in nonadherence compared to "pure internals" with a low number of flare-ups. Among subjects reporting a high level of flare-ups, the "double externals" and "pure powerful others" were most likely to report an increase in depressive symptomatology over the year's period, while the "believers in control" actually reduced their reported depression in the face of active arthritis.

One of the most pervasive findings from the multitude of studies done with the MHLC scales is that when the target of the investigation is preventive health behaviors engaged in by healthy persons, the PHLC scores are generally less predictive of the behavior than either CHLC or IHLC scores (Wallston & Wallston, 1981, 1982). However, when an illness behavior such as medical compliance is investigated in a sample of persons diagnosed with a chronic disease, the PHLC scale is the only one of the three subscales to have predictive validity across studies; the greater the PHLC scores, the greater the compliance (Roskam, 1985). This trend in the literature was born out by Roskam's (1986) dissertation: all three types of rheumatoid arthritis patients high in PHLC beliefs were high in adherence regardless of degree of arthritis activity.

Although several studies have assessed attribution-outcome linkages (measuring adjustment to disease, health status, and health behavior; see Dobbins, 1986), there is no clear and simple way to summarize the findings. All studies do, however, suggest a need to assess mediating factors since there seems to be no strong direct relationship between attributions and outcomes. Such mediators might be coping and vulnerability (e.g., Timko & Janoff-Bulman, 1985) and intention to participate in out-

come behaviors (e.g., King, 1984). Also important to consider in this research area is a temporal effect: people's attributions and perceptions of their health status can change over time, particularly when their disease state is altered (Taylor, et al., 1984).

One promising approach which has incorporated the construct of perceived control is the work by Kobasa (1979, 1982) on the "hardy personality." Hardiness, according to Kobasa, is made up of the three Cs: commitment, control, and challenge, with control being defined as "the tendency to believe and act as if one can influence the course of events" (Kobasa, 1982, p. 7). The research done with this construct has demonstrated that people with a hardy personality (i.e., those high on the three Cs) are able to withstand the onslaughts of a myriad of stressors without becoming physically ill (Kobasa, 1982). Kobasa uses Rotter's I-E scale as one means of operationalizing PC. A similar, but health-specific, approach has been developed by Pollock (1986) who uses the MHLC scales as part of her measure of "health-related hardiness." Pollock (1986) found that control and commitment predicted both physiological and psychological adaptation in a sample of patients with diabetes mellitus. This integrative approach of Kobasa's (and Pollock's) is more sophisticated than earlier efforts which conceived of LOC by itself as a measure of "personality" (e.g., Lefcourt, 1976).

A number of investigations (e.g., Derogatis, Abeloff, & Melisaratos, 1979) have claimed to be able to predict cancer patients' survival status from measures of personality or emotional expressivity (see Fox, 1983, for a review). Smith (1984) was the first to utilize a measure of PC in this regard. While there was no simple relationship between MHLC beliefs and length of survival (Jamison, Burish & Wallston, 1986), Smith (1984) was successful in predicting time to death using an interaction of MHLC scores and coping style.

PC over Behavior

The distinction has been made elsewhere in this paper between perceptions of control over one's behavior (also referred to as self-efficacy) and over one's outcomes/reinforcements (i.e., LOC). From Strecher et al.'s (1986) recent review of the empirical literature linking self-efficacy beliefs to health behaviors it is safe to conclude that this PC belief (i.e., that one *can* do a particular health behavior) is a strong correlate of whether or not one actually does the behavior. Just because one is highly self-efficacious in regard to a particular behavior, however, does not automatically lead to the consequence of engaging in that behavior. One does not walk three miles every day simply because one perceives that one can do so; there are more elements to the behavioral prediction equation than perceived control of the behavior (see Wallston & Wallston, 1984). On the other hand, negative self-efficacy beliefs (e.g., "I cannot walk three miles every day") may be a sufficient causal explanation for the nonoccurrence of a particular health behavior (i.e., not walking three miles on a daily basis). In fact, it is not unreasonable to speculate that the seeming ability of self-efficacy beliefs (and other aspects of perceived control) to predict behavior may be mostly (if not entirely) due to the low end of the scale. To date, this hypothesis has not been tested.

To the extent that health behaviors do, indeed, determine health status, a consequence of lower perceived control over those behaviors will be poorer health status. For example, if a heavy smoker lacks any confidence in his/her ability to quit smoking, s/he will continue to smoke and will increase his/her likelihood of developing cancer or cardiovascular problems. On the other hand, there are plenty of smokers who believe they can "kick the habit any time they want to"—only they never want to. Thus, this perception of control over a habit may be essentially irrelevant to the prediction of behavior or health status changes unless one takes into account the motivations (values) of the individual. Other behavior-specific beliefs, such as whether or not the particular behavior will lead to the desired outcome, also play a major role here (e.g. Kristiansen, 1984). A smoker may want to be healthy but may be unconvinced that smoking is related to health status or that quitting will do any good. This person will not quit smoking regardless of his/her level of perceived control. (See Wallston & Wallston, 1984, for a further explication of what factors might indeed predict health behavior.)

PC over Process

Theoretically, and to some extent empirically (e.g., Langer & Rodin, 1976; Mills & Krantz, 1979; Schulz, 1976), the perception that one has control over what occurs in a given health care setting results in a better adjustment to the setting (e.g., less anxiety or other forms of distress; greater satisfaction and well-being; less reactance behavior such as noncompliance or other forms of "acting out" or expressing anger or frustration) than not perceiving control.

Despite the pessimistic outcomes of many of the well designed and executed field experiments in which the beneficial consequences of manipulated PC were not readily apparent (e.g., Padilla et al., 1981; Smith et al., 1986; Wallston, B.S., et al., in press; Wallston, K.A., et al., 1986), it is possible that there were undetected but significant health effects accruing to subjects given control over some aspect of their health care. Follow-up studies (Rodin & Langer, 1967; Schulz & Hanusa, 1978) of subjects in two of the pioneering studies in this area (Langer & Rodin, 1976; Schulz, 1976) have shown dramatic long-term health consequences following experimental attempts at manipulating control. Noteworthy is the dramatic shift in health consequences (from somewhat positive to highly negative) in the Schulz and Hanusa (1978) study when control was taken away from persons who had been given control in the original experiment. Rodin (1986) also emphasizes the detrimental health consequences of taking away control from persons who have had it. It is better for a person's health never to have had control than to perceive that one has lost it. Undoubtedly, it may be "easier" to influence a person's health status negatively than to have a positive influence upon it—there are fewer miracles than deaths—but it is unethical to put this supposition to empirical test.

PC over Behavior and Outcome

As an example of how locus of control and self-efficacy work together to determine health consequences, consider the study by Kaplan, Atkins, and Reinsch (1984). One

facet of their study involved using a number of individual difference measures to predict the amount of exercise tolerance and health status criteria in their chronic obstructive pulmonary disease (COPD) patients following a variety of treatments. When they split patients into "health internals" vs. "health externals" on the basis of HLC scores, only the internals' self-efficacy scores predicted the outcome variables. For internals, the more efficacious they felt (about walking, general exertion, and climbing in particular), the more they tolerated exercise, and the better their vital capacity and overall health status. For externals, there was no relationship between efficacy beliefs and outcomes.

The discovery by Kaplan et al. (1984) that PC over outcomes moderates the relationship between self-efficacy beliefs (i.e., PC over behavior) and outcomes is analogous to an earlier finding by Chambliss and Murray (1979). Instead of measuring efficacy, however, these latter researchers manipulated it by telling one group of smokers that the pill they had received to help them quit was, in reality, a placebo; thus, their success in the program should be attributed to their own competence. This self-efficacy manipulation was only effective among smokers with an *internal* LOC orientation (as assessed by Rotter's I-E scale.) These two studies lend weight to the hypothesis that PC over outcomes moderates the effect of PC over behavior.

Conclusion

The most important point we wanted to get across in this section is that we strongly adhere to the position that few of the consequences which we have mentioned are singly or uniquely determined; almost all are multiply determined. Perceived control, alone, does not lead to these consequences. If PC is a determinant of any outcome, it is because PC works in conjunction or interaction with other constructs or elements to produce an effect. The Wallstons have always argued that internal health locus of control (IHLC) beliefs by themselves will not be strongly predictive of the frequency with which healthy behaviors are carried out (Wallston, Maides, & Wallston, 1976; Wallston & Wallston, 1981, 1982). Instead, one also must take into consideration such things as the person's health value and other behavioral and outcome expectancies. Such reasoning is consistent with social learning theory (Rotter, 1954) which also states that the individual's "psychological situation" plays a major role in determining which expectancies and values will be operative at any one moment. In short, perceived control may be a central psychological construct, but it does not act in isolation from other important constructs.

NOTE

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REFERENCES

Averill, J.R. (1973). Personal control over aversive stimuli and its relationship to stress. *Psychological Bulletin, 80,* 286-303.

Bandura, A. (1977a). *Social learning theory*. Englewood Cliffs, NJ: Prentice Hall.

Bandura, A. (1977b). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*, 191-215.

Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist, 37*, 122-147.

Blittner, M., Goldberg, J., & Merbaum, M. (1978). Cognitive self-control factors in the reduction of smoking behavior. *Behavior Therapy, 9*, 553-561.

Brickman, P., Rabinowitz, V.C., Karuza, Jr., J., Coates, D., Cohn, E., & Kidder, K. (1982). Models of helping and coping. *American Psychologist, 37*, 368-384.

Burbach, D.J., & Peterson, L. (1986). Children's concepts of physical illness: A review and critique of the cognitive and developmental literature. *Health Psychology, 5*, 307-325.

Chambliss, C.A., & Murray, E.J. (1979). Cognitive procedures for smoking reduction: Symptom attribution versus efficacy attribution. *Cognitive Therapy Research, 3*, 91-95.

Chein, I. (1972). *Science of behavior and the image of man*. New York: Basic Books.

Cohen, S. (1980). After-effects of stress on human performance and social behavior: A review of research and theory. *Psychological Bulletin, 88*, 82-108.

Collins, B.E. (1974). Four components of the Rotter internal-external scale: Beliefs in a difficult world, a just world, a predictable world, and a politically responsive world. *Journal of Personality and Social Psychology, 29*, 381-391.

Croog, S.H., & Richards, N.P. (1977). Health beliefs and smoking patterns in heart patients and their wives: A longitudinal study. *American Journal of Public Health, 67*, 921-930.

DeVellis, R.F., DeVellis, B.M., Wallston, B.S., & Wallston, K.A. (1980). Epilepsy and learned helplessness. *Basic and Applied Social Psychology, 1*, 241-253.

Derogatis, L.R., Abeloff, M.D., & Melisaratos, N. (1979) Psychological coping mechanisms and survival time in metastatic breast cancer. *Journal of the American Medical Association, 242*, 1504-1508.

DuCette, J., & Keane, A. (1984). "Why me?": An attributional analysis of a major illness. *Research in Nursing and Health, 7*, 257-264.

Dobbins, C.J. (1986). Attributions and chronic disease: A formulation of the issues. Unpublished major area paper, Vanderbilt University, Nashville, TN.

Dobbins, C.J., Brown, G.K., & Wallston, B.S. (1986). Stress process of work interference in rheumatoid arthritis: Effects on global health and depression. Unpublished manuscript, Vanderbilt University, Nashville, TN.

Dohrenwend, B.S., & Martin, J.L. (1979). Personal versus situational determination of anticipation and control of the occurence of stressful life events. *American Journal of Community Psychology, 7*, 453-468.

Elder, R.G. (1973). Social class and lay explanations of the etiology of arthritis. *Journal of Health and Social Behavior*, 28-38.

Folkman, S. (1984). Personal control and stress and coping processes: A theoretical analysis. *Journal of Personality and Social Psychology, 46*, 839-852.

Fox, B.H. (1983). Current theory of psychogenic effects on cancer incidence and prognosis. *Journal of Psychosocial Oncology, 1*, 17-31.

Garber, J. & Hollon, S.D. (1980). Universal vs. personal helplessness in depression: Belief in uncontrollability or incompetence? *Journal of Abnormal Psychology, 89*, 56-66.

Glass, D.C., Reim, B., & Singer, J.E. (1971). Behavioral consequences of adaptation to controllable and uncontrollable noise. *Journal of Experimental Social Psychology, 7*, 244-257.

Hansen, R.E., & O'Leary, V.E. (1985). Sex-determined attributions. In V.E. O'Leary, R.K. Unger, & B.S. Wallston (Eds.) *Women, gender and social psychology*. Hillsdale, N.J.: Erlbaum.

Harris, B., & Harvey, J.H. (1975). Self-attributed choice as a function of the consequences of a decision. *Journal of Personality and Social Psychology, 31*, 1013-1019.

Harvey, J.H., & Harris, B. (1975). Determinants of perceived choice and the relationship between perceived choice and expectancy about feelings of internal control. *Journal of Personality and Social Psychology, 31*, 101-106.

Harvey, J.H., & Weary, G. (1984). Current issues in attribution theory and research. *Annual Review of Psychology, 35*, 427-459.

Jamison, R.N., Burish, T.G., & Wallston, K.S. (1986). Psychogenic factors in predicting survival of breast cancer patients. Unpublished manuscript. Vanderbilt University, Nashville, TN.

Jenkins, H.M., & Ward, W.C. (1965). Judgment of contingency between responses and outcomes. *Psychological Monographs, 79*, (1, Whole No. 594).

Johnson, J.E. (1975). Stress reduction through sensation information. In I. Sarason & C. Spielberger (Eds.), *Stress and anxiety*, Volume 2. New York: Wiley.

Jones, E.E., & Nisbett, R.E. (1972). The actor and the observer: Divergent perceptions of the causes of behavior. In E.E. Jones et al. (Eds.), *Attribution: Perceiving the causes of behavior*. Morristown, N.J.: General Learning Press.

Kanfer, F.H. (1970). Self-regulation: Research, issues, and speculations. In C. Neuringer & J.L. Michaels (Eds.), *Behavior Modifications in Clinical Psychology* New York: Appleton-Century-Crofts.

Kaplan, R.M., Atkins, C.J., & Reinsch, S. (1984). Specific efficacy expectations mediate exercise compliance in patients with COPD. *Health Psychology, 3*, 223-242.

Kelley, H.H., & Michela, J.L. (1980). Attribution theory and research. *Annual Review of Psychology, 31*, 457-501.

Kelly, G. (1955). *Psychology of personal constructs*. New York: Norton.

King, J.B. (1984). Illness attributions and the health belief model. *Health Education Quarterly, 10*, 287-312.

Kobasa, S.C. (1979). Stressful life events, personality, and health: An inquiry into hardiness. *Journal of Personality and Social Psychology, 37*, 1-11.

Kobasa, S.C. (1982). The hardy personality: Toward a social psychology of stress and health. In G.S. Sanders & J. Suls (Eds.), *Social psychology of health and illness*. Hillsdale, NJ: Erlbaum.

Kristiansen, C.M. (1984). Preventive health behavior: A social-psychological analysis. Unpub. Ph.D. diss. University of Exeter, England.

Kruglanski, A.W., & Cohen, M. (1974). Attributing freedom in the decision context. Effects of the choice alternatives, degree of commitment, and predecision uncertainty. *Journal of Personality and Social Psychology, 30*, 178-187.

Langer, E.J. (1983). *Psychology of control*. Beverly Hills, CA: Sage.

Langer, E., & Rodin, J. (1976). Effects of choice and enhanced personal responsibility for the aged: A field experiment in an institutional setting. *Journal of Personality and Social Psychology, 34*, 191-198.

Lau, R.R. (1984). Dynamics of the attribution process. *Journal of Personality and Social Psychology, 46*, 1017-1928.

Lau, R.R. (in press). Beliefs about control and health behavior. In D. Gochman (Ed.) *Health behavior: Emerging research perspectives*. New York: Plenum.

Lau, R.R., & Ware, J.E., Jr. (1979). Refinements in the measurement of health-specific locus-of-control beliefs. *Medical Care, 19*, 1147-1158.

Lefcourt, H.M. (1982). *Locus of control: Current trends in theory and research*, second edition. Hillsdale, NJ: Erlbaum.

Levenson, H. (1974). Activism and powerful others: Distinctions within the concept of internal-external control. *Journal of Personality Assessment, 38*, 377-383.

Leventhal, H. (1970). Findings and theory in the study of fear communications. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology* (vol. 5). New York: Academic Press.

Miller, D.T., & Ross, M. (1975). Self-serving biases in the attribution of causality: Fact or fiction? *Psychological Bulletin, 82*, 213-225.

Miller, S.M. (1979). Controllability and human stress: Method, evidence, and theory. *Behavior Research and Therapy, 17*, 287-304.

Mills, T., & Krantz, D.S. (1979). Information, choice, and reactions to stress: A field experiment in a blood bank with laboratory analogue. *Journal of Personality and Social Psychology, 37*, 608-620.

Mirels, H.L. (1970). Dimensions of internal vs. external control. *Journal of Consulting and Clinical Psychology, 34*, 226-228.

Mumma, C., & McCorkle, R. (1982-83). Causal attribution and life-threatening disease. *International Journal of Psychiatry in Medicine, 12*, 311-319.

Nagy, V.T., & Wolfe, G.R. (1983). Chronic illness and health locus of control beliefs. *Journal of Social and Clinical Psychology, 1*, 58-65.

Nelson, D.W., & Cohen, L.H. (1983). Locus of control and control perceptions and the relationship between life stress and psychological disorder. *American Journal of Community Psychology, 11*, 705-722.

Nicki, R.M., Remington, R.E., & MacDonald, G.A. (1985). Self-efficacy, nicotine-fading/self-efficacy monitoring and cigarette smoking behavior. *Behavior Research and Therapy, 22*, 477-485.

Padilla, G.V., Grant, M.M., Rains, B.L., Hansen, B.C., Bergstrom, N., Wong, H.L., Hanson, R., & Kubo, W. (1981). Distress reduction and the effects of preparatory teaching films and patient control. *Research in Nursing and Health, 4*, 375-387.

Peters, B. (1978). School-aged children's beliefs about causality of illness: A review of the literature. *Maternal Child-Nursing Journal, 7*, 143-154.

Peterson, C. (1980). A sense of control over one's life: A review of recent literature. Paper presented at the Social Science Research Council's Meeting on "The Self and Personal Control over the Life Span," October 3-6, 1980, New York City.

Peterson, C., & Seligman, M.E.P. (1984). Causal explanations as a risk factor for depression: Theory and evidence. *Psychological Review, 91*, 347-374.

Peterson, C., Semmel, A., von Baeyer, C., Abramson, L.Y., Metalsky, G.I., & Seligman, M.E.P. (1982). The attributional style questionnaire. *Cognitive Therapy and Research, 6*, 287-300.

Pill, R., & Stott, N.C. (1982). Concepts of illness causation and responsibility: Some preliminary data from a sample of working class mothers. *Social Science and Medicine, 16*, 43-52.

Pill, R., & Stott, N.C.H. (1985). Choice or chance: Further evidence on ideas of illness and responsibility for health. *Social Science and Medicine, 20*, 981-991.

Pollock, S.E. (1986). Human responses to chronic illness: Physiologic and psychosocial adaptation. *Nursing Research, 35*, 90-95.

Rehm, L.P. (1977). A self-control model of depression. *Behavior Therapy, 8*, 787-804.

Rhodewalt, F. (1984). Self-involvement, self-attribution, and the type A coronary-prone behavior pattern. *Journal of Personality and Social Psychology, 47*, 662-670.

Rhodewalt, F., & Davison, J. Jr. (1983). Reactance and the coronary-prone behavior pattern: The role of self-attribution in responses to reduced behavioral freedom. *Journal of Personality and Psychology, 44*, 220-228.

Rodin, J. (1986). Aging and health: Effects of the sense of control. *Science, 233*, 1271-1276.

Rodin, J., & Langer, E. (1977). Long-term effects of a control-relevant intervention with the institutionalized aged. *Journal of Personality and Social Psychology, 35*, 897-902.

Roskam, S. (1985). Health locus of control beliefs in chronic illness. Unpublished major area paper. Vanderbilt University, Nashville, TN.

Roskam, S. (1986). Application of a health locus of control typology approach towards predicting depression and medical adherence in rheumatoid arthritis. Unpub. Ph.D. diss. Vanderbilt University, Nashville, TN.

Rothbaum, F., Weisz, J.R., & Snyder, S.S. (1982). Changing the world and changing the self. A two-process model of perceived control. *Journal of Personality and Social Psychology, 42*, 5-37.

Rotter, J.B. (1954). *Social learning and clinical psychology*. Englewood Cliffs: NJ: Prentice Hall.

Rotter, J.B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs, 80*, (1 Whole No. 609).

Rotter, J.B. (1975). Some problems and misconceptions related to the construct of internal vs. external control of reinforcement. *Journal of Consulting and Clinical Psychology, 43*, 56-67.

Sandler, I.N., & Lakey, B. (1982). Locus of control as a stress moderator: The role of control perceptions and social support. *American Journal of Community Psychology, 10*, 65-80.

Schoeneman, T.J., vanUchelen,. C., Stonebrink, S., & Cheek, P.R. (1986). Expectancy, outcome, and event type: Effects of retrospective reports of attributional activity. *Personality and Social Psychology Bulletin, 12*, 353-362.

Schulman, B.A. (1979). Active patient orientation and outcomes in hypertensive treatment. *Medical Care, 17*, 267-280.

Schulz, R. (1976). Effects of control and predictability on the physical and psychological well-being of the institutionalized aged. *Journal of Personality and Social Psychology, 33*, 563-573.

Schulz, R., & Hanusa, B.H. (1978). Long-term effects of control and predictability-enhancing interventions: Findings and ethical issues. *Journal of Personality and Social Psychology, 36*, 1194-1201.

Skowronski, J.J., & Carlston, D.E. (1982). Effects of previously experienced outcomes on the desire for choice. *Journal of Personality and Social Psychology, 43*, 689-701.

Smedslund, J. (1963). The concept of correlation in adults. *Scandanavian Journal of Psychology, 4*, 165-173.

Smith, M. (1984). Predicting cancer patient survival length. Unpub. masters thesis. Vanderbilt University, Nashville, TN.

Smith, R.A., Wallston, B.S., Wallston, K.A., Forsberg, P.R., & King, J.E. (1984). Measuring desire for control of health care processes. *Journal of Personality and Social Psychology, 47*, 415-426.

Smith, R.A., Wallston, B.S., King, J.E., Wallston, K.A., & Zylstra, M. et al. (1986). Individual differences in control attitudes and responses to control over aspects of daily living by surgical patients. Unpub. manuscript. Vanderbilt University, Nashville, TN

Steiner, I.D. (1979). Three kinds of reported choice. In L.C. Perlmuter & R.A. Monty (Eds.) *Choice and perceived control*. Hillsdale, NJ: Erlbaum.

Strecher, V.J., DeVellis, B.M., Becker, M.H., & Rosenstock, I.M. (1986). The role of self-efficacy in achieving health behavior change. *Health Education Quarterly, 13*, 73-91.

Strickland, B.R. (1978). Internal-external expectancies and health-related behaviors. *Journal of Consulting and Clinical Psychology, 46*, 1192-1211.

Strube, M.J. (1985). Attributional style and the type A coronary-prone behavior pattern. *Journal of Personality and Social Psychology, 49*, 500-509.

Taylor, S.E., Lichtman, R.R., & Wood, J.V. (1984). Attributions, beliefs about control, and adjustment to breast cancer. *Journal of Personality and Social Psychology, 46*, 489-502.

Tennen, H., & Sharp, J.P. (1983). Control orientation and the illusion of control. *Journal of Personality Assessment, 47*, 369-374.

Thompson, S.C. (1981). Will it hurt less if I can control it? A complex answer to a simple question. *Psychological Bulletin, 90*, 89-101.

Timko, C., & Janoff-Bulman, R. (1985). Attributions, vulnerability, and psychological adjustment: The case of breast cancer. *Health Psychology, 4*, 521-544.

Wallston, B.S., Smith, R.A., Wallston, K.A., King, J.E., Rye, P.D., & Heim, C.R. (In press). Choice and predictability in the preparation for barium enemas: A person-by-situation approach. *Research in Nursing and Health*.

Wallston, B.S., & Wallston, K.A. (1978). Locus of control and health: A review of the literature. *Health Education Monographs, 6*, 107-117.

Wallston, B.S., & Wallston, K.A. (1981). Health locus of control. In H. Lefcourt (Ed.), *Research with the locus of control construct*. (vol. 1) New York: Academic Press.

Wallston, B.S., & Wallston, K.A. (1984). Social psychological models of health behavior: An examination and interaction. In A. Baum, S. Taylor, & J.E. Singer (Eds.), *Handbook of Psychology and Health, Volume IV: Social Aspects of Health*. Hillsdale, NJ: Erlbaum.

Wallston, B.S., Wallston, K.A., Kaplan, G.D., & Maides, S.A. (1976). Development and validation of the health locus of control (HLC) scales. *Journal of Consulting and Clinical Psychology, 44*, 580-585.

Wallston, K.A., Maides, S., & Wallston, B.S. (1976). Health-related information-seeking as a function of health-related locus of control and health value. *Journal of Research and Personality, 10*, 215-222.

Wallston, K.A., & O'Connor, E. (1987). The initial development and validation of the Smoking Cessation Locus of Control scale. Unpub. manuscript. Vanderbilt University, Nashville, TN.

Wallston, K.A., Smith, R.A., King, J.E., Forsberg, P.R., Wallston, B.S., & Nagy, V.T. (1983). Expectancies about control over health: Relationship to desire for control of health care. *Personality and Social Psychology Bulletin, 9*, 377-385.

Wallston, K.A., & Wallston, B.S. (1982). Who is responsible for your health? The construct of health locus of control. In G. Sanders & J.M. Suls (Eds.), *Social psychology of health and illness*. Hillsdale, NJ: Erlbaum.

Wallston, K.A., Wallston, B.S., & DeVellis, R. (1978). Development of the multidimensional health locus of control (MHLC) scales. *Health Education Monographs, 6*, 160-170.

Wallston, K.A., Smith, R.A., Burish, T.G., Wallston, B.S., Rye, P.D., King, J.E., Smith, S., & O'Connell, S. (1986). Interaction of desire for control and choice of antiemetic treatment for cancer chemotherapy. Unpub. manuscript. Vanderbilt University, Nashville, TN.

Weidner, G. (1980). Self-handicapping following learned helplessness treatment and the type A coronary-prone behavior pattern. *Journal of Psychosomatic Research, 24*, 319-325.

Weiner, B. (1974). *Achievement motivation and attribution theory*. Morristown, NJ: General Learning Press.

Weisz, J.R., & Stipek, D.J. (1982). Competence, contingency, and the development of perceived control. *Human Development, 25*, 250-281.

Wortman, C.B., & Dintzer, L. (1978). Is an attributional analysis of the learned helplessness phenomenon viable?: A critique of the Abramson-Seligman-Teasdale reformulation. *Journal of Abnormal Psychology, 87*, 75-80.

Wortman, C., & Dunkel-Schetter, C. (1979). Interpersonal relationships and cancer: A theoretical analysis. *Journal of Social Issues, 35*, 120-155.