CHAPTER 5

Assessment of control in health-care settings

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INTRODUCTION

The focus of this chapter is on the various ways in which control can be assessed in health-care settings. In illustrating these methods, I draw heavily on the work my colleagues, students, and I have done over the past 15 years as we wrestled with how best to assess this construct in our own research. This will be a 'how to do it' (or 'how not to do it') chapter, focusing more on methodological considerations than on a review of substantive findings.

Because the other chapters of this book deal explicitly with why it is important to assess control in the context of the relationship between stress and health, it is not necessary to go into great detail here about the role that control plays in contributing to, moderating, or mediating that relationship. For the reader of *only* this chapter, however, I offer a number of possible theoretical linkages: (a) a lack of control can act as a stressor and have a direct, negative effect upon one's health status; (b) providing a sense of control to a person experiencing a stressor may buffer the deleterious effects of the stressor; or (c) a sense of control might increase the likelihood that the individual would engage in one or more health behaviors, thus having a direct, positive effect on his or her health status.

Control is a multifaceted construct. It is especially important, for assessment purposes, to be clear about which aspect of control one wishes to measure and why one wishes to do so. Most often, in health-related research, 'control' means 'perceived control' as opposed to veridical or 'actual control'. 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' (Wallston *et al.*, 1987). Defining perceived control as a belief indicates that it is an individual difference construct; something which, when assessed, varies among individuals and within the same individual over time. In contrast, veridical or actual control is conceived of as a property of the situation and setting. Although it, too, may vary over time, in assessing veridical control one looks for low inter-observer variability in judging how much control is present at a given point in time.

Because we have done no research assessing veridical control, the majority of this chapter will concentrate on measures of perceived control. The targets of these measures varied from perceived control over one's health status (typically assessed by a measure of health 'locus of control'), over one's health behavior (using measures of 'self-efficacy' beliefs), or over one's health-care situation (using a combination of measures described below). In addition to perceived control, this chapter will describe our assessment of a related but different individual difference construct, 'desire for control' over one's health-care situation. 'Desire for control of health care is a preference for behaviors that (a) allow direct influence on the process of health care, (b) provide relevant information about the health care situation, or (c) do both' (Smith *et al.*, 1984, p. 416).

A theme running throughout the entire chapter is the issue of the optimum level of specificity at which to measure control. Is it better to design or tailor instruments to fit each researcher's unique situation or should one sacrifice 'goodness-of-fit' and utilize a more general scale—one whose psychometric properties are well-established and the use of which would more easily allow cross-study or cross-situational comparisons?

PERCEIVED CONTROL OVER THE HEALTH-CARE SETTING

A few years ago, under the auspices of a grant from the National Center for Health Services Research, my colleagues and I carried out a series of three field experiments in which we attempted to manipulate patients' perceived control over their health-care situation. We based this work on the findings of social psychologists who had demonstrated the positive health benefits of small-scale control-enhancing interventions such as: (a) letting blood donors choose from which arm the blood should be drawn (Mills and Krantz, 1979); (b) giving nursing-home residents a plant to take care of and letting them choose which night to attend a movie (Rodin and Langer, 1977); or (c) allowing nursing-home residents to select the frequency and timing of a visit from a college student volunteer (Schulz, 1976). Our research was designed to manipulate perceived control by giving certain patients predictability information about and choice over selected aspects of their health-care regimen.

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Although not all of the studies upon which we based our work reported assessing perceived control, we felt it was essential to do so. One reason was as a manipulation check. An assessment of perceived control following the manipulation would inform us if our manipulation had been successful. Secondly, by assessing perceived control part way through our study, we would be able to correlate this measure of the hypothesized 'intervening variable' with the various assessments of physical and psychological well-being which constituted the dependent variables. The following are three case studies of how the best of intentions do not always pan out like they are supposed to.

Study one

In our first experiment in this series (Wallston, B. S. *et al.*, 1987), the stressor was having to prepare for a barium enema on an out-patient basis. Having a barium enema is, in and of itself, a highly stressful experience for any patient. The unpleasantness of the situation, however, is compounded by having to follow a strict bowel-cleansing regimen at home or at work for 24–48 hours prior to the radiological examination. (The standard regimen at that time involved a combination of a liquid diet, ingesting an evil-tasting, caster-oil-like preparation, and taking laxatives in order to ensure that one's bowels and intestines would be empty before being given the barium enema.) Our proposed means of 'improving' the situation was to develop two other alternative regimens, each of which had equal efficacy. One-third of our patient–subjects were allowed to choose from among the three regimes after we carefully described what each experience would involve. We hypothesized that patients randomly assigned to this 'choice' condition would perceive the greatest amount of control and, subsequently, would have the most favorable outcomes (e.g. be less distressed and most likely to follow the regimen).

To complete the design of this randomized clinical trial, another third of the patients were given one of the regimens along with the complete description of what it would involve—including the sensations they would experience. These patients constituted the 'predictability' condition. We were not sure how much perceived control to hypothesize for these subjects, since Schulz (1976) had found that his 'predictability alone' subjects fared as well as those given choice. The remaining patients were given neither choice nor enhanced sensory information about the regimen assigned them. We hypothesized that these latter subjects would have the least perceived control.

In this study we assessed perceived control in two ways. Because we were already using a 'multiple affect adjective checklist' (MAACL) to assess anxiety, depression and hostility, we modified that MAACL by adding three items: helpless, in control, and powerless. Then we constructed a Helpless score (or an assessment of feeling 'out of control') by giving one point each time the subject

checked 'helpless' or 'powerless' or did not check 'in control'. The second method was an 11-item Likert scale which we termed PCON (for 'perceived control'). The instructions and items for PCON, which had an alpha reliability of 0.81, can be found in Table 1.

Unfortunately, we did not find condition main effects for PCON or Helpless (measured 30 minutes or so before the barium enema was to take place), even though other manipulation checks indicated that patients in the 'choice' condition did, indeed, perceive that they were given a choice over their mode of preparation. Elsewhere I have referred to our manipulation of control in this study as 'choose your poison'. Perhaps patients in this condition looked at our options as a sham choice, and reacted against having to select from among three unappealing alternatives.

One alternative explanation for these null results is that the measures of the constructs are invalid. In this study we had some evidence that this might be the case, but we also had some results which were less pessimistic. On the side of invalidity was the finding of no relationship ($r = -0.10$) between PCON and Helpless, our two purported measures of perceived control. This lack of concurrent validity could mean that either one or both of the indicators was not tapping the construct. On the other hand, both measures correlated significantly ($r = 0.20$, $p < 0.05$) with anxiety as assessed by the MAACL, thus providing some indication of the construct validity of both. Also, in a separate study, we found that the mean PCON score of our out-patient subjects was significantly ($p <$

TABLE 1. The perceived control (PCON) scale as utilized in the barium enema study (Wallston, B. S. *et al.*, 1987)

Instructions: Mark the degree to which you agree or disagree (using a six-point LIKERT scale) with the following statements:

The other day in clinic, when I was being told about preparation for today's barium enema I felt ...

1. That I was unable to influence the type of preparation I received.
2. That I was in control of the situation.
3. That I was just told what to do.
4. That I could get all of my questions answered.
5. That I was allowed to play an active role in my health care.
6. That what I did or said made no difference.

During the past few days, while I was getting ready for today's barium enema examination, I felt ...

7. Very much 'on top' of the situation.
8. Totally out of control.
9. At a loss to know what I would be experiencing.
10. If I wanted to, I could change the way I got ready for the barium enema.
11. I knew what the preparation would do to me.

0.04) higher than PCON for a sample of hospitalized in-patients awaiting a barium enema. This, too, provided some indication of construct validity.

Our strongest correlational findings ($r = 0.81$, $p < 0.01$) was between PCON and a six-item Likert scale measure of patients' satisfaction with how they had been treated (e.g. 'I was very satisfied with the manner in which I was told to get ready for my barium enema.'). Although this correlation was in the hypothesized direction, we felt it was *too* high. When two measures of theoretically distinct constructs correlate $\gg 0.70$, it is probably due to shared method variance and/or a lack of discriminant validity. In this instance we knew there was too much shared method variance (the satisfaction measure was filled out immediately after PCON and used a similar six-point Likert response scale). We suspected that we should not make too much of the finding that the more control patients perceived they had, the more satisfied they were.

Study two

In this study the stressor was receiving chemotherapy for cancer and its attendant side effects, especially nausea and vomiting. We used a two-group experimental design. Half of the patients were randomly assigned to the 'choice' condition where they were given information about three distinctly different antiemetic treatments, each purportedly equivalent in reducing the noxious side effects of the chemotherapy treatments. The other group of cancer patients were assigned an antiemetic treatment, rather than being given a choice, but were provided the same sensory and procedure information as those in the 'choice' condition. (For ethical reasons, we did not feel comfortable in utilizing a no-information 'control' group in this study.) The patients, all of whom were just beginning chemotherapy or resuming chemotherapy after at least a year's time, were studied for four consecutive sessions.

Perceived control was assessed in a similar fashion as in study one, except that PCON was shortened to five items. In this study, PCON assessed the degree of agreement/disagreement with statements such as 'Since I began this treatment for nausea and vomiting, I felt very much "on top" of the situation.' This Likert scale, which had a low alpha reliability (0.49), was administered at the beginning of the second and fourth sessions. The test–retest stability of PCON across these two sessions ($r = 0.15$) was also low. The MAACL, containing the Helpless subscale, was given at the beginning of the third and fourth sessions. The test–retest stability of the Helpless index was 0.77. Once again, the two ways of measuring perceived control were not highly correlated with one another ($r = 0.00$ to -0.36).

As in study one, there were no differences between experimental groups on PCON at either session 2 or 4. On the Helpless index, however, there were condition main effects at both session 3 ($p = 0.06$) and session 4 ($p < 0.04$). In

both instances, the patients in the choice condition checked fewer helpless adjectives than those in the no-choice condition.

Study three

In the final study in this series the health care stressor was the postoperative period in the hospital following major surgery. Patients were studied for five days post-surgery (or after being released from the surgical intensive care unit). Typically, patients feel dreadful for a day or two post-surgery, then they begin to recover. By five to seven days post-surgery, if complications have not occurred, they are usually well enough to be discharged. In the immediate postoperative period, when one is not feeling well, being 'in control' is probably not highly salient for most patients. However, as they begin to recover, many patients become distressed at being in a situation characterized by some (e.g. Taylor, 1979) as lacking in opportunities for patients to have any control. We reasoned that this would especially be the case for those aspects of the patients' lives that they would normally control if they were at home instead of being in the hospital (such as if and when to take a bath or to receive visitors).

In the hypothesized high perceived control condition, one of our research nurses visited the patient–subject on four consecutive postoperative days to offer a 'menu' of choices in a number of areas: sleeping aids; bathing; diet; visitors; telephone calls. The patient was free to make as many, or as few, choices off the 'menu' as desired, and could change the selections on a daily basis. In contrast, those randomly assigned to the 'predictability-only' condition were not given choices but were, instead, given enhanced predictability information (e.g. they would/would not receive a back rub that evening, or a half bath in the morning). Finally, those assigned to the 'standard operating procedure' condition received only the routine nursing care available to all patients on those post-surgical units.

A modification of the PCON scale was administered on the afternoon of the third and fifth postoperative days. This seven-item, seven-point Likert scale asked the patient to agree or disagree with such statements as 'Since my operation, I was given as much control over my activities in the hospital as I have at home', and 'I was unable to have a say in what my daily routine was during this hospital stay'. The alpha reliabilities of this scale were 0.67 on day 3 and 0.64 on day 5, and the test–retest reliability over two days was 0.58. We did not use the MAACL in this study, so we did not have an alternative measure of perceived control.

Once again, as in the other two studies, we found no condition main effects for PCON on either of the two postoperative days. We did, however, have one intriguing finding involving our final assessment of perceived control. We had kept track of the number of choices off the menu selected by patients in the choice condition over the four days during which they were offered choices. When we correlated this 'number of environmental changes' with PCON measured on day 5, we found a significant 'negative' relationship ($r = -0.34$, $p = 0.02$). When

given an option, the more that patients said 'No thanks' to a change in routine, the more control they reported they had!

Discussion

In all three of our field experiments in which we attempted to increase patients' sense of perceived control over their health-care setting, our assessments of perceived control generally told us that we had failed to accomplish our objective. Assuming that our PCON scales were valid, what do these null results tell us? It might mean we were poor experimenters, unable to manipulate perceived control by the particular methods we selected to do so. While that is possible, it is not likely. In each of the three studies, we had some results on other outcome variables which were interpretable in light of a hypothesized interaction between patient's desire for control and the experimental conditions (see below).

We prefer to think that our Likert scale measure of perceived control, although probably valid, was insensitive to the subtle differences between groups in the settings in which we conducted these investigations. In other words, in order to have the situational control necessary to carry out these complex field experiments, we worked in settings (e.g. a university medical center) where all patients experienced a fair degree of control. This was even the case in study three, where the level of nursing care on the post-surgical units was excellent.

Another factor mitigating against significant condition differences in perceived control is the fact that all patient–subjects had given their informed consent to participate in our studies. The knowledge that, as volunteers, they could end their participation whenever they wished in and of itself could have contributed to their overall high perception of control over the health-care settings we studied. Finally, it is also possible that the subjects in the no-choice conditions experienced an 'illusion of control' (see Langer, 1975) and indicated experiencing more control than the situation offered them. This argument is bolstered by the fact that the mean PCON score for all subjects in all three studies was above the hypothetical midpoint, suggesting that, on the whole, patients felt in control no matter what we did to them. All of these factors taken together make it extremely difficult to assess significant condition differences in perceived control in this type of experimental study.

DESIRE FOR CONTROL OVER THE HEALTH-CARE SETTING

In each of the three experiments described above, we measured, at the outset, how much control each patient wanted in the particular health-care setting. Our theoretical prediction was that the outcome variables (e.g. psychological well-being, compliance) would be determined by an interaction between this individual difference variable, desire for control, and the experimental conditions (in

which we felt we would be differentially manipulating perceived control). When we first began these studies, we hypothesized that patients high in desire for control would respond very favorably to our choice conditions and negatively to being assigned to the standard operating procedure conditions. Conversely, we felt that those low in desire for control would do all right if left alone, but might even become somewhat stressed if 'forced' to make choices (i.e. exercise decisional control) or if presented with sensory and procedural information (i.e. heightened informational control). We soon learned how naive we were in making those predictions. We were correct in looking for an interaction, but the form of the interaction surprised us.

Based upon a series of pilot studies (described in detail in Smith *et al.*, 1984), we measured desire for control by combining two seven-item scales: the Information subscale (K–I) from the Health Opinion Survey (Krantz *et al.*, 1980), and a shortened version of our own DCON scale (Smith *et al.*, 1984). The K–I scale, consisting of items such as 'I usually wait for the doctor or nurse to tell me about the results of a medical exam rather than asking them immediately', assessed persons' preference for health-care-related information in a variety of health-care settings. The DCON scale, on the other hand, was designed to be tailored for specific health-care settings. For example, in the barium enema study, when patients filled out the DCON scale, they were instructed to respond with what they wanted 'as a patient in this particular clinic'. By combining K–I and DCON, the two measures which showed the greatest discriminant validity in our pilot studies (Smith *et al.*, 1984), we had a measure of desire for control which was somewhere between highly and moderately situation-specific.

In analyzing the data for study one, while attempting to test the hypothesized interaction between desire for control and the experimental conditions, we soon realized that we had many more 'significant' findings if we did a three-way rather than a two-way split on desire for control. This decision to trichotomize rather than dichotomize our individual difference variable proved fortunate; indeed, by doing so we established a pattern of findings which we replicated over the next two studies. If we had stuck by our initial decision to simply separate patients into high v. low desire for control (or if we had adopted a regression rather than an ANOVA approach to the analysis), we probably would have missed the most important findings. Briefly, what we found in all three of these studies was that the *only* patients who profited by our 'enhanced control' manipulation were those who were *moderate* in desire for control. Contrary to prediction, those high in desire for control who were given choices did poorly (e.g. became upset, were non-compliant), while those low in desire for control who were given choices did fine, but not as well as those moderate in desire for control (Wallston, B. S. *et al.*, 1987; Wallston, K. A. *et al.*, 1987).

In study three, one of my graduate students, Marc Zylstra, examined for his master's thesis whether patients' desire for control scores changed from the pre-

surgical assessment to five days post-surgery. The mean scores on K–I and DCON remained constant over time regardless of experimental condition. This null finding suggests that desire for control over health-care settings might be more stable than measures of perceived control over health-care settings.

Discussion

What did we learn from these findings? We learned that, for these particular settings, we could not give a sufficient amount of control to the high desire for control patients to meet their needs. For patients with a high desire (or need) for control, the kinds of choices we were able to give were not enough to satisfy them. We may, in fact, have raised their expectations by dangling choices in front of them, and then dashed their hopes when the choices did not lead to the control they desired. Perhaps certain patients can only feel in control by seizing it. Control which is 'given'to them does not meet their needs.

We also learned that health-care providers will not do any harm by offering enhanced choices and/or information to patients who do not want control. Across all three studies, our low desire for control patients did fine no matter which condition they were in. Theoretically, there are two ways one could be low in desire for control. One could actively 'not want' control or one could be indifferent to it. Apparently our subjects were more of the latter type. Because 'being in control' was not a salient issue for them, they were able to 'go with the flow' and were not affected by whether or not they had choices or predictability information. In examining the demographic correlates of desire for control, two variables—age and educational level—consistently showed significant negative relationships with desire for control scores. When controlling for educational level, we still found significant age effects for both K–I and DCON. Persons aged 60 or older professed less of a desire to control their health-care setting than younger adults (Smith *et al.*, 1988). Given our finding that elderly patients are more apt to be lower in desire for control than younger patients, it is reassuring, but not surprising, that those low in desire for control were not adversely affected by our interventions.

Most importantly, we learned that providing opportunities for taking control had a positive benefit for at least some patients—those with moderate desire for control. Although their perceived control scores were no different than any other subjects, the moderate desire for control patients who were given choices did significantly better on many of the other dependent variables than other patients given choices or moderate desire for control patients in other conditions. Too often, when assessing control, we assume that linearity prevails; the more control perceived or desired, the better. As will be pointed out again below, this assumption of straightforward linearity may mask the true role that individual differences in control play in helping us explain variance in health outcomes.

PERCEIVED CONTROL OVER ONE'S HEALTH STATUS

By far, the most typical means of assessing control in health-care settings is the use of some measure of locus of control beliefs. 'Locus' means 'place', and the logic behind the use of locus of control measures is that a person perceives more control when the locus of that control is 'internal'—i.e. dependent upon the person's own behavior—than when the locus is 'external'—i.e. dependent upon the actions of other persons, or a matter of fate, luck or chance. This assumption that internality is more related to perceived control than externality is debatable in the context of certain health-care situations.

Rotter put forth the locus of control construct as one generalized expectancy within his version of social learning theory (Rotter, 1954, 1982). The target of control was 'valued reinforcements'. His widely adopted I–E Scale (Rotter, 1966) assesses the extent to which individuals typically believe that important outcomes occur as a function of what they do or who they are (an internal locus of control orientation). If individuals cannot endorse these internal beliefs, the 'forced-choice' nature of the I–E Scale leads them to endorse externally worded items, statements which reflect control being in the hands of powerful other people or random happenings. Because these beliefs are cross-situational and are learned over a lifetime of experiences, they are considered to be relatively stable. In fact, most researchers (see Lefcourt, 1976; Phares, 1976) typically accord generalized locus of control orientation the status of a personality variable, an enduring trait not easily amenable to change.

In social learning theory (Rotter, 1954), the principal function of expectancy measures is to aid in the prediction of behavior. The major formula in the theory states that the potential for a given behavior to occur in a given psychological situation is a function of the expectancy that the behavior will lead to a particular reinforcement and the value of that reinforcement to the individual in that situation. Generalized expectancies, such as locus of control, operate predominantly in novel situations in which the individual has not had enough experience to develop specific expectancies. According to Rotter (1979), 'Measurement in a specific area is enhanced by devising tests limited to that specific area, particularly if the specific area is one in which the individual has a great deal of experience' (p. 265). For many people, especially adults, health is one specific domain where experience is plentiful.

The Multidimensional Health Locus of Control Scale

While the I–E Scale and other, similar, generalized locus of control measures have been and continue to be used to assess perceived control in health-related research (see Strickland, 1978; Wallston and Wallston, 1978 for reviews of this work), many health researchers over the past 10–12 years have chosen to use

more situation-specific, health-related locus of control measures in their investigations. The most widely used instrument of this sort is the Multidimensional Health Locus of Control (MHLC) Scale developed by this author and his colleagues (Wallston *et al.*, 1978). The MHLC Scale consists of two alternative forms (A and B), each of which contain 18 items. Each form, in turn, contains three six-item Likert scales which, in 'normal, healthy' populations, are uncorrelated, or only slightly correlated, with one another (Wallston and Wallston, 1981). The Internal Health Locus of Control (IHLC) dimension assesses the degree to which one believes one's health status (a valued outcome or reinforcer) is influenced by one's own behavior. People who score high on the IHLC are said to have a sense of responsibility for their own health (Wallston and Wallston, 1982). PHLC measures the belief that powerful other people—one's family, friends or health-care providers—control one's health. Lastly, CHLC assesses perceived *non*-control of health, or the belief that one's health status is determined by fate, luck or chance.

Discussion

Both PHLC and CHLC are external dimensions; however, scoring high on the PHLC dimension does not necessarily indicate low perceived control. In many health-care situations, particularly if one is acutely or chronically ill, it is realistic to believe that other people's actions can influence one's health status. It may also be beneficial to hold these beliefs, particularly if the 'powerful other' people are expert practitioners who have only one's best interests at heart. Scoring high on the CHLC dimension usually does mean low perceived control (except if one truly believes one can control random events); however, moderately high CHLC beliefs may be advantageous in certain circumstances when, in fact, there is little one could actually do to change one's health status (e.g. Burish *et al.*, 1984). Finally, a high score on the internal health dimension (IHLC) does not necessarily signify that one thinks one is in control of one's health; agreement with IHLC items could indicate perceived responsibility for one's poor health status but not one's good health.

Some consumers of the MHLC Scale have mistakenly tried to compute a total health locus of control score by, for example, subtracting the two external dimensions (PHLC and CHLC) from IHLC, and treating the resultant score as a measure of perceived control. This is fallacious, owing to the ambiguous nature of PHLC, and is rarely, if ever, justified. On the other hand, particularly if one wishes to use the MHLC scores to predict an index of health behaviors in 'normal, healthy' individuals, it is all right to subtract CHLC from IHLC and to use the difference score in place of the two raw scores. This has the added advantage of eliminating response set bias, since people's tendency to agree or disagree with items regardless of their content will be cancelled out in the

difference score. In those analyses, PHLC scores can be treated separately, or even ignored (since they are less relevant to the prediction of health behavior in healthy samples).

Currently, the MHLC Scale still predominates in the literature as the preferred means of assessing control in health-related settings. Although this measure is well used, it is not always used well or wisely. Some suffer from what I call the 'silver bullet complex'—the belief that a single measure of a single construct will somehow magically help explain a significant amount of the variance in health behavior or health status. They mistakenly assume that 'locus' of control is the only aspect of control that there is to measure, and that an often-cited instrument (such as the I–E Scale of the MHLC Scale) is the best brand of silver bullet available.

Hardly any researcher who has used the MHLC Scale has examined the individual dimensions in a non-linear fashion—for example, investigating whether it was 'better' to be moderately high on the IHLC dimension (e.g. a score of 26–30) than very high (a score of 31–36). The discussion above, about the value of a three-way split on desire for control, would indicate that it is at least worth while to explore the possibility with internality that 'too much of a good thing is no good'. It might also be the case that failing to perceive (or denying) the true role that chance plays in determining many aspects of our health can be as detrimental as placing too high a belief in random occurrences.

Although examining the non-linearity of locus of control scores remains a fertile area left to be explored, examining the joint actions of two or three of the dimensions at once is being done with increasing frequency. Much of this work is based on a multidimensional typology in which median splits on the three dimensions are crossed in a $2 \times 2 \times 2$ fashion to create eight hypothetical types (see Wallston and Wallston, 1982). One of the more interesting types to emerge is the 'believers in control', those persons who score above the median on both IHLC and PHLC but below the median on CHLC. These are people for whom the issue of 'locus of control' is irrelevant, as long as health status is determined by something other than luck. Roskam (1986), for example, found that patients with rheumatoid arthritis who were classified as 'believers in control' on the basis of their MHLC scores were 'inoculated' against increases in depression when their arthritis flared up. In fact, this type of rheumatoid arthritis patient actually became less depressed over time, while other MHLC types became more depressed if their condition worsened.

A caution must be given to those considering using a typology approach such as the one described above. The MHLC scales are not meant to be assessments of relatively enduring beliefs. They are more state-like than trait-like measures of expectancies. People's health beliefs should change as a function of their direct or vicarious experience. Thus, typologies of individuals determined by MHLC scores should not be accorded the status of 'personality' types. The typologies are not necessarily stable. From our longitudinal investigation of patients with

rheumatoid arthritis, we have found that only about two-thirds will be classified in exactly the same manner based on MHLC scores obtained a year later.

As mentioned above, the easiest way to classify a person into one of the eight MHLC types is to do median splits on each dimension. However, Rock *et al.* (1987) have recently shown that cluster analysis can be used to assign persons to types. Their method of cluster analysis came up with six groupings of persons, exactly mapping six of the eight MHLC types posited by Wallston and Wallston (1982). We are currently working on other analytical approaches, such as creating interaction terms by multiplying two or more MHLC subscales together, which approximate the information obtained in the typologies. These interaction terms can then be used more efficiently in regression analyses than having to dummy code each of the separate MHLC types. Again, however, it must be remembered that all of these approaches suffer from linear rather than non-linear thinking. If the 'best' profile is to be moderately high on the IHLC, moderate on the PHLC and moderately low on the CHLC, none of these approaches will discover it.

Other measures

Within the last year, we have developed and tested a new form of the MHLC Scale—tentatively labeled Form C—which is designed to be used with persons who already have an existing medical condition (such as cancer, diabetes, AIDS, arthritis, pneumonia, headache). Form C was developed for two reasons: (1) many investigators who attempted to use the MHLC Scale with persons with a chronic disease discovered that some patients had difficulty in knowing how to respond to items which referred to their 'health' when, in reality, what was most salient to them was their disease; and (2) there began to appear in the literature a proliferation of new measures, modelled after the MHLC, assessing such constructs as 'cancer locus of control', 'diabetes locus of control' and 'pain locus of control'. Each of these new scales used a different set of items; thus, results on those scales were not comparable across studies. Furthermore, scale development is not an easy process and it was terribly inefficient for each investigator to have to construct a new measure to suit his or her unique purpose.

Form C is a generic instrument, useful for assessing locus of control beliefs about any health condition. In its current form, it consists of 24 items, 8 for each of the 3 dimensions: internality, powerful others and chance. (It is our intention, after sufficient preliminary work has been done, to shorten Form C to 18 items to make it comparable to forms A and B.) Each of the 24 items contain the word 'condition'. All a researcher has to do to use Form C is to substitute a specific entity (e.g. 'diabetes') for 'condition' in each item. We have tested Form C in our longitudinal investigation of patients with rheumatoid arthritis (by changing 'condition' to 'arthritis') and the preliminary results look very promising. The

alpha reliabilities of the subscales and the intercorrelations of the Form C subscales with their counterparts on Form B are presented in Table 2.

A different approach toward assessing perceived control over one's chronic condition was developed by Clare Bradley and her colleagues in the UK (Bradley *et al.*, 1984a). They based their assessment of perceived control of diabetes on the attribution style questionnaire (ASQ) developed by Seligman and his associates (Peterson *et al.*, 1982), but embellished it with the health locus of control dimensions from our work and some wrinkles of their own. Their measure presents the diabetic patient with six hypothetical diabetes-related events, three 'positive' and three 'negative', and asks the patient to indicate what the most likely cause of each event might be. Patients are then asked to rate each of the likely causes on a series of seven dimensions: internality; treatment; powerful others and chance externality; personal control; medical control; and foreseeability. These scales have been found to be useful in understanding patients' choice of treatment regimen, individual differences in the efficacy of treatment and the occurrence of the life-threatening complication of diabetic ketoacidosis (Bradley *et al.*, 1984b; Bradley *et al.*, 1986)

We have adapted the Bradley *et al.* (1984a) attributional approach for use in our study of rheumatoid arthritis patients, dropping the medical control and forseeability dimensions and adding stability and globality. These dimensions, which are included on the ASQ but were not included by Bradley *et al.* (1984a), tap the longevity of the cause and the generalizability of the cause to many aspects of one's life. In our work with these dimensions, we only assessed attributions of causes of negative events, such as arthritic symptoms. The alpha reliabilities of our seven dimensions (across three items) ranged from 0.60 to 0.73. The internal dimension (the cause is totally due to me v. not at all due to me) is uncorrelated with the personal control dimension (I have control over the cause v. I have no control over the cause) or, for that matter, any of the other five dimensions. The personal control dimension, which is a purer measure of

TABLE 2. Alpha reliabilities and intercorrelations of the subscales of forms C and B of the MHLC Scale

	Form C Arthritis—specific			Form B Health—general		
	I	P	C	I	P	C
Arthritis—internality	(0.85)					
Arthritis—powerful others	0.12	(0.75)				
Arthritis—chance	−0.04	0.17	(0.72)			
Health—internality	*0.60*	−0.05	−0.16	(0.59)		
Health—powerful others	0.06	*0.67*	0.08	0.10	(0.67)	
Health—chance	−0.09	0.18	*0.71*	−0.15	0.19	(0.54)

Note: ($N = 266$). Numbers in parentheses are alpha reliabilities. The Form C subscales have eight items each, compared to six items each for the Form B subscales.

efficacy' (HSE) by rewording the items to be relevant to health behaviors. In a pilot test with students in a health promotion course, the internal consistency of the HSE Scale was > 0.80. Data from this pilot study demonstrated that HSE scores moderated the relationship between relative health value and a composite index of preventive health behaviors ($r = 0.38$; $N = 80$; $p < 0.001$). The HSE measure comes closer to what Bandura (1986) means by a 'domain-linked' scale, much in the same way that the health locus of control scales are 'domain-linked'. Shelton Smith's dissertation research, currently in progress, will help add to the validity evidence for the HSE Scale.

Discussion

As with assessments of locus of control, or perceived control over outcomes, the literature contains more and more examples of measures of perceived control over health behaviors. Again, careful scale development takes a considerable amount of time and effort, and there are an awful lot of health behaviors which people wish to investigate. Nevertheless, as more of these scales get developed and put into the literature, the need for developing new behavior-specific measures should subside.

Over the past several years, I have been trying to bring about a rapprochement between the two social learning theories of Rotter and Bandura. I have concluded from the evidence in the literature that, in general, measures of self-efficacy are much stronger predictors of behavior than measures of locus of control beliefs (assuming, of course, that reinforcement value is sufficiently high in the sample). However, in my 'newly revised', modified social learning theory, the effect of self-efficacy beliefs on behavior potential is modified by one's locus of control orientation. Only for 'internals' do self-efficacy beliefs predict behavior; if someone does not believe that their behavior influences their outcomes, then it is irrelevant whether the person believes he or she can do the behavior. Initial evidence for this theory can be found in the Kaplan *et al.* (1984) study with COPD patients. One of my students, Keith Peterson, and I have recently conceptually replicated this finding with a sample of newly diagnosed cardiovascular patients involved in a smoking-cessation project. Thus, it is the interaction of perceived control over behavior and perceived control over outcomes which best predicts behavior, not either one alone.

Our perceived competence scale is more than simply a self-efficacy measure. Because it combines a behavioral expectancy with an outcome expectancy it captures the full range of the expectancy construct described in social learning theory. One problem, however, with a 'generalized self-efficacy' construct such as this is that it is difficult to distinguish it, both theoretically and psychometrically, from a similar construct, self-esteem. In fact, a colleague gave the eight-item version of our perceived competence measure along with the Rosenberg Self-Esteem Scale (Rosenberg, 1965) to a sample of college students and found

that the two measures were very highly correlated (R. F. DeVellis, personal communication, August 1985). The fact that perceived competence highly correlates with self-esteem may not be a problem to many investigators; after all, perceived competence is a large determinant of one's sense of self-worth. Showing that measures of the two constructs correlate is a demonstration of construct validity, but such a high correlation raises questions about discriminant validity. It is likely, however, that our new 'health self-efficacy' scale will be less highly correlated with measures of self-esteem than the more omnibus-perceived competence scale, because one's overall sense of esteem is not totally dependent on one's perceived capability in any one specific domain.

PERCEIVED CONTROL AS A COMPONENT OF HARDINESS

Personality hardiness (Kobasa, 1979, 1982) is an individual difference variable which has been shown to moderate the relationship between stress and negative health outcomes. Over the past nine years there have been a myriad of studies in the literature showing that 'hardy' individuals do not break down and become ill in the face of stressors, as do non-hardy individuals. Based upon an existential theory of personality (Kobasa and Maddi, 1977), personality hardiness is believed to be a combination of three constructs: perceived control, commitment, and challenge. Perceived control, defined as the tendency to believe and act as if one can influence the course of events, has been a major, if not *the* major, component of hardiness in almost every analysis which has looked at the components separately.

The assessment of personality hardiness has been problematical from the onset, although the challenge component has had more difficulties than either control or commitment (Hull *et al.*, 1987). In the original version of the hardiness scale, perceived control was assessed by a combination of Rotter's I–E Scale and the Powerlessness and Nihilism scales of the Alienation Test (Maddi *et al.*, 1979). In the latest 50-item version (distributed by the Hardiness Institute in Chicago), the perceived control items read more like self-efficacy (or perceived competence) than locus of control items. Interestingly, the latest version of perceived control in the hardiness scale only correlates 0.24 (p = NS) with the previous assessment of perceived control (S. Kahn, personal communication, August 1987).

Pollock (1986) developed a health-related hardiness scale (HRHS) in which the MHLC Scale constituted the perceived control dimension. Pollock originally computed a total control score by subtracting IHLC from the sum of PHLC and CHLC, but subsequent analyses of her data from a sample of diabetic patients and our data from our sample of rheumatoid arthritis patients have shown that eliminating the PHLC items from the control dimension increases the scale's internal consistency. One of my students, Deborah Abraham, and I have recently developed a completely new HRHS in which we assess control through a

combination of IHLC, CHLC and HSE (health self-efficacy) items. We are in the process of testing the concurrent and discriminant validity of our new HRHS against the 50-item personality hardiness measure.

Discussion

I am convinced that, once the measurement problems have been resolved, the construct of choice for researchers examining the role of individual differences as moderators of the stress–health status relationship will be hardiness. Hardy individuals are apparently healthier to begin with and are more resistant to stressors if and when they occur. The jury is still out on whether the measurement of hardiness should be at the more general, personality level or via a health-specific assessment such as the HRHS. It is also not clear whether a composite hardiness score should be calculated by simply adding together the component subscores, as is currently the case, or by some multiplicative function, which is more consistent with hardiness theory (S. Ouellette-Kobasa, personal communication, August 1987). Nevertheless, hardiness 'works' because it casts perceived control in a central role, yet recognizes that control does not work alone. Commitment (which, like reinforcement value, is a motivational construct) and challenge (a cognitive coping strategy) co-star along with control in the production of a superordinate construct that makes sense theoretically and can be validated empirically.

SUMMARY

This chapter draws upon fifteen years' worth of my research to illustrate the variety of ways with which aspects of control in health-care settings have been assessed. Three complex field studies in which we measured the desire for and perception of control over three different health-care settings were briefly presented. Our inability to document that we had, indeed, manipulated perceived control by giving enhanced choices to certain patients in those studies was pointed out, along with *ex post facto* explanations as to why those null findings might have come about. The Multidimensional Health Locus of Control Scale was discussed along with alternative methods of assessing perceived control over one's health status. The minimal role that MHLC scores have had in predicting health behavior was discussed, and a 'newly revised' modified social learning theory was presented in which assessments of self-efficacy beliefs (perceived control over one's behavior) play a central role. Finally, the important but non-singular role that perceived control plays in the construct of psychological hardiness was presented, and the notion of assessing health-related hardiness was discussed. Throughout the chapter, the advantages of 'domain-linked' (Bandura, 1986) over more generalized assessments of control have been stressed.

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