1990

Dimensions of locus of control in the health perceptions questionnaire : a validity study

Donna A. Hughs
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**Dimensions of locus-of-control in the Health Perceptions
Questionnaire: A validity study**

Hughs, Donna A., M.S.

San Jose State University, 1990

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**DIMENSIONS OF LOCUS OF CONTROL IN THE HEALTH
PERCEPTIONS QUESTIONNAIRE: A VALIDITY STUDY**

A Thesis

Presented to

**The Faculty of the Department of Psychology
San Jose State University**

**In Partial Fulfillment
of the Requirements for the Degree
Master of Science**

by

Donna A. Hughs

May, 1990

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Health Perceptions Questionnaire

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**Dimensions of Locus of Control in the Health
Perceptions Questionnaire: A Validity Study**

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Running Head: HEALTH PERCEPTIONS QUESTIONNAIRE: VALIDITY

Footnotes

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Abstract

The Health Perceptions Questionnaire (HPQ) is a measure developed to predict adherence to medical regimens. In order to provide a test of its construct validity, it was proposed that scores on four of the HPQ subscales would correlate with scores on certain locus of control measures. The HPQ subscales of Stressors, Self-Management, Regularity, and Well-Being were administered to a group of 159 undergraduate psychology students along with the Rotter Internal-External Locus of Control Scale, the Mirels Factor I (called Fatalism) of the Rotter scale, and the Self-Control subscale of the Reid-Ware Three-Factor Internal-External Scale. Significant correlations were found between Self-Management and the Rotter, Self-Control, and Fatalism measures; between Stressors and the Self-Control measure; and between Regularity and the Self-Control measure. These findings lend support to the construct validity of the Self-Management, Stressors, and Regularity subscales and may allow for the application of locus of control measures to the prediction of adherence. Recommendations for further research are given.

Dimensions of Locus of Control in the Health
Perceptions Questionnaire: A Validity Study

A great deal of research in health psychology has recently focused on the perception that many failures in the prevention and treatment of illness are due to patients' inadequate adherence to a medical regimen, and may be avoidable. For example, it is estimated that up to 70% of hypertensive patients do not benefit from treatment, in large part because they are not following their doctor's instructions (Haynes, 1982; Kerr, 1985). A variety of interventions have been designed which have enhanced short-term adherence, but which individually have not been sufficient to sustain adherence for longer periods (Cox, 1985; Fisher, 1982; Haynes; Kerr; Marlatt, 1982). Haynes states that the few methods which have shown long-term effectiveness in maintaining adherence generally require multiple interventions. This is perhaps not surprising in light of his research review in which he found over 250 variables related to adherence.

Two instruments which together are designed to predict non-adherence as well as indicate various areas in a patient's life where interventions to increase adherence might be made are the Health Perceptions Questionnaire (HPQ) and the Health Events Questionnaire (Goodwin, Insull, Russell, & Probstfield, in press). The authors of these instruments used social learning theory as a starting point

Health Perceptions Questionnaire

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and drew from literature on adherence and from the clinical experience of adherence counselors in order to develop the instruments' subscales. The measures have not been fully standardized, but some of the HPQ subscale scores did significantly correlate to scores on biochemical and clinical measures in a dietary trial (Goodwin et al.; see Method section), suggesting some predictive validity.

The purpose of this study is to examine one aspect of the construct validity of the following four HPQ subscales: Stressors, Self-Management, Regularity, and Well-Being. In the initial study with this measure, the subscales appeared independent of each other with the exception that Self-Management showed a low to moderate correlation with the other three (see Method section). Thus it appears that to some degree the measures tap different dimensions of a common construct. It is proposed that the concepts underlying their development are comparable or related to the concept of locus of control, which is also derived from social learning theory. This proposition, in various forms, will be tested by comparing scores on the HPQ subscales to scores on selected locus of control measures, obtained by concurrent administration to the same group. Cronbach and Meehl (1955) observe that a benefit of construct validity studies is that the establishment of relationships of test performance to other constructs "permits the clinician to predict performance with respect to criteria which have not

yet been employed in empirical validation studies" (p. 282). Thus, findings of significant relationships between the HPQ and locus of control measures would lend support for drawing upon the locus of control literature in the prediction of adherence to regimens with the HPQ.

Before the hypotheses are stated more specifically locus of control will be discussed, with particular reference to its relationship to health behaviors. In addition, the HPQ subscales which are a focus of this study will be described. A statement of the hypotheses will conclude the section.

Locus of Control

The locus of control concept is derived from Rotter's (1966) social learning theory and is based on people's perceptions of causes of event outcomes in their lives. Simply stated, persons are said to have a more internal locus of control if they perceive the outcomes of events in their lives as being the consequence of their own behaviors and hence under their own control. Conversely, persons described as having a more external locus of control perceive the outcome of these events as independent of their own behavior and thereby beyond their control. Rotter also maintained that the locus of control orientation was a more useful predictor of behavior in novel situations, and that past behavior was more useful in predicting familiar situations.

Many studies have been done assessing locus of control with Rotter's Internal-External Locus of Control Scale (Lefcourt, 1982; Rotter, 1966; Strickland, 1978). Those who scored as having a more internal locus of control were found to perform better than those scoring as more external under conditions of greater stress (Novaco, Stokols, Campbell, & Stokols, 1979). Internals were found to use more problem-solving coping methods where external scorers used more emotion-directed coping responses, as assessed through structured interviews (Anderson, 1977). Following failure on a task, internals worked harder on a subsequent task, as measured by length of time spent working (Weiss & Sherman, 1973). Internals responded more appropriately to task demands by taking more time than externals to make decisions in skill-oriented activities and less time in chance-oriented activities (Lefcourt, Lewis, & Silverman, 1968). Businessmen who scored as internal reported more engagement in activities such as working long hours, creating and expanding businesses, and developing goals and plans, when compared to external scorers over an 18-month period (Durand & Shea, 1974). Internals have demonstrated little or no responsiveness to experimenter manipulations and attempts at influence, compared to externals (Doctor, 1971; Lefcourt & Siegel, 1970; Ryckman, Rodda, & Sherman, 1972). And, internals were more willing than externals to tolerate the stress of mild electric shock in order to give

help to peers in an experimental situation (Midlarsky & Midlarsky, 1973).

Locus of control has been associated with measures of perceptions about health. Wise and Rosenthal (1982) studied 88 patients seen at a psychiatric consultation service at a general hospital. They administered the Rotter scale along with a measure relating to illness beliefs and found significant relationships between greater externality on the Rotter scale and higher scores on two subscales, one assessing fear of illness and pain and the other assessing preoccupation with symptoms and fear of currently having a serious disease. These results suggest a relationship between greater internality and greater confidence about one's health. These findings are consistent with those of another investigation (Seeman, Seeman, & Sayles, 1985), which is notable for being a longitudinal study of a random sample of 931 persons in Los Angeles county. Researchers used a health locus of control scale and found that internality on the scale was associated with higher self-ratings of health obtained both at the time of administration and a year later. These results suggest a positive relationship between internality and perceived well-being.

The Rotter scale has also been used to predict health behaviors. Internality has been significantly related to follow-up weight loss of 8 weeks to 3 months (Balch & Ross,

1975; Kincey, 1981; Manno & Marston, 1971); to cooperation with hospital staff in a study of 300 inpatients (Cromwell, Butterfield, Brayfield, & Curry, 1977); and to diet compliance and participation in vocational rehabilitation in a study of 40 subjects on chronic hemodialysis (Poll & De-Nour, 1980). In studies to reduce smoking, locus of control interacted significantly with treatment conditions to predict reduction in smoking rates (Best & Steffy, 1975; Chambliss & Murray, 1979); but it did not predict quitting at a 4-year follow-up in a study by Benfari and Eaker (1984). Other studies also show less consistent results. Manno and Marston (1971) found that internality predicted weight loss only for their control group, not for treatment groups; and Lowery and DuCette (1976) found internality more predictive of adherence only in shorter-term (3-year) diabetics but not in longer-term (6-year) diabetics, among whom externals performed more successfully.

In her review of studies on the relationship between health behaviors and locus of control, Strickland (1978) criticized much of the research for its correlational nature and its failure to control for situational variables and subjects' values. Despite these problems, she concludes that locus of control research does support the idea that internals are more apt than externals to engage in positive health behaviors.

Such findings suggest that it might be desirable to

change an individual's locus of control in a more internal direction, if this were possible. Rotter (1975) conceived of locus of control as a generalized expectancy built up from a variety of experiences and thus as a relatively stable personality characteristic. However, some research supports the possibility that locus of control might be responsive to manipulations to change it. Strickland (1978) writes that a large number of studies indicate that individuals in therapy or self-improvement groups develop a more internal locus of control during the process of treatment. Blittner, Goldberg and Merbaum (1978) obtained a significant shift towards more internal locus of control from pre- to post-treatment in a smoking-cessation program. After being given a battery of psychological tests, three groups were selected at random. The first experimental group was told that they were admitted in preference to others because their test scores showed great potential for being able to stop smoking. The second group was told that they were selected for treatment at random. A third group took the tests but received no treatment. The first two groups then participated in behavioral smoking-cessation treatment programs which differed only in the continual emphasis on 'demonstrated' capacity for self-control given to the experimental group. Tests given following the two-month treatment showed a significant change towards internality on the Rotter scale within the first

experimental group ($t(17) = 1.80, p < .05$), with only a slight tendency towards greater internality in the second group and no change in the control group.

There is some evidence which suggests that locus of control undergoes a shift to greater externality in response to chronic illness or disability (Poll & De-Nour, 1980; Strickland, 1978). Strickland notes that "chronically handicapped individuals, particularly children, appear to be more external than their control counterparts" (p. 1198). Also, Poll and De-Nour, in reviewing a number of studies on chronic hemodialysis patients, conclude that a shift to a more external locus of control seems to occur among these patients. Changes in locus of control may also depend on phases of illness; Bruhn, Hampton, and Chandler (1971) found a marginally severe group of hemophiliacs demonstrating a more external locus of control than either a mild or severe group. They suggested that those in the marginally severe group may see their condition as less predictable and are more dependent on external cues to determine their well-being.

Among diabetics the relationship of locus of control to adherence is no clearer than among hemodialysis patients. Lowery and DuCette (1976) predicted that among diabetics, internals on the Rotter scale would maintain significantly more control over their diabetes (as indicated by a lower frequency of problems such as

hyperglycemic or hypoglycemic episodes and infections) than externals. Their results held up for their group of 3-year diabetics; but among their group of 6-year diabetics the reverse was true, with externals maintaining significantly more control over the disease. Lowery and Ducette offer explanations consistent with other findings about internals and externals. They note research suggesting that the present state of medical knowledge about the disease is too limited to permit adequate therapeutic recommendations for many of those afflicted with it. They consequently conjecture that internals, after eventually discovering the limitations of current knowledge, become frustrated (as well as, perhaps, reluctant to comply with authority when the advantages of doing so are not clear), and diminish their efforts at self-control. Externals, on the other hand, manage to control their diabetes more successfully in the long run in such matters as keeping doctors' appointments and adhering to required regimens because of their greater willingness to comply with authority (Rotter, 1966).

Findings such as the above render more problematic the idea of treatment to change locus of control to more internal, as has been suggested (Arakelian, 1980; Goldstein & Reznikoff, 1971). Moreover, researchers differ on the implications of an external locus of control for the chronically ill. Poll and De-Nour studied a group of

patients who had a minimum of two years on dialysis. They found that an external locus of control was not adaptive, correlated as it was with poorer diet compliance, lower levels of vocational rehabilitation (employment), and lower levels of acceptance of disease (as measured on an Acceptance of Disability scale). However, Wallston and Wallston (1978) found a few studies suggesting that among the chronically ill, externals are more compliant, and concluded that such evidence "in some instances, could indicate that it is more functional to hold external beliefs" (p. 112). Also, Wilson et al. (cited in Poll & De-Nour, 1980) found evidence that a shift in locus of control scores towards greater externality among their group of patients was adaptive. Their group had an average of 15 months on dialysis when first tested. A year later the group demonstrated an increase on their Rotter mean score from 9.83 to 12.18, as well as an increase in the sense of well-being as measured by the California Psychological Inventory. No results of tests to indicate the significance levels of these findings were stated. Since most studies on locus of control in the chronically ill are correlational in nature, and few time-lagged studies on the same group have been done, much more research is needed. Nevertheless, some writers (Arakelian, 1980; Lazarus & Folkman, 1984; Strickland, 1978) suggest that shifting to an external locus of control may be

adaptive for some patients (particularly, the elderly) by relieving them of the stress that is engendered by continual self-monitoring of their condition (Burger, 1989; Shultz & Hanusa, 1978) and by helping them, in the words of the Alcoholics Anonymous Serenity Prayer, to "accept the things... (they) cannot change."

These findings have supported a shift by researchers away from questions of whether internals or externals perform better to investigations of the circumstances under which each performs well. Such recent studies demonstrate that internals appear to perform better in a treatment modality which gives them more individual responsibility and control, and focuses more on internal cues; whereas externals do better in a modality that is more structured and focuses more on external cues (Strickland, 1978; Wallston & Wallston, 1978). This type of approach is supported by results in the areas of group therapy (Abramowitz, Abramowitz, Roback, & Jackson, 1974; Kilmann, Alber, & Sotile, 1975); smoking reduction (Best & Steffy, 1975); weight loss (Winter, 1975); diastolic blood pressure reduction (DeGood, 1975); and adjustment in dental surgery (Auerbach, Kendall, Cuttler, & Levitt, 1976). A particularly interesting result was the outcome of a study of 186 acute myocardial patients by Cromwell et al. (1977), in which the researchers examined the interaction of locus of control with the level of participation of patients in

their own treatment. None of the patients in congruent groups (internal with high participation, external with low) returned to the hospital or died within 12 weeks; all those who returned ($\underline{n} = 12$) or died ($\underline{n} = 5$) were in incongruent combinations. This finding did not reach significance ($p < .06$ for both groups), but was enough of a trend to underscore the need for further study. Research such as the above indicates that even a measure of generalized expectancy for locus of control may be useful for the design of interventions around health behaviors.

Studies by Mirels (1970) exploring the multidimensionality of Rotter's scale have lead to the development of more refined locus of control measures. Mirels found two factors in Rotter's scale. Factor I (termed Fatalism by Reid and Ware, 1973) reflected the degree to which respondents attribute event outcomes in their lives to fate or luck; Factor II (termed Social Systems Control by Reid and Ware) reflected the extent to which respondents believed it possible to affect sociopolitical institutions. Other researchers since Mirels have gone on to devise multidimensional locus of control scales incorporating his two dimensions into their scales (Levenson, 1974; Reid and Ware, 1974; Wallston, Wallston, & DeVellis, 1978). The usefulness of multidimensional scales is partly dependent on the demonstration of differential validity of the subscales (in

comparison to each other or to the total test score) against separate criteria or treatments (Anastasi, 1985, p. 85). Differential validity has been found for these derived subscales in studies investigating client usage of a nursing clinic (Muhlenkamp, Brown, & Sands, 1985); coping strategies of cancer patients (Achterberg & Lawlis, 1979); and more versus less successfully treated alcoholics (Caster and Parsons, 1977).

In the development of their locus of control scale, Reid and Ware (1974) built two subscales based on Mirels' factors and added a third, the Self-Control subscale. This subscale assesses the degree of control subjects believe they have over their own impulses, desires, and emotional behavior. Reid and Ware felt that inclusion of such a domain might be useful in the prediction of response to the treatment of alcoholism, drug abuse, and smoking behavior. A modified version of their scales was used by Shlegel and Crawford (1978) in their examination of a variety of drug use among high school students over a two-year period. They found that more external scores on the Fatalism and Self-Control subscales showed a significant positive relationship to usage of some of the drugs, as measured by percentages of users of the drug. They also found differential validity for scores on the individual subscales compared to total subscale scores (as on a unidimensional scale); for example, beer and marijuana use

was correlated to high scores on Fatalism but not to total scores.

This study will use the Rotter scale because of the construct validity established by a large number of studies which have demonstrated a generally modest but significant relationship between scores on the Rotter and measures of a wide range of behaviors (Mirels, 1970; Reid & Ware, 1973; see also Method section); and because, like the HPQ, the domain of behaviors sampled is not restricted specifically to health behaviors. This study will also take advantage of the multidimensional approach by using not only the full scale scores but scores from the subscale of Fatalism determined by Mirels' work. Additionally, the Reid-Ware Self-Control subscale will be used, as the domain of events represented in this measure is distinct from the domain represented in the Rotter scale. The use of various locus of control subscales may be more helpful in clarifying the relationships among HPQ subscales, which have shown some factorial independence as well as an ability to predict to a common target of adherence behavior.

Health Perceptions Questionnaire

The HPQ was developed from the perspective of cognitive-social learning theory, which assumes that the learning, maintaining, and unlearning of behavior is a function of reinforcement contingencies within a person's environment (Goodwin et al., in press). With this model,

adherence behaviors are explained and predicted by assessing events in patients' current environments and their perceptions, beliefs, and intentions relating to these events. The HPQ authors designed subscales purporting to measure variables with demonstrated associations to adherence, taking into consideration the variable's previously demonstrated influence on adherence, ease of modifiability (thus eliminating factors such as age and sex), and ease of measurement. They developed five subscales: Stressors, Self-management, Regularity, Well-being, and Support System. The first four of these are the focus of this study. The HPQ consists of 49 statements or descriptive phrases which the respondent rates on a 5-point Likert-type scale ranging from "very much like me" to "very much unlike me." High scores on the subscales are intended to reflect inclination to adhere to a regimen. The subscales are defined as follows:

Stressors. This subscale is intended to assess the perception of stress with items such as "even temporary setbacks are upsetting." A high score is indicative of a low level of perceived stress, which is seen as likely to predict adherence behaviors.

Self-Management. This subscale was intended to measure the degree to which subjects perceive themselves as effective in achieving their goals. Items refer to control over not only external but also intrapersonal events, such

as "I think before I act."

Regularity of Daily Routines (Regularity). This subscale was intended to assess respondents' preferences for orderliness and routine as well as their level of tolerance for ambiguity. Items focus on the preference for the routine or the perception of having a predictable life, as in "Life is pretty much the same from week to week." Adjusting schedules for medication and suggesting adherence aids related to daily routine are currently very salient activities for adherence counselors (Goodwin et al., in press.)

Well-Being. This subscale was designed to assess respondents' perceptions of and perceived control over their own health and well-being with items such as "I'm healthy most of the time" and "I want to feel more confident about my health."

Hypotheses

The hypotheses of the study follow, with brief explanations of their rationale. Each numbered hypothesis relates to a different HPQ subscale, and the subhypotheses deal with relationships between the HPQ subscale and the Rotter, Self-Control, and Fatalism locus of control measures.

Hypothesis 1. (a) Scores on Stressors will be significantly and negatively correlated with scores on the Rotter scale. (Internality is represented by a low score on

the Rotter scale.)

A heightened response to stressors has been associated with an external locus of control score, or a comparable concept such as helplessness, by various researchers (Anderson, 1977; Byrne & Whyte, 1980; Krause & Stryker, 1984; Vogel, 1985).

(b) Scores on Stressors will be significantly and negatively correlated with scores on the Reid-Ware Self-Control subscale. (Internality is represented by a low score on the Self-Control subscale.)

The appearance of some items on the Stressors scale related to perceptions of intrapersonal control, such as "easily upset," suggest that scores on this scale may also be significantly related to scores on the Self-control subscale.

Hypothesis 2. (a) Scores on Self-Management will be significantly and negatively correlated with the Rotter scale.

Seeing oneself as achieving one's goals predominantly through one's own actions (as suggested by higher scores on Self-Management) would seem to be inconsistent with perceiving outcomes in one's life from being determined mainly by external forces (as a higher score on the Rotter would suggest).

(b) Scores on Self-Management will be significantly and negatively correlated with scores on the Reid-Ware

Self-Control subscale.

Since the Self-Management subscale contains items about perceptions of intrapersonal control over one's impulses, a high score on this scale might be expected to correlate with a high score on the Reid-Ware Self-Control subscale.

(c) Scores on Self-Management will be significantly and negatively correlated to scores on Mirels' Fatalism subscale. (Internality is represented by a low score on the Fatalism subscale.)

Though those prone to superstitious beliefs might expect that they can exert some control over their luck through their own actions, in general it would seem that attributing outcomes to luck or chance (as demonstrated by a high Fatalism score) would be inconsistent with seeing one's own actions as primarily responsible for the achieving of one's goals (as a high Self-Management score would suggest).

(d) Scores on Self-Management will be significantly more related to scores on Self-Control than to scores on Fatalism.

One may deny a significant role to fate or luck in determining life outcomes but expect that outcomes are more controlled by, for example, other people rather than oneself. Thus, internality on Fatalism may relate less consistently to internality on Self-Management than

internality on Self-Control does.

Hypothesis 3. (a) Scores on Regularity will be significantly and negatively related to scores on the Rotter scale.

To be able to predict something about an event is one way of having some perceived control over it (Burger, 1989; Thompson, 1981). It thus seems quite possible that one way internals would seek to gain more control over outcomes in their lives would be to make the structure of their lives more predictable by introducing orderliness and routine. If so, one would expect a positive relationship between internality on the Rotter scale and a high Regularity score.

(b) Scores on Regularity will be significantly and negatively correlated with scores on the Reid-Ware Self-Control subscale.

High Regularity scorers would seem to require more self-control in order to suppress impulses in following routines and creating an orderly life than low scorers; thus they could be expected to score higher on the Self-Control subscale.

(c) Scores on Regularity will be significantly and negatively correlated with scores on Mirels' Fatalism subscale.

High scorers on Regularity would have a very orderly, predictable life and thus could be quite unlikely to see

elements of chance and luck as playing much of a role in their lives. Hence they could be expected to score as very internal on Mirels' Fatalism subscale.

Hypothesis 4. Scores on Well-Being will be significantly and negatively correlated with the Rotter scale.

As previously noted, studies by Seeman, Seeman, and Sayles (1985) and Wise and Rosenthal (1982) suggest that internality is positively related to a sense of well-being and confidence about one's health.

Method

Research Participants

Participants were 159 students (101 females and 58 males) enrolled in undergraduate psychology classes at San Jose State University. They took part in the study voluntarily to earn extra credit towards their grade.

Measures

Health Perceptions Questionnaire. The HPQ (see Appendix A) along with information on its standardization, reliability, and validity appear in an article reporting on some clinical trials of the instrument (Goodwin et al., in press). The authors insured cohesiveness of the subscales by eliminating all items which did not attain a correlation of at least .40 with the item total in a pilot study. Self-Management showed significant commonalities with the

other three subscales considered in this study, but they were otherwise independent of each other.

Validity was assessed by examining the relationships of the HPQ with three measures of adherence. These were: (1) ratings of adherence behaviors by clinical staff; (2) self-recorded 5-day diet diaries recorded once every 5 weeks; (3) biochemical indicators from serum assays, taken during the 5th week of the second and third controlled eating periods. Correlations frequently differed by gender, but all subscales considered here predicted to both genders and to at least two measures of adherence for men, women, or the full cohort, thus demonstrating predictive validity for the HPQ subscales.

Rotter Internal-External Locus of Control Scale.

The present version of the scale was published in a monograph by Rotter (1966; see Appendix B). It consists of 23 forced-choice items relating to outcome expectancies, along with 6 filler items. The score is the number of responses scored as external. In many studies a median split has been used to form groups called internals and externals, but a typology or bimodal distribution was never hypothesized by the developers of the scale, and among various samples the distribution of scores has tended towards a normal curve (Rotter, 1975). Though no systematic standardization was done on the instrument, Rotter (1966) has provided descriptive statistics for

various populations. Rotter found (Kuder-Richardson) reliability coefficients for internal consistency to range from .65 to .73. Phares (1978) states that these slightly low scores are appropriate in light of the additive nature of the measure and the broad range of behaviors sampled. Test-retest reliability coefficients range from .49 to .83, with a tendency towards lower scores as time length increased (up to two months) or as testing conditions varied.

Evidence for construct validity for the scale has been presented by a variety of reviewers, including Rotter (1966, 1975), Phares (1978) and Lefcourt (1982). MacDonald refers to various reviews and then observes, "The literature does indicate that there are individual differences in perception about one's control over one's destiny and that the Rotter scale is sensitive to these differences" (1973, p. 228).

Predictions made with the Rotter have generally been modest; this has been attributed to the generalized nature of the scale and to the fact that many studies have not attempted to control for two other factors of reinforcement values related to a behavior and psychological variables of the situation, both of which Rotter considered major determinants of behavior (Rotter, 1975; Strickland, 1978). Many studies have demonstrated relationships between observed behavior and Rotter scores (Anderson, 1977; Balch

& Ross, 1975; Best & Steffy, 1975; Chambliss & Murray, 1979; Cromwell et al., 1977; Doctor, 1971; Durand & Shea, 1974; Kincey, 1981; Lefcourt, Lewis, & Silverman, 1968; Lefcourt & Siegel, 1970; Manno & Marston, 1971; Midlarsky & Midlarsky, 1973; Novaco, Stokols, Campbell, & Stokols, 1979; Poll & De-Nour, 1980; Ryckman, Rodda, & Sherman, 1972; Weiss & Sherman, 1973). These demonstrated relationships are essential to a construct validity study (Cronbach & Meehl, 1955, p. 291) and thereby recommend the Rotter scale for this investigation of the HPQ.

Fatalism subscale. In his analysis of the Rotter scale Mirels (1970) found two factors consisting of 8 and 4 items respectively. These factors have already been described. Viney (1974) found comparable factors to Mirels in a study with two groups of Australian adolescents, as did Reid and Ware (1973) with a group of Canadian women. MacDonald and Tseng (cited in Lefcourt, 1982) also obtained similar results, and with a female sample found a third factor pertaining to social instead of achievement reinforcements. Differential validity of each of the two factors considered as subscales (when compared to the other subscale score and the overall Rotter score) has received some support in studies by Berzins & Ross (1973) and Abramowitz (1973), but not in a study of weight reduction by Balch & Ross (1975). That the amount of research done with the Mirels factors seems quite limited may be

attributable to the development a few years later of the three-dimensional scales of Levenson (1974) and of Reid and Ware (1974), both of which drew heavily from Mirels' work. The use of Mirels' factors in this study seemed a desirable alternative to making a very long and possibly tiresome set of measures for students.

Reid-Ware Three-Factor Internal-External Scale (Self-Control Subscale). The Reid-Ware scale (1973, 1974; see Appendix C) has a forced-choice format. There are 8 items comprising the Self-control subscale and 12 items each for the other two subscales, Social Systems Control and Fatalism (developed from Mirels' factors). Like Rotter, Reid and Ware did not seek to develop norms for their scale. They did present results of factor and item analyses on the scores of 167 male and female college students. The three dimensions all showed comparably high internal consistency, with alpha coefficients for Self-control of 0.71. Correlations between the Self-control subscale and the other two subscales ranging between $r = .14$ and $r = .30$ have been reported (Goodman & Waters, 1987; Reid & Ware, 1974). Goodman and Waters found correlations between the Self-Control subscale and the Rotter scale of $r = .25$. These findings suggest that the Self-control subscale is relatively independent, and thus a particularly good choice for use along with the Rotter in investigating the HPQ.

Design

This study is a correlational investigation for which Pearson product moment correlations were computed between each of the four HPQ subscales of Stressors, Self-Management, Regularity, and Well-Being, and the three locus of control measures, which were the Rotter scale, the Mirels' Fatalism subscale, and the Reid-Ware Self-control subscale. Williams' formula, as recommended by Steiger (1980), was used to test Hypothesis 2(d) predicting significant differences between correlations. This comparison is essentially a t-test, and was employed in a one-tailed direction.

Procedure

Students were given all measures in a single session during class time. Items from the Reid-Ware Self-Control subscale were interspersed among items from the Rotter to disguise the intent of the subscale.

Results and Discussion

Table 1 presents the correlations obtained between locus of control scores and HPQ subscale scores. As gender effects were noted, results by gender are given in Table 2.

Hypothesis 1(a) predicted that scores on Stressors would be significantly and negatively correlated with scores on the Rotter scale. An examination of the coefficients presented in Table 1 suggest that the

Table 1

Intercorrelations Between Health Perceptions Questionnaire
Subscale Scores and Three Locus of Control Measure Scores

Locus of control measure	HPQ subscale			
	ST	SM	RE	WB
Rotter	-.05	-.15*	-.09	-.09
Self-Control	-.21**	-.26**	-.21**	.00
Fatalism	-.01	-.17*	-.04	-.06

N = 159.

* $p < .05$.

** $p < .01$.

Table 2

Intercorrelations Between Health Perceptions Questionnaire
Subscale Scores and Three Locus of Control Measure Scores
According to Gender

Locus of control measure	HPQ subscale			
	ST	SM	RE	WB
Male subjects ($\underline{n}$ = 58)				
Rotter	-.05	-.22	-.21	-.22
Self-Control	-.24*	-.43***	-.32**	-.06
Fatalism	-.11	-.19	-.14	-.16
Female subjects ($\underline{n}$ = 101)				
Rotter	-.02	-.11	.00	.00
Self-Control	-.12	-.16	-.13	.10
Fatalism	.07	-.14	.04	.01

* $p < .05$.** $p < .01$.*** $p < .001$.

association between scores on Stressors and the Rotter scale was not sufficient to reject Null Hypothesis 1(a).

Hypothesis 1(b) predicted that scores on Stressors would show a significant and negative correlation with scores on the Reid-Ware Self-Control subscale. The association between scores on these two measures fell in the predicted direction and were significant ($r = -.21$, $p < .01$), thus supporting the hypothesis. These findings suggest that those who score high on the Stressors scale are more likely than low scorers to perceive that they are in control of their own feelings and impulses. This is consistent with the perception of a lower level of stress that higher scorers on Stressors would be expected to have. These results thus lend modest support to the construct validity of the Stressors subscale.

Table 2 shows coefficients obtained when comparisons are made between HPQ scores and locus of control scale scores according to gender. An examination of this table suggests a significant relationship exists between Stressors and Rotter scores for males only. There also appeared to be a possible influence of age on Stressor scores for male subjects, as a correlation of $r = .23$ ($p < .05$) indicating lower levels of perceived stress for older male subjects was observed.

Hypothesis 2(a) predicted a significant and inverse correlation between scores on Self-Management and the

Rotter scale. This association fell in the predicted direction and was significant ($r = -.15$, $p < .05$).

Thus, the hypothesis was supported.

Hypothesis 2(b) predicted a significant and inverse correlation between scores on Self-Management and the Reid-Ware Self-Control subscale. This hypothesis was supported ($r = -.26$, $p < .01$), indicating that higher scorers on Self-Management are characterized by a greater sense of control over their feelings and impulses than lower scorers. This result lends support to the construct validity of the Self-Management scale.

Results shown in Table 2 again suggest gender effects, with correlations between Self-Management and Self-Control scores reaching significance for males only.

Hypothesis 2(c), which predicted that scores on Self-Management and Fatalism would show a significant and negative relationship, gained support ($r = -.17$, $p < .05$). Thus, higher scorers on this subscale may be more likely to perceive luck or chance as having a lesser influence over outcomes in their lives than lower scorers. These findings lend support to the construct validity of the Self-Management scale.

Hypothesis 2(d) predicted that scores on Self-Management would show a significantly greater relationship to scores on Self-Control than to scores on Fatalism. Though the difference was in the predicted

direction, the findings were not sufficient to reject the Null Hypothesis.

Hypothesis 3(a) predicted a significant and negative correlation between scores on Regularity and the Rotter scale. The correlation shown in Table 1 shows that the association between the two measures was not sufficient to warrant rejection of Null Hypothesis 3(a).

Hypothesis 3(b) predicted that scores on Regularity would be significantly and negatively related to scores on the Reid-Ware Self-Control scale. A significant linear correlation in the predicted direction ($r = -.21$, $p < .01$) was found, lending support to the hypothesis. These results suggest that higher scores on the Regularity subscale are associated with a perception of a higher degree of control over one's feelings and impulses.

Hypothesis 3(c) proposed a significant and inverse relationship between Regularity scores and Fatalism scores. The relationship found ($r = -.04$) was not sufficient to reject the Null Hypothesis. Thus, these results suggest that a belief that outcomes are determined by chance or luck does not, in itself, contribute to variability among Regularity scores.

Hypothesis 4(a) predicted that Well-Being scores would correlate significantly and negatively with the Rotter scale. The correlation found was not sufficient to reject the Null Hypothesis.

The Self-Management subscale was the only subscale to demonstrate significant correlations to all three locus of control measures. The stated purpose of the subscale is to assess the degree to which subjects perceive themselves as effective in reaching their goals. The concept of locus of control over outcomes is closer to this purpose than to that of any of the other HPQ scales. The consistency of the correlational findings with the conceptual relationships lends support to the construct validity of the HPQ scales and to the validity of the Self-Management scale, in particular.

The lack of a significant finding for the Rotter and Regularity subscales may be due to the possibly different meaning of a regular lifestyle for certain internals and externals. A predictable lifestyle may be an expression of the control some internals may want to have more generally over their lives, whereas the routine of a regular lifestyle may be perceived by some externals as imposed by external forces, or alternatively may be used as a buffer between themselves and what they see as an unpredictable world. Further research would be necessary to clarify this relationship.

The failure to find a significant relationship between Stressors and the Rotter scale may be in part due to differences in the stressors assessed by this subscale and the stressors found to be related to locus of control in

other research.

Limitations of the Study

Features of the subscales themselves may be partly responsible for several non-significant coefficients; for example, the relatively small number of items in the Fatalism and Well-Being subscales may result in attenuated coefficients simply because of their restricted range. The homogeneity among the sample tested in terms of variables such as age, education, and socioeconomic status could also obscure the relationships among subscales which might be found in a more heterogeneous group.

The study could have been more valuable were hypotheses to be generated about relationships to other factors found in the Rotter scale, possibly allowing for tests of discriminant as well as convergent validity (Campbell and Fiske, 1959).

The results of this study indicated significant gender and/or age differences on all of the HPQ measures. Further clarification of these relationships would be a useful goal of future research.

The results of this study demonstrate limited support for the construct validity of the Stressors, Self-Management, and Regularity subscales. For the Stressors and Self-Management subscales, cautious use of results of locus of control research in predicting adherence is supported.

Summary

Four subscales of the Health Perceptions Questionnaire (HPQ), a measure developed to predict adherence to medical regimens, were tested for construct validity. Higher scores on HPQ subscales were generally expected to correlate with greater internality on certain locus of control measures. The four HPQ subscales of Stressors, Self-Management, Regularity, and Well-Being were administered to a group of 159 undergraduate psychology students along with the Rotter Internal-External Locus of Control Scale, the Mirels Factor I (called Fatalism) of the Rotter scale, and the Self-Control subscale of the Reid-Ware Three-Factor Internal-External Scale. Pearson product moment correlations were calculated between the HPQ measures and the locus of control measures.

Significant correlations were found between Self-Management and the Rotter, Self-Control, and Fatalism measures; between Stressors and the Self-Control measure; and between Regularity and the Self-Control measure. The consistently significant relationship shown by the Self-Management subscale to locus of control scales was consonant with the intent of the subscale, which was to assess respondents' perceptions of effectiveness in reaching their goals. These findings support the cautious application of locus of control research to prediction of adherence with the Self-Management and Stressors subscales.

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Exploration of the bases for apparent differences in correlation coefficients related to gender and/or age would be a useful goal for future study. Administration to a group more representative of a normal population, at least in age range, would also be desirable. A third possible consideration for future research would be the inclusion of a wider variety of locus of control measures allowing for determination of discriminant as well as convergent validity for the HPQ subscales.

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Appendix A

Health Perceptions Questionnaire

We need your help in this effort by completing this questionnaire. You should read each short statement to yourself, decide whether the statement is true for you or not and check () your response. Your choices are (1) very much like me, (2) like me, (3) neutral, (4) unlike me, and (5) very much unlike me. Work quickly and check your first impression without taking time to ponder over each item. Answer all questions. Choose the answer that most closely matches your perceptions.

-
1. I think before I act.
 2. I'm healthy most of the time.
 3. Life is pretty much the same from week to week.
 4. It's hard for me to disappoint people.
 5. I keep wondering what will go wrong next.
 6. I schedule my time carefully.
 7. I enjoy routines.
 8. I want to feel more confident about my health.
 9. Disorganization bothers me.
 10. I envy people who are physically fit.
 11. I seldom miss a day of work.
 12. I seek variety.
 13. I like to stir up some excitement every now and then.
 14. I don't like surprises in my work.

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15. It's easy for me to gain weight.
16. Breaking bad habits is very very difficult for me.
17. I like a job that challenges me.
18. My life is predictable.
19. Even temporary setbacks are upsetting.
20. I like to please others around me.
21. I envy people who can eat all they want and not get fat.
22. I envy people with strong will power.
23. I regard myself as capable.
24. I can count on my family to help me stay healthy.
25. It's difficult for me to admit I've failed at something.
26. I generally have dinner by myself.
27. In our family, it's "everyone for himself."
28. When I hurry, I almost always make mistakes.
29. I would be surprised if my family helped me stay on a diet.
30. I like to work at my own pace.
31. If I have to eat by myself, I don't have much of an appetite.
32. Routines are not my "cup of tea."
33. I enjoy new challenges.
34. It's hard for me to accept compliments.

Next, you will find a list of phrases or words. Read

Health Perceptions Questionnaire

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each quickly and indicate by a check to what degree the phrase fits you. Your choices include (1) very much like me, (2) like me, (3) neutral, (4) unlike me and (5) very much unlike me.

-
- 35. Hard working.
 - 36. Eager for change.
 - 37. Easily upset.
 - 38. Work best alone.
 - 39. Long suffering.
 - 40. Seldom finish anything.
 - 41. Smile easily.
 - 42. Stable.
 - 43. Get things done.
 - 44. Adjust easily to changes.
 - 45. Conservative.
 - 46. Enthusiastic.
 - 47. Good-natured.
 - 48. Aggressive.
 - 49. Strive to please.

Note: The actual questionnaire had five boxes to the right of each statement, with each column of boxes headed by a response phrase. Subjects were asked to register their choices on a computer scoring sheet instead.

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