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Hocus-Pocus, the Focus Isn't Strictly on Locus: Rotter's Social Learning Theory Modified for Health[1]

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This paper shows how the author's original modification of Rotter's social learning theory (SLT) highlighting the construct of health locus of control beliefs is no longer adequate. It develops a new modification of SLT where the internal health locus of control beliefs moderate but do not mediate health-promoting behavior. It discusses the development and utility of global indicators of perceived control over health in preference to a strict focus on the locus *of the control.*

KEY WORDS: please provide key words.

Trying to understand why individuals engage, or fail to engage, in actions which promote or threaten their health status has long been of concern to health psychologists (Rodin & Salovey, 1989). Of all the complex determinants of health behavior, one's beliefs about one's health have received the greatest attention. And foremost among those beliefs have been cognitions regarding control over health (Wallston, 1989; Wallston, Wallston, Smith, & Dobbins, 1987). People's perceptions of control over their own health

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Job Title: CTR-2, Vol. 16, No. 2, Article #718
Original keyboarding: MTW/January 25, 1992
Makeup: MTW/January 27, 1992
Last revision: MTW/February 9, 1992

status, regardless of the truth of those perceptions, are generally believed to be major determinants not only of their health-related behavior, but, ultimately, of whether they stay healthy or become ill.

The focus of most of the work in perceived control of health has been on beliefs about the locus, or place, of that control. Within 10 years of the introduction of the construct locus of control (LOC) of reinforcements by Julian Rotter (1966), the I-E Scale — the instrument Rotter developed to assess internal vs. external (or I-E) LOC belief orientation — became one of the most frequently employed individual differences measures, being used in countless studies throughout the world (Rotter, 1990; Strickland, 1989). As Rotter (1975) himself pointed out some years later, many of the utilizers of the I-E Scale did so without taking into consideration all of the facets of his social learning theory (SLT; Rotter, 1954) which formed the conceptual basis for this highly popular construct. Particularly ignored was the fact that SLT is an expectancy-*value* theory, not simply a theory about expectancies. Most of the attention has been focused on one limited set of cognitions, one's LOC belief orientation, to the exclusion of the other components of the theory.

The basic proposition behind Rotter's (1954) version of SLT is that the potential for a person to engage in a set of functionally related behaviors in a given psychological situation is a joint function of (1) the person's expectancy that the behaviors will lead to a particular outcome in that situation and (2) the value of the outcome to the person in that situation. The language in that formulation is context-specific, but Rotter believed the theory could operate on at least two levels, only one of which was specific to a given situation. The other, broader level was one that could be generalized across situations, and contained such constructs as "need potential," "freedom of movement," and "need value." It was the introduction of LOC as a *generalized expectancy* that captured the imagination of researchers around the world. A generalized expectancy is something the person carries from one situation to the next. It is more trait-like than state-like and is therefore akin to a "personality" dimension.

It is noteworthy that Rotter chose *locus* of control as his first (and major) generalized expectancy construct. Given his proposition that expectancies linked actions to outcomes, he could just as easily have developed and/or advocated some other cognitive expectancy construct such as self-efficacy, mastery, or competence. There is nothing inherent in his basic SLT proposition that necessitated *locus* of control as opposed to *perception* of control to be the major generalized expectancy in SLT. In any case, the internal-external distinction struck the right responsive note for the times;

Job Title: CTR-2, Vol. 16, No. 2, Article #718
Original keyboarding: MTW/January 25, 1992
Makeup: MTW/January 27, 1992
Last revision: MTW/February 9, 1992

once having promulgated this dimension and having developed a scale to assess it, Rotter felt no need to develop other control expectancies and/or measures to assess them.[3]

My late colleague, Barbara Strudler Wallston, and I developed our first health locus of control (HLC) scale (Wallston, Wallston, Kaplan, & Maides, 1976) in an attempt to increase the predictability of the LOC construct in health-related situations. A stimulus for doing so was our recognition of the analogy between the emerging *zeitgeist* of "patients' being responsible for their own health" and the notion that people with an "internal" LOC orientation believed and acted as if their outcomes were contingent upon their actions. We were also guided by Rotter's assertion that, when the individual has experience with a given situation, situationally specific expectancies were more likely to predict behaviors specific to that situation than were generalized expectancies (Rotter, 1975). HLC beliefs were specific to the health domain, but not to any given health behavior. HLC beliefs were not thought to be as stable as more general LOC beliefs. Thus, we never conceived of HLC as an indicator of a personality trait; instead, one's HLC belief orientation was thought of as a disposition to act in a certain manner in health-related situations. This disposition could very well change with new experiences or with changes in the situation.

Part of the reason that the majority of LOC investigators carried out their studies without adherence to Rotter's SLT, I suspect, is that the I-E Scale, which assessed only expectancies, was almost never utilized by Rotter and his colleagues with a measure of reinforcement value. My colleagues and I were less guilty of this omission than most when we attempted to apply Rotter's SLT to the prediction of health behaviors utilizing our HLC Scale. We, at least, emphasized that the HLC measure was only to be utilized to predict the potential of an individual engaging in health behavior in conjunction with an assessment of the value of health to the individual.[4] Yet, neither Rotter nor we appreciated then what I believe now is an important truth: The construct of LOC plays a far less significant role in predicting health-directed behavior than does either health value by itself or other control-related expectancy constructs, such as self-efficacy (Bandura, 1977, 1982), mastery (Pearlin & Schooler, 1978), or perceived competence (Smith, Dobbins, & Wallston, in press).

[3]Rotter did develop one more generalized expectancy, interpersonal trust (Rotter, 1980), but this concept was unrelated to LOC.

[4]See Wallston, 1991, for a short, but cogent, explication of this point.

Job Title: CTR-2, Vol. 16, No. 2, Article #718
Original keyboarding: MTW/January 25, 1992
Makeup: MTW/January 27, 1992
Last revision: MTW/February 9, 1992

PURPOSE

One purpose of this article is to review some of the research that we and others have done over the years attempting to link HLC beliefs to measures of health behaviors in "healthy" samples (i.e., those who have not been selected for study because of a medical diagnosis). By doing so, I hope to demonstrate that, *even when one selects only those persons who value their health highly and even when the dependent variable is an* index *of health behaviors rather than a single behavior,* the amount of variance in health behavior explained by HLC beliefs is relatively small. A second purpose of this article is to emphasize that LOC only constitutes a relatively small portion of the larger and more important construct, perceived control over health (Wallston, et al., 1987). Finally, I will present a new, modified social learning formulation that salvages the notion of HLC by casting such beliefs as *moderators* of the relationship between other expectancy measures (e.g., efficacy beliefs[5]) and behavior potential much in the same way my associates and I argued in the past that health value moderated HLC beliefs.

MULTIDIMENSIONALITY OF HEALTH LOCUS OF CONTROL

Our first attempt at operationalizing HLC (Wallston, Wallston, et al., 1976) was an 11-item summated Likert scale consisting of five internally worded and six externally worded items. Following Rotter's lead, the HLC Scale was scored in such a manner that high scores represented an external orientation toward one's health status — particularly the belief that one's health status was due to fate, luck, or chance — and low scores represented an internal orientation. In our early studies using this unidimensional HLC Scale in conjunction with a measure of health value (HV), we showed that our health-related measure of generalized expectancy did a better job of predicting certain health-related behaviors/outcomes (e.g., information-seeking) than did the more generalized I-E Scale (Wallston, Wallston, et al., 1976; Wallston, Maides, & Wallston, 1976). In another study done by our students, Kaplan & Cowles (1976) showed that, while HV alone predicted which subjects would cut back on cigarette consumption, the combination of HV and internal health locus of control (IHLC) was the most predictive.

Since the late 1970s, we have written about the multidimensionality of HLC beliefs, demonstrating that not only were internal beliefs orthogo-

[5]This article will not attempt to make the definitive strong case for the importance of self-efficacy beliefs in the health domain. Such a case has been made by Bandura (1988); see, also, O'Leary's article in this volume.

Job Title: CTR-2, Vol. 16, No. 2, Article #718
Original keyboarding: MTW/January 25, 1992
Makeup: MTW/January 27, 1992
Last revision: MTW/February 9, 1992

nal to external beliefs, but external beliefs were made up of at least two dimensions, chance and powerful others (Wallston & Wallston, 1981; Wallston, Wallston, & DeVellis, 1978; Wallston, 1989). In fact, we no longer support the usage of our original, unidimensional HLC Scale, suggesting that investigators should employ the psychometrically superior multidimensional HLC (MHLC) Scale. In this article, however, I will concentrate primarily on the *internal* dimension of HLC — the belief that one's health status is affected by one's own behavior(s). I do so not only because it is easier (both for the author and the reader) to deal with only one dimension, but because: (1) it is the internal dimension (IHLC) that most people have in mind when they think that HLC predicts health behavior; (2) beliefs that powerful other persons influence one's health (PHLC) almost never correlate significantly with health behaviors in healthy people; and (3) beliefs that fate, luck or chance influence one's health (CHLC) are more appropriately conceived of as indicators of *a lack of perceived control than as an external* LOC dimension. Furthermore, even though chance HLC beliefs occasionally "significantly" predict health behaviors when internal HLC beliefs do not, the absolute difference in the magnitudes of the correlation coefficients are usually nonsignificant.

Actually, even the construct of internal HLC may be multidimensional. Marshall (in press) has shown that internality consists of at least four separate factors — illness prevention, illness management, self-blame, and self-mastery — and that it is only self-mastery (which refers to one's belief in one's physical capacity to actually obtain desired outcomes, a notion very similar to self-efficacy or perceived competence) which independently is related to physical health status. The implications of Marshall's work will become apparent later in this article.

SOCIAL LEARNING THEORY APPLIED TO HEALTH BEHAVIOR

The theoretical formulation that guided our work from its inception went as follows: the potential for an individual to engage in a set of health behaviors is a *multiplicative* function of (a) the degree to which the individual believes his or her actions will influence his or her health status, i.e., a belief in an internal health locus of control, and (b) the extent to which the individual values health (which we defined as "psychological and mental well-being"). In such a formulation, the value of health (HV) is conceived of as a moderator of the relationship between IHLC beliefs and health behaviors. Only if the person truly values health would the person's IHLC beliefs predict whether or not the person would engage in those actions which supposedly promote, enhance, or maintain health. HLC beliefs should be independent of (i.e., uncorrelated with) health behavior for

Job Title: CTR-2, Vol. 16, No. 2, Article #718
Original keyboarding: MTW/January 25, 1992
Makeup: MTW/January 27, 1992
Last revision: MTW/February 9, 1992

those with relatively "low" HV or those who value other things — e.g., an "exciting life" — more than they value health.[6]

We have referred elsewhere to this theoretical application as *modified social learning theory.*[7] Not only does it modify Rotter's SLT by being applied to the health domain, but it also explicitly states that values *moderate* the expectancy–behavior relationship. Therefore, if modified SLT were correct, one should expect interactions of IHLC and HV to be more predictive of health behavior than either HLC or HV alone. (Rotter's original formulation was not specific about whether expectancies and values were additive or multiplicative in their effect.) Also, although specific to health, IHLC and HV are still fairly generalized measures and should only properly be used to predict global indices of health behaviors (e.g., leading a healthy lifestyle) rather than specific behaviors such as smoking or exercise. In order to predict specific behaviors, one needs to supplement one's set of predictors with more behaviorally specific expectancies such as self-efficacy beliefs (Bandura, 1977, 1982) or other specific behavioral expectancies (e.g., Ajzen & Fishbein, 1980).

Our published reviews of the power of our modified SLT to predict specific health behaviors or even global indices of health behavior have been largely pessimistic (Wallston & Wallston, 1981, 1982, 1984). We felt that, even in the best of circumstances, IHLC and/or the interaction of IHLC and HV rarely explained more than 10% of the variance in the behavioral measure, and that this was not all that impressive. Nevertheless, our basic theoretical formulation has been endorsed and adopted by Rick Lau who, along with John Ware, is responsible for developing another multidimensional HLC scale (Lau & Ware, 1981). In a review of past research linking LOC/HLC measures to health behavior, Lau (1988) took us to task for our pessimism, stating that:

> . . . the Wallstons, with so much invested in the area, have expectations that are too high. Several times in their review of the literature, they discount theoretically consistent and statistically significant results because the amount of variance explained by health locus of control beliefs is small. (p. 47).

Lau (1988) then went on to present some of his own data from a longitudinal study of students at Carnegie-Mellon University in an attempt to show that our pessimism was unfounded. The *largest* correlation Lau presents, between his measure of "self-control over health" and a summary scale of health behaviors for females who highly value health, is .34.[8]

[6]See Smith and Wallston (in press) for a discussion of the relative value of health.
[7]See Wallston and Wallston, 1984, for a comparison of this theoretical framework with other social-psychological models of health behavior.
[8]To make his point, Lau (1988) resorts to the ploy of correcting this correlation for attenuation due to measurement error by factoring in the reliability coefficients of his measures. When

Job Title: CTR-2, Vol. 16, No. 2, Article #718
Original keyboarding: MTW/January 25, 1992
Makeup: MTW/January 27, 1992

In addition to predicting health behavior, we and others have examined the relationship between HLC beliefs and indicators of health status. Doing so, however, calls for an extension of SLT. SLT was developed by Rotter to predict behavior potential, not the outcomes of that behavior. A generalized expectancy such as IHLC will only predict health status to the extent that one's health status is, in fact, predictable from one's health behavior. Given the *at best* weak correlation between health behavior and health status (Kaplan, 1984), it is not too surprising when IHLC is even less predictive of health status than of health behavior. (When, as is sometimes the case in cross-sectional research, one finds a correlation between an index of health status and IHLC beliefs, one should always bear in mind the possibility that the IHLC beliefs are themselves partially determined by one's health status rather than the other way around. This more parsimonious explanation is totally in accord with SLT, which holds that one's expectancies are the products of one's past experiences, which would include one's appraisal of one's health status.)

THE SECONDARY ANALYSIS OF MHLC DATA PROJECT

Most of the studies using the MHLC Scale that I and my colleagues at Vanderbilt carried out were on small, convenience samples, as were the large majority of studies, done by others, that crossed our desk. We thought, perhaps, that our disappointment in the "failure" of the IHLC scale to perform up to our "high" expectations was a function of the adequacy of the datasets which heretofore had been analyzed, or, possibly, was due to the failure of other investigators to analyze fully or appropriately the data they had collected. We therefore began a project in which we invited other researchers who had utilized the MHLC Scale in relatively large samples to share their data with us in the hope that we might find something in their datasets that they had not yet uncovered. The results of this project to date have only reconfirmed our initial pessimistic impressions.

Health Locus of Control in New Jersey. The first "large-scale" dataset made available to us on this project came from Jeff Levy and Norman Lasser of the New Jersey College of Medicine and Dentistry. These investigators had studied approximately 660 employees of a Newark-based insurance company. Not only were there self-report measures of cardiac risk behaviors in their battery of questionnaires (along with the MHLC

he does so, the .34 correlation magically grows to .71, thus bolstering the coefficient of determination (r^2) to .50 instead of only .11. There is, however, great controversy over whether or not it is kosher to correct these correlations for attenuation (cf. Allen and Yen, 1979, pp. 98-99), and the practice is hardly normative in the field.

Job Title: CTR-2, Vol. 16, No. 2, Article #718
Original keyboarding: MTW/January 25, 1992
Makeup: MTW/January 27, 1992
Last revision: MTW/February 9, 1992

items), but the researchers also performed a physical exam on each of their subjects. This enabled us to examine correlations of IHLC beliefs with actual indicators of health status. There was not, however, any measure of health value in their dataset. After nearly a year of trying to wring some significance (statistical and/or clinical) out of their data, we reported back to Levy and Lasser that there was nothing much going on in their data that we hadn't seen before, and, when it came to linking the MHLC beliefs to the objective indices of health status, even less than what we were used to seeing. For instance, no linear combination of the three MHLC subscales accounted for more than 6% of the variance in self-reported health behavior, and the amount of variance explained in the health status measures was never higher than 2%.

Health Locus of Control in Wales. In 1985, under the auspices of a project entitled Heartbeat Wales directed by Professor John Catford of the University of Cardiff, a randomized sample of over 2,200 Welsh men and women completed the MHLC Scale as part of a larger battery of measures assessing their health status and practices. Through the generosity of Professor Catford and his colleague, Don Nutbeam, I obtained a tape of those data and, with the financial assistance of Vanderbilt's University Research Council, I set about trying to show that with a large enough dataset one could predict health behavior from MHLC scores and generalize those results to an entire country.

Unfortunately, the Heartbeat Wales dataset was also devoid of a "traditional" measure of health value. Nevertheless, there was one item that I felt could be used as a proxy for HV. Respondents were asked whether, in their opinion, the government of Wales spent too much money on prevention of heart disease, just the right amount of money, or not enough money. I reasoned that those who answered that "too much money was being spent on heart health in Wales" — less than 30% of the total — could be considered as placing a low value on health. These "low-HV" subjects were excluded from further correlational analyses.

The next thing that I did was to construct an index of health behavior from the many questions asked on the survey. Eventually, I developed an index of "poor health behavior" by adding one point for each of the following behaviors: smoking, drinking to excess,[9] eating improperly, not exercising, and not having had their blood pressure checked in over a year. Finally, I correlated this behavioral index with the MHLC scores for the 1,400+ persons who were left in the sample after the "low-HV" respondents were removed, and found that IHLC correlated −.02 with this index.

[9]This varied according to gender, but it is worth noting that the operational definition of excess in Wales is quite different than one would apply in the States!

Job Title: CTR-2, Vol. 16, No. 2, Article #718
Original keyboarding: MTW/January 25, 1992
Makeup: MTW/January 27, 1992
Last revision: MTW/February 9, 1992

At least the correlation was in the "right" direction! Actually, each of the two external MHLC scales correlated .13 with the index of poor health behavior, and .16 if one looks only at the 880 Welsh females in the sample. None of these correlations, however, exceeded that of a far less sophisticated, single-item measure which asked respondents whether or not there was anything they could do to lower their chances of a heart attack. This single item, which is similar to an assessment of self-efficacy, correlated −.12 for males and −.21 for females with the behavioral index.[10]

Health Locus of Control and the Navy. The largest and, in many ways, the best datasets that I have helped analyze as part of the secondary analysis project come from the Naval Health Research Center in San Diego, California. The person most responsible for obtaining, sharing, and analyzing these data has been Terry Conway, with whom I have been collaborating for the past several years. During this period, Terry and I have taken the approach that "with all these data around, there must be a pony!" We've yet to come up with more than a gelding or two, but we enjoy the process of collaboration so much that we persevere despite the paucity of dramatic results.

The first dataset Conway shared with me came from a study of male naval personnel who were aboard ships at the time they completed the MHLC and a variety of other measures. Conway used both forms A and B of the MHLC in this shipboard study. She also had a two-item measure of health value which she dichotomized in order to created "high" (n = 292) and "low" (n = 91) value groups. Also, although there were many potential measures of health behavior in this study, the one that produced the "best" results (i.e., the highest correlations with the MHLC Scale) was a 14-item measure called Health Hygiene.

The findings from this shipboard study did little to advance the cause of modified social learning theory. Forms A and B of the MHLC are supposed to be "equivalent," but they did not produce equivalent findings. Form A behaved somewhat as expected. IHLC for the high-health-value men correlated higher with health hygiene (r = .18) than did IHLC for the low-health-value men (r = .13). IHLC from form B, however, correlated more highly (r = .30) for the low-health-value men than for the high-health-value men (r = .15). All of these correlations were statistically significant, but none were worth writing home about.

Over the past four years, Conway has been conducting an annual evaluation of the Navy's Health and Physical Readiness Program. In this

[10]Because the internal consistency of this index was low, it is questionable as to what, exactly, is being assessed by such a summative index. Therefore, I also correlated each of the behaviors making up the index with each of the MHLC scales. None of these individual correlations exceeded .15.

Job Title: CTR-2, Vol. 16, No. 2, Article #718
Original keyboarding: MTW/January 25, 1992
Makeup: MTW/January 27, 1992
Last revision: MTW/February 9, 1992

evaluation, she studies random samples of naval personnel regardless of age, rank, gender, or shipboard status. Form B of the MHLC was included in all but the first of these annual surveys along with the two-item Likert measure of health value and a 10-item index of "wellness behaviors" (see Vickers, Conway, and Hervig, 1990, for a further description of this behavioral index). Only the findings from the first survey to contain the MHLC Scale will be presented here, although these findings have now been replicated over two successive independent waves. Also, although Conway and I have analyzed these data using both hierarchical multiple linear regressions and 3 × 3 analyses of variance (to examine possible nonlinearities), only the regression analyses will be presented here to enable the reader to compare these findings to others presented in this paper.

The bottom line to all of these analyses is that the measure of health value alone does as good a job of predicting wellness behavior (r = .45) as the interaction of IHLC and HV (r = .44) or IHLC alone (r = .25), and health value accounts for the lion's share of the linear combination of all three predictors (R^2 = .47). Admittedly, IHLC adds a significant 1.6% to the variance in wellness behaviors once health value is entered into the equation, but the interaction term, entered on the last step, only adds an insignificant 0.1% of the variance, again not a ringing endorsement for modified SLT.

What is even more damaging for IHLC's predictive validity is an analysis of this same dataset done by Conway and Vickers in conjunction with Paul Costa, the developer of the NEO personality inventory (NEO-PI) (Costa & McCrae, 1985). Although the NEO-PI was not administered to these subjects, an adjective checklist was. Costa determined which of these adjectives were consistent with the "Big 5" personality dimensions: neuroticism, extroversion, openness, agreeableness, and conscientiousness. This jerry-rigged measure of the five-factor model correlated as highly with the index of wellness behaviors as the more health-specific MHLC Scale, with extroversion and conscientiousness outperforming the IHLC. Health value, however, was still more predictive of wellness behavior than were the "personality" measures.

Health Locus of Control in the Workplace. In a recently published study, Nola Pender and her colleagues (Pender, Walker, Sechrist, & Frank-Stromborg, 1990) investigated the relationship between MHLC beliefs and the likelihood of engaging in health-promoting behaviors. All 589 of the subjects were participants in one of six Midwestern health-promotion programs located within their own companies. The likelihood of engaging in health-promoting behaviors was assessed at baseline and, again, 3 months later by the Health-Promoting Lifestyle Profile (HPLP; Walker, Sechrist, & Pender, 1987), a 48-item instrument "worded as positive actions or perceptions directed toward enhancing health and well-being" (Pender et al.,

Job Title: CTR-2, Vol. 16, No. 2, Article #718
Original keyboarding: MTW/January 25, 1992
Makeup: MTW/January 27, 1992
Last revision: MTW/February 9, 1992

1990, p. 328). The baseline measure of IHLC correlated .24 with the initial assessment of HPLP and .23 with the 3-month followup, but only the latter was significant in a hierarchical multiple regression after controlling for the constructs *definition of health, importance of health,*[11] and *health status,* as well as for the other two MHLC scales.[12]

IF NOT LOCUS, THEN WHAT?

The most significant finding from the Pender et al. (1990) study did not involve MHLC scores. The most highly significant predictor of HPLP in the entire study was another measure I had developed, one which Pender et al. refer to as "personal competence" or PC. This 8-item scale explained a far greater proportion of the variance in baseline and followup HPLP (simple r = .36 and .32, respectively) than did IHLC or any other single predictor, and, in fact, added significantly ($p < .001$) to the variance explained by the model after all of the other predictors were already in the equation.

Elsewhere I have referred to the construct being measured by the personal competence scale as "generalized self-efficacy" (Wallston, 1989) or, bowing to Bandura's preference that self-efficacy be reserved for highly behaviorally specific indices, "perceived competence" (Smith et al., in press). It is, in essence, a measure of a person's expectancy that he/she can effectively interact with his/her environment.[13] This type of generalized ex-

[11]Importance of health was operationalized the same way we typically operationalize HV (by a value ranking procedure), and was not a *significant* predictor, by itself, of HPLP ($r < .10$). Also, because Pender's health promotion model is additive instead of multiplicative, she did not examine the interaction between IHLC and HV.

[12]Pender et al.'s findings illustrate well a point I made earlier in this article: Although the beta weight for CHLC in the concurrent regression was significant (p = .002) while that for IHLC was not (p = .063), the simple r for CHLC (−.240) was almost the mirror image of that for IHLC (.238). Interestingly, and perhaps importantly, the beta weight for PHLC in the concurrent regression was the most highly significant ($p < .001$) of the three MHLC subscales, even though the simple r between PHLC and HPLP was "only" .065. In the prospective hierarchical regression, the betas for all three subscales were significant.

[13]Rodin and Salovey (1989) have pointed out that the field of health psychology continues to be plagued by the fact that scales that measure the same construct may be given different names, thus violating the requirements for discriminant validity. We make no special claims for the uniqueness of our perceived competence measure. The Generalized Expectancy for Success Scale (Fibel & Hale, 1978), which "was designed to assess an individual's expectation of positive outcomes across a range of behaviors" (Strickland, 1989, p. 3), as well as Pearlin and Schooler's (1978) Mastery Scale probably would perform in a similar manner to the original (i.e., non-health-related) version of our measure. However, a good case for the discriminant validity of perceived competence vs. a more generalized measure of self-esteem has been made (see Smith, Dobbins, & Wallston, in press), and, to my knowledge, there is nothing in the health domain quite comparable to our Perceived Health Competence measure.

Job Title: CTR-2, Vol. 16, No. 2, Article #718
Original keyboarding: MTW/January 25, 1992
Makeup: MTW/January 27, 1992
Last revision: MTW/February 9, 1992

pectancy combines a behavioral expectancy (e.g, "I am capable of doing the behavior") with an outcome expectancy (e.g., "The behavior will get me what I want") without the ambiguity inherent in *locus* of control. It is the kind of a measure that Rotter could have developed but did not.

One of my former students, Shelton Smith, changed the wording of the PC measure to make it health-related, thus creating a measure of "perceived health competence." These items, in turn, are the cornerstone of the "perceived control of health" component of the Health Hardiness Inventory which I and another one of my students, Deb Abraham, have been developing. Perceived control of health has some IHLC and CHLC items in it, but I believe that research will bear out that it is the perceived health competence items which carry the greatest predictive power. These days, when I am asked for advice by other researchers as to which measure they should employ to assess health control expectancies, I advise them to use one of these newer scales rather than the MHLC.[14] LOC is *part* of the larger, more important, construct, perceived control, but only a small part.

A MODIFICATION OF MODIFIED SOCIAL LEARNING THEORY

An internal HLC orientation is a necessary, but not a sufficient, condition for engaging in "proper" health behavior. One must believe, to at least some degree, that one's health status is dependent upon one's health behavior in order for one to act (assuming, of course, that one is motivated to do so by valuing the reinforcement that good health would bring). But just because the person values health and feels responsible for his/her health does not mean that the person feels capable of taking the right steps to control his/her health status. That is where perceived health competence (or perceived control over health) fits in beautifully.

The newly modified SLT is as simple as the original version, with the substitution of *perceived control* as the important generalized expectancy rather than simply *locus* of control. It is intended to be a rapproachment of two social learning theories, the one by Rotter and the one by Bandura.[15]

[14]The perceived competence measures and the Health Hardiness Inventory are as yet unpublished, but interested readers should write me for copies.

[15]Some might argue that there really is no need for a rapproachment. For instance, Kirsch (1985) contends that self-efficacy theory can be deduced from Rotter's SLT. Also, Bandura has softened his stand against the notion of a generalized sense of self-efficacy. Although he does contend that domain-linked measures of personal capability typically predict changes in functioning better than do general measures (see Bandura, 1988), a point earlier made by Rotter (1975), Bandura also states that use of domain-linked scales does not mean that there is no generality to perceived capability (see Bandura, 1989). Our Perceived Health Competence scale is both domain-linked and generalized across behaviors. Either by itself, or as part of the Health Hardiness Inventory, it ought to perform quite admirably within. modified SLT.

Job Title: CTR-2, Vol. 16, No. 2, Article #718
Original keyboarding: MTW/January 25, 1992
Makeup: MTW/January 27, 1992
Last revision: MTW/February 9, 1992

The health-related version of modified SLT states that the potential for an individual's engaging in a set of health-promoting behaviors is a function of the interaction of HV and perceived control over health. People must value health as an outcome, believe that their health actions influence their health status, *and concurrently* believe that they are capable of carrying out the necessary behaviors in order to have a high likelihood of engaging in a health-directed action. Furthermore, at any one point in time, individuals are faced with deciding among multiple potential behaviors, including *not* engaging in health-directed behavior. Depending on the expected outcomes for these other behaviors, and the value of these other outcomes, the behavior potential for an alternative behavior may be stronger than for the health-promoting behavior.

As with reinforcers in general, small but immediate consequences will overwhelm large but remote ones. Eating a banana split while watching TV will win out over taking a 30-min walk to decrease one's risk of a heart attack 99.44% of the time! Therefore, in order to understand and predict an individual's health behavior, one needs to attend to many more values than simply assessing the value of health (Smith & Wallston, in press). Also, it is important to recognize that there is a distinction to be made between health as a "terminal" value (i.e., an end in and of itself) and health as an "instrumental" value (i.e., a means to a different end).

Incorporating a more to-the-point indicator of expectation of control into Rotter's SLT, one more congruent with Bandura's version of SLT (or social cognitive theory, as he now refers to it; Bandura, 1986), is entirely in keeping with changes that have been made by two other popular health behavior theorists. Irwin Rosenstock has recently highlighted "self-efficacy" beliefs as part of the health belief model (Rosenstock, Strecher, & Becker, 1988), and Isek Ajzen has improved upon his (and Martin Fishbein's) theory of reasoned action by explicitly featuring perceived control as one of the major explanatory constructs in the theory of planned behavior (Ajzen & Timko, 1986).

IMPLICATIONS OF MODIFIED SLT FOR OTHER BEHAVIORS

This paper has concentrated on predicting healthy persons' health-promoting behaviors, but the theoretical framework is not restricted to that domain. It can, in fact, be easily applied to other phenomena of interest to health psychologists, such as illness behavior and/or sick-role behavior. An article by Kaplan, Atkins, and Reinsch (1984) focused on the relationship between behaviorally specific self-efficacy beliefs of chronic obstructive pulmonary disease patients and the degree to which the patients carried out their prescribed exercise behaviors. Hidden in that article, however,

Job Title: CTR-2, Vol. 16, No. 2, Article #718
Original keyboarding: MTW/January 25, 1992
Makeup: MTW/January 27, 1992
Last revision: MTW/February 9, 1992

and largely ignored by most who cite it as an example of the relationship between self-efficacy and health-related behaviors, is the fact that the mediational relationship only held for those who were internal in their HLC beliefs. For the "HLC externals," there was no mediational relationship between self-efficacy and exercise behavior. Thus, this pattern of findings is support for a moderational role for HLC beliefs.

For another example, take the (hypothetical) case of predicting adherence to the medical regimen for a group of insulin-dependent diabetics. Because their health status is compromised by their medical condition, it is probably safe to assume that the diabetics would highly value being healthy. Therefore, the cognitions which would be most operative in predicting adherence would mostly be perceptions of control. It is not, however, crucial, or even desirable, that the patient subscribe strictly to an internal locus of control orientation in order to adhere to the regimen; adherence might also follow the belief that one's health care providers control one's health (an external belief). As long as one has faith in one's health care providers, one would probably adhere to any regimen advocated by those providers. In fact, patients with chronic conditions such as diabetes might be most compliant if they entered into a partnership with their health care providers, a partnership which combines internal HLC beliefs with belief in control by powerful others (Wallston & Wallston, 1982).

The speed with which one seeks medical attention when one first notices symptoms indicative of a health problem is another type of behavior which might be better predicted by health value or by control expectancies other than locus of control. The more one values health, the more one should be motivated to do something about it when it is threatened. Also, the more one expects that one's health behaviors generally lead to favorable outcomes (which is what is being measured by the Perceived Health Competence Scale), the less reason to delay seeking definitive information. A person with an internal LOC orientation may partially blame him/herself for the symptom — thinking, perhaps, that it was something he/she did that was responsible for the onset of the symptom. This self-blame (which Marshall, in press, has shown to be one of the factors contributing to internality) may lead to avoidance and delay rather than to confrontation. (It is also possible that an overinflated sense of self-mastery could lead to greater delay, if the internally oriented individual thought he/she could handle the problem without help from others.)

In addition to modified SLT being used to predict illness and/or sick-role behaviors, it also has some implications for understanding adjustment to chronic illness. If one perceives one has control over one's disease, its symptoms, or treatment, one has a more positive emotional response (Affleck, Tennen, Pfeiffer, & Fifield, 1987). On the other hand, if actual

Job Title: CTR-2, Vol. 16, No. 2, Article #718
Original keyboarding: MTW/January 25, 1992
Makeup: MTW/January 27, 1992
Last revision: MTW/February 9, 1992

control over one's health is low, one might reduce one's dissonance and feelings of distress by lowering one's health value. Concluding that it is not all that important to be in good health when, in fact, there is little that one can do about one's health status is an instance of what Rothbaum, Weisz, and Snyder (1982) refer to as engaging in secondary control. Cognitive interventions with patients confronting chronic illnesses can focus on changing expectancies, values, or both.

Finally, there is no real reason why the modified SLT being proposed in this paper should be restricted to the domain of health. Just as I borrowed the theoretical constructs first put forth by Rotter to explain all of human behavior in order to better understand health behavior, it is possible that other-than-health psychologists might borrow back these constructs and apply them to other domains, particularly those areas traditionally of interest to clinical and counseling psychologists that have been virtually ignored by health psychologists (e.g., alcohol abuse). I suspect that one day I or someone else will write a sequel to this article entitled, "Hocus-pocus, the focus isn't strictly on health!"

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Job Title: CTR-2, Vol. 16, No. 2, Article #718
Original keyboarding: MTW/January 25, 1992
Makeup: MTW/January 27, 1992
Last revision: MTW/February 9, 1992