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The Common-Sense Model of Illness Representation: Theoretical and Practical Considerations

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This article focuses on several areas. After reviewing the most commonly used approaches in the study of health behaviors, (e.g., the medical model, the health belief model, and the theory of reasoned action) the common-sense model is presented as an alternative. By presenting evidence across a wide range of illness domains, we demonstrate the usefulness of the common-sense, self-regulatory approach. We then discuss the importance of the common-sense model for health research among minorities. We conclude the article with examples of the operationalization of illness representations in past research and directions for future research.

KEY WORDS: health behavior; cross-cultural research.

INTRODUCTION

Over the last two decades there have been significant changes in the way researchers and practitioners approach the study of health and illness behavior. Since Engel's (1977) call for an integrated bio-psycho-social approach, the outlook has changed from a disease-oriented medical model to theoretical conceptualizations that emphasize environmental factors as well as individual beliefs about health and illness. The self-regulatory framework developed by Leventhal and colleagues integrates these factors

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around a patient's common-sense representations of health and illness arguing that an individual's beliefs are major determinants of health behavior (e.g., Leventhal, 1970; Leventhal, Diefenbach, & Leventhal, 1992).

THE VALUE OF THEORY IN THE STUDY OF HEALTH BEHAVIOR

Individuals are capable of dealing, often automatically, with large amounts of information from varying sources, and it is easy for the researcher to become overwhelmed by the number of potential factors that might influence health-related evaluations and decisions. Consider the example of a woman who suddenly experiences a sharp pain in her abdomen. She will automatically localize the origin of the pain, although, depending of the quality of the discomfort, she might not be able to pinpoint its exact location. Next, she will try to establish the cause of her pain. Is it something she ate? Did she have the pain before? The answers to these questions determine what she will do next. For example, she might take some over-the-counter medications, call a friend for advice, seek professional care, or wait and see whether the pain will dissipate on its own. Cultural and social factors (e.g., "I can't get sick now") influence this evaluation process, as well as affective responses to the painful and threatening stimulus (e.g., "I'm afraid it might be cancer").

This example illustrates the multitude of information that needs to be considered when evaluating an unknown somatic symptom that ultimately might lead to the decision to seek care (Safer, Tharps, Jackson, & Leventhal, 1979). It also demonstrates the need for a theoretical framework that is capable of organizing information from multiple external and internal sources and that incorporates coping actions and appraisal. Although the need for theory has been recognized by researchers in the field and various attempts have been made to explain health behavior (e.g., Janz & Becker, 1984; Ajzen & Fishbein, 1988), none of these attempts integrate all important facets of health behavior.

The Medical Model

Medical science looks back on a long history and a list of unprecedented advances in the detection and treatment of diseases. The scientific view of disease that developed with the discovery of vaccines in the late eighteenth century and that slowly expanded over the next 100 years has shaped how medical practitioners treat their patients. Two important developments have influenced current thinking in medicine. First, the acceptance of germ theory as a causal explanation in the development of illness has reinforced a rather mechanistic view of the body as a complicated machine that can be repaired (i.e., treated) by applying the appropriate tools. Second, the technical aspects of medical science have often overshadowed the human side involved in treating patients. As a result, patients are often viewed as passive recipients (first of a disease-causing agent, then of medical treatment) rather than as active participants in the treatment process. The term "compliance" reflects this thinking quite aptly: it describes the expectation that a patient should follow a prescribed medical regimen almost blindly. Consequently, a patient's failure to comply is interpreted as a refusal to follow treatment orders and is seen as the patient's fault.

An emphasis on the technical side of medicine has blurred the distinction between *disease* and *illness*. A disease is characterized by a set of physical signs and symptoms. A physician can use these clusters to diagnose an underlying disease and prescribe an appropriate treatment. Illness, on the other hand, is the social definition of a disease. As such, illness emerges when practitioner and family agree that an individual is sick (i.e., becomes a patient), and is less clearly defined than disease. An illness might, but does not need to include all disease-specific signs and symptoms (Kleinman, 1988). For example, it is not uncommon for a person to feel ill and complain about symptoms without any physical signs of a disease. In these cases, the medical model is unable to provide explanations that satisfy either patient or practitioner. This points to the most obvious shortcoming of the medical model, which ignores the patient's psychological processes (cognitive and emotional) in the evaluation of symptoms and in a wide variety of treatment situations. When psychological factors are included in the diagnosis, it is usually in the form of personality factors (e.g., Type A personality, Neuroticism, or Extroversion) which are offered as explanations for the presence of the symptoms. The medical model treats psychological factors in the same way that it treats physiological and clinical variables (i.e., as a trait that is either present or absent), and ignores the processes that connect the trait to the behavior in question (e.g., compliance). Fortunately, these limitations of the medical model have been recognized, largely through advances in compliance/adherence research (e.g., Blackwell, 1992), and have led to the development of alternative theoretical approaches to the study of health behavior. These approaches will be discussed next.

The Health Belief Model

Social psychologists developed the Health Belief Model (HBM) in the 1950s and refined it in subsequent decades (see Rosenstock, 1974 for a historical overview of the HBM). The purpose of the HBM was to explain the determinants of health behavior. It was developed from the Lewinian tradition that postulates that behavior depends on (1) the value placed by an individual on a particular outcome, and (2) the individual's estimate of the likelihood that a given action will result in that outcome (Maiman & Becker, 1974). Translating these general ideas into the health domain yielded the more specific conceptualization of a desire to maintain health and avoid illness and the conviction that a given health behavior will avert or prevent illness.

Specifically, the HBM postulates that health behavior is a function of four factors: the perception of susceptibility to a health threat, the perception of its severity, and the perception of the benefits, costs and barriers for each of the members of a possible set of actions useful for avoiding or controlling the threat. Perceived susceptibility, the individual's feeling of vulnerability to a disease, and the perceived severity of the disease threat, which might include pain, disability, and social and economic consequences of the disease, are the source of motivation for action. They are not, however, sufficient for action: action will be carried out only if the individual perceives it as beneficial and worthwhile. However, the perceived costs and barriers to action can counteract and cancel the perceived benefits. For example, although the benefits of regular exercise are universally acknowledged, many barriers prevent people from exercising (e.g., it is time consuming or expensive, the gym is in an inconvenient location, and so forth). In addition to the aforementioned extrinsic barriers, there are intrinsic barriers to exercise as specific exercises can be difficult and painful to perform. According to the HBM, individual cognition involves a cost benefit analysis, the outcome of which can be the selection of one among several preventive or curative actions, or no action at all. Finally, a *cue* to action (e.g., a symptom, the illness of a friend, or a public health campaign) is necessary to activate the variables comprising the HBM model. Demographic, cultural, and personality variables also are moderating factors.

Empirical Support. The HBM has been used in a number of studies examining preventive health behavior (e.g., any behavior that the individual believes to prevent disease; Rosenstock, 1974), sick role behavior (e.g., seeking treatment; Becker, 1974), and behavior related to chronic illnesses (compliance with treatment; Kasl, 1974). Janz and Becker (1984) summarized the results of 29 studies that used the HBM in the decade between 1974–1984. The majority of these studies focused on preventive-health and sick-role behavior and included both retrospective and prospective designs. The findings of these studies suggested that perceived barriers was the one variable that was consistently and significantly related to both preventive health and sick-role behaviors. Not surprisingly, perceived susceptibility was more important for activating behaviors to prevent potential disease threats than for actions (that is, sick role behaviors) to adjust to existent illness. Perceived benefits of action influenced sick-role behavior more than it influenced preventive behaviors.

More recently, the HBM has been applied to a variety of different health-related issues, such as mammography use among women at risk for breast cancer (Stein, Fox, Murata, & Morisky, 1992), the decision to use amniocentesis among pregnant women (French, Kurczynski, Weaver, & Pituch, 1992) and HIV prevention among adolescents (Brown, DiClemente, & Reynolds, 1991). Further, the model has been applied to study children's health beliefs (Bush & Iannotti, 1990) and to predict compliance among adolescent diabetics (Bond, Aiken, & Somerville, 1992).

A prospective study by Hyman, Baker, Ephraim, Moadel, and Philip (1994) exemplifies an attempt to identify a parsimonious set of HBM variables to predict mammography use by women 35 years and older. The three HBM variables that were included in the study were perceived susceptibility to breast cancer, perceived barriers to treatment, and perceived benefits to mammography. In addition, the researchers controlled for four demographic variables (i.e., age, ethnicity, education, family breast cancer history). The sample consisted of 82 employees of a major hospital who were referred for mammography by their physicians. The specific goal of the study was to examine the relationships among HBM variables in three groups of women: (1) those who had a mammogram, (2) those who made an appointment that was never kept, (3) and those who never made an appointment. Multiple questionnaire items were used to assess perceptions of susceptibility, benefits, and barriers. Factor analyses confirmed the hypothesized 3-factor structure of the HBM variables. A discriminant analysis based on the three HBM variables and the demographic variables distinguished women who underwent mammography from those who did not. Ethnicity accounted for the largest portion of the variance followed by perceived benefits, family history of breast cancer, and perceived barriers. Contrary to previous research, a positive family history and being White were associated with noncompliance, and perceived susceptibility to cancer did not predict taking a mammogram. This study is interesting for two reasons. First, the researchers employed a parsimonious set of variables to assess the major dimensions of the HBM model, and second, external variables (i.e., ethnicity and family history) were stronger predictors of compliance/noncompliance than the HBM variables, demonstrating limitations in the usefulness of the latter.

Although there has been ample empirical support for the HBM (Janz & Becker, 1984), the model has been subjected to considerable criticism. First, although a core set of variables define the dimensions of the original

HBM, they are by no means uniformly operationalized across studies. Janz and Becker's (1984) call for a more consistent approach to scale construction does not seem to have deterred researchers from developing their own scales to measure the model's constructs. While this raises questions respecting the reliability and validity of specific measures and whether the different studies actually support a common, theoretical model, it may also reflect the fact that different questions are needed to assess the "same variable" for different situations and diseases. We will have more to say about this later on. Finally, while investigators have considered a number of moderator variables, these factors have not been systematically integrated into the model.

Third, the dimensions of the HBM are hypothesized to interact and to form a causal sequence from perceptions of threat through the evaluation of benefits and barriers to the selection and performance of a health behavior. We are unaware of studies, however, that test such a hypothesized structure of the HBM using a multivariate or structural modeling approach. Thus, we agree with Wallston and Wallston's (1984) assessment that "...at this point, the Health Belief Model is a catalogue of variables more than a model" (p.29).

In summary, the HBM was the first systematic approach to include psychological variables to explain health behavior. Although a large number of studies used the HBM, differences in operationalization of the model's core concepts and the inclusion of a variety of moderator variables make comparisons across studies difficult. In addition, the number of variables that have been suggested to test the key components of the model are so large that their inclusion in any one study is not feasible and thus makes an overall test of the entire model impossible. Finally, substantial reasons exist for doubting the utility of the model's basic variables: specifically, there is reason to question whether people think in probabilistic terms with regard to their vulnerability, or whether the various outcomes or severities should be integrated into a single, scalar variable.

Integrating the Social Context: The Theory of Reasoned Action/Planned Behavior

Based on the assumption that individuals are conscious of and consider the consequences of specific actions before acting, Ajzen and Fishbein (1980) proposed the "Theory of Reasoned Action," more recently renamed the "Theory of Planned Behavior"(Ajzen, 1991), as a model for the prediction of health actions. According to their formulation, behavior is a function of an intentional factor that is based upon both a personal or attitudinal factor and a social or normative factor. The personal factor is comprised of the individual's attitude toward the behavior (e.g., to quit smoking), or the values it promotes and those it deters. The social or normative component represents the individual's perception of the opinions held by important others about that behavior (e.g., all my friends are nonsmokers and will welcome my efforts to quit smoking). Note that the social norms that influence behavior via intentions are perceived social norms; that is, they do not need to represent a socially accepted standpoint. The personal and social components forming the intentional factor are weighted by the importance the person assigns to each component. For example, a person likely to stop smoking is one who values being healthy, who thinks smoking is bad and who seeks the opinion and support of his/her friends. However, the same person is less likely to quit smoking if she thinks her friends will not support her decision or if she places little value upon her friends.

In distinguishing between attitudinal and normative beliefs, the theory acknowledges the influence of social factors on a person's decision making, which, as seen in the above example, have the potential to be more powerful in determining intention and behavior than personal beliefs. Personality factors or demographic variables play a secondary role in the theory and are hypothesized to have only indirect effects on behavior via their influence on attitudinal and normative beliefs and intentions. Ajzen's (1988) revision of the theory, which he renamed the theory of planned behavior, added perceived control as a determinant of the connection of intention to action. As the model is focused on attitudes toward specific actions, Ajzen's concept of control is essentially equivalent to Bandura's (1977) notion of self-efficacy.

Empirical Support. Although the Theory of Reasoned Action/Planned Behavior was designed to predict behavior across various situations, it has mostly been applied to the health domain. For example, the theory has been used to predict medication compliance among hypertensive patients (Miller, Wikoff, & Hiatt, 1992), condom use among students (Kashima, Gallois, & McCamish, 1993), and condom use among female African Americans to reduce their risk of sexually transmitted HIV infection (Jemott & Jemott, 1991). It has also been used to explain nurse turnover (Prestholdt, Lane, & Matthews, 1987), and student nurses' attitudes toward their care of AIDS patients (Goldenberg & Laschinger, 1991).

A recent study by Brubaker and Wickersham (1990) illustrates the operationalization and the limitations of the Theory of Reasoned Action/Planned Behavior. The study predicted the willingness to perform testicular self-examination (TSE) among 232 male college students using the traditional variables of the model, including the recently proposed self-efficacy variable, plus two external variables, one assessing knowledge about TSE, and another assessing the effects of an intervention. The intervention involved placing posters in dormitories where half of the sample's students lived reminding students to perform TSE. A questionnaire assessed the core variables of the model, such as the intention and attitude to perform TSE in the next month, subjective norms (e.g., siblings, parents, doctors would support TSE), outcome beliefs (i.e., positive and negative outcomes of performing TSE weighted by an outcome value), and normative beliefs (i.e., the general endorsement of TSE by specific individuals or groups). Finally the questionnaire included a self-efficacy item that measured the subjects' confidence to perform TSE, and items assessing the students knowledge about TSE. Six weeks after the initial assessment subjects were asked whether they performed TSE during the past months and whether they had seen the posters.

The authors used regression analyses to predict the intention to perform TSE by attitude and subjective norm variables. Together, the two variables accounted for 39% of the variance, with the attitude variable making the greater contribution of the two. Adding the self-efficacy and the knowledge variables in the regression equation increased the variance accounted for in the intention response to 52%. Attitudes was still the strongest predictor of intention to perform TSE, followed by self-efficacy, external knowledge, and subjective norms. The strength of self-efficacy as the second strongest predictor and the significance of the knowledge score as a variable not included in the original model is surprising, indicating the importance of these variables for this particular threat and the actions to avoid it. The crucial test, however, was that relating intention to behavior, (in this case, reports of action) in the follow-up data collected 6 weeks later. Although 43% of the students reported having performed TSE, the correlation between the intention to perform TSE and reports of doing so was only moderate ($r = .30$), though statistically significant. The association of intention to reported action was higher for subjects exposed to the posters ($r = .48$) than for the non-exposed, control group ($r = .17$, not significant).

The study illustrates four important points: (1) it supports the theory's contention that behavior can be predicted, albeit modestly, by intention; (2) it demonstrates the importance of the attitudinal variable over the social norms variable as a determining factor of intentions; (3) it shows that self-efficacy is an important addition to the theory's framework; and (4) it suggests that future studies using the Theory of Planned Behavior should evaluate whether external variables affect behavior because they affect intentions or do so directly (i.e., without affecting intentions).

In summary, focusing on subjective and normative beliefs makes the theory of reasoned action/planned behavior appear parsimonious at least in comparison to the HBM. However, there are at least two reasons why this parsimony may be illusory. First, the assessment of subjective and normative beliefs is often difficult and time-consuming, since they have to be separately assessed for each behavior. Second, the model does not specify what values or beliefs are of particular relevance for the evaluation of health actions. Indeed, while the assessment process may reveal that a health action is performed for non-health rather than health reasons, this conceptual distinction is not part of the model. The model also ignores the environmental stimuli or cues to attitudes and actions. Thus, it does not help us to conceptualize the database that people use in recognizing the presence of a threat or the utility of an action to prevent it. Because it does not specifically conceptualize health variables, it omits the factors such as barriers to action, the variable found to be most predictive in the HBM. Such variables would only be included if they would arise during attitude assessment.

Self-Regulation and Common-Sense: The Individual as an Active Problem Solver

The common-sense model of illness representation emerged from a series of studies of fear communications which were conducted in the late 1960s by Leventhal and colleagues (Leventhal, 1970). In this extended series of studies, high fear messages were consistently more effective in changing attitudes toward a recommended health action in comparison to low fear messages. The change in attitude, however, was rather short-lived and did not exceed 24 to 48 hours after exposure to the fear message (Leventhal & Niles, 1965). More importantly, however, the data also showed that actions such as reducing and stopping smoking or getting tetanus inoculations occurred only when the participants exposed to the fear messages also received a second message which facilitated the development of an action plan (e.g., providing a leaflet with a map that depicts the central location of the Student Health Center on campus and lists its hours of operation); the proportion of people acting in response to the combination of action plan and fear message was virtually identical whether the fear message was strong (high fear) or mild. Neither the fear message alone (high or low), nor the action plan alone, resulted in action. As the combination of action plan and high or low fear message produced action over a period of days and sometimes weeks, and as subjective feelings of fear and fear induced attitude change faded within 48 hours, it became clear that the action plan was linked not to fear itself, but to some changed way of thinking about or representing the health threat. The realization that the representation of the health threat in combination with the action plan was the determining factor for subsequent coping actions led to studies designed to define the nature of this representation: the result was the common-sense model of illness representation (Leventhal, Meyer, & Nerenz, 1980).

The common-sense model conceptualizes the individual as a problem solver dealing with two phenomena: the perceived reality of the health threat and emotional reactions to this threat; the individual is engaged in parallel processing (see Fig. 1). Three central tenets underlie the model: (1) the individual is an active problem solver both seeking information and acting to test hypotheses about the meaning of his or her somatic sensations (symptoms) and physical condition and the relevance of these meanings to media and interpersonal messages about health risks; (2) the illness representation is the central cognitive construct that guides coping and the appraisal of action outcomes; (3) representations are highly individualized and may not be in accord with medical facts.

The Cognitive Level. According to the model, external and internal stimuli evoke illness representations when they come into contact with and are decoded by schematic structures of prior health and illness experiences. When the stimulus is an internal, somatic cue, its meaning or representation will depend upon its similarity to one or another schematic structure of a prior illness episode, or a schemata of an imagined disease, e.g., cancer. The matching process appears to revolve about five distinct attributes of illness representations: their identity, timeline, cause, controllability, and consequences. The *identity* attribute includes a disease label and the individual's ideas about the somatic representation of that disease (e.g., the location, extent, and feel, of its symptoms; Baumann, Cameron, Leventhal, & Zimmerman, 1989; Meyer, Leventhal, & Gutmann, 1985). The *timeline* connects the stimulus to an expected timeframe. It answers questions as to whether the stimulus is acute, chronic, or cyclic (e.g., if an abdominal/chest pain is acute and nonrecurrent, it can be labeled as gastric distress, if chronic, as a cardiac or gastric ulcer; Croyle, 1990). The *causal* attribute lends further definition to the stimulus: if it occurs after a heavy meal, the association will encourage a gastric meaning and label, if it occurs after intense physical activity, a cardiovascular label (Meyer *et al.*, 1985). The perceived *controllability* of the stimulus, its responsiveness to self and/or professional intervention, further defines its common-sense meaning and will have profound effects upon the emotional reactions accompanying it (Lau & Hartman, 1983). For example, if the stimulus consists of a cluster of symptoms, such as a sore throat, a runny nose, and a general feeling of malaise that is responsive to an over-the-counter treatment, a person would most likely identify it as a minor cold or flu rather than a severe, life-

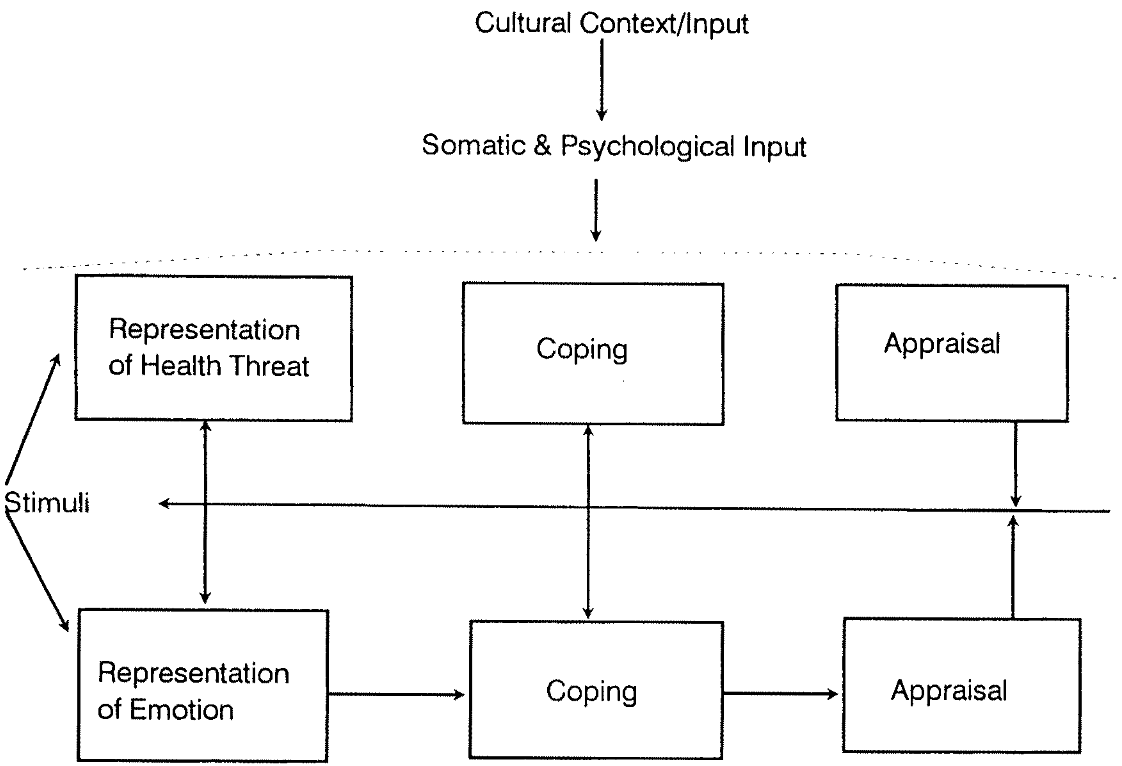

Fig. 1. The common-sense model of illness representation.

threatening bacterial infection. Finally, the representation will include a set of imagined *consequences* or anticipated repercussions (in terms of personal experiences, economic hardship, or emotional upheaval) of the stimulus or illness.

The categorization of a stimulus, that is its meaning, will shape the selection and performance of one or more coping procedures. A cold might be controlled by taking some decongestant pills, drinking lots of fluids, and by resting. Other more serious conditions might need professional attention. Finally, in the last stage of the information-processing chain, the progress of the coping actions is evaluated and compared with expected outcomes. This is expressed in questions, such as "Did the medications alleviate my symptoms?" and "Do I feel better now?" It is important to note that representation, coping and, appraisal stages are not unidirectional, that is, the information flow may occur from the bottom-up or the top-down (e.g., appraisal information updates the representational stages which might lead to new and different coping actions). For example, if a headache is not alleviated with a couple of aspirins, the initial self diagnosis of "headache" will be revised and an alternative explanation sought. This could encourage seeking social information such as asking family and friends whether they have experienced similar symptoms, or seeking professional help (Cameron, Leventhal, & Leventhal, 1993).

A similar process takes place when the eliciting stimulus is external. For example, a media campaign to encourage participation in screening for breast and or colon cancer, or the occurrence of cancer in a close family member or friend, will elicit representations of the particular type of cancer. These representations will be checked against the individual's sense of his or her physical health and somatic weaknesses and his or her awareness of somatic sensations indicating the possibility of illness, which will elicit worry about breast cancer (Easterling & Leventhal, 1989). Worry can stimulate preventive behavior if the representation of cancer is that it is preventable and treatable, and the procedures for cancer avoidance are perceived as relevant to its cause and available.

The Emotional Level. In parallel and in association with the cognitive activity just described, health-relevant stimuli also evoke emotional responses: for example, the cluster of symptoms labeled as flu might elicit feelings of depression, annoyance, or anger. Alternatively, a sudden sharp pain in the chest can be interpreted as a torn muscle, which is unpleasant, but not anxiety provoking, or as a precursor to a heart attack, which is threatening and highly anxiety provoking. Similarly, a man who detects a lump on his neck while shaving might examine the lump with little or no expression of emotion until he comes to the conclusion that it might be a cancerous tumor. The horror and dread of that realization will very likely lead to actions to reduce fear and his simultaneously activated representation of cancer; assumptions about the procedures to control and/or cure it will lead to action to definitively diagnose and to treat his cancer. Thus, coping actions are performed and appraised with respect to the emotional reactions elicited by an illness threat as well as by the cognitive activity generating the representations of the threat (see Leventhal, 1970, and Lazarus & Feldman, 1984 for the distinction between problem and emotion focused coping).

The Self and the Environment: Different Levels of Organization

The processes involved in representing a health threat, mounting a coping procedure to the threat, and experiencing and coping with emotional reactions to the threat, are at the interface connecting the individual to the environment; this is the domain of solving problems for avoiding and managing ongoing health threats. These cognitive and emotional processes do not occur, however, in a vacuum. Information is processed by an individual with a specific history, a set of personality dispositions or traits, and in an interpersonal, and cultural context. These factors impinge upon and moderate the problem-solving process.

The Individual Personal Context. Individual history can play a major and dramatic role in shaping the problem-solving process. Prior illnesses can generate memories which have a major impact on the representation of future somatic stimuli and can have powerful effects in shaping emotional responses and coping procedures. Moreover, these memory structures can operate automatically, creating experiences of dread and powerful emotional reactions without conscious participation. Striking examples of such memories have been recorded in the area of phantom pain, the vivid experience of the presence of amputated limbs complete with pain and its accompanying emotional distress (Leventhal & Everhart, 1979; Melzack, 1973). While infrequent, there is reason to believe that memory processes of this sort operate in a far broader spectrum of illness experiences and may play a role in a variety of somatic syndromes such as hypochondriasis, chronic fatigue syndrome, and sensitivity to environmental toxins.

In addition to illness history, an individual's somatic self provides a backdrop against which changes in somatic experiences are evaluated. The blemishes and aches and pains of daily living that comprise this backdrop becomes salient when the individual begins to struggle with the interpretation of ambiguous somatic changes and has difficulty determining if he or she is or is not experiencing something new or something that is a stable part of the self. This background is also visible when one compares somatic experience across age groups and discovers that individual's attempt to distinguish somatic sensations which are signs of aging versus those which are signs of illness (Keller, Leventhal, Prohaska, & Leventhal, 1989). In addition to providing a backdrop for comparison processes, the somatic self is also influenced by biological and genetic factors, as well as by psychological dispositions. Although biological and genetic characteristics are likely to determine the somatic functioning of the body and its susceptibility to disease, they influence illness representations only if they are salient and known to the individual. Thus, a susceptibility to cardiovascular disease based on family history will impact the illness representations and coping actions only after the individual has been made aware of its potential influence, (e.g., through the death of a close family member caused by a heart attack).

Finally, personality traits form a set of personal factors which differ across persons and may affect the way persons represent and cope with illness. While there has been much speculation about the influence of personality factors on the occurrence of disease, as seen in the many studies on the relationship of Type A behavior to cardiovascular disease (Glass, 1977; now changed to hostility and cynicism, Barefoot, Dahlstrom, & Williams, 1983), Type C personality on cancer (Temoshok, 1987), neuroticism (Costa & McCrae, 1985), or hardiness as a protective factor against disease (Kobasa, 1979), there has been less interest in the way personality traits affect the way people represent and cope with illness. One exception is the effect of neuroticism on symptom reporting, an exception with multiple demonstrations of the relationship between traits for the reporting of both negative affects and symptoms (Watson & Pennebaker, 1989). But while the data are consistent in showing a small positive relationship between reports of symptoms and reports of negative affect, the relationship appears to be a background phenomenon; that is, negative affect is related to usual reports of symptoms but seems to have far less effect in the report or interpretation of changes in somatic symptoms (Diefenbach, Leventhal, Leventhal, & Patrick-Miller, in press). Another possible effect is seen in data showing that emotional distress associated with chronic disease symptoms is greater among individuals prone to catastrophizing (Park, 1994), though it is unclear whether this ruminative, emotionally focused coping strategy should be regarded as a personality trait. In summary, although personality factors may have a modest effect on disease (Contrada, Leventhal, & O'Leary, 1990), we know relatively little as to how they affect the way people interpret and cope with somatic symptoms.

The Social and Cultural Context. Illness representations are influenced by the social and cultural context in which we live as much as they are a product of our own somatic and psychological experiences. The relationship between the beliefs we regard as unique to ourselves and cultural context becomes most apparent when we experience a culture other than our own. Kleinman (1980) provides a detailed description of the influence of Chinese culture on reporting symptoms and affects by citizens of Taiwan. Because psychological symptoms and the expression of negative affects such as depression are highly stigmatized in Chinese culture, individuals within this culture are less able to describe and communicate their emotional states in comparison to individuals from Western cultures. As a consequence, the Chinese emphasize physical and de-emphasize psychological symptoms when describing conditions that Western psychiatrists would label as states of depression or anxiety.

Kleinman (1980) describes the case of a woman who sought help for energy loss, late afternoon fatigue, headaches, and early rising without being able to go back to sleep. The symptoms began after her father forced her to break her engagement to an unsuitable man. After seeing Western- and Chinese-style doctors, who were both unable to alleviate her symptoms, she was referred to a psychiatric clinic. During the first sessions with the psychiatrist she denied that her family situation might have had anything to do with her "bad feelings." When asked to describe her "bad feelings" in greater detail she was unable to do so and preceded to complain about her physical symptoms. She explained that the best way of coping with her situation was to immerse herself in work, often to the point of total exhaustion. During those days she would come home late from work, eat dinner, and immediately go to sleep. Because she went to bed early she was unable to sleep through the night, woke up early, and was preoccupied with dysphoric affect and ruminative thought. To deal with her feelings she started her routine again by reading and working. As these occasions repeated themselves, she developed headaches that became so debilitating that she was unable to distract herself with work, exacerbating her negative affects. She was diagnosed as having a depressive episode and was given antidepressant medication.

This vignette makes several points about the influence of culture and the construction of illness representations. First, culture will determine which of many symptoms will be reported among those associated with a given disease. If somatic symptoms are more acceptable than psychological symptoms in a culture, the former will be incorporated in the illness representations and the latter will be excluded. Second, the symptomatic focus establishes expectations for treatment. Thus, when psychiatric conditions are somatized, patients expect a somatic treatment and will fail to recognize and seek treatment for the underlying psychological causes. The case illustrates how cultural context provides a framework for the individual construction of illness representations via shared common knowledge (e.g., which symptoms are "acceptable" and which are not) and underscores the importance of the cultural context as an influence on health and/or sick role behavior (Mechanic, 1978). This realization raises the following questions: (1) How do cultural representations develop? (2) How do researchers identify and assess cultural representations?

The Development of Cultural Representations

The difficulty of observing the development of culture-wide illness representations can be overcome by examining changes in the representation of a disease when it first appears in a community. Farmer and Good (1991) did just that when they described the changes and elaborations in illness narratives of the representation of AIDS among inhabitants of a small Haitian village over a time frame spanning several years. They analyzed a sequence of interviews of 20 villagers who were asked to describe what they know about AIDS, tuberculosis, and "bad blood." In 1983, when the interviews started, AIDS was a disease that the villagers had only heard of, but not had directly experienced. At this time, the interviews produced few consistencies among the villagers' reports about the disease; it was associated with the capital Port-au-Prince (e.g., "something that city people get"), homosexuality, and diarrhea. Villagers were not particularly interested in the disease, it was not a topic of naturally occurring conversations and only a few people thought of it as a lethal disease. Thus, before 1984, a collective representation of the disorder did not yet exist.

Three years later the picture had changed completely. Informants were quite willing to give their opinion about AIDS and there was more overlap between the different accounts. The illness and the death of the village's first AIDS victim, who died of tuberculosis, strongly influenced the illness narratives. It was now believed that AIDS was the result of a curse and sorcery, i.e., that it might be a "sent illness." The inclusion of a supernatural explanation in the illness representation was fostered by the personal circumstances of the village's AIDS victim: he was a popular member of the community who held three important positions in the village. It was believed that people who were jealous of his fortune cursed him and sent the disease. In addition to the supernatural explanation, villagers talked about contracting AIDS via transmission through germs and through sexual contacts with someone who has the germ. Attributions to homosexuality, prevalent in earlier accounts, were rarely mentioned, though strong associations were seen for AIDS with skin infections, diarrhea, and tuberculosis.

This study suggests that in its early phase, a collective representation can undergo radical changes with little agreement among the different accounts. With the accumulation of more information, the shared cultural knowledge consolidated and more agreement about the properties of the illness was achieved among the villagers. Such a consolidation process is often reinforced after a high-profile event is witnessed by a large part of the community (e.g., the death of the first well-known AIDS victim).

Procedures to Validate Common-Sense Illness Cognitions

As we assume that people are active problem solvers, it is incumbent upon us to identify the procedures they use to cope with illness threats. Because we have listened to our study participants rather than followed the usual, empirically-driven course of factor analyzing a set of investigator generated coping statements, we have discovered several procedures that people use to identify and more fully understand their conditions (Leventhal & Diefenbach, 1991). The questions people ask and the procedures they use to define or label an illness or symptom were the first discovered. Answers to questions such as "Am I ill?" or "I wonder what's wrong with me" have a clear influence on subsequent steps in the construction of the illness representation, including related emotional responses and the selection of more elaborate coping procedures. Over the years we have collected evidence for three "rules," or questions and associated procedures, that people use to specify the identity of symptoms and illnesses.

The Symmetry Rule. Our earliest childhood experiences teach us that being sick means not feeling well. This linkage is further reinforced by our experience with physicians who routinely probe for symptoms when we come in for treatment and use our symptom reports to help establish a diagnosis. It is therefore not surprising that we search for a label (i.e., a name) when we experience symptoms or *expect* to be symptomatic when being told by the doctor that we are ill. The latter part of the symptom–illness relationship was confirmed in a study examining compliance of hypertensive patients (Baumann & Leventhal, 1985) and in a laboratory study with undergraduate students who reported more symptoms (e.g., headaches, tenseness, a warm face) after they were led to believe that their blood pressure was elevated (Baumann *et al.*, 1989). We named this symptoms–illness relationship the *symmetry rule.*

Noncompliance with medication among hypertensive patients often effects their common-sense application of the symmetry rule. Meyer, Leventhal, and Gutmann (1985) found that 90% or more of hypertensive patients wrongfully believed that they could monitor their blood pressure using symptoms as indicators. In comparison to patients who did not believe that treatment improved their symptoms, those patients who believed their medication alleviated their hypertension symptoms were more compliant with medication; the result was better blood pressure control for the latter group. On the other hand, patients who had just started hypertension treatment were very likely to drop out in the following months if they believed their condition was symptomatic and communicated this belief to their doctors. As the belief is false and their physicians disagreed, the stage was set for non-overlapping views of the disease and its treatment.

The Stress-Illness Rule. The second, *stress-illness* rule, involves an answer to the question, “Am I sick or am I stressed?” Data show that the attribution of symptoms to a medical condition occurs when no stressful life-event is present in the environment; if a stressful event is present, the attribution moves toward stress and away from illness. The extent of the shift is moderated, however, by the type of symptoms: symptoms which are clear signs of disease or injury are not subject to stress attributions. In the first of two studies showing these effects, students were presented with a set of six symptoms (representing diabetes, mononucleosis, and an ambiguous symptom set) and asked to rate the likelihood that they would attribute the symptoms to stress or illness if they were to experience the symptoms the next day. Students were asked either the day before their midterm examination or on a Friday before a stress-free weekend. The results showed that students rated two of the symptom sets (the ambiguous and the diabetes set) as signs of stress when they completed the task the day before the midterm; the same symptoms were more likely to be attributed to illness when rated the day before the free weekend (Baumann *et al.*, 1989). The study confirmed the hypothesis that individuals incorporate information from their social context in constructing illness representations, often without being aware of it, and it also shows the limits of the attribution process; stress attributions did not take place for mononucleosis symptoms as students were familiar with this cluster.

The second study examining the stress/illness rule examined the effects of these attributions on seeking medical care; the data were from a longitudinal study of older adults, not a “make believe” or simulation with undergraduates (Cameron *et al.*, 1995). The 366 persons in this sample reported on their symptoms, life stressors, and care-seeking over a series of five interviews. One symptom report from each participant was evaluated as a clear sign of illness or a possible sign of psychophysiological distress: four internists did the evaluations. Life stressors were grouped as recent (new stressor in the past 3 weeks) or prolonged (ongoing for more than 3 weeks). The results showed that when symptoms were rated as clear signs of illness, virtually identical proportions (48%) of the participants sought health care whether they were experiencing a new, an old, or no stressful life-event. When symptoms were psychophysiological (i.e., ambiguous indicators of illness) and occurred in the context of a present life stressor, they were attributed to stress. If the stressor was recent, the proportion of participants seeking care (22%) for ambiguous symptoms was not significantly different from that for participants who were not experiencing stress (18%). Prolonged stressors, (i.e., events ongoing for more than 3 weeks), increased the rate of care seeking (40%): the combined emotional upset of symptoms on top of a chronic stressor, leads to care seeking, probably to ascertain that the prolonged stress has not finally led to illness.

The Age-Illness Rule. The third, *age-illness* rule for which substantial evidence exists, concerns the response to the question, "Is this symptom a sign of aging or an indication of illness." The normal aging process leads to a variety of physical changes (e.g., loss in visual acuity, hearing difficulties, loss in strength and endurance) and the distinction between aging vs. illness-related changes becomes more and more important as one ages. Data from patients seeking medical care (Prohaska, Keller, Leventhal, & Leventhal, 1987) demonstrated that care-seeking was unaffected by age attributions when symptoms were novel and sudden in onset. Symptoms that were familiar and gradual in onset were attributed to age and less likely to promote care seeking.

Interacting with the Environment. There is no reason to believe that the three rules outlined above are the only ones that influence the construction of illness representations, coping actions, and appraisals. Individuals rarely keep it to themselves when they experience symptoms and discomfort; rather, they interact with other people to exchange information about their condition, to have their initial hypotheses about the origin and likely causes confirmed or disconfirmed (Zola, 1973). For example, Croyle and Jemmott (1991) reviewed a number of studies demonstrating the effects of social information on perceptions of seriousness of a disease. Students rated a fictitious disease as less serious when tested "positive" for that disease compared to students who tested negative. Also, seriousness ratings were lower when several students at once were told that they had the disease compared to an experimental condition where one student was the only one testing positive among a group of negative testing students. Thus, seriousness ratings were clearly influenced by perceptions of prevalence and by social comparison processes (i.e., "it can't be serious if everybody has it and seems to be healthy").

Emotion and Emotion Control

Each point during the construction of illness representations offers a potential for the elicitation of affect. For example, symptoms of an impending flu can elicit worry and anxiety about unfinished work and deadlines that are in jeopardy, and feelings of anger and disbelief are regularly reported by patients after being diagnosed with cancer (Meyerowitz, 1983). Regardless of whether affect is an integral part of illness representations or whether it is an independent component that is elicited by cognitive aspects of the representation, emotion can function in two ways. On the one hand, the research on fear communication suggests that fear, in combination with an action plan, can motivate the individual to engage in health preventive behavior (Leventhal, 1970; Sutton, 1982). On the other hand, a sizeable literature on motivation for breast cancer screening suggests that fear of cancer and possible treatment options were powerful barriers to screening. French and colleagues reported that, although attenders and non-attenders of a breast-screening clinic were equally anxious about the screening procedure, non-attenders were more afraid of cancer being detected and significantly more often endorsed the statement that "one shouldn't go looking for trouble" (French, Porter, Robinson, McCallum Howie, & Roberts, 1982). Another study reported that 30% of women who were notified to undergo a mammography screening felt anxious after receiving the reminder letter (Dean, Roberts, French, & Robinson, 1986). The apparent inconsistency in these findings likely reflects a common, underlying theme: people act to avoid threats. If an action can serve to avoid threat (e.g., getting a tetanus or flu inoculation, quitting smoking), the stronger the threat the more likely the action will be taken. If an action moves toward an uncontrollable threat, however (e.g., getting a mammogram and finding an untreatable cancer), the stronger the threat, the less likely the action will be taken. It is not surprising, therefore, to find that the very same people will adopt one health promotive action (e.g., attempting to quit smoking) while avoiding another (e.g., taking a chest X-ray; Leventhal, 1970).

The picture is further complicated by age, as the influence of fear can change over the life-span. For example, a longitudinal study examined medical care seeking behavior among members of an HMO ranging in age from 45 to over 75 years. Analyses indicated that older adults, compared to younger patients, sought care more quickly for symptoms they regarded as potentially serious (Leventhal, Leventhal, Schaefer, & Easterling, 1993b). The middle-aged group reported that they avoided seeking care because they were concerned about what would be found; the older (65 and over) group rarely mentioned avoidant motivation. Older persons appear less willing to delay care seeking and appear to prefer to resolve uncertainty and worry and conserve energy, while younger subjects are willing to tolerate the stress of delay.

Given the influence of affective variables on health behavior, the lack of research examining the effects of these variables on the interpretation of symptoms and care seeking is surprising. Emotions can influence the construction of illness representation, inhibit or facilitate coping and affect appraisal in multiple ways. The common-sense framework acknowledges that emotions are an integral part of health decisions and is a platform for the investigation of their effects.

The Common-Sense Model and Research in a Multi-Cultural Context

It has become a truism that more research is needed that considers the values and life situations of ethnic minorities. Although an impressive amount of data has been collected showing differences in disease rates between ethnic and gender groups, we are more often than not left with the question of why these differences exist. None of the theoretical models, with the exception of the common-sense model, address the processes that are responsible for group differences. Thus, we have to go beyond assessing group differences and adopt a methodology that is capable of identifying *processes* that are responsible for these group differences. By focusing on the processes that construct cognitive and emotional responses and determine subsequent behaviors, we will not only detect individual and group differences, but also be able to evaluate the likely reasons for their presence.

We believe that differences among ethnic groups involve both conceptual and empirical issues. Researchers need to be sensitive to the nature of these differences, whether they are part of the personal, immediate social (e.g., family), or cultural context, and develop concepts and instruments for their assessment. An interesting challenge in this area has arisen in our own research with regard to the conceptualization of religious attitudes among elderly African Americans. Religious commitment is a multifaceted value system involving, at the very least, spiritual (e.g., belief in God) and community factors (e.g., church attendance and participation in church activities). While not specifically health beliefs, attitudes in both areas can affect the representation of health threats and the procedures for coping with such threats. Participation in church activities is clearly associated with frequent contacts with an active social network which can affect exposure to information and to individuals suffering from specific diseases. This can influence how these diseases are represented and the procedures selected for coping with them.

Conceptualization and assessment in the area or participation may not, however, require the same degree of attention to ethnic issues as the formulation of spirituality. Many of our elderly African American participants appear to believe that the occurrence of a serious, life threatening disease such as cancer reflects "God's will." "God's will" is not expressed, however, in the same way by all respondents. For some, the expression of "God's will" may indicate passive acceptance of fate and the absence of motivation for self-protective action. For others, "God's will" may be embedded in a system of beliefs encouraging protective action, a belief system that can be summarized by the saying, "God helps those who help themselves." As we were sensitized to this difference after completing over 20 interviews and did not conceptualize the difference at the outset, it was unclear whether we had questioned or probed sufficiently to reliably discriminate these two versions of spiritual commitment. Had we attended to our earlier recommendations for the assessment of illness cognition (Leventhal & Nerenz, 1985), as discussed in the following section, we might have avoided this dilemma.

The Assessment of Illness Representations

Earlier, we pointed out that the common-sense framework views the individual as an active problem solver who strives to assign meaning to a somatic sensation. This makes the identity attribute central to the construction of illness representations, but also emphasizes the importance of somatic sensations as a trigger for cognitive and emotional processing. For example, in their investigation of the relationship between hypertension, symptom report and adherence to medication and treatment, Meyer *et al.* (1985) assessed the "Identity" domain with the question "Do you think you can tell when your blood pressure is up?" and "How can you tell?" These questions go beyond the mere elicitation of a name for a condition, but attempt to tap into a perceived relationship between symptom reporting and illness.

If the illness domain in question is not defined, for example, the goal is to assess a tally of recent illnesses in a specified time-frame, one might ask whether the respondent can identify the condition (i.e., give it a name) and to list the symptoms that he or she experienced. We utilized this approach in an ongoing longitudinal study of elderly African-Americans who were asked about infectious and acute illnesses, the onset or flare-up of chronic conditions, as well as injuries and accidents. For example, for chronic illnesses, the question read "In the past month did you have the onset of a chronic condition, or the recurrence, worsening, or flare-up of an existing, chronic condition or health problem?" (Answer choices: Yes/No). If the respondent answered in the affirmative, we asked "Please tell us what recurrence or flare-up you have had most recently" and "What symptoms went along with it?" This approach is especially well suited if a complete picture of recent illnesses is desired. The information can be summed across domains to obtain a summary score of infectious and chronic illnesses and accidents. Depending on the research questions, the illness names can be further categorized into disease categories (e.g., heart disease, arthritis) areas of the body (e.g., gastrointestinal vs. joint/muscles), malignancy (malignant vs. nonmalignant), or infectious vs. noninfectious. The only drawback to this approach is that it is fairly labor intensive and time consuming. Questions assessing the second attribute, the "Timeline" dimension, are fairly similar across disease categories. Meyer *et al.* (1985) asked hypertensive patients "How long do you think it will take for the treatment to control your high blood pressure?" and "How long do you think you'll need to be on treatment?" Other questions might address an acute/chronic dimension by asking "Do you think this condition is something that will (1) go away, (2) you will have for the rest of your life, or (3) that periodically will come and go." Still another approach was used by Petrie and colleagues who developed the Illness Perception Questionnaire (IPQ) to assess illness representation among arthritis patients (Petrie & Weinman, 1994). They asked patients to agree or disagree with statements such as "My arthritis will last for a long/short time" or "My arthritis will improve with time."

The attribute "Cause" reflects the patient's view of what caused the illness. It can be asked as an open-ended question (e.g., "What do you think caused your *illness-name*?"; or "How do you think high blood pressure started in your case?"), or as a series of questions specifying the researcher's hypotheses about the causal nature of the illness. For example, to test a stress-illness or an aging-illness hypothesis one could ask "Do you think your *illness-name* was brought on by (1) stress; (2) by aging?"

The "Consequences" dimension is the fourth attribute defining illness representations. Petrie and Weinman (1994) included four questions to tap how arthritis affects the patients' life and his/her self-image. For example, the general influence of the illness onto the patient's life is represented with "I am aware of my illness all the time," "My illness has not had much effect on my life." The personal dimension is assessed with "My illness has strongly affected the way I see myself as a person."

Finally, the "Control" dimension indicates the beliefs about control and cure a person might have about his/her condition. Petrie and Weinman (1994) used five items to asses this dimension that ranged from beliefs about high internal or external control (e.g., "What I do will determine whether my illness gets better or worse"; "The course of my illness is largely dependent on fate or chance") to beliefs about the number of things one can do to control the disease (e.g., "There is a lot/very little which can be done to control my symptoms").

In general, the inclusion of open-ended questions in addition to a closed-ended format seems the best method to assess all possible dimensions of an illness-representation. However, we realize that an open-ended format is not always possible or that the time and labor requirements of such an approach can be unfeasible. As a compromise, it is always possible to use open-ended questions on a smaller sample and then convert the most frequent answers into a closed-ended format. In any case, one might consider to include one open-ended question to give the respondent the possibility to indicate responses that were not included in the closed-ended format.

CONCLUSIONS

We have presented three of the most widely used theoretical frameworks in health psychological research to explain health and illness behavior and contrasted it with the medical model. We consider the common-sense model of illness representation the model of choice, given the multiple sources of input and the various strands of information an individual considers and integrates before making a decision about his/her somatic and psychological state. We base our preference on the following 4 factors: (1) the common-sense approach is the only framework that places the illness representation into the center of those cognitive and emotional processes that are responsible for evaluating health and illness; (2) the dynamic framework of the model takes into account the changing nature of various inputs that allow for the *construction* of illness beliefs: (3) a growing body of evidence supports the common-sense approach across various illness domains; (4) the common-sense approach is valuable for testing theories about health and behavior, as well as for descriptive data collection.

It is worth emphasizing the last point. Suppose a researcher is interested in examining the relationship between health and religion. On the one hand the researcher can rely on such "hard" indicators of religiosity, such as frequency of church visits, attendance of bible study groups per month, engagement in prayer, etc. In this type of approach, an index of religiosity is derived by summing across all items, and this index is related to other indices of health and illness. Although one might obtain interesting associations between religiosity and health, this type of data is mute with regard to the underlying processes that might be responsible for such an association. An alternative and superior approach is suggested by testing different hypothetical relationships that might be responsible for the association between religiosity and health. For example, by using the common-sense framework, the researcher might ask respondents to indicate not only the frequency of engaging in religious activities, but also about the benefits of such behavior. One might test a hypothesis of benefits through social support derived from regular church attendance, that would not be expected among people who are religious, but do not engage in organized religious practices. One can easily see how such a theory-driven data collection approach yields more informative and powerful results than the first descriptive method.

In this context, another point that we made earlier is worth emphasizing: As long as enough under-represented groups are included in a study, the theory driven approach will not only be able to detect and test for group differences, but will also provide information about potential causal influences. Thus, "race" or "gender" are more than just discrete variables, they are windows through which we can examine different processes.

Where Do We Go from Here?

(a) Standardized Measures. We have given examples of questions that have been used successfully in past research to assess the different attributes of illness representations, however a standardized set of questions is still lacking. Petrie and colleagues have contributed a measure that should aid the assessment of illness representations among arthritis patients, and that easily can be adopted for other illnesses.

(b) Model Improvement. The common-sense model represents a framework to assess the influence of various internal and external variables on cognitive and emotional representations, coping, and appraisal. Future research could improve the model in several areas: (1) the interaction of emotional with cognitive factors needs to be delineated in more detail. Are illness representations truly separate from emotional factors, or are certain aspects fused together? (e.g., can the illness name "cancer" ever be emotionally neutral?). (2) The influence of the cultural environment in the construction of illness representations needs more attention. More work is needed to identify those illness representation attributes that are most susceptible to cultural influences, compared to somatic or personal experiences.

In sum, a process-oriented research approach, that includes common-sense representations of health and illness, will contribute to a deeper understanding of those factors that determine behavior and that are responsible for group and individual differences.

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