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Cognitive appraisals of rheumatoid arthritis

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City University of New York, 1989

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COGNITIVE APPRAISALS OF RHEUMATOID ARTHRITIS

by

KATHLEEN M. SCHIAFFINO

A dissertation submitted to the Graduate Faculty in Psychology in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York

1989

This manuscript has been read and accepted for the Graduate Faculty in Psychology in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

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Abstract

Cognitive Appraisals of Rheumatoid Arthritis

by

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This longitudinal study examines cognitive appraisals in adaptation to chronic illness in 101 recently diagnosed rheumatoid arthritis (RA) patients. Three theoretical models were compared, _self-efficacy_, _learned helplessness_, and _stress and coping_. Components of these three models were also considered within the broader framework of the cognitive representation of illness model. Data were collected at two points using a structured format. Primary and secondary appraisals, self-efficacy beliefs, and causal attributions of _diagnosis_ were assessed initially. One year later they were assessed with reference to a symptom _flare_, as were illness representations. Coping behavior, functional disability, depression and helplessness were assessed, as outcome variables, at both times.

Self-efficacy was consistently related to less helplessness and disability. This was true for diagnosis and flare, concurrently and over time, independent of level of pain. However, at high pain self-efficacy was related to higher depression a year later, suggesting that the benefits of self-efficacy deteriorate in the face of greater pain.

As predicted by the learned helplessness paradigm, internal, global, stable attributions were associated with greater depression, but only at high levels of pain or when the RA was seen as uncontrollable. However, the internal-external component alone was not related to outcomes. The importance of reporting component scores was thus noted.

For the stress and coping model, threat appraisals re: diagnosis were associated with less concurrent disability and reduced helplessness one year later, whereas threat appraisals of flare were related to greater depression. Change and challenge flare appraisals were associated with less helplessness and disability.

Relationships between appraisals of diagnosis and coping were weak. Conversely, flare appraisals were related to problem-solving coping, suggesting that people arrive at a plan of action regardless of appraisals.

The cognitive representations of illness model added two constructs - illness label and illness controllability. Ascribing to a label of RA as serious, painful, and disabling was associated with higher concurrent depression when pain was high. Belief in the controllability of RA was associated with lower helplessness. The implications of these findings for intervention and research are discussed.

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Cognitive Appraisals Of Rheumatoid Arthritis

Introduction

Rheumatoid arthritis (RA) is a chronic illness of unknown cause which affects approximately 1% of the population (Masi & Medsger, 1979). This illness occurs most commonly in women (75% of cases) and between the ages of 20 and 50. However, older men are affected at about the same rate as older women; among patients with severe disease the ratio is also about equal (Anderson et al., 1985).

RA is characterized by joint inflammation and a variety of systemic changes that result in chronic pain and physical limitations. In some cases, a diagnosis of RA will occur quickly following the rapid onset of severe symptoms; more typically, symptoms develop slowly and a firm diagnosis will not be made for months or years. The course of this illness varies greatly, with a strong tendency toward spontaneous remissions and exacerbations (Genest, 1983).

An individual diagnosed as having rheumatoid arthritis is faced with a continual process of adjusting to this chronic illness and its impact on his or her life. The patient's first task may be tolerating an extended period of uncertainty and confusion during the time it takes to confirm a diagnosis. Thereafter, the individual will need to appraise the implications of this illness for his or her immediate functioning, i.e., How will this affect my life? Will I be able to continue to function in my job?

Finally, the patient may only gradually begin to understand that this is a chronic illness with problems which will sometimes get better and sometimes get worse, but will never go away. It is this need to deal continually not only with symptoms, but also with the unpredictability of their occurrence and severity, which makes RA so stressful. However, it is this same unpredictability, uncertainty and apparent lack of control over a long period of time which makes this illness particularly relevant to the study of coping·behavior.

Most theoretical models acknowledge that the coping process involves a cognitive appraisal of the stressor in question (Bandura, 1986; Flor & Turk, 1987; Folkman & Lazarus, 1985; Smith et al., 1988). Appraisal informs and directs the coping behaviors that follow. Coping research has, however, given only cursory attention to this appraisal process; rather, the focus of research has been on the enumeration of coping behaviors and the discovery of relationships between these behaviors and various outcomes.

In recent studies of coping with chronic illness, three theoretical models have been used to consider the role of cognitions in adjustment to illness. The <u>stress and coping model</u> (Folkman et al., 1986; Lazarus & Folkman, 1984) begins with a primary appraisal of an event in terms of an assessment of harm/loss, threat, or challenge, followed by a secondary appraisal of one's coping resources and the initiation of coping efforts. The <u>self-efficacy model</u> (Bandura et al., 1977; Lorig et al., 1989; Turk et al.,

1983) emphasizes the individual's assessment of his or her ability to influence the outcome as the key component of successful management of illness. For example, through patient education interventions, increased self-efficacy beliefs have been linked to decreased pain among RA patients (O'Leary et al., 1989). Finally, the _learned helplessness model_ has posited that the attributions of causality that follow the perception of objective non-contingency of an event are the primary determinants of successful coping on the one hand, or helplessness and depression on the other (Abramson et al., 1978; Bradley, 1985).

All three of these models have been applied to the study of adjustment to rheumatoid arthritis (Affleck, Pfeiffer, Tennen, & Fifield, 1987; Dobbins & Wallston, 1987; Regan, Lorig & Thoresen, 1988). They have not, however, been considered in terms of their relative ability to predict functional and psychological outcomes.

This dissertation study will (1) consider the ability of these three models to explain functional and psychological adjustment to RA, and (2) identify empirically any overlap or contradiction among the models. In addition, (3) the _cognitive repr_ [illegible] _of illness model_ (Nerenz & Leventhal, 1983) will be proposed as providing an alternate theoretical framework for a study of the cognitive appraisal of chronic illness. This model considers the way in which the patient is defining the illness, its symptoms and its impact on his or her life. The perceptions and interpretations upon which the illness representation is based reflect the private experiences, communications with others, and overarching cultural beliefs which contribute to the patient's understanding of the illness experience. It is this illness representation which guides coping efforts and influences global well-being.

Coping and Adaptation

The diagnosis of chronic illness carries with it the threat of long-term impact on the life of the patient and on the lives of the people with whom the patient is involved. The stress of this event can be either heightened or minimized by various aspects of the patient's social and psychological environment.

Recent psychological research has demonstrated considerable interest in the process of coping with illness (Felton & Revenson, 1984; Folkman & Lazarus, 1985; Rosentiel & Keefe, 1983; Suls & Fletcher, 1985). This research, however, has often used the concepts of coping, adjustment, adaptation and mastery somewhat interchangeably and without adequate definition.

White (1974) defines adaptation as that which is "done by living systems in interaction with their environments" (p. 52). Within this on-going process of adaptation, the individual secures information from the environment and assesses this information in terms of its potential benefit or harm to the individual; adaptive behavior will sometimes involve seeking more information and sometimes will consist of attempts to cut down on information input. White defines coping as the organism's response to "...a fairly drastic change or problem that defies familiar ways of behaving, requires the production of new behavior, and very likely gives rise to uncomfortable affects like anxiety, despair, guilt, shame or grief, the relief of which forms part of the needed adaptation. Coping refers to adaptation under relatively difficult conditions" (pp. 48-49).

Murphy (1974) defines coping as any attempt to master a new situation which is potentially threatening, frustrating, challenging, or gratifying, focusing less on the negative aspects of the situation and suggesting that there may be a need to cope with "good" problems, as well. Above coping, in the adaptive hierarchy, Murphy places mastery which results from effective and well-practiced coping efforts. This in turn leads to the sense of competence which accompanies the collection of skills resulting from cumulative mastery achievements.

The person-environment fit model (French, Rodgers & Cobb, 1974) defines adjustment as goodness of fit between the characteristics of the person and the properties or demands of the environment. This model has particular relevance for much contemporary coping research which emphasizes the transactional nature of successful coping, i.e., the continual process of exchange and accommodation which occurs between the individual and his or her environment (Lazarus & Folkman, 1984). This interactive approach introduces the possibility that successful adaptation may sometimes depend on behavior which is not under the direct control of the individual. There are occasions when the most adaptive alternative is to accept the fact that someone else is in a better position to resolve a problem (e.g., turning to one's doctor for treatment of a broken arm would be more adaptive than staying home and treating the break by oneself).

The question of the location of control over adaptive behaviors and outcomes has generated a separate but related body of research. Although this control literature does not constitute a theory of adaptation, it has received considerable attention in studies of health beliefs and coping with health threats.

The Importance of Control for Adaptation

According to Thompson (1981), control can be defined as the belief that one has at one's disposal a response that can influence the aversiveness of an event. More specifically, the individual has recourse to three types of control: behavioral control, aimed at regulating the occurrence of some stimulus or modifying the stimulus in some fashion; cognitive control, including information-seeking and appraisals of the stimulus; and, decisional control or choosing among several courses of action (Averill, 1973). Thompson (1981), Michela (1986), and others have reviewed a considerable body of research aimed at demonstrating the contributions of behavioral control and cognitive control to successful coping. Much of this research is retrospective or cross-sectional and, therefore, limited in its ability to establish causal relationships. Nevertheless, it is generally agreed that perceptions of control are important to adaptation. Control provides the individual with information about the self. Individuals need a sense of mastery and personal competence (deCharms, 1968) and they experience arousal and negative affect (reactance) when their freedom to act is threatened (Brehm, 1966).

Control also informs future outcomes. Miller has proposed a minimax hypothesis (Miller, 1979) in which having control in a situation means being able to minimize maximum future danger. In some situations, people will prefer no control if control in the hands of another is seen as minimizing danger. Minimax captures one important dimension of control - the meaning of the event for the individual. The meaning assigned to misfortune determines reactions to it and ability to cope (Bulman & Wortman, 1977). The minimax hypothesis brings with it an assurance that one will not face an event that is beyond the limits of endurance.

The social learning analyses of Rotter (1966) and others gave rise to the concept of generalized expectancies for internal versus external locus of control of reinforcement. This formed the basis of the construct of multidimensional health locus of control (MHLC), which refers to general beliefs about control over health outcomes (Wallston & Wallston, 1982). The scale developed to measure this construct includes a subscale measuring health internality and two subscales assessing external control of health outcomes: the Powerful Others scales assesses the belief that one's health is dependent upon other powerful persons, i.e., health professionals; the Chance scale measures the belief that one's health is mostly a matter of fate, luck, or chance.

A variety of studies done using the MHLC scales have found that the powerful other scale is generally less predictive than the chance or internal scales when the behavior in question is preventive health behavior by healthy persons; however, when medical compliance is examined in a chronic disease population, the powerful others scale is the only one to have predictive validity across studies (Wallston et al., 1987).

With this general orientation to the constructs of coping and adaptation, and the complex ways in which perceptions of control interact with coping efforts and adaptive behavior, it is possible to review more specifically the stress and coping model, self-efficacy model, and learned helplessness model, giving special attention to the components of these models which involve the construct of appraisal.

The Stress and Coping Model

Lazarus defines coping as the problem-solving efforts made by an individual when the demands faced are highly relevant to his or her welfare and when these demands tax adaptive resources (Lazarus & Folkman, 1984). Coping represents a transaction between an individual and the environment and cannot be assessed or evaluated without regard to environmental demands. The appraisal of a stressful event, such as the diagnosis of chronic illness, involves an initial assessment of the harm or loss which has already resulted from the event, an assessment of the threat of future harm, and the perception of the event as a potentially challenging opportunity to grow as a result of successfully mastering the experience. This primary appraisal is then followed by a secondary appraisal of the coping options or resources available to the individual and then by the initiation of coping efforts (Figure 1). This model of the coping process acknowledges the centrality of the individual's cognitive appraisal of the stressful encounter and provides a framework within which to consider the complexities of these cognitive appraisals. Elaborations of the appraisal process, however, have been largely theoretical thus far.

In one study, Folkman and Lazarus (1980) asked healthy adults to name a problem situation, and to then appraise that problem as one which either could be changed or must be accepted. Appraisals were found to be strongly related to coping choices. Problems which must be accepted were related to the use of emotion-focused coping strategies -- behaviors aimed at the regulation of emotions or distress, e.g., "looking for the silver lining," "accepting sympathy and understanding from someone," or "trying to forget the whole thing." Problems that respondents felt could be changed were related to instrumental coping -- behaviors aimed at the management of the problem causing distress,

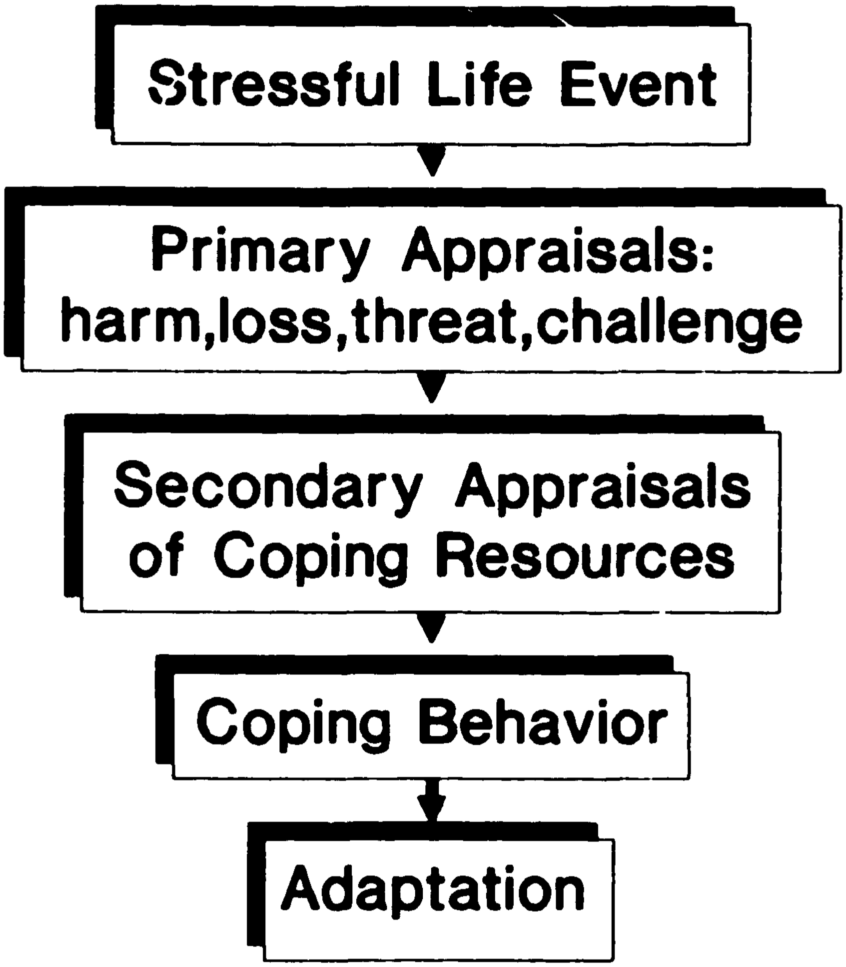


Figure 1. Stress and Coping Model

e.g. "made a plan of action and followed it," or "stood your ground and fought for what you wanted." Moreover, emotion-focused coping was more likely to be used for health problems, especially when the problem was perceived as uncontrollable (Folkman & Lazarus, 1980).

A recent longitudinal study of the coping process more systematically assessed the appraisal process (Folkman et al., 1986a, 1986b). Seventy-five couples were interviewed in their home once a month for six months; subjects were asked about the most stressful encounter which they had experienced during the previous week. Information was gathered concerning the primary and secondary appraisal of the incident, coping processes used, outcome of the incident, somatic health status and psychological symptoms. Patterns of appraisal and coping did not appear to be stable over time (Folkman et al., 1986a); they conclude that this finding reflects, in part, the sensitivity of appraisals to conditions in the environment. Only modest and negative relations among appraisal, coping, and somatic health status were reported, indicating that the more subjects appraised a situation as being one in which they had something at stake, and the more they tried to cope, the poorer their somatic health status was at month six. When subjects felt that a lot was at stake in a given situation, they were also more likely to report psychological symptoms. More specifically, primary appraisals of threat concerning physical health were associated with greater use of the coping strategies of support seeking and escape-avoidance (Folkman et al., 1986b); encounters which were appraised as having to be accepted were associated with the coping behaviors of distancing and escape-avoidance. Overall, the relation between primary appraisal and outcome was weak. The relation between secondary appraisal and outcomes was stronger: encounters which were successfully resolved were related to secondary appraisals that the situation could be changed; encounters which were not successfully resolved were related to secondary appraisals that one would have to hold back from acting.

The stress and coping model has been applied to the study of both osteoarthritis and rheumatoid arthritis (Felton, Revenson & Hinrichsen, 1984; Felton & Revenson, 1984; Parker, McRae, Smarr, Beck, Frank, Anderson & Walker, 1988; Regan, Lorig & Thoresen, 1988; Revenson & Felton, 1989). Regan et al. report that the use of problem-solving coping by osteoarthritis patients was associated with higher levels of pain and that primary appraisals of harm/loss were associated with dependent coping, high pain and high depression. Parker et al. assessed the coping behavior of a predominantly male group of RA patients and found that the use of cognitive restructuring to cope with the pain of RA was associated with lower levels of depression, whereas the use of wish-fulfilling fantasy and self-blame were related to higher depression levels. Felton et al. (1984) found that RA patients used emotion-focused coping strategies to a greater extent than do patients with other chronic illnesses (hypertension, diabetes and cancer), and that this emotion focused coping was associated with poorer illness adjustment and greater negative affect (Felton et al., 1984; Felton & Revenson, 1984). In addition, they have noted that the effects of coping behavior in response to chronic illnesses have tended to be relatively small.

The Self-efficacy Model

Self-efficacy refers to personal judgments of how well one can organize and implement patterns of behavior in situations that may contain novel, unpredictable and stressful elements (Schunk & Carbonari, 1984). Bandura (1977) has distinguished between outcome expectations and efficacy expectations (Figure 2). Outcome expectations refer to the belief by the individual that the performance of a given behavior will result in a given outcome. Efficacy expectations concern the belief by a given individual that he or she will be able to perform the required behavior if so motivated to do so. According to this theory, people learn the extent of their self-efficacy through personal and vicarious experience.

Self-efficacy approaches do not address the cognitive appraisal of a specific environmental event which precipitates evaluations of self-efficacy. Rather, perceptions of self-efficacy seem to be similar to what Lazarus and Folkman have termed "secondary appraisal", i.e., appraisal of the coping resources available to the individual in the face of some stressful event (Strecher et al., 1986).

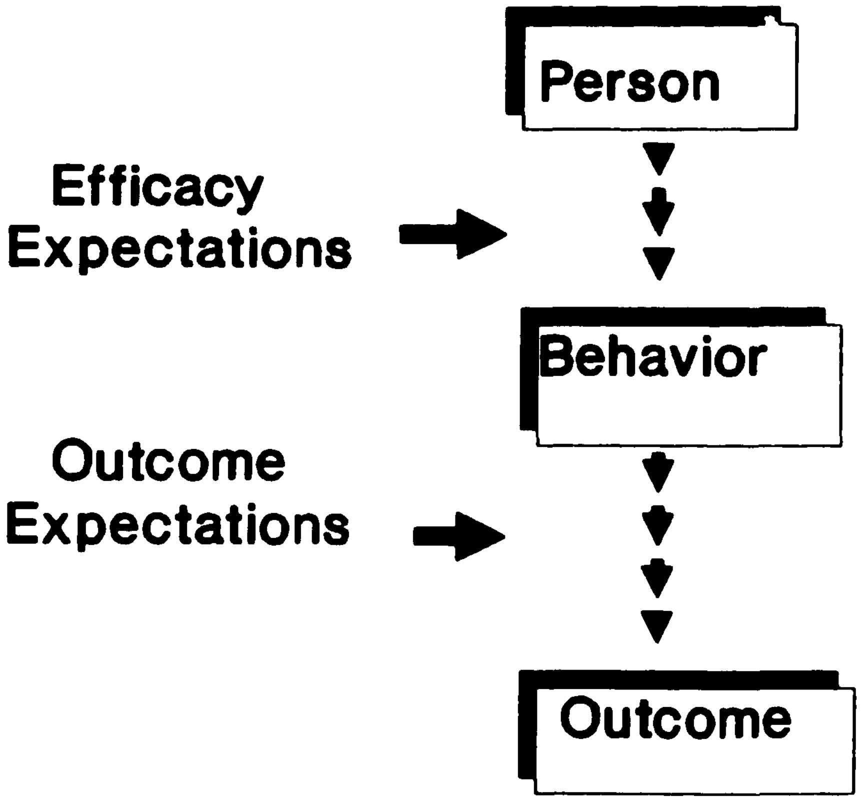


Figure 2. The Self-Efficacy Model

Perceived self-efficacy also should not be confused with locus of control (Bandura, 1977). An internal locus of control can interact in a variety of ways with self-efficacy and behavior. For example, an individual who normally experiences outcomes as being under his or her control and then confronts a situation in which he or she lacks the skills to perform the needed behavior might reasonably be expected to experience low self-efficacy. Perceived locus of control refers to a relatively stable belief in one's ability to influence outcomes in a variety of circumstances. In contrast, the concept of self-efficacy relates tc beliefs about capabilities of performing specific behaviors in particular situations. Furthermore, self-efficacy does not refer to a personality characteristic or a global trait that operates independently of contextual factors (Strecher et al., 1986).

However, perceived control over a specific behavioral outcome (as opposed to global perceptions of cognitive control, for example) is conceptually similar to perceived self-efficacy and the two concepts have been used together in the literature (Wallston et al., 1987). Turk, Meichenbaum and Genest (1983) describe their efforts to assess self-efficacy to manage pain as part of a multidimensional treatment program. In describing this work elsewhere (1984), they refer to perceived control as a cognitive factor mediating pain and depression.

Investigators at the Stanford Arthritis Center have been assessing self-efficacy in arthritis patients as part of the Arthritis Self-Management Program (Lorig, Laurin & Gines, 1984; O'Leary, 1984; O'Leary, Shoor, & Lorig, 1989; Shoor & Holman, 1984). This community-based program uses lay leaders (also arthritis patients) to provide group instruction on arthritic diseases, nutrition, relaxation methods, exercise, joint protection and arthritis medications; participants are grouped by illness. Lenker, Lorig and Gallagher (1984) interviewed previous participants in this program and found two factors that distinguished those whose health status had since improved from those whose health had not: an enhanced sense of control over their disease as a result of the course; and, increased positive affect. The authors conclude that persons who feel in control of their arthritis feel self-efficacious in carrying out the self-management techniques that work for them. These investigators have since found that self-efficacy is positively related to psychological adjustment, less pain, and seeing RA as a challenge, independent of changes in behavior (O'Leary, et al., 1989).

It is important to distinguish between efficacy expectations for future outcomes and the causal attributions which individuals make for outcomes which have occurred. In the self-efficacy model, causal attributions are one source of efficacy information (Bandura, 1977). It has been suggested that self-efficacy beliefs are closely related to attributions to ability, an internal and stable cause (Schunk & Carbonari, 1984). However, perceived self-efficacy can be influenced by nonability factors, as well.

"Persons who view themselves as possessing the ability to succeed in some area may nevertheless not feel efficacious if they believe that a great deal of effort is required. Many diets are broken not because individuals lack the ability to restrict their caloric intake but because they no longer wish to exert the requisite effort" (Schunk & Carbonari, 1984, p. 233).

The Learned Helplessness Model

According to Seligman's reformulated learned helplessness model (Abramson et al., 1978), the causal attributions which follow upon the perception of noncontingency (that is, the recognition that an event has occurred independently of one's actions) are the primary determinants of successful coping on the one hand or helplessness and depression on the other (Figure 3). Applying the learned helplessness literature to RA, Bradley (1985) noted the particular relevance of the learned helplessness model for understanding the impact of rheumatoid arthritis. RA is characterized by noncontingency or the absence of any apparent relationship between a given behavior and a resulting outcome. While several etiologic mechanisms have been proposed, the cause of RA is still unknown. Endocrine, metabolic and nutritional factors have been considered; geographic, occupational, and other demographic variables have also been studied with no convincing success. "More promising lines of research have concentrated on possible infectious agents that may initiate the immunologic process involved in disease manifestations

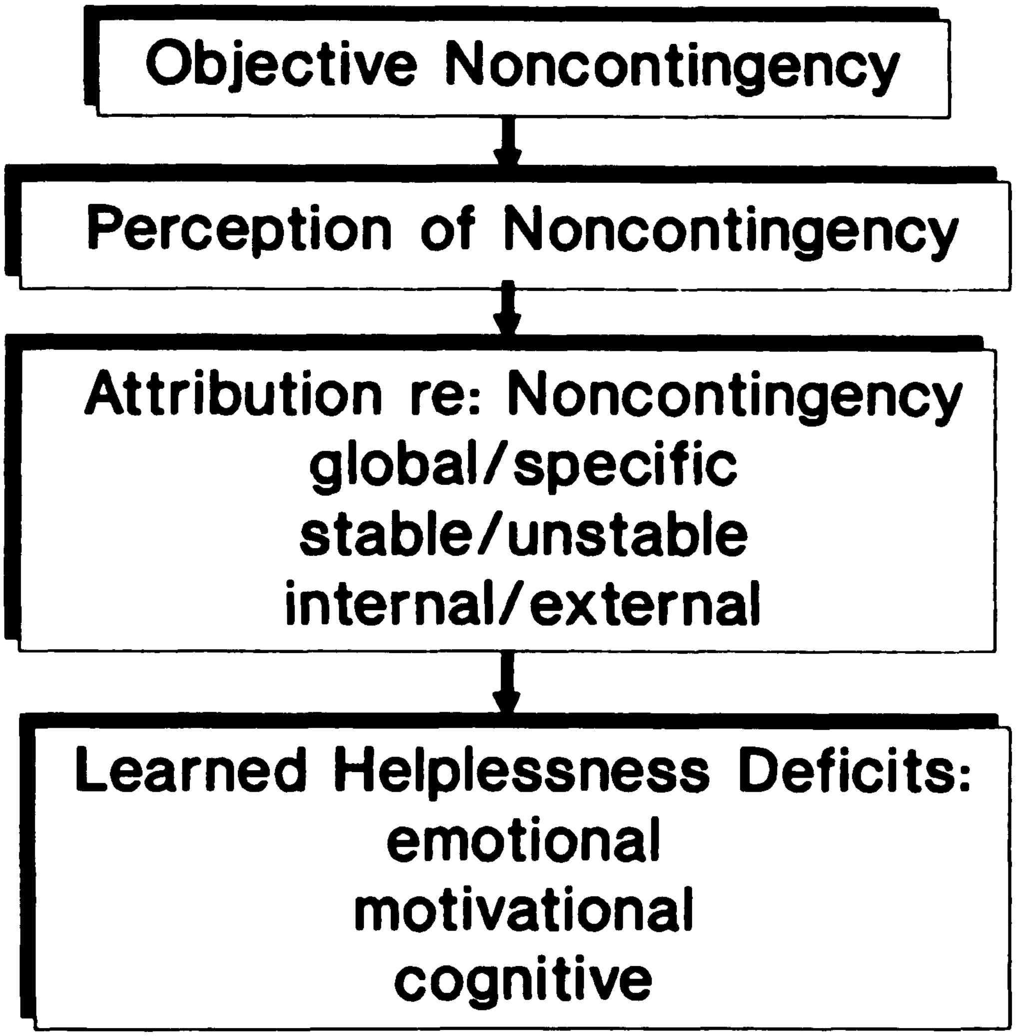


Figure 3. Learned Helplessness Model

and on host genetic factors that may play a role in this process" (Anderson et al., 1985, p. 359). Similarly, the course and prognosis of RA are unknown and unpredictable. Thus, the nature of the illness satisfies the first condition of the Learned Helplessness Model: perceptions of noncontingency.

An outcome of depression following upon an appraisal of noncontingency is also consistent with the learned helplessness model. RA patients display higher than normal levels of depression when tested on a number of instruments (Anderson et al., 1985; Crown & Crown, 1973; Liang et al., 1984; Meyerowitz, 1968; Moos & Solomon, 1964). For example, one study which included an appropriate control group of patients with noninflammatory rheumatic disorders found significant depression in 46% of RA patients as compared with 19% of the controls (Zaphiroporelos & Burry, 1974, cited in Anderson et al., 1986). This evidence is even more convincing as depression was assessed using the Beck Depression Inventory with items assessing physical symptoms common to arthritis (e.g., fatigue, weight loss) removed.

The reformulated Learned Helplessness Model also holds that objective noncontingency (such as the unexpected occurrence of a chronic illness like RA) must be followed by perception of this noncontingency by the individual in question <u>and</u> attribution of the cause for this noncontingency to an internal, global and stable cause ("it's something about me that made me get this illness"). Only then should individuals demonstrate an increased likelihood to expect noncontingency in future events and to display the symptoms of helplessness, i.e., depression.

Outside the Learned Helplessness Model, the role of causal attributions in predicting adjustment has been studied in reference to illness (Taylor et al., 1984) and accidents (Bulman & Wortman, 1977) and to other areas, e.g. achievement behavior (Weiner, 1974) and loneliness (Peplau et al., 1979). Considerable evidence exists that individuals do make attributions about the causes of their illnesses or accidents (Bulman & Wortman, 1977; Taylor et al., 1984; Timko & Bulman, 1985). The relationship between these attributions and successful adaptation is mixed. While internal, or self-blaming, attributions are sometimes associated with depression and poorer physical outcomes, internal attributions have also been found to be associated with successful adjustment (e.g., Bulman & Wortman's finding that accident victims with spinal cord injuries who felt responsible for their accident tended to cope with their situation better).

Several problems can be identified in the application of attribution theory, in general, and the Learned Helplessness Model, in particular, to RA. If RA is a classic example of noncontingency, why is it that <u>all</u> patients do not demonstrate helplessness, as the model would predict? Do they not perceive the noncontingency or do they acknowledge and then successfully adjust despite it? Can we be sure that the depression which is observed results from the causal attribution made? Might it not, instead, be a reaction to chronic pain, as argued by Turk and his associates (1983)? Peplau et al. (1979) raise the important issue of distinguishing between attributions of control over the precipitating event (in this case, the occurrence of illness) versus control over "maintenance" factors (i.e., management of symptoms). Are causal attributions made in response to specific events, as suggested by the reformulated model (Abramson et al., 1978), or is there a characteristic attributional style, as suggested by Peterson & Seligman (1986), with which people tend to respond across a variety of negative events? Finally, do people make causal attributions following a diagnosis of RA? If not, the learned helplessness model as applied to arthritis falls into serious question.

Comparison of the models within an integrative framework

Having briefly reviewed the three models under consideration, one can begin to consider their similarities and differences in terms of the larger context of adaptation to chronic illness. The models will be compared at four points in the adaptational process: (1) when the patient learns the diagnosis and attempts to understand this event and its meaning for his or her life; (2) during the assessment of coping options available to the individual; (3) at the initiation of coping efforts; and (4) at the point where the preceding steps result in some outcome regarding the patient's physical and psychological functioning. While this discussion will approach the process in a linear fashion, "beginning" with appraisals at the time of diagnosis and "ending" with some measure of adaptive outcome at a later point in time, it should be remembered that this process of coping and adaptation is, in fact, continual, involving frequent reappraisals and also involving coping behavior which changes over time as the demands of the illness and its treatment change.

Appraisals at the time of diagnosis. Both the stress and coping model and the learned helplessness model begin with appraisals of the event in question, i.e., the diagnosis of chronic illness. The stress and coping model begins with the patient asking "How will this event affect me?" According to the theory, this question may be answered in terms of the objective or tangible consequences of the event (i.e., that it will result in harm and/or loss) or in terms of the individual's emotional response to the event (i.e., that it will be experienced as threatening or challenging).

The learned helplessness model begins with the perception that something has occurred over which you had no control. It then moves quickly to ask "why" the uncontrollable event has happened and focuses on the answer to this question as the primary determinant of future outcome. Neither the stress and coping model nor the self-efficacy model ask "why?". In fact, self-efficacy theories do not address the appraisal of the event at all.

Assessment of coping options. Efficacy theories move directly to the assessment of coping options, that is, the assessment of one's ability to act in such a way as to produce the desired outcome. This assessment of self-efficacy is made in terms of a specific behavior which needs to be performed in order to achieve a specific outcome.

The stress and coping model suggests that, after primary appraisal, the individual identifies coping options which he/she may or may not perceive as being available and relevant to addressing the outcome in question. For example, the individual may assess the situation as being one which he or she has the resources to change, or one for which they can/should mobilize their support network. The decisions the individual makes in reference to these coping options will guide the coping behaviors which are initiated.

According to the learned helplessness model, an internal, stable, global attribution will result in depression, decreased motivation to act on the situation and decreased belief that one has the ability to act. Thus, the motivational and cognitive deficits are comparable to reduced efficacy expectations and to an assessment that one has no coping options; the emotional deficit of depression fits more appropriately in the "outcome" component of this schema.

Coping behavior. In the self-efficacy model, the behavior which results when the individual believes him or herself able to influence an outcome would constitute coping. For example, a patient who participates in a self-management course for arthritis patients and comes to believe they have the ability to control their pain will be more likely to actually do the relaxation exercises they have been taught to reduce vulnerability to pain (Lorig, Laurin & Gines, 1984).

The stress and coping model has been most thoroughly tested vis-a-vis coping behavior. On-going study of the behaviors performed by individuals in the face of a stressful life event has resulted in a number of coping checklists assessing a broad range of cognitive and behavioral strategies people use to manage stressful demands (Felton, Revenson & Hinrichsen, 1984; Folkman & Lazarus, 1980; Stone & Neale, 1984).

The attributions made as part of the learned helplessness model will either lead to effective coping or will lead to a decreased likelihood that coping behavior will be initiated at all.

Outcome. The stress and coping approach defines outcome in terms of successful adaptation, but does not define a priori what successful adaptation is. Instead, adaptive outcomes are defined in terms of the stressor in question. For RA, successful adaptation is generally defined in terms of general psychological status and symptom management; defining adaptation as "cure" or "remission" would not be appropriate, given the nature of the illness.

Self-efficacy interventions designed for RA patients and pain patients have specific outcomes targeted: e.g. symptom management, pain reduction. These interventions are less likely to focus on levels of depression as an appropriate outcome measure.

The emotional, cognitive and motivational deficits implied in the phrase "learned helplessness" are this model's outcome.

Figure 4 presents a summary of these relationships across the four points in the process: at diagnosis when attempts are made to understand this event; during the assessment of coping options available to the individual; at the initiation of coping behavior; and, at the point where the preceding steps result in some outcome regarding the patient's physical and psychological functioning.

Upon review of the three models which have been described, the following impressions emerge. Whereas the stress and coping model describes the process of coping and has contributed empirically to our understanding of relationships between modes of coping and psychological outcomes, limited progress has been made in clarifying the relationship between appraisals and outcome (e.g., Regan, Lorig & Thoresen, 1988). Only recently has the Lazarus group attempted to assess this relationship, using a healthy population; while some association was found between primary appraisals and psychological symptoms, the case for physical

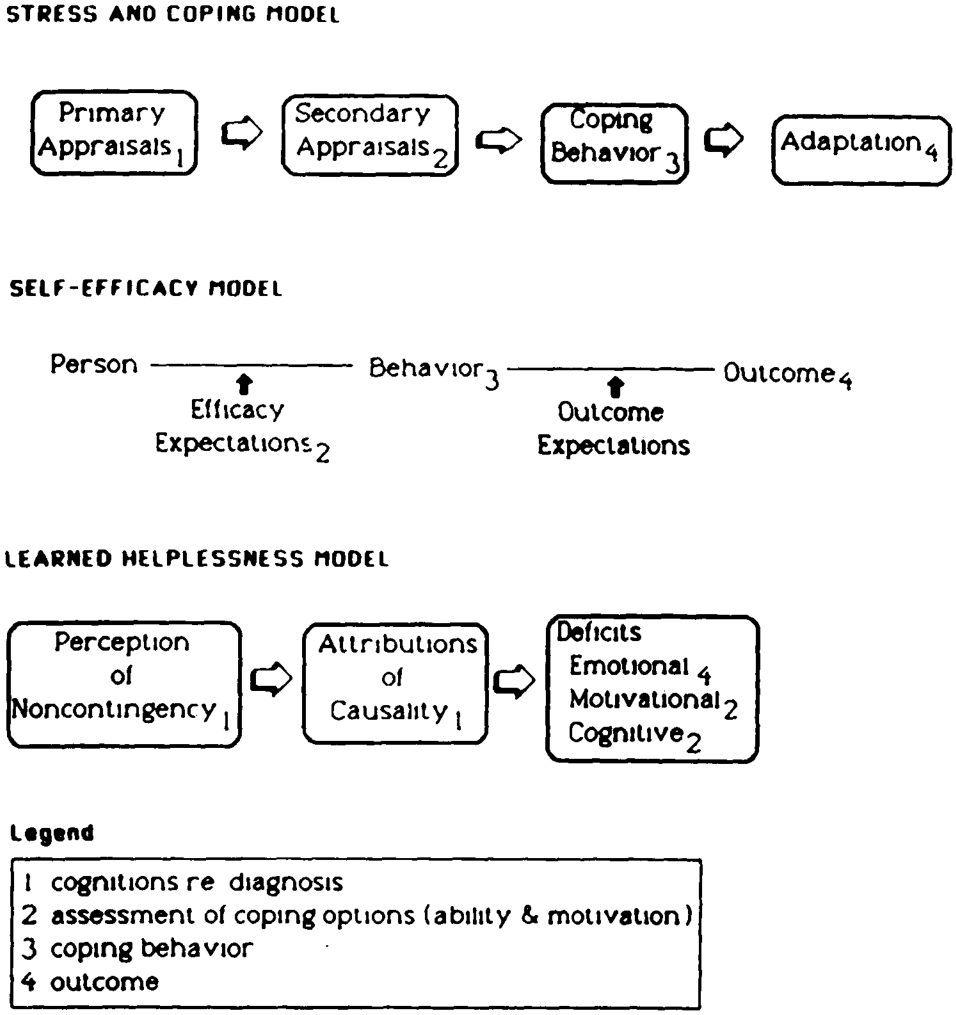


Figure 4 Comparison of the Models

symptoms was much weaker (Folkman et al., 1986a, 1986b). In our test of the models, we should also expect to find strong relationships between secondary appraisals and physical and psychological outcomes and a weaker relationship between primary appraisals and level of physical functioning.

The self-efficacy model may demonstrate the strongest relationship to functional outcome, partially because it is the most narrowly-focused model. It is not unreasonable to expect that belief in one's ability to handle functional limitations will be strongly associated with less disability. In addition, this model fails to address in any way the meaning of this illness experience for the individual's life, resulting in a model which is helpful in assessing the effectiveness of symptom management, but little more.

The learned helplessness model will prove most limited, largely because of the many unexplained factors which intervene between diagnosis and outcome. The model's limitation is, curiously, precisely the feature that has made it so attractive in a theoretical analysis of RA. The learned helplessness model defines a very specific situation and predicts the outcome of that situation. RA would appear to be a classic example of a learned helplessness-inducing situation. According to this theory, patients should, therefore, fail to exhibit coping behavior, fail to adhere to treatment, and display high levels of depression. Although these things sometimes happen, the model does not provide a way to understand variations among patients in their response to the situation.

This review of the three models most frequently used in studies of coping with arthritis seems to indicate that the models are not redundant. Instead, they each emphasize different aspects of a larger coping process (Figure 4). For example, both the stress and coping model and the learned helplessness model address cognitive appraisals of the illness event, but the former looks at the consequences of the event for the individual, while the latter looks at the individual's appraisal of the cause of the event. Only the stress and coping model includes all four components of the coping process (cognitive appraisal, assessment of coping options, coping behavior, and outcome).

Appraisals of diagnosis vs. appraisals of symptoms

These three models vary in the extent to which they focus on appraisals of and coping with the illness diagnosis vs. the symptoms associated with the illness. For example, self-efficacy theory could be applied to diagnosis or symptoms (e.g., flares). One could assess ability to respond to the diagnosis in terms of meaning for one's life; more typically, however, self-efficacy effects have been assessed in terms of symptom-related behavior, i.e., the ability to cope with the pain, limitations and treatment demands of illness.

The concept of primary appraisal in the stress and coping model could address diagnosis and/or symptoms. The model allows for both since it incorporates an on-going reappraisal process. Thus, the individual could respond to the initial diagnosis with primary appraisals concerning the loss of a former healthy self which this diagnosis implies; on the other hand, the patient might later respond to a flare-up of symptoms with appraisals of challenge.

The learned helplessness model, on the other hand, addresses primarily the individual's understanding of the illness' occurrence as captured in its diagnosis. In fact, the learned helplessness model might be more useful if it were applied to symptom-related behavior and if a feedback process were incorporated into the model. In their reformulation, Abramson et al. (1978) acknowledge that such a reattributional process may take place over time, but the model is not usually applied in this way. In the Peplau et al. (1979) analysis of loneliness, however, the importance of this reattributional process is stressed. They distinguish between attributions concerned with a precipitating event (here, illness diagnosis) and attributions regarding the maintenance of the situation (here, on-going illness symptoms).

This distinction between focus on illness diagnosis vs. illness symptoms is an important one for recently-diagnosed RA patients. If patients are asked if they have the ability to change or control their RA, we might reasonably expect them to say no; this is, in fact, the case for RA according to the medical literature thus far (Schumacher, 1988). If they are asked about their ability to change or control their pain and limitations or the cause of a recent flare-up, we might be more optimistic, since factors such as overactivity or stress may be related to symptom exacerbation (Schumacher, 1988).

Appraisal of the illness diagnosis is more likely to be abstract, cognitive, concerned with the impact of the event on the sense of self, or the meaning of the experience in terms of one's life (Leventhal et al., 1984). In contrast, appraisal of symptoms is more likely to be concrete, perceptual, concerned with specific instances and variable from instance to instance. This aspect would be more amenable to interventions aimed at change.

The RA literature which has utilized these three models has not considered clearly the importance of this diagnosis vs. symptom distinction; for example, successful participants in a self-management training program are reported to experience an enhanced sense of control over their "disease" (O'Leary, 1984). It is not at all clear whether this word is meant to stand for the symptoms associated with the disease or if patients actually view the entire illness in a different manner following increased efficacy in symptom management.

Future study of the ability of patients to cope with chronic illness would benefit from a model which incorporates each of the discrete features present in the three models discussed, but one which also considers more clearly the way in which the patient is defining the diagnosis and its symptoms. The cognitive representation of illness model (Leventhal et al., 1984) might provide such a comprehensive frame of reference.

The Cognitive Representation of Illness Model

Leventhal's theory of illness cognitions starts with the theoretical assumption that people are active problem-solvers and that their response to a new situation is directed by their perceptions and interpretations of specific situational stimuli. Beginning from this premise, he has constructed a self-regulation model of illness representation which describes the adaptive stages which guide an individual's response to illness. According to this model, the person must first form a cognitive representation of the illness experience. This representation includes three components: 1) abstract labels (e.g., "malignant" or "cardiovascular disease") and concrete symptoms (e.g., pain in stomach, pain in arm, shortness of breath) associated with the illness; 2) perceptions regarding the causes and consequences of this illness; and 3) beliefs about the chronology of this illness -- whether it is a single time-limited event, such as the mumps, likely to recur, such as an allergy, or likely to remain permanently in some way, such as hypertension (Leventhal et al., 1984). The perceptions and interpretations upon which the final illness representation are based will reflect the individual's private experiences, communications with others about this experience, and overarching cultural beliefs. Further, the processing of all this information will involve both concrete, situationally-specific material and highly abstract, conceptual material.

The cognitive representation of the illness experience which is formed in this process guides the "action plan" or coping responses; the success of these coping behaviors is then evaluated in terms of the outcome which was desired and as part of a reappraisal/feedback process which can then modify the original cognitive representation and lead to revised coping behaviors. This reappraisal process can be directed towards "danger control" (reduction of health threat) or "emotion control" (regulation of the subjective feeling states accompanying the illness experience).

As discussed before, the illness representation includes the individual's beliefs about the chronology of the illness episode, that is, its likely duration. Illness representations can be defined in terms of their expected duration as acute (symptomatic and curable), cyclic (symptomatic, removable, but recurrent), or chronic (a stable part of the self regardless of the symptomatic nature). An expectation that an illness is acute and soon likely to go away should lead to very different beliefs and behaviors than would an expectation that a condition is chronic and likely to be a continuing part of one's life. For example, Myers (1981) reported that hypertension patients who held acute models were more likely to drop out of treatment once symptoms subsided than were patients with chronic representations.

Like hypertension, rheumatoid arthritis is a chronic illness which has a continuing impact on the individual despite variations in overt symptomology. Following the diagnosis of rheumatoid arthritis, a patient may form an illness representation consistent with an acute illness model. When the pain and stiffness subside, the person may believe the RA has "gone away," may feel greatly relieved, and may even stop taking medication (thinking it is no longer necessary). In time, however, after repeated flare-ups and remissions, the patient may come to realize the chronicity of the condition, and thus the time line associated with this illness representation will change from "short-term or removable" to "permanent, on-going, chronic." An acute disease model implies that illness is present only when one is symptomatic (Leventhal & Hirschman, 1982). For the rheumatoid arthritis patient, symptoms may be vary greatly and the definition of health and illness may become quite relative.

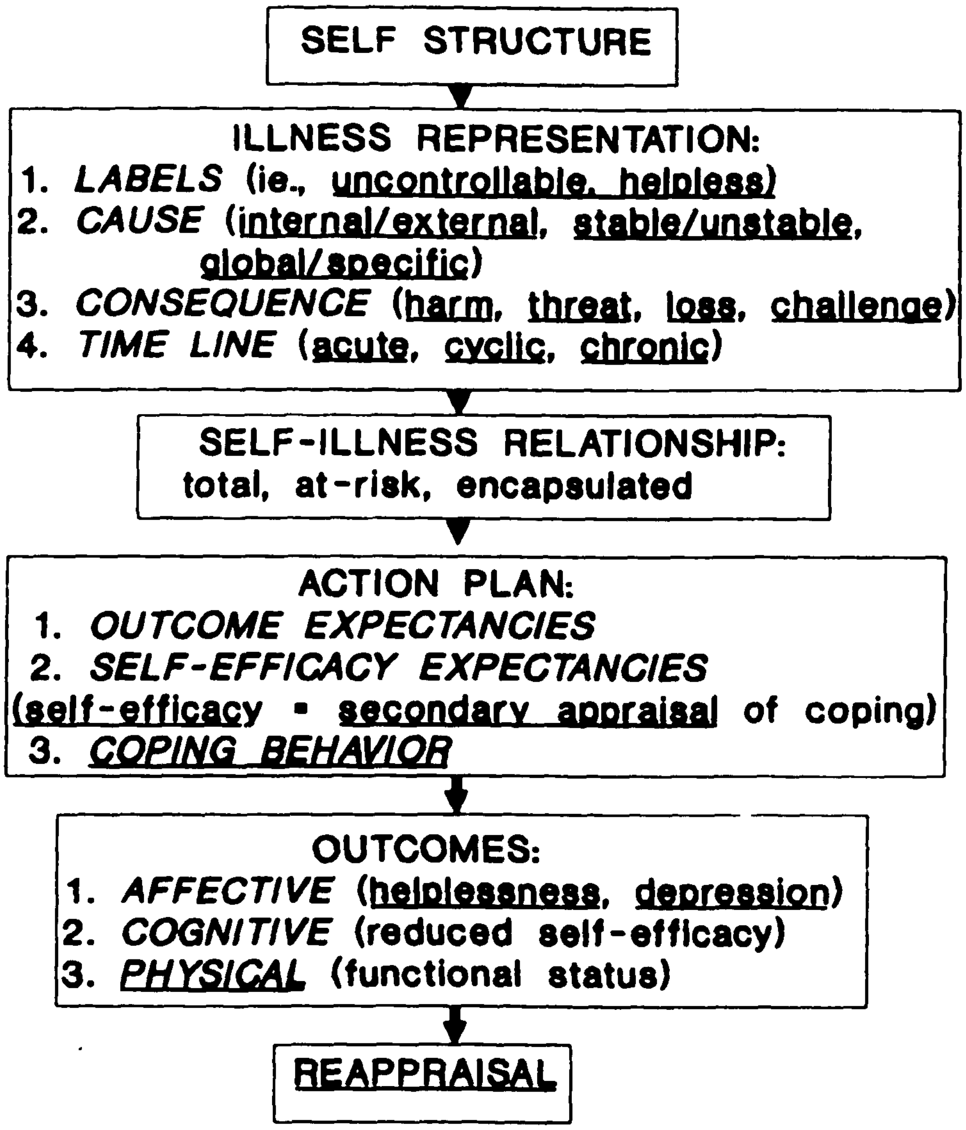
Turk et al. (1986) have developed an Implicit Models of Illness Questionnaire which includes questions directly assessing four of the five components of Leventhal's illness representation (labels and symptoms; causes; time line; and consequences). This 38-item scale was administered to 55 diabetic educators (registered nurses), 55 diabetic patients, and 55 college students. Factor analysis revealed four factors: Seriousness; Personal Responsibility; Controllability; and Changeable. Comparisons among the three groups supported the conclusion that there is a general implicit model of illness which individuals use: diabetic patients and educators displayed almost identical weightings on the four factors; students' ratings of flu (a disease that was salient for them) was significantly different from patients' and educators' ratings of their salient disease (diabetes). Thus, this measure assesses a number of components of the illness representations model, and as such should provide additional information about the interrelationships among the various models.

A Comprehensive Model of Adaptation to RA

Leventhal's cognitive representation of illness model can be seen as incorporating the discrete aspects of adjustment addressed by the three models considered previously. Figure 5 specifies the main components of Leventhal's model and places the other three models within this larger framework. The causal attribution component of the learned helplessness model is included under the sub-section "cause"; Lazarus' concept of primary appraisals are included under the sub-section "consequence" of the illness.

Outcome expectations and self-efficacy expectations form part of the action plan which results from the illness representation. Self-efficacy corresponds to secondary appraisals of coping resources, as noted earlier, and is the opposite of the motivational and cognitive deficits which result from helplessness attributions. Affective, cognitive, physical and behavioral outcomes are included, and the system then feeds back upon itself in a continual process of reappraisal, as is also suggested in the stress

Figure 5. Illness Cognitions Model[a]



[a] underlined items are components of other models

and coping model. The illness representation can, in this way, begin to include labels such as "uncontrollable," "universal helplessness," or "personal helplessness" based on earlier experiences with the illness.

This reappraisal process also provides a framework within which to track the transition from appraisals of the diagnosis to appraisals of symptoms, as well as the gradual transition from an appraisal of the illness as acute to an appraisal of the illness as chronic.

Significance of the Proposed Research

The stress and coping model, the self-efficacy model and the learned helplessness model have each been employed in psychological research on adaptation to rheumatoid arthritis and other chronic illnesses. Each has been useful in helping to understand individual differences among patients. The learned helplessness model has been employed most frequently in the study of depression among RA patients. The self-efficacy model has been used to assess the effectiveness of interventions programs intended to help arthritis and chronic pain patients better manage their symptoms. The stress and coping model has been applied in studies of the relative effectiveness of various coping behaviors to contribute to improved physical and psychological status among chronically ill patients.

Unfortunately, the differences in focus which exist between these models has resulted in a somewhat fragmented approach to a theoretically interesting phenomenon. RA is a chronic illness of unknown cause and uncertain course; it is characterized by unpredictable exacerbations and remissions. The usual course of treatment employed is similarly unpredictable in its likelihood of success and in its probable risk of serious side effects.

The process by which individuals come to understand this experience, make sense of it in terms of their own goals and values, and finally get on with the every day business of living is one of great psychological interest. However, the fragmentation which has resulted from the application of the three models mentioned above contributes little to a real understanding of patient behavior in particular or adaptive behavior in general.

The present analysis has proposed a larger model, theoretically well-suited to the intricacies of this adaptation process. The cognitive representation of illness model offers a framework which is able to incorporate concrete and abstract factors, symptom episodes and definitions of health and illness, outcomes such as daily functioning and global well-being.

It remains to be seen whether an empirical test of this particular model will show it to be as useful as the present theoretical analysis seems to suggest. The need for a comprehensive frame of reference, suited to longitudinal field work with chronic illness patients, is clear.

Research Objectives

Drawing upon the preceding theoretical analyses, the proposed study will:

(1) consider the relative ability of the three coping models to explain adjustment to RA

(2) identify empirically any overlap or contradiction among the components of the models

(3) test the comprehensive model, which consists of components of the three coping models placed within the framework of the cognitive representation of illness model, to determine if this comprehensive model better explains variation found in the physical and psychological outcomes.

Method

Procedures

This dissertation involves data collected from a sample of RA patients at two times. Time One included baseline data collected by means of an in-person interview as part of a seven-wave longitudinal study of psychological adaptation to the onset of RA.[1] Time Two data collection took place twelve to fourteen months later using a mailed questionnaire designed specifically for this dissertation research. (This questionnaire was one of five mailed questionnaires sent to respondents at bi-monthly intervals.)

Patients for the study were recruited consecutively from the Rheumatic Disease Clinic of the Hospital for Special Surgery and from the private practices of rheumatologists associated with that hospital. A total of twenty (20) physicians referred patients to the project. Six of these physicians were located in suburban areas (Nassau County, Westchester, southern Connecticut). Five physicians serve in the HSS clinic once a week but have offices in New York City (Bronx, Brooklyn, Queens, Manhattan). Another four physicians only see patients at the Rheumatic Disease Clinic; the remaining five see patients at the clinic and also see private patients in another part of the Hospital. As a result of the diverse referral sources, participants represent a broad range of ethnic and socioeconomic groups, including subjects seen in clinic and private practice, urban and suburban settings. The private practice and suburban populations have been somewhat under-represented in earlier research on RA (Henkle, 1975; Hoffman, 1974; Schwartz et al., 1978).

Patients in the sample met the following criteria:

1. Diagnosed with rheumatoid arthritis (as defined by ARA criteria, Schumacher, 1988) within two years of initial contact. The Hospital for Special Surgery is a tertiary referral center and therefore defines "new" patients as those individuals who have not been seen previously at the clinic. This designation does not necessarily imply that the individual has been recently diagnosed or not yet diagnosed with a rheumatological disorder. Further, not all patients coming to Rheumatic Disease clinic have RA; there are a number of other rheumatic diseases which might cause an individual to come to this clinic (e.g., osteoarthritis, lupus) as well as joint pain caused by trauma or virus. In addition, some RA patients come to the clinic having already been diagnosed and treated for some time by an internist or rheumatologist closer to their home. These patients will be referred to the clinic only when some special problem makes such a referral to the "experts" necessary. Patients may go through tentative or conflicting diagnoses before any confident diagnosis is made. For these reasons it is very difficult to identify a "brand-new" RA patient. Since it was the intent of the study to identify patients who were in the early stages of understanding and coping with their illness, it was decided to include all patients diagnosed with RA within the last two years.

2. English-speaking. Approximately 20% of the patients seen at the clinic are Spanish-speaking. However, reliable Spanish translations of the measures being used were not available and it was therefore decided to include only English-speaking subjects in the present study.

3. At least eighteen years of age. Patients younger than eighteen would be more likely to have a diagnosis of juvenile rheumatoid arthritis (JRA) rather than RA; these illnesses are similar but not identical. In addition, patients younger than eighteen are likely to be living with their parents and dependent on their parents in a manner that is normal for their age, but which may reflect coping strategies very different from the others in the sample.

4. No recorded psychiatric disorder. An important characteristic of RA patients is the high level of depression which is often seen. It is important to exclude subjects with pre-existing psychiatric problems which might confound any relationships which are observed. Potential participants whose medical history indicated prior diagnosis and treatment for serious psychiatric problems were excluded from the sample.

5. Attempts were made to exclude patients with pre-existing chronic illness or life crises which are likely to be the focus of the subject's attention and likely to require coping efforts that overshadow the coping with RA. For example, a physician referred a young man who was a new RA patient, but who also had Tourette's syndrome. It was decided that the struggle of coping with Tourette's syndrome

was of much greater significance for the young man and would make our questions concerning the problems of RA relatively meaningless. Similarly, a patient was referred who, when contacted, said her husband had just died and she could not think about anything else. Patients of this type were excluded from the sample.[2]

Procedures for Entering Patients into Study

Clinic. The Rheumatic Disease clinic is a specialty clinic that sees patients with scheduled appointments every Monday and Wednesday mornings. At each clinic session the Project Director obtained the list of all patients to be seen that day who were new to the clinic. After these persons were seen by a physician, an immediate determination was made whether that person fit the criteria for the study as described above. All referrals who met the criteria were contacted within a week and asked to participate in the study.

Private practice. Participating physicians were asked to refer all new RA patients seen at their office. Patients were given a description of the study by the physician and were asked for permission to pass their name along to the Project Director. Patients who agreed to this were contacted by phone by the Project Director, given more information about the study, and asked to participate if they met the criteria as outlined above.

When establishing these referral procedures, it was made clear to all participating physicians that every patient who comes to them for treatment and who meets the criteria stated above must be referred to the study in sequential order. This was done in an attempt to control for sample selection bias. It is impossible to assess the extent to which physicians actually complied with this requirement. However, it was possible to compare the characteristics of this sample with those of RA patients participating in comparable research and also to compare the sample to descriptions of "typical" RA patients to determine the representativeness of our sample.

Referrals

In all, 195 referrals were made (Figure 6). After repeated attempts, we were able to contact 170 (87%) of all patients referred. Once contact was made with a patient, the study and interview were described further and an effort was made to verify that the person actually met the study criteria. Persons who did not meet all five criteria were thanked for their cooperation and eliminated from the sample at that point.

Of the 146 patients referred by physicians who met all study criteria, 108 (74%) agreed to participate in the longitudinal study. The most often cited reason for non-participation was limited time, given the length of the interview and the fact that most of the referrals were employed individuals. Some people simply indicated no interest; only two seemed angry about being contacted. Several refused because of other personal problems, e.g., a sick husband. A few of those who expressed no interest offered as an explanation that they were presently free of

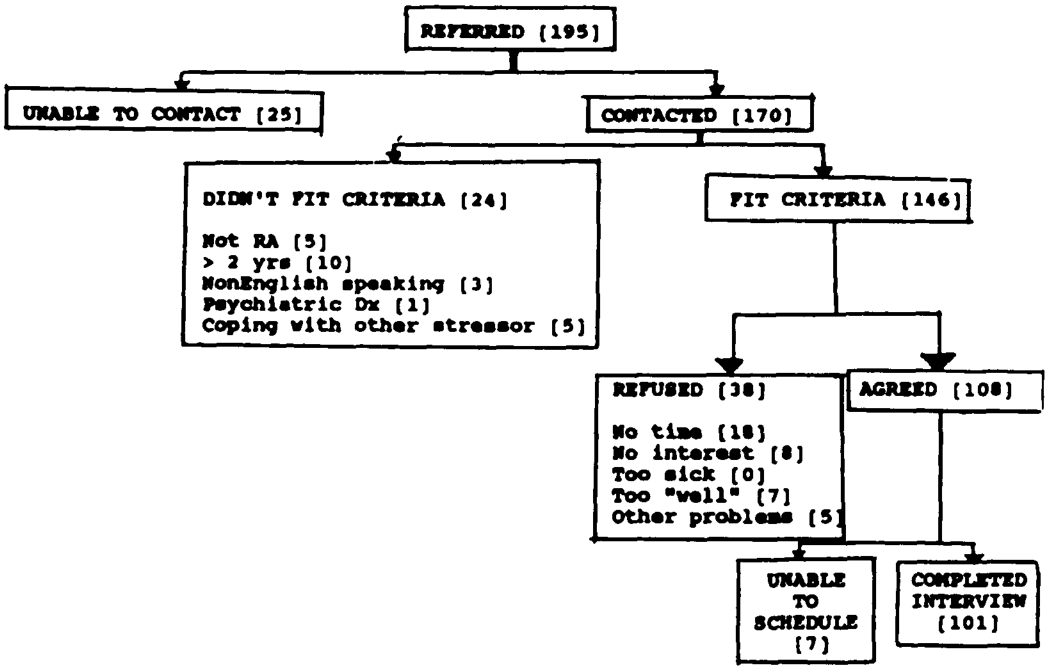


Figure 6. Process of sample formation based on total referrals.

symptoms, had been for some time and therefore would have no symptom experiences to describe. Seven people who agreed to participate were unable to schedule interviews within the month, resulting in a final sample of 101 recently-diagnosed patients.

Data Collection

Time One interviews took place primarily in subjects' homes, but also at the Project office (13%) and at the clinic (3%). The interview took about two hours to complete and included primarily structured items. Before beginning the interview, the interviewer read a formal statement of consent, outlining the study and clarifying the patient's right to confidentiality, anonymity, and freedom to withdraw at any point. No interview was begun without this formal consent signed by the subject and the interviewer. The Time One interview assessed cognitive appraisals regarding the onset of the illness, functional status, psychological status, coping strategies employed in response to specific instances of pain and physical limitation, and social support received in connection with experiences of pain and limitation.

Time Two data were collected by a mailed questionnaire administered approximately twelve to fourteen months after the first interview. A cover letter asked participants to complete and return the questionnaire packet within one week of receiving it, and a stamped, addressed return mail envelope was enclosed. One week after the first mailing, a reminder postcard was mailed. If the questionnaire was not returned within two weeks of its mailing, a replacement was sent. If it was still not returned, an effort was made to contact the individual by telephone and arrange to complete the questionnaire by telephone. Included in this questionnaire were measures assessing the cognitive appraisal of a specific flare episode and aspects of the illness representation, and repeated measures of functional and psychological status.

Sample Characteristics

The Time One sample consisted of 101 adult RA outpatients (Table 1). The mean age of the patients was 51 (SD = 15). Eighty-two percent of the sample were female, 75% were White (14% Black and 8% Hispanic), and 61% were married; 45% had a high school education or more; and the median income was between $25,000 and $40,000.

Nationally, women are affected with RA two to three times more often then men. Peak onset for women is between age forty and sixty (Schumacher, 1988). The sample reflects slightly higher educational and income levels than seen in comparable studies (Affleck, Pfeiffer, Tennen & Fifield, 1987; Dobbins & Wallston, 1987; Mason, Anderson & Meenan, 1988; Spiegel, Leake, Spiegel, Paulus, Kane, Ward & Ware, 1988).

Although physician referrals indicated a diagnosis within the past two years, the mean length of time diagnosed as reported by the patient was 23 months, with 46% of the sample reporting a diagnosis of less than one year. This

Table 1

Demographic Characteristics of the Sample

	Initial Sample (N = 101)	Longitudinal Samp (N = 65)
Age (in years)		
Mean	51.1	52.8
Standard Deviation	15.2	14.2
Gender		
Female	82%	90%
Male	18	10
Ethnicity		
White	75%	81%
Black	14	10
Hispanic	8	6
Other	3	3
Religion		
Jewish	13.1%	
Protestant	27.3	
Catholic	57.6	
None/other	2.0	
Marital Status		
Married	61%	62%
Separated/divorced	12	8
Widowed	12	11
Never married	15	19
Education		
Less than H.S. diploma	11%	11%
H.S. diploma/some college	55	52
Undergraduate degree	12	15
Graduate/Prof. school	22	22
Income		
Mean range	$25,000 - 40,000	$25,000 - 40,000
Length of Illness reported by patient		
Mean	23 months	23
One year or less	46%	43%
Physician's Diagnosis		
Possible RA	5%	3%
Probable RA	28	24
Definite RA	36	45
Classical RA	15	13
Missing	17	15
Functional Class		
Class I - no disability	32%	34%
Class II - discomfort	49	47
Class III - limited ability	7	5
Class IV - incapacitated	0	0
Missing	13	14

represents a shorter illness duration than can be found in most comparable studies of adaptation to RA (Affleck, et al., 1987; Dobbins & Wallston, 1987).

In 1958, the American Rheumatism Association (ARA) established diagnostic criteria for RA (Schumacher, 1988). RA can be diagnosed at one of four levels of certainty, from a diagnosis of possible RA, the least certain alternative, through classical RA, the most certain diagnosis. Five patients (5%) in the present study were diagnosed by their physicians with possible RA, 28% with probable RA, 36% with definite RA, and 15% with classical RA.

Functional classification of the sample at Time One was: Class I (complete functional capacity) 32%; Class II (limited mobility of one or more joints) 49%; Class III 7% (ability to perform only a few or none of usual activities). No patients were rated [illegible]ally incapacitated. The absence of severe functional d[illegible] among this sample is not surprising given the fact that all of these patients have relatively recent disease and RA is characterized by an intermittent course at first, with long periods between episodes of active disease, and later a continuous and progressive course (Anderson et al., 1985).

Measures

Overview of Materials

Measures assessing the cognitive appraisal of the illness diagnosis were included in the Time One interview. Measures of illness status (i.e., severity of pain) were also included at this time, as were demographics and baseline measures of physical and psychological functioning.

Measures assessing the cognitive appraisal of a specific flare episode and additional aspects of the illness representation were obtained by means of the Illness Representation Questionnaire mailed to subjects at twelve to fourteen months after the initial interview (Time Two). Measures assessing functional status and psychological status were also included. A list of measures included at each time is presented in Table 2.

Measures of Cognitive Appraisals

Questions assessing cognitive appraisals of the illness diagnosis reflect conc[illegible] each of the three identified models. The cognitive appraisal items were asked at Time One in reference to the diagnosis of the illness and at Time Two in reference to the subject's most recent symptom flare-up, i.e., a time when symptoms are markedly worse than usual.

Stress and Coping Appraisals. Primary and secondary appraisal questions were drawn from the work of Folkman and Lazarus (1980, 1985). Folkman and Lazarus typically consider appraisals of discrete self-named problematic events. Primary appraisal refers to perceptions that the event in question has caused harm, that it represents a

Table 2

Measures Included at each Administration

Measure	Time of Administration	
	T1	T2
Cognitive Appraisals		
re: Illness Diagnosis:		
Primary Appraisals	x	
Secondary Appraisals	x	
Efficacy Expectations	x	
Causal Attributions	x	
re: Symptom Flare:		
Primary Appraisals		x
Secondary Appraisals		x
Efficacy Expectations		x
Causal Attributions		x
Illness Representation:		
IMIQ		x
Coping Behaviors:		
Coping with Pain	x	
Coping with Flare		x
Affective Functioning:		
CESD	x	x
AHI	x	x
Physical Functioning:		
AIMS	x	x

Note: T2 consisted of a questionnaire mailed twelve to fourtee months after the T1 interview.

IMIQ = Implicit Models of Illness Questionnaire
CESD = Center for Epidemiologic Studies - Depression Scale
AHI = Arthritis Helplessness Index
AIMS = Arthritis Impact Measurement Scales (includes pain and functional disability scales)

loss, that it constitutes a future threat, or that it is seen as a challenge (Folkman & Lazarus, 1985). The primary appraisal items were similar to the modification of the Folkman and Lazarus (1985) items made by Aldwin and Revenson (1987). In separate items, patients were asked if, at the time of diagnosis, they felt harmed because this illness had occurred, threatened by something that may happen in the future as a result of this illness, challenged by the occurrence of this illness, or if they felt they had lost something as a result of it.

Secondary appraisals involve a cognitive assessment of the person's coping options or resources available to deal with the event. The format of the secondary appraisal questions came from Folkman, Lazarus, Dunkel-Schetter, DeLongis and Gruen (1986a) with minor changes in wording. Subjects made separate ratings of the extent to which they felt that their RA was something "that you could change or do something about," "that you had to accept," "which you needed to know more about," and "in which you had to hold back from doing what you wanted to do."

Both the primary and secondary appraisal questions were modified from the original format which asked subjects to indicate which one primary appraisal and which one secondary appraisal they would choose as best describing their thoughts and feelings. In the present study, subjects responded to each of the eight appraisals using a five-point scale from "not at all" to "extremely." This change was made in order to see if appraisals are sometimes combinations of factors, rather than entirely separate. Descriptive statistics for the primary and secondary appraisal items are presented in Table 3.

Self-efficacy Appraisals. Self-efficacy refers to personal judgments of how well one can implement behaviors in specific situations which may contain novel, unpredictable or stressful elements (Bandura, 1977). Items were developed based on the work of Turk, Meichenbaum and Genest (1983) concerning self-efficacy in the management of pain. Three items concerned beliefs about ability to manage pain, ability to deal with physical limitations, and ability to follow one's treatment regimen. A fourth item was derived from the early work of Lorig (1985), and assessed ability to continue one's activities despite RA. All four items were assessed on a five-point scale.

Descriptive statistics for the self-efficacy items are presented in Table 3. The "treatment regimen" item had a higher mean and more restricted variance than the other items at Time One; this suggests a limited ability to discriminate among subjects and a positive bias, not atypical of self-report compliance measures (Kirscht & Rosenstock, 1979). In addition, this item was significantly correlated with the Marlowe-Crowne Social Desirability Scale ($r = .32$, $p < .001$). Therefore, a decision was made to eliminate the item from further analyses and from inclusion at Time Two. The other three self-efficacy items assess aspects of symptom management and were highly intercorrelated (Table 4). Moreover, in a principal

Table 3

Descriptive Statistics For Appraisal Items

	Time One		Time Two	
Primary Appraisal Items	M	SD	M	SD
Did you feel:				
Harmed because it had occurred?	3.36	1.44	2.61	1.24
Threatened by something that might occur in the future?	3.49	1.50	2.80	1.31
Challenged by the situation?	2.83	1.53	2.71	1.29
Something has been lost or taken away?	3.54	1.39	2.75	1.17
Secondary Appraisal Items				
Do you think it is something:				
You can change or do something about?	3.03	1.31	2.83	1.43
You have to accept?	3.68	1.28	2.91	1.84
You need to know more about before acting?	3.69	1.34	2.73	1.26
You have to hold back from doing what you wanted?	3.38	1.46	3.43	1.30
Self-Efficacy Items				
How much ability do you think you have to:				
Manage your pain?	3.99	.93	3.65	1.02
Deal with your physical limitations?	3.73	.91	3.54	1.05
Follow your treatment regimen?	4.47	.74	--	--
Continue activities despite your RA?	3.90	.92	4.22	.88

Note. Items were answered on five-point scales ranging from "not at all" to "extremely". At Time One the items were asked in reference to the diagnosis; at Time Two they were asked in reference to a recent flare.

Table 4

Intercorrelation Matrix for Time One Self-efficacy Items

Ability to Handle:	*Pain*	*Limitations*
Pain	--	
Limitations	.44***	--
Continued Activity	.38***	.51***

***p <.001

components factor analysis, ability to manage pain, limitations, and continue activities formed one factor. The resulting Self-Efficacy Scale (*M* = 3.87; *SD* = .73) had a coefficient alpha of .71.

Causal Attributions. The beliefs which individuals hold regarding the cause of an unexpected negative event have been posited to influence their future coping efforts. In particular, beliefs that the event was caused by some intrinsic characteristic of oneself and that this cause is relatively permanent and relatively global were expected to be related to feelings of helplessness and depression.

One of the earliest attempts to assess attributional processes in relation to the occurrence of an illness was undertaken by Taylor, Lichtman and Wood (1984) in research on patients' reactions to breast cancer. The open-ended question which they used to elicit patients' beliefs about the causes of her cancer was adapted for use here. Respondents were told that, even though we don't actually know what causes RA, most people have some "hunch" or theory about what caused their illness and were asked to share their hunch or hunches. Responses were recorded verbatim.

Peterson has proposed a content analysis scheme to code open-ended causal statements for attributional style on three seven-point scales for externality-internality, instability-stability, and specificity-globality. These three dimensions were analyzed separately in initial analyses and also averaged to produce a composite attribution score with a possible range of one to seven.

(CAVE; Peterson et al., 1988). Using this scheme, causal beliefs were coded by Dr. Christopher Peterson and by another independent rater for reliability; these ratings were averaged to produce one overall causal attribution score at Time One.[3]

Inter-rater reliabilities for the internality, stability and globality ratings were .72, .71, and .39 respectively, and for the composite score, .76. While all of these correlations are statistically significant at $p <$ .001, agreement on the global dimension seems particularly low.

A structured item used by Taylor et al. (1984) in their breast cancer research was also included. After the open-ended item, respondents were asked to attribute responsibility for their RA to one cause (self, someone else, environment or chance). Twenty-four percent of the sample said they would attribute responsibility for their RA to themselves, 11% said someone else was responsible, 22% attributed responsibility to the environment and 43% attributed responsibility for their illness to chance.

Causal Attributions Concerning Flare. At Time Two, the individual was asked to describe a recent flare -- an episode of marked increase in pain or limitation resulting from the RA -- and to make attributions regarding the cause of this flare, using structured items from the Attributional Style Questionnaire (ASQ; Peterson et al., 1982). This time, respondents themselves indicated the cause of the flare on seven-point scales assessing the dimensions of internality, stability and globality. To do this, they were asked to rate the cause of the flare as: (a) something about themselves or something about other people or circumstances (internality); (b) something which, in the future, will always be present or will never again be present (stability); and (c) something that affects many areas of their life or something that affects just one particular part of their life (globality).

Again, ratings were averaged to produce a composite *Causal Attribution* score with low scores on this composite index indicate an unstable/specific/external attribution and high scores a stable/global/internal attribution. Peterson recommends using an average score because of the high correlations usually found among the three dimensions (Peterson et al., 1988). In this study, the correlations between the internal dimension and the stable and global mensions (.26 and .24, respectively) were quite a bit lower than the correlation between the stable and global dimensions (.70). Descriptive statistics for all attributional scales are presented in Table 5.

Implicit Models of Illness Questionnaire. Turk et al. (1986) developed a 45-item Implicit Models of Illness Questionnaire (*IMIQ*) which assesses four of the five components of Leventhal's illness representation model (labels and symptoms, causes, time line, and consequences). Descriptive statistics for all 45 items are presented in Table 6. The first sixteen items were endorsed by at least 50% of the respondents, suggesting a strong tendency by this

Table 5

Descriptive Statistics For Causal Attribution Items

	M	SD
Time One		
Internality	4.08/4.52[a]	2.32/2.5
Stability	4.65/4.53	1.97/2.0
Globality	4.76/4.01	1.59/2.2
Total Causal Attribution	4.41	1.72
Time Two:		
Internality	4.23	2.22
Stability	4.56	1.91
Globality	4.38	2.15
Total Causal Attribution	4.37	1.61

Note. Items were answered on seven-point scales with high scor indicating more of the dimension in question. A total attribut score was computed by summing the three dimensions and dividing three.

[a] Rater 1/Rater 2

Table 6

Descriptive Statistics For Time 2 Implicit Models of Illness It

Item	M	S
1. RA is controllable.	3.67	.8
2. RA requires medical attention.	4.58	.5
3. RA is chronic rather than acute.	4.33	.7
4. RA is affected by stress or nerves.	3.76	1.1
5. A symptom of RA is fever.	3.00	1.1
6. RA is disabling.	3.91	1.1
7. Symptoms located in stomach/intestinal tract.	1.73	.8
8. RA is cured by medication.	2.29	1.2
9. RA has serious consequences for the individual.	3.71	.9
10. RA is influenced by germs or virus.	2.72	1.0
11. RA is caused by changes in weather.	2.53	1.1
12. Symptoms seem to be on surface of skin.	1.92	1.0
13. RA is painful.	4.53	.7
14. RA is related to one's behavior.	2.43	1.0
15. Symptoms similar to the common cold.	1.82	.9
16. RA requires hospitalization.	2.29	.6
17. RA is permanent rather than temporary.	3.9[illegible]	7
18. RA is influenced by changes in weather.	3[illegible]	[illegible]
19. RA is cured by reduced stress.	[illegible]	8
20. RA is caused by stress or nerves.	2.[illegible]	.9
21. RA goes away on its own.	2.3[illegible]	1.0
22. RA is caused by one's behavior.	2.17	.9
23. The symptoms of RA are constant.	2.95	1.2
24. RA is cured by proper eating habits.	2.22	.8
25. RA is affected by lack of rest.	3.67	1.0
26. RA is controllable by the individual.	3.03	.9
27. RA is cured by rest.	2.07	.9
28. Presence relates to something you did.	1.87	.8
29. RA is contagious.	1.37	.5
30. The symptoms of RA change seasonally.	2.83	1.0
31. RA is caused by germs or virus.	2.39	.9
32. RA is caused by lack of rest.	1.97	.9
33. RA can be avoided.	1.98	1.0
34. RA is serious.	4.22	.9
35. RA often comes back.	4.16	.6
36. No one is responsible for the onset of RA.	3.98	.7
37. RA is changeable.	3.92	.7
38. RA is caused by a poor diet.	2.25	.8
39. RA is curable.	2.27	.9
40. RA is related to a poor diet.	2.40	.9
41. RA changes over time.	3.63	.8
42. Symptoms located in head or nervous system.	2.27	.9
43. RA affects many parts of the body.	4.22	.9
44. RA is cured by physical exercise.	2.03	.6
45. RA is terminal.	2.24	1.1

Note. Items were answered on five-point scale ranging from "strongly disagree" to "strongly agree."

group of RA patients to see their illness as chronic and permanent, disabling, serious and with serious consequences, painful and affecting many parts of the body; they also see it as controllable, affected by stress and by a lack of rest, changeable, tending to come back, changing over time, requiring medical attention and influenced by weather, but believe no one is responsible for its onset.

Turk et al. developed the questionnaire on three samples: diabetic educators, diabetic patients, and college students. Factor analysis revealed four dimensions: Seriousness, Personal Responsibility, Controllability, and Changeability. An attempt to replicate this factor structure was not successful; thus, a theoretically-derived subset of IMIQ items was used to test the illness representations model.

Construction of Illness Representation Scales

IMIQ items were categorized according to the components of the illness representation model: causes, consequences, curability, controllability, and duration. The scales described below were created by summing across items and dividing by the number of valid items, resulting in a possible range of one to five for all scales.

Eight IMIQ items described possible causes of RA: weather, stress, own behavior, something the person did, germs or virus, lack of rest, poor diet, and no one is responsible. These items (with "no one is responsible" reversed) were combined to form a Causes scale; internal consistency reliability was .73 (M = 1.20, SD = .57). A high score on this scale reflects beliefs that there are one or more causes of RA, some of which are concerned with environmental factors or the behavior of others and some of which are related to one's own behavior.

Six IMIQ items were concerned with the consequences of the illness and constitute a fairly accurate RA label: serious, painful, disabling, affecting many parts of the body, and requiring medical attention. These items formed the *RA Label* scale with a mean of 4.24 (*SD* = .50) and internal reliability of .65. A high score on this scale reflects a belief that RA is characterized by these features.

Seven IMIQ items addressed the duration of the illness: RA is chronic, permanent, changeable, changes over time, often comes back, symptoms change seasonally, and RA goes away by itself. The last item correlated negatively with the others, so it was reversed to create a *Chronicity* scale with an internal consistency reliability of .54 (*M* = 3.82, *SD* = .43). A high score on this scale indicates a belief that RA is both permanent and changeable; this belief is not so strange, given the fact that the illness is permanent, but the symptoms are changeable.

Seven IMIQ items concerned cures for the illness: curable, cured by medication, by reduced stress, by proper eating habits, by rest, by exercise, and can be avoided. These items formed a *Curability* scale with a mean of 2.15 (*SD* = .57) and internal consistency reliability of .76.

High scores indicate greater belief that something can be done to cure the illness.

Finally, one item assessed the medical controllability of RA and one item assessed the extent to which the illness is controllable by one's self. These two items were averaged to form a Controllability "scale" (M = 3.39, SD = .71) in which higher scores were associated with belief that the illness can be controlled.

Intercorrelation of these five scales (Table 7) revealed a negative relationship between the curability of the illness and its chronicity and a positive relationship between the RA label and chronicity. Curability and causes were also highly related. Thus, believing that RA can be cured is associated with not believing that it is chronic; believing that the cause was somewhat related to your own behavior was associated with the belief that there was something you could do to cure RA. Not surprisingly, believing that RA is chronic was also associated with espousing the RA label.

Coping Behavior

The present study is concerned with the ways that the participant's cognitive appraisals of the illness experience shape responses to that illness. The appraisal items at Time One address the meaning for the patient of the diagnosis of illness. A measure of characteristic coping was, therefore, appropriate to observe the ways in which appraisals of this relatively abstract event tend to direct one's general coping behavior. Further, the pain associated

Table 7

Intercorrelation of Time Two Illness Representations

Illness Representations:	Cause	Cure	Chronicity	Label
Cure	.68***			
Chronicity	-.25	-.49***		
Label	-.08	-.23	.44***	
Control	-.10	-.07	.19	-.10

***p <.001

with rheumatoid arthritis tends to be the most salient feature of the illness during its early stages, with disability becoming a prominent factor over time, as a result of joint destruction and muscular atrophy (Schumacher, 1988). For this reason a measure of characteristic coping in response to pain was used.

Coping behavior was assessed with a modification of the scale developed by Stone and Neale (1984) for use with chronic illness patients (Revenson, 1988). Patients were asked to describe a recent episode of pain and then to report which of 11 coping strategies he or she used characteristically in response to pain, using a card-sorting method; the method and measure is described in detail elsewhere (Revenson, 1988). Respondents indicated if each strategy was "not at all characteristic," "somewhat characteristic," or "very characteristic" of them.

Factor analysis of these items (Revenson, 1988) uced four theoretically meaningful factors which explained 59% of the variance. *Problem-focused Coping* includes thinking about solutions, gathering information, actually doing something, and seeking professional help. *Tension-reduction* includes relaxation, seeking emotional support and expressing one's emotions. *Diversion/Distraction* includes diverting attention and seeing the pain in a different light; this factor reflects a cognitive restructuring process rather than tension-reduction. The fourth factor includes only a single item: *Spiritual Coping*.

Coping behavior was assessed again at Time Two, with the card sort methodology converted to a written form. Since the appraisal items at Time Two addressed the meaning for the patient of a recent _symptom flare_, the measure of coping also needed to target the specific coping strategies employed in response to that flare. Therefore, instead of assessing how respondents _characteristically_ cope with flare episodes, they were asked to indicate on a four-point scale which strategies they had used in response to their most recent flare ("not used at all" to "used a great deal").

The factor solution for flare coping was quite similar to that at Time One for diagnosis. The _Diversion/Distraction_ factor remains the same. The _Problem-focused_ factor still includes thinking about solutions, gathering information, and actually doing something; however, relaxing replaces seeking professional help as the fourth item. The spiritual coping item has been joined by "seeking emotional support" and "accepting that nothing can be done" to form a _Spiritual Acceptance_ factor. The remaining item from Time One's tension-reduction factor, expressing emotions, combines with seeking professional help to form a _Help-Avoidance_ factor. The signs of the loadings indicate that one would be seeking professional help and _not_ expressing their emotions (_or_ expressing their emotions _and not_ seeking professional help).

Scales were created for all coping scales by unit-weighting the items in each factor, reversing items where loadings so indicated, summing the items and dividing by the number of items. The resulting scales had a possible range of one to three at Time One and one to four at Time Two. Descriptive statistics for all coping items are presented in Table 8.

Outcome Measures

Psychological Functioning. Mental health outcomes were assessed in two ways. Depressive symptomatology was assessed using the 20-item scale developed by the Center for Epidemiologic Studies at NIMH (CES-D; Radloff, 1977). The scale is a self-report measure of depressed mood which was developed for use with community populations. It is sensitive to current levels of symptomology and to change in symptomology over time (Radloff, 1977). The possible range of scores is zero to 60. When tested by Radloff (1977) in three different community samples, the CES-D produced means scores of 7.94 to 9.25; when tested with a psychiatric population the scale had a mean score of 39.11, thus demonstrating a capacity to discriminate clinical levels of depression.

Descriptive statistics and reliability coefficients for Times One and Two are presented in Table 9. These scores are higher than those found with representative community samples, but not as high as those found in psychiatric samples, and are comparable to those found with RA populations (Blalock et al., 1987; Brown et al., 1986; Cohen et al., 1986; Dobbins et al., 1987).

Radloff established a cut-off point of 16 to distinguish levels of clinical depression. (This number

Table 8

Descriptive Statistics for Coping Items

	Time One		Time Two	
Pain Strategies:	M	SD	M	SD
1. Diverted attention away from pain by thinking about other things or engaging in some activity.	2.50	.64	2.80	1.02
2. Tried to see pain in a different light that made it more bearable.	2.15	.74	2.31	1.14
3. Thought about solutions to handle pain.	2.47	.63	3.16	1.01
4. Gathered information.	2.24	.80	2.20	1.23
5. Actually did something to handle pain.	2.69	.53	3.28	.98
6. Expressed emotions to reduce tension, anxiety or frustration.	1.94	.79	2.59	1.12
7. Accepted the fact that the pain was there, but nothing could be done about it.	1.82	.84	1.84	1.03
8. Sought or found emotional support from loved ones or friends.	2.05	.80	2.47	1.17
9. Sought help or advice from professionals.	2.38	.78	2.37	1.25
10. Did something with the explicit intention of relaxing.	2.27	.81	3.04	1.00
11. Sought or found spiritual comfort.	1.85	.86	2.18	1.05

Note. Items were answered at Time One on three-point scales ranging from "not at all characteristic" to "very characteristic". At Time Two items were answered on four-point scales ranging from "not at all used" to "used a great deal". Therefore, the means and standard deviations from Time One to Time Two are not directly comparable.

Table 9

Descriptive Statistics for Outcome Measures

Scale	M	SD	alpha
Depression (CESD)			
Time One	15.44	11.00	.89
Time Two	12.90	11.56	.80
Helplessness (AHI)			
Time One	38.57	5.39	.54
Time Two	37.94	6.97	.73
Functional Disability (AIMS)[a]	3.17	1.44	.57
Pain Scale (AIMS)[a]	5.32	2.17	.85

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[a] Scores are presented after normalization, ranging from 0 - 10 (see Meenan et al., 1980). Higher scores indicate poorer health status.

represented the upper quintile in that study.) In the present study, the upper quintile of subjects had much higher scores, ranging from 28 to 42 at Time One, and 21 to 56 at Time Two. In fact, the means were quite close to Radloff's definition of clinical depression.

In trying to understand these relatively high CES-D scores for an RA population, it is important to consider whether characteristics of the illness may confound the findings. RA is characterized by symptoms such as fatigue, loss of appetite, sleep difficulties resulting from chronic pain and stiffness, and continuing levels of pain and limitation which interfere with most daily activities. Is it possible that some of the CES-D items reflected these normal RA symptoms?

A review of the content of the CES-D identified four items tapping symptoms frequently experienced by RA patients which might artificially inflate depression scores: "I did not feel like eating - my appetite was poor"; "I felt that everything I did was an effort"; "My sleep was restless"; and, "I could not get 'going'." With these four items removed, internal consistency remained high with (.88). More importantly, the correlation of this scale with the full CES-D at Time One was .98. It was thus concluded that these four symptom-related items were not artificially inflating CES-D scores. Therefore, analyses here will use the full CES-D scale to maximize generalizability with other RA studies.

Helplessness was measured using the Arthritis Helplessness Index (AHI; Nicassio et al., 1985). The AHI is a brief, easily completed 15-item scale assessing patients' perceptions of helplessness in coping with their arthritis symptoms.

Items were scored on a 5-point scale from "strongly disagree" to "strongly agree." (The original AHI had a four-point response scale; "uncertain" was added as a midpoint.) The resulting AHI scale had a possible range of 15 to 75 (higher scores indicate greater helplessness). Note that internal consistency reliability was low at Time One, as compared to Nicassio et al.'s original alpha of .69. Descriptive statistics are presented in Table 9.

Functional Disability

Functional outcomes were measured using the Physical Function Scale from the Arthritis Impact Measurement Scales (AIMS; Meenan et al., 1980, 1984). The AIMS is a 66-item multidimensional index measuring specific outcome domains of health status for arthritis patients. The AIMS has been well-validated for use on arthritis populations, is highly reliable, and is easy to complete. It can be used with patients of varying educational levels, and has been shown to be sensitive to changes in the patient's health status. The physical functioning scale was composed of the subscales of dexterity, mobility, physical activity, and household activity. High scores indicate poor functional status. Descriptive statistics are presented in Table 9.

Pain

The AIMS also includes a separate pain scale, which will be used as a covariate to control for the impact of present pain levels on physical and psychological outcomes. This scale assesses the severity of pain, as well as the duration of severe pain over the past month. Descriptive statistics are presented in Table 9.

Results

Two questions were used to guide analysis of the data: (1) To what extent do cognitive appraisals of the illness influence coping efforts, psychological adjustment, and functional disability? and (2) In what ways are the appraisal constructs from the different theoretical models similar, different, and/or complementary? These two questions were answered first using the Time One data (cross-sectional analyses) and then using Time One appraisals to understand coping and adjustment one year later at Time Two (longitudinal analyses). Cross-sectional analyses of the Time Two data incorporated the contributions of the Illness Cognitions Model to an over-all understanding of the appraisal process.

Covariates

As a preface, the ways in which either characteristics of the illness or characteristics of the participants were related to the outcome measures of functional status or psychological adjustment were considered. It may be that participants varied in their level of depression or physical functioning directly as a result of age, education, degree of pain, etc. In order to examine the contribution of illness appraisals to the adjustment process, it was first necessary to identify and control for other influences, if they exist.

Illness Characteristics

Analyses of variance of the four appraisal scales, four coping scales, three outcome scales, the pain scale, and physicians' ratings of clinical status by diagnostic category (possible, probable, definite and classical RA) and functional class (I - IV) were conducted. As was expected, physician ratings of clinical status varied by diagnostic category ($F(3,79) = 4.52$, $p < .01$)[4] with patients diagnosed as having classical RA displaying poorer clinical status. No differences by diagnostic category were found.

Patients who were assessed by their physicians as having least ability to carry out the daily activities of their life (Class III) reported higher levels of pain ($F(2,85) = 3.26$, $p < .05$; Duncan post-hoc comparison, $p < .05$). Those patients classified as most disabled by physicians also self-reported more functional disability on the AIMS Physical Functioning Scale ($F(2,86) = 17.72$, $p < .001$; Duncan post-hoc comparison, $p < .05$). These findings demonstrate the validity of the self-report data received from the patient, in that the patient's assessment of physical status is consistent with that of their physician.

Self-reported helplessness, too, varied by functional status ($F(2,85) = 3.21$, $p < .05$). Curiously, helplessness was greater for patients with some handicap than for patients with full ability to carry on their activities. There was no significant difference in helplessness when patients with the most serious limitations were compared to the other two groups. Perhaps this finding reflects the efforts of the patients with some handicap to keep up full activity despite their problems, whereas the more seriously limited individuals may have adjusted their expectations to their limitations.

Patients in functional class III (the most disabled in this sample) were more likely to make internal, stable, global attributions for the cause of their RA than were patients in the other two classes ($F(2,73) = 3.23$, $p < .05$; Duncan post-hoc comparison, $p < .05$); and were also older ($F(2,86) = 4.77$, $p < .01$; Duncan post-hoc comparison, $p < .05$).

Patients who reported the shortest length of time since diagnosis reported greater pain ($r = .24$, $p < .05$). Length of time since diagnosis, however, was not related to either self-reported physical functioning or physicians' ratings of clinical status. Therefore, pain is not merely a correlate of physical functioning. Its relationship to physical outcome appears to be more complex. These separate relationships between length of time since diagnosis and pain on the one hand, and functional status and pain on the other, may be a reflection of greater sensitivity to the symptoms early in the illness when there is less certainty about what the symptoms mean, or they may reflect the presence of greater pain before treatment is effective. Pain has been identified as a potentially complex factor influencing the adjustment process (Romano & Turner, 1985). Rather than controlling for the impact of this factor, it will be important to consider the interaction of the level of pain with appraisals in predicting coping and adaptational outcomes.

Patient Characteristics

People bring a variety of strengths or weaknesses to any new situation, based in part on personal characteristics. As adaptational level may be shaped by these characteristics, the relation of age, gender and level of education were examined in relation to key variables.

No gender differences were found. Age was related to only one of twelve outcomes: greater feelings of helplessness ($r = .24$, $p < .05$). Educational level was inversely related to pain ($r = -.24$, $p < .05$), helplessness ($r = -.30$, $p < .01$), depression ($r = -.26$, $p < .01$), and functional status ($r = -.23$, $p < .05$). These kinds of relationships have been found in other studies of health and mental health (Catalano & Dooley, 1977) and may, in part, be explained by the availability of more resources to those at higher socioeconomic levels (Pearlin & Schooler, 1978). Given these findings, it will be necessary to control for level of education in analyses.

Sample Attrition

Because I was interested in knowing how appraisals affect adjustment over time, a follow-up assessment was made 12 months after the initial interview. Sixty-three individuals from the original sample of 101 completed questionnaires at Time Two. Since changes in the sample might, in themselves, explain longitudinal outcomes, I needed to find out in what ways the original sample of 101 individuals differed from the longitudinal sample of 63. When the Time One responses of these 63 individuals were compared to those of the non-responders, responders used more problem-solving coping in response to pain ($t = -2.02$, $p < .05$), and reported less functional disability ($t = 2.18$, $p < .05$) and less pain ($t = 2.59$, $p < .01$) than did patients who dropped out of the study after Time One. Thus, the longitudinal sample saw themselves as somewhat healthier than those individuals who chose not to continue participation, although the two groups did not differ in either physician's ratings of their health status or functional classification.

Tests of the Appraisal Three Models: Cross-sectional Analyses

For each of the three models, the following sets of analyses were conducted: (1) simple correlations between the appraisals and the outcomes of coping and physical and psychological adjustment; (2) partial correlations between these same variables, controlling for the contribution of educational level; and (3) hierarchical multiple regression analyses (one for each of the seven outcomes) with level of education entered first, followed by pain, then the appraisal, and finally by an interaction term of pain-by-appraisal.

Stress and Coping Model

The Stress and Coping model suggests that primary and secondary appraisals are independent cognitive processes, the former assessing the impact of an event, and the latter assessing the coping options available to the individual in efforts to respond to the event. Respondents tended to make either negative or positive primary appraisals and intercorrelations suggest that primary and secondary appraisals were not completely independent. Harm, threat and loss primary appraisals were associated with secondary appraisals that one needed to know more before acting and that it was necessary to hold back from doing what you wanted. A complementary pattern emerged in which a primary appraisal of challenge was associated with a secondary appraisal that the RA was something you could change or do something about (see Table 10).

A principal components factor analysis of the primary and secondary appraisal items confirmed these correlational patterns (Table 11). A two-factor solution explained 53% of the variance in the items. For reasons of parsimony, the Stress and Coping Model will be tested using the two appraisal factors of Threat and Challenge. Scales were constructed by unit weighting and summing the items loading above .50 and then dividing by the number of items in the scale; this results in a range of scores between 1 and 5 and facilitates comparisons across scales. Descriptive statistics for Threat were M = 3.50, SD = 1.06, alpha = .83

Table 10

Intercorrelations Among Time One Primary and Secondary Appraisals

	Primary Appraisals				Secondary Appraisals		
	Harm	Threat	Challenge	Loss	Change	Accept	Know More
Primary							
Harm							
Threat	.67***						
Challenge	-.07	-.03					
Loss	.49***	.51***	.15				
Secondary							
Change	-.16	-.14	.33***	-.09			
Accept	.03	.14	-.06	.16	-.10		
Know More	.27**	.26**	.11	.36***	-.04	.06	
Hold Back	.52***	.50***	-.01	.46***	-.26**	.09	.30***

**p <.01 ***p <.001

Table 11

Factor Analysis of Time One Primary and Secondary Appraisals

	Factor Loadings		
	I	II	h^2
% Variance Explained by Factor	35.9%	17.4%	
Threat Appraisals:			
Threat	.79	-.18	.66
Loss	.79	.07	.63
Harm	.79	-.21	.66
Hold Back	.73	-.24	.59
Know More	.57	.17	.35
Challenge Appraisals:			
Challenge	.17	.81	.70
Change	-.13	.77	.61
Items which didn't load on either factor:			
Accepted the RA	.16	-.23	.07

Note: Factor loadings are from orthogonal (varimax) rotation of a principal components factor analysis.

and for Challenge, M = 2.94 and SD = 1.16, r = .53. The correlation between these two scales was -.08.

Relationship of Appraisal to Coping and Outcome. Since I was concerned with understanding the way that appraisal shapes adjustment to RA, I looked next at the way these appraisals were related to the coping efforts people make and to their psychological and functional status. Thus, threat and challenge appraisals were examined in relation to a set of seven outcome variables: four coping strategies and three adjustment outcomes. (None of the four coping scales were related to the psychological outcomes of depression, helplessness or functional ability.) As shown in the first two columns of Table 12, challenge appraisals were only associated with higher levels of spiritual coping. Threat appraisals were only related to higher levels of depression.

It was noted previously that level of education was related to helplessness, depression and functional status. erefore, the effect [illegible] of education was partialled out to see if the two relationships described above persisted. When level of education was controlled, the relationship between threat appraisals and depression was no longer significant, but the relationship between challenge appraisals and spiritual coping persisted (partial $r = .26$, $p < .05$). Moreover, when level of education was controlled a significant relationship emerged between threat appraisals and problem-solving coping (partial $r = .22$, $p < .05$).

Pain may have either a direct effect on psychological and physical adjustment or an indirect effect, in

Table 12

Correlation of Appraisals with Coping and Outcome at Time One

	Threat	Challenge	Self-Efficacy	Causal Attribution Score
Coping Scales:				
Problem-focused	.14	.13	.14	-.07
Tension-reduction	.15	.01	-.21*	-.03
Distraction/diversion	.12	.08	-.07	.03
Spiritual Comfort	.00	.28**	.21*	-.06
Outcome Scales:				
CES-D	.24*	-.08	-.14	-.18
AHI	.13	-.15	-.29**	-.10
Functional Disability	-.11	-.09	-.34***	-.10

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

Note: CES-D = Center for Epidemiologic Studies depression scale
AHI = Arthritis Helplessness Index.

interaction with threat and challenge appraisals. In order to test for these interactions, a series of hierarchical multiple regression analyses were performed. In each, level of education was entered on the first step, thereby partialling out the effect of this variable. Pain was entered on the next step, followed by the Threat Appraisal scale. This order was based on the hypothesis that threat appraisals are made in response to pain. An interaction term, created by multiplying Pain-by-Threat (see Cohen & Cohen, 1975, p. 295)[5], was entered on the final step. Seven regression equations were computed with the four coping factors and three adjustment outcomes as separate dependent variables. Following this, a parallel set of seven multiple regression analyses were performed for Challenge appraisals and their interaction with pain, by creating a Pain-by-Challenge interaction term in the same fashion. (This same regression technique will be used to test the self-efficacy and learned helplessness models later.)

The results of these regression analyses are presented in Tables 13 and 14. As expected, levels of education and pain were related to depression and helplessness, with higher levels of education associated with lower levels of depression and helplessness, and greater pain associated with higher levels of depression and helplessness. Education was marginally related to lower functional disability, whereas pain was significantly related to better functional status. On the other hand, neither level of

TABLE 13

Outcomes at Time 1 Explained by Pain, Threat Appraisals and their Interaction

	Education			Pain			Threat			Interaction: Pain x Threat		Total Equation	
Dependent Measure	ΔR^2	F	B	ΔR^2	F	B	ΔR^2	F	B	ΔR^2	F	ΔR^2	F
Coping													
Problem-solving	.01	1.07	11	.01	<1	- 07	03	2 58	16	01	<1	05	1 23
Tension-reduction	.00	<1	- 05	01	1.19	-.11	02	2 15	15	00	<1	04	1 02
Distraction/diversion	01	<1	- 09	00	<1	06	01	<1	09	02	1.46	04	<1
Spiritual	.01	1.04	- 10	.00	<1	-.07	.01	<1	00	.00	<1	.02	<1
Adjustment													
Depression	.07	7 40**	-.27	17	21 51***	42	.03	3 30	16	.00	<1	.27	8 73***
Helplessness	.10	10.23**	-.31	06	6.90**	.25	.01	<1	08	.02	2.51	.19	5 31***
Functional Disability	03	3.33	-.18	.13	14.37***	37	.03	4.00*	-.19	.01	1.53	21	6 10***

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

TABLE 14

Outcomes at Time 1 Explained by Pain, Challenge Appraisals and their Interaction

	Education			Pain			Challenge			Interaction: Pain x Challenge		Total	
Dependent Measure	ΔR^2	F	B	ΔR^2	F	B	ΔR^2	F	B	ΔR^2	F	ΔR^2	F
Coping													
Problem-solving	.01	1 07	.11	.01	<1	- 07	.01	1.40	.12	.01	1 3	.04	1 06
Tension-reduction	00	<1	-.05	.01	1.19	-.11	.00	<1	01	.00	<1	02	<1
Distraction/diversion	.01	<1	-.09	.00	<1	.06	.01	1.16	.11	.00	<1	03	<1
Spiritual	.01	1.04	- 10	.00	<1	- 07	.07	7.17**	.27	.01	<1	.10	2 42*
Adjustment													
Depression	.07	7.40**	- 27	17	21.51***	42	.00	<1	- 02	.00	<1	24	7 48***
Helplessness	.10	10.23**	-.31	06	6 90**	25	.02	1 81	-.13	.02	2 85	.20	5.74***
Functional Disability	.03	3.33	-.18	13	14.37***	.37	.00	<1	-.03	.00	<1	.16	4 48**

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

education nor pain was related to any of the coping behaviors.

As shown in Table 13, neither threat appraisals nor their interaction with pain was related to coping. Threat appraisals were related to lower functional disability and were marginally related to higher levels of depression, but were unrelated to helplessness. The interaction of threat appraisals and pain was not significantly related to depression, helplessness or physical functioning.

As shown in Table 14, challenge appraisals were related to greater use of spiritual coping, over and above the influence of level of education and pain. Challenge appraisals were unrelated to any other outcomes.

In sum, threat appraisals were related to better functional status and challenge appraisals were related to the greater use of prayer as a coping strategy. For neither threat nor challenge appraisals were the relationships conditional upon level of pain experienced.

Self-efficacy Model

Coping efforts can be thought of as the behavior which occurs as a function of self-efficacy appraisals. Thus, self-efficacy beliefs should be associated with efforts at active coping. However, as shown in Table 12, self-efficacy was positively related to spiritual coping and negatively related to with tension-reduction coping, but was unrelated to either problem-focused coping or distraction-diversion.

Because the self-efficacy scale assessed ability to manage RA symptoms and not generalized mastery, self-efficacy might be more closely related to functional outcomes. As predicted, self-efficacy was related to better physical functioning and to less helplessness, but was unrelated to depression.

When level of education was partialled out, the correlation of self-efficacy with tension-reduction disappeared, but the relationships to spiritual coping (partial $r = .26$, $p < .05$) and physical and psychological outcomes persist (partial $r = -.36$, $p < .001$ for functional status; partial $r = -.3$[illegible], $p < .01$ for helplessness).

The possibility that self-efficacy appraisals might vary in their relationship to outcome across pain level was tested next, using the regression techniques described in the Stress and Coping model analyses.

The contribution of self-efficacy to coping was non-significant for all four coping strategies. (Although the main effect of self-efficacy with tension-reduction and spiritual coping was significant, the full equations were not.) When predicting physical functioning and helplessness, much stronger relationships were observed (see Table 15). Self-efficacy was significantly related to both physical functioning and helplessness; as indicated by the beta weights, greater self-efficacy was related to less functional disability and less helplessness. None of the pain-by-efficacy interactions were significant.

To summarize thus far, self-efficacy was strongly related to two out of the seven outcomes (functional disability and helplessness). By comparison, in the stress

TABLE 15

Outcomes at Time 1 Explained by Pain, Self-efficacy Appraisals and their Interaction

	Education			Pain			Self-efficacy			Interaction: Pain x Efficacy		Total	
Dependent Measure	ΔR^2	F	B	ΔR^2	F	B	ΔR^2	F	B	ΔR^2	F	ΔR^2	F
Coping													
Problem-solving	.01	1.07	.11	.01	<1	-.07	.02	1.62	.13	.00	<1	.03	<1
Tension-reduction	00	<1	-.05	01	1.19	-.11	.04	4.44*	-.21	00	<1	.06	1.47
Distraction/diversion	01	<1	-.09	00	<1	06	00	<1	-.06	02	1.99	04	<1
Spiritual	.01	1.04	-.10	.00	<1	-.07	04	4.36*	21	00	<1	06	1.49
Adjustment													
Depression	07	7.40**	-.27	.17	21.51***	42	.01	1.37	-.10	.01	1.02	.26	8.25***
Helplessness	10	10.23**	-.31	.06	6.90**	.25	.07	8.30**	-.26	.00	<1	23	6.91***
Functional Disability	.03	3.33	-.18	.13	14.37***	.37	.10	13.01***	-.32	.00	<1	.26	8.33***

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

and coping model, challenge was strongly related to one of the seven outcomes (spiritual coping) and threat to one (functional disability).

Learned Helplessness Model

According to the learned helplessness model, the causal attributions a person makes in response to an unexpected event will result in either successful adaptation or helplessness and depression. Respondents were given two opportunities to describe their attributions for the occurrence of RA. First, in a closed-ended question, they were asked to ascribe responsibility for the occurrence of the RA to either self, others, environment, or chance. They were also given an opportunity to describe their causal attributions in an unstructured fashion.

To assess whether the structured attribution item was associated with coping and/or adjustment, seven oneway analyses of variance were performed. No differences in coping or adjustment were found among the four attributional groups. However, internal or self attributions for the illness should be associated with poorer outcome. To explore this, a dichotomous variable was created to compare "self" (N = 24) with "chance, environment, or other" attributions (N = 77). However, these comparisons similarly revealed no differences.

Open-ended responses were rated for internality vs. externality; stability vs. instability; and globality vs. specificity. As suggested by Peterson and his associates (Peterson et al., 1988), these ratings were combined to create a composite Causal Attribution Scale with higher scores indicating more internal, global, stable attributions. This composite measure, however, was also unrelated to coping efforts or adjustment outcomes, whether level of education was partialled or not.

Hierarchical regression analyses similar to those described for the Stress and Coping and Self-efficacy models were computed to test for interactions between pain and attributions, using the composite attributional scale. Neither the main effects nor the interaction terms were significant for any of the four coping behaviors (Table 16). There were no main effects for the three adjustment outcomes. However, there was a significant interaction between pain and causal attributions in relation to helplessness. At low levels of pain, more external, unstable, specific attributions were associated with higher levels of helplessness. As pain increased, however, internal, stable, global attributions became associated with greater helplessness (see Figure 7).

To summarize the cross-sectional findings, threat appraisals were related to better functional status and challenge appraisals were related to the greater use of prayer as a coping strategy. Self-efficacy was related to better physical functioning and less helplessness. The interaction of pain and causal attributions was related to helplessness such that, as pain increased, internal, stable, global attributions were related to greater helplessness.

TABLE 16

Outcomes at Time 1 Explained by Pain, Causal Attributions and their Interaction

	Education			Pain			Cause			Interaction: Pain x Cause		Total Equation	
Dependent Measure	ΔR^2	F	β	ΔR^2	F	β	ΔR^2	F	β	ΔR^2	F	ΔR^2	F
Coping													
Problem-solving	.01	<1	.09	.01	<1	-.09	.01	<1	.08	.01	<1	.03	<1
Tension-reduction	.00	<1	.02	.01	1 06	-.11	.00	<1	-.02	.00	<1	.01	<1
Distraction/diversion	.00	<1	-.07	00	<1	.07	.00	<1	.07	01	<1	03	<1
Spiritual	.01	<1	-.08	00	<1	-.05	.00	<1	-.06	03	2.12	04	<1
Adjustment													
Depression	04	3.55	-.20	19	20.16***	.44	.02	2.17	- 14	.00	<1	.25	6 68***
Helplessness	.08	6 78**	-.27	06	6 16*	26	01	<1	- 09	.07	7 25**	.22	5 61***
Functional Disability	.03	2 48	- 17	.16	16 11***	.40	02	2 51	16	.02	1 82	23	5 99***

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

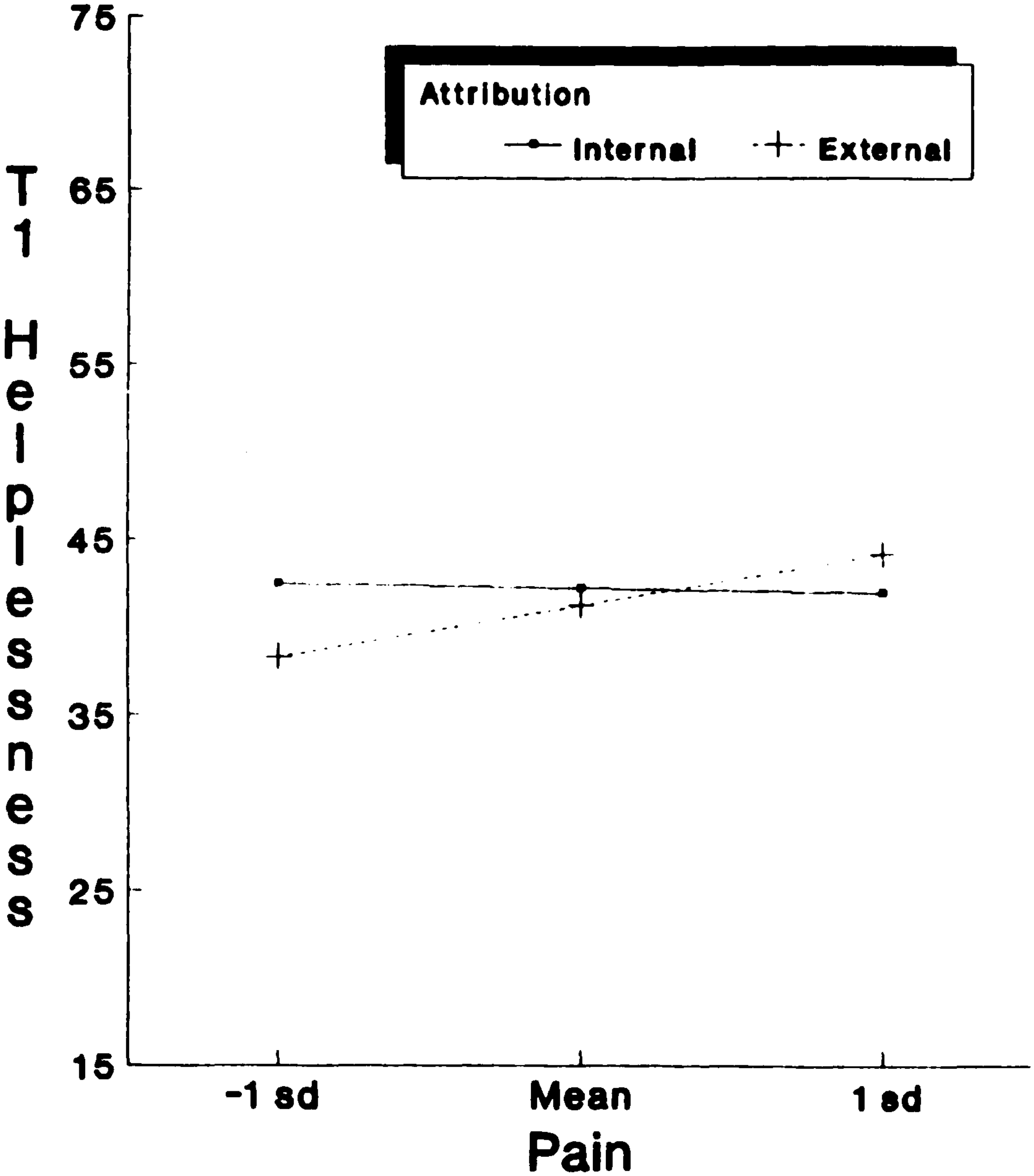

Figure 7. Interaction of Pain and Causal Attribution on T1 Helplessness

Comparison of Appraisal Constructs Across the Models

Theoretical analysis of the models suggested that some of the component constructs might actually be measuring the same thing: self-efficacy is similar to secondary appraisals of coping options; both self-efficacy and secondary appraisals may be reflections of one's perception of control and reported as internal attributions. In turn, this perception of control should be the exact opposite of the experience of helplessness.

The pattern of interrelationships among these variables, as well as their relationships to coping and outcomes, indicated, however, that the constructs were not identical. First, only challenge and self-efficacy were significantly interrelated ($r = .25$, $p < .01$). Second, the patterns of relationships between appraisals and coping/adjustment outcomes were different across the three models. If the constructs were identical, the Challenge scale, which includes the positive secondary appraisal of change, would show the same relationship to outcome as Self-efficacy; the Threat scale, which includes negative secondary appraisals, would be associated with the same outcomes as internal attributions, and both threat and internal attributions should be related to outcomes in a manner opposite to self-efficacy. However, challenge appraisals were associated with spiritual coping, while self-efficacy was not. And, self-efficacy was related to less helplessness and less functional disability, while challenge appraisals were not. Surprisingly, it was the threat appraisals which were related to less functional disability, in direct contradiction of the hypothesized relationship. The interaction of pain and causal attributions was related to more helplessness, as was expected.

Longitudinal Tests of the Three Models

The next question was to what extent these three models can help us understand coping efforts and adjustment approximately one year later. It may be that initial appraisals of the illness have a delayed effect, after the meaning of the experience has developed.

The same data analysis strategies used in the cross-sectional analyses was repeated to test the effects of Time One appraisals on Time Two coping and outcomes. The one change in these longitudinal analyses was that coping was now measured in response to a recent episode of flare instead of pain. As level of education was significantly related to helplessness and depression one year later, it was again controlled in analyses to facilitate comparisons with the cross-sectional findings.

The Stress and Coping Model

Correlational analyses of the longitudinal data (Table 17) indicated that threat appraisals were related to greater use of spiritual acceptance and to higher levels of depression and were marginally related to the use of problem-focused coping. Challenge appraisals were related

Table 17

Correlation of Time One Appraisals with Time Two Outcome

	Threat	Challenge	Self-Efficacy	Causal Attribution Score
Flare Coping Scales:				
Problem-focused	.23	.05	.49***	.03
Help-avoidance	-.00	.06	-.21	-.05
Distraction/diversion	-.04	-.00	.14	-.15
Spiritual Acceptance	.41**	.09	.36**	.15
Outcome Scales:				
CES-D	.28*	.10	.03	.06
AHI	.23	-.16	-.32**	-.00
Physical Functioning	.05	-.27*	-.29*	.05

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

Note: CES-D = Center for Epidemiologic Studies depression scale
AHI = Arthritis Helplessness Index.

to less functional disability. With level of education partialled, only the relationship of threat appraisals to spiritual acceptance persisted (partial $r = .33$, $p < .05$).

The multiple regression analyses which were performed with the cross-sectional data were replicated with the longitudinal data, this time predicting Time Two coping behavior and adjustment (see Table 18 and Table 19). Threat appraisals were related only to spiritual acceptance, and none of the pain-by-threat interaction terms were significant. For challenge appraisals, there were no main effects or interaction effects of sufficient strength to contribute to significance for the equation as a whole.

Self-efficacy Model

There was a strong positive relationship between self-efficacy and both problem-solving coping and spiritual acceptance (Table 17). Self-efficacy was also related to greater functioning and less helplessness, although it was unrelated to depression. With the exception of the correlation between self-efficacy and functional disability, these correlations remained strong when level of education was controlled (partial r for problem-solving = .55, $p < .001$; for spiritual acceptance = .39, $p < .01$; and for helplessness = -.33, $p < .05$).

In the multiple regression analyses testing the self-efficacy model, main effects of self-efficacy were found for problem-solving coping, spiritual acceptance, physical functioning and helplessness above and beyond the effects of both level of education and pain (Table 20). In addition,

TABLE 18

Outcomes at Time 2 Explained by Time 1 Pain, Threat Appraisals and their Interaction

	Education			Pain			Threat			Interaction: Pain x Threat		Total Equation	
Dependent Measure	ΔR^2	F	B	ΔR^2	F	B	ΔR^2	F	B	ΔR^2	F	R^2	F
Coping													
Problem-solving	.01	<1	-.08	.05	2 47	-.22	.05	2.95	.24	.00	<1	.11	1.43
Help-avoidance	.01	<1	.10	.00	<1	-.02	.00	<1	.02	01	<1	.02	<1
Distraction/diversion	.02	<1	- 14	.06	3.27	-.25	.00	<1	- 06	01	<1	.09	1.29
Spiritual acceptance	.04	1.99	- 1	.00	<1	.06	.14	8.27**	.38	.01	<1	.19	2.79*
Adjustment													
Depression	.06	3.59	-.24	.05	3.26	.23	.04	2.56	.20	00	<1	.15	2.44
Helplessness	.08	5.19*	-.28	.04	2 86	.21	.02	1.30	.15	02	1.33	.16	2.73*
Functional Disability	.03	1.92	-.18	.04	2 53	.21	.00	<1	- 05	.00	<1	.07	1.13

**p<.01 *p<.05

TABLE 19

Outcomes at Time 2 Explained by Time 1 Pain, Challenge Appraisals and their Interaction

	Education			Pain			Challenge			Interaction: Pain x Challenge		Total Equation	
Dependent Measure	ΔR^2	F	β	ΔR^2	F	β	ΔR^2	F	β	ΔR^2	F	R^2	F
Coping													
Problem-solving	.01	<1	-.08	.05	2.47	-.22	.00	<1	.04	.02	1.04	.07	<1
Help avoidance	.01	<1	.10	.00	<1	-.02	.00	<1	.06	.08	4.55*	.10	1.32
Distraction/diversion	.02	<1	-.14	.06	3.27	-.25	.00	<1	-.01	.07	3.98*	.15	2.12
Spiritual acceptance	.04	1.99	-.19	.00	<1	.06	.01	<1	.08	.00	<1	.05	<1
Adjustment													
Depression	.06	3.59	-.24	.05	3.26	.23	.02	1.08	.13	.01	<1	.13	2.14
Helplessness	.08	5.19*	-.28	.04	2.86	.21	.02	1.30	-.14	.00	<1	.15	2.40
Functional Disability	.03	1.92	-.18	.04	2.53	.21	.05	3.09	-.22	.00	<1	.12	1.92

*$p<.05$

TABLE 20

Outcomes at Time 2 Explained by Time 1 Pain, Self-efficacy Appraisals and their Interaction

	Education			Pain			Self-efficacy			Interaction: Pain x Efficacy		Total	
Dependent Measure	ΔR^2	F	β	ΔR^2	F	β	ΔR^2	F	β	ΔR^2	F	ΔR^2	F
Coping													
Problem-solving	.01	< 1	-.08	.05	2.47	-.22	.21	13.61***	46	.03	1.99	.29	4.85**
Tension-reduction	.01	<1	.10	.00	<1	-.02	.05	2.47	-.22	.00	<1	.06	<1
Distraction/diversion	.02	<1	-.14	.06	3.27	-.25	.01	<1	.11	.01	<1	.10	1.37
Spiritual	.04	1.99	-.19	.00	<1	.06	.14	8.68**	.38	.01	<1	.19	2.92*
Adjustment													
Depression	.06	3.59	-.24	.05	3.26	.23	.00	<1	.06	.06	4.35*	.17	2.97*
Helplessness	.08	5.19*	-.28	04	2.86	.21	.09	6.29*	-.30	00	<1	.21	3.83**
Functional Disability	.03	1.92	-.18	.04	2.53	.21	.08	5.10*	-.27	01	<1	.16	2.66*

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

the interaction of pain and self-efficacy predicted depression one year later. At low levels of pain, depression did not vary in response to self-efficacy (see Figure 8). At high levels of pain, however, individuals with high self-efficacy were *more* depressed than individuals with low self-efficacy. It would appear that the beneficial effects of perceptions of self-efficacy on depression deteriorate under conditions of severe pain.

Learned Helplessness Model

The composite causal attributions measure was unrelated to flare coping or to physical and psychological status one year later, whether or not educational level was partialled. In the multiple regression analyses, however, there was a significant interaction between pain and attribution in predicting depression (Table 21). At low levels of pain, internal, stable, global attributions were associated with slightly lower levels of depression. At higher levels of pain, internal, stable, global attributions were associated with much higher depression (see Figure 9). By comparison, level of pain was not associated with depression for external, unstable, specific attributions.

Summary

To summarize the longitudinal findings, the stress and coping model showed only a weak relationship to outcomes. Threat appraisals were associated with spiritual acceptance at Time Two; challenge appraisals were not significantly related to any outcomes. Recall that, in the cross-

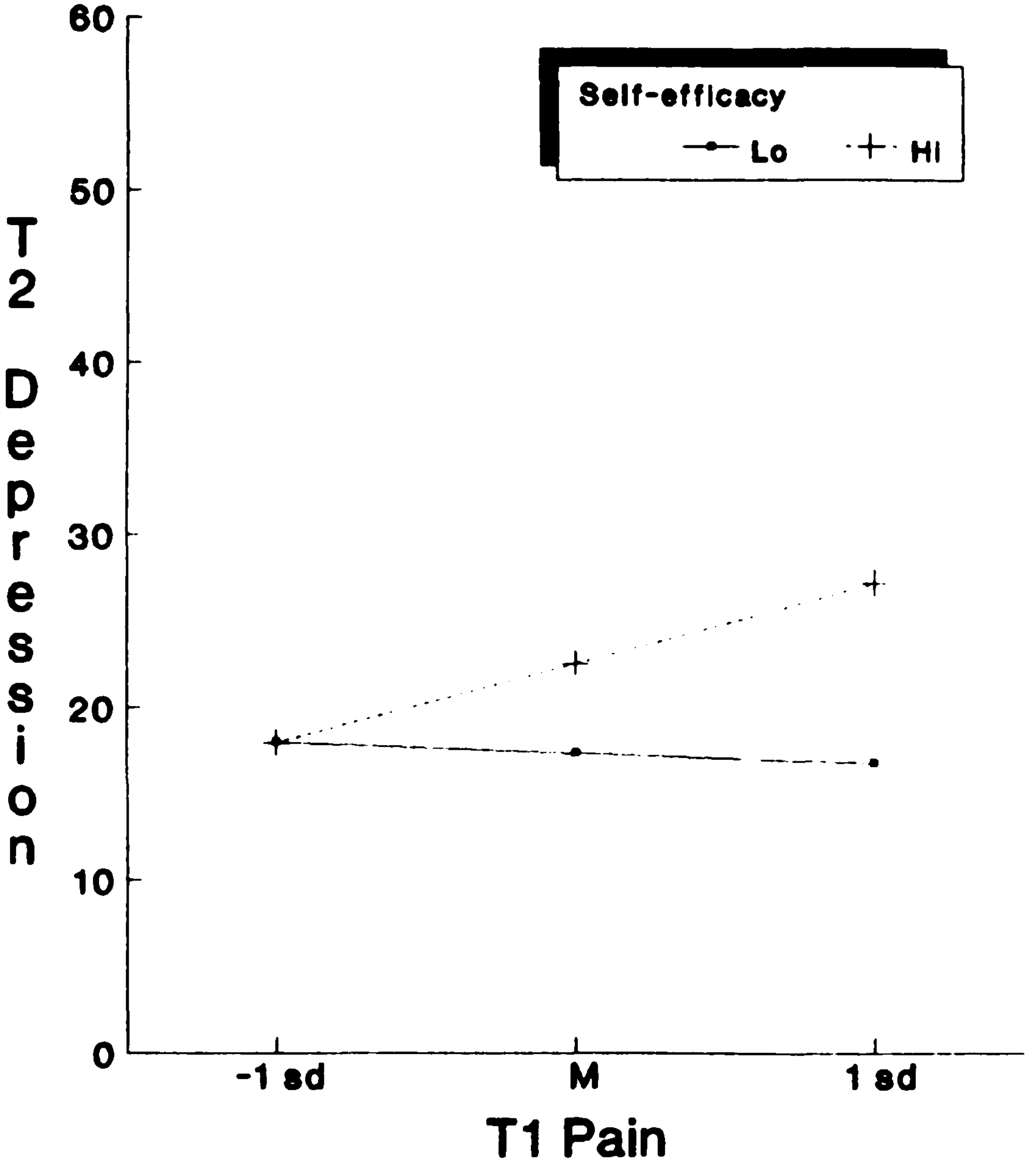

Figure 8. Interaction of Pain and Self-efficacy on T2 Depression

TABLE 21

Outcomes at Time 2 Explained by Time 1 Pain, Causal Attributions and their Interaction

	Education			Pain			Cause			Interaction: Pain x Cause		Total	
Dependent Measure	ΔR^2	F	β	ΔR^2	F	β	ΔR^2	F	β	ΔR^2	F	ΔR^2	F
Coping													
Problem-solving	.01	<1	-.08	.04	1.62	-.19	.00	<1	.02	.03	1.47	.08	<1
Tension-reduction	.08	3.98*	.29	.01	<1	-.08	.01	<1	-.13	.00	<1	.11	1.24
Distraction/diversion	.04	1.77	-.20	.06	2.90	-.25	.02	<1	-.15	.04	1.81	.16	1.91
Spiritual	.05	2.07	-.21	.00	<1	- 03	.04	1.70	.20	.04	1.93	.13	1.45
Adjustment													
Depression	.01	<1	-.10	.10	5.27*	.31	.02	1.04	.14	.07	4.19*	.20	2.89*
Helplessness	.07	3.43	-.26	.04	1.97	.19	.01	<1	08	.00	<1	.11	1.43
Functional Disability	.02	1.17	- 15	.33	1.69	.18	.02	<1	14	.00	<1	.08	<1

*$p < .05$

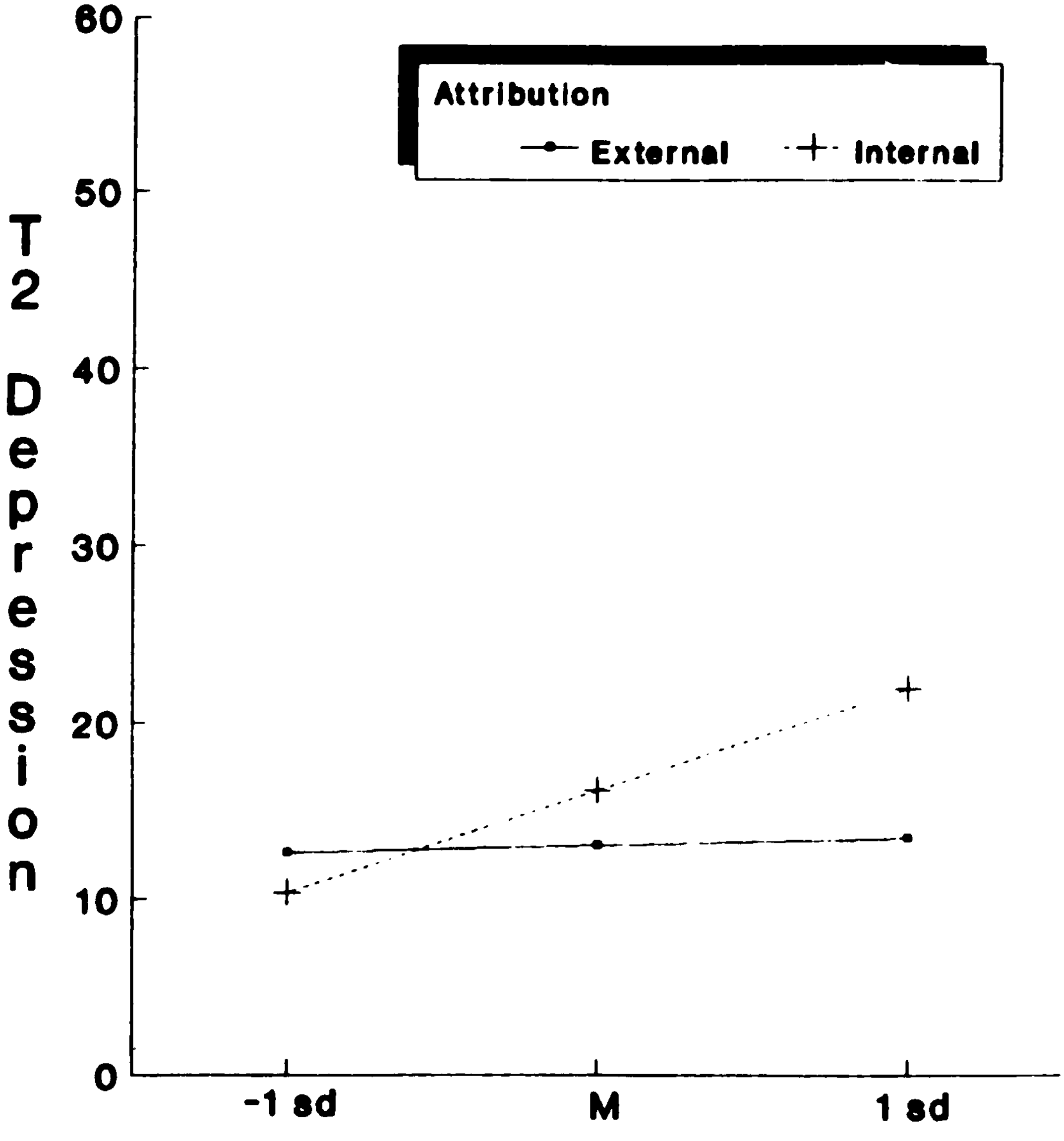

Figure 9. Interaction of Pain and Causal Attribution on T2 Depression

sectional data, threat was related to better functioning and challenge was related to spiritual coping.

On the other hand, the self-efficacy model showed even stronger findings with the longitudinal data. Main effects for self-efficacy, in the predicted directions, were found in four out of the seven outcomes. In addition, the interaction of pain and self-efficacy predicted depression one year later. The positive impact of self-efficacy on depression was weakened when perceptions of self-efficacy were accompanied by high levels of pain.

The learned helplessness model revealed a significant interaction between pain and attributional style on the outcome of helplessness when using the cross-sectional data. With the longitudinal data, the interaction between pain and causal attributions emerged for depression only. Internal, stable, global attributions predicted lower depression under relatively low levels of pain; at high levels of pain, depression was greater for "internals" as compared to "externals."

Predictors of Changes in Adjustment

Although these longitudinal analyses suggest relationships between initial appraisals of illness diagnosis and psychological and physical status one year later, the analyses do not take into consideration the initial status of the individual on psychological and physical measures. This is important because, for example, it is well established that depression is the best predictor of later depression (Monroe et al., 1983).

In order to find out if the relationships which were found between initial appraisals of diagnosis and outcomes one year later were indeed related to the appraisals, or were, to some degree, a reflection of the individual's continuing or changing health status, the patient's initial adjustment level was controlled in a parallel set of longitudinal hierarchical regression analyses. That is, the longitudinal regression analyses were re-computed for depression, helplessness and physical functioning with level of education, once again, entered on the first step as a covariate. The Time One measure of the outcome in question (depression, helplessness or physical functioning) was entered on the next step. As with all of the previous multiple regression analyses, Time One pain was entered next, followed by one of the appraisals measures (threat, challenge, self-efficacy or causal attribution), and finally by the interaction term for pain and the particular appraisal in step three. This data-analytic strategy first removes the influence of level of education and the initial level of adjustment before examining the unique contributions of pain, cognitive appraisals and their interaction on later adjustment. It is thus analogous to examining residualized change.

In these analyses, level of education continued to be related to later depression and lower helplessness, and initial outcomes were strongly related to outcomes one year later, demonstrating the stability of physical and psychological status over the year. Initial levels of pain, however, were unrelated to changes in depression, helplessness or functional disability.

Stress and Coping Model

There were no main effects of threat appraisals on helplessness, depression, or physical status when initial levels were controlled (Table 22). However, there was a significant interaction effect between threat and pain in predicting helplessness: at low levels of pain, threat appraisals were related to increased helplessness, whereas at higher levels of pain, threat appraisals were associated with decreased helplessness (see Figure 10). That is, individuals who responded to the diagnosis with feelings of threat and reported high pain at Time One also reported significantly less helplessness one year later than they had at the time of diagnosis.

Challenge appraisals failed to contribute to depression, helplessness or physical functioning one year later when initial outcome was controlled (Table 23). The challenge-by-pain interactions were similarly nonsignificant.

Self-efficacy Model

Self-efficacy continued to be marginally related to less functional disability when controlling for initial levels of functional disability ($p < .06$;Table 24). The interaction of pain and self-efficacy failed to predict change in depression.

TABLE 22

Change in Outcomes at Time 2 Explained by Time One Pain, Threat Appraisals and their Interaction

	Education		T1 Outcome		Pain		Threat		Interaction: Pain x Threat		Total	
Dependent Measure	ΔR^2	F	ΔR^2	F	ΔR^2	F	ΔR^2	F	ΔR^2	F	ΔR^2	F
Depression	.06	3.59	27	23 27***	.00	<1	00	<1	.01	1.19	34	5.80***
Helplessness	.08	5.19*	38	40 19***	.00	<1	01	<1	.06	6.52**	52	11.98***
Functional Disability	.03	1.92	35	33 82***	00	<1	00	<1	02	2.14	41	7.74***

$^{*}p<.05$ $^{**}p<.01$ $^{***}p<.001$

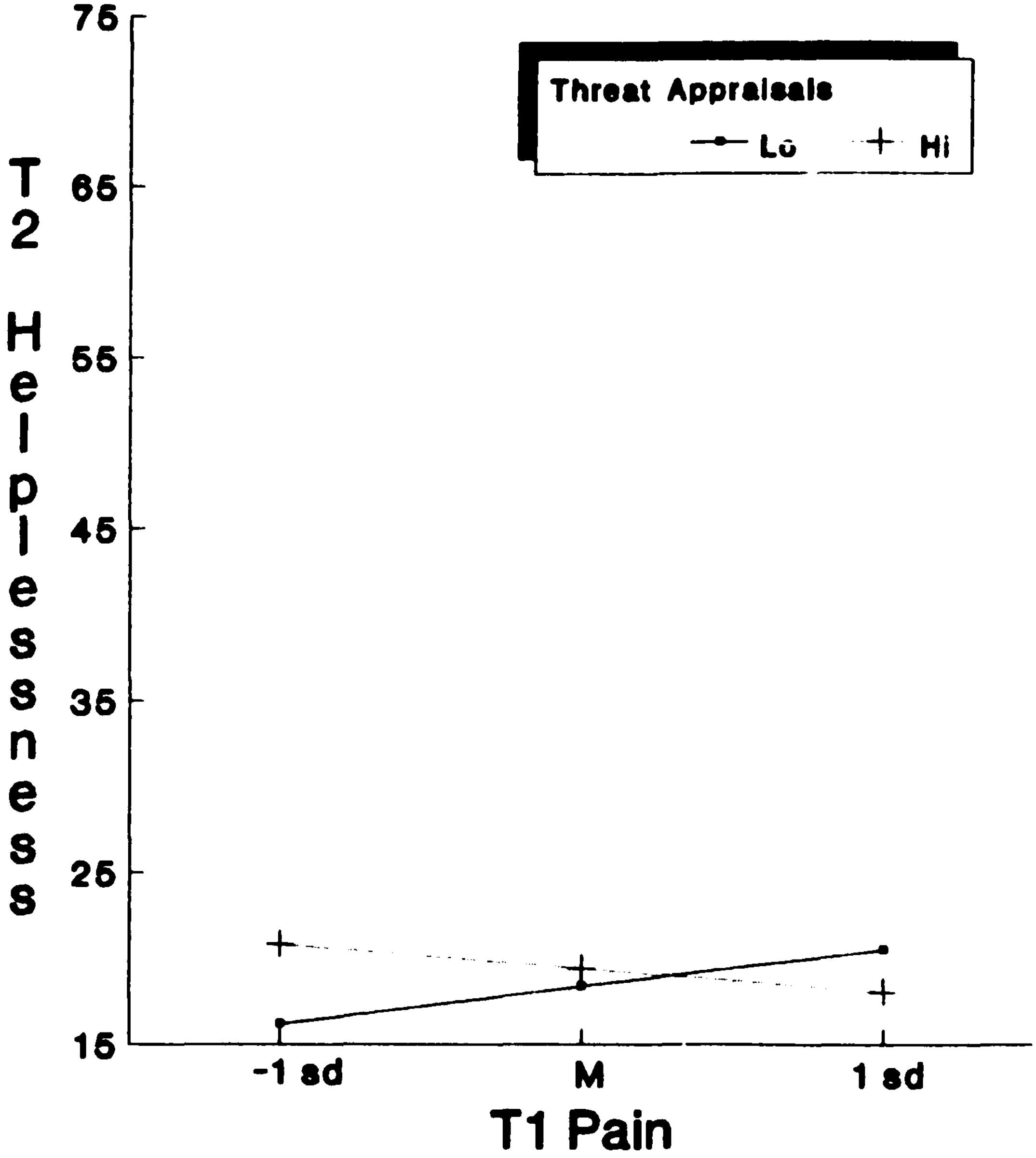

Figure 10. Interaction of Pain and Threat on Change in Helplessness

TABLE 23

Change in Outcomes at Time 2 Explained by Time 1 Pain, Challenge Appraisals and their Interaction

	Education		T1 Outcome		Pain		Challenge		Interaction: Pain x Challenge		Total Equation	
Dependent Measure	ΔR^2	*F*	ΔR^2	*F*	ΔR^2	*F*	ΔR^2	*F*	ΔR^2	*F*	ΔR^2	*F*
Depression	.06	3.59	.27	23.27***	.00	<1	.02	1.42	.01	<1	35	6.06***
Helplessness	.08	5.19*	.38	40.19***	.00	<1	.00	<1	.02	2.07	48	10.09***
Functional Disability	.03	1.92	35	33.82***	.00	<1	03	2.77	.00	<1	.42	7.95***

*p<.05 ***p<.001

TABLE 24

Change in Outcomes at Time 2 Explained by Time 1 Pain, Self-efficacy Appraisals and their Interaction

	Education		T1 Outcome		Pain		Efficacy		Interaction: Pain x Efficacy		Total	
Dependent Measure	ΔR²	F	ΔR²	F	ΔR²	F	ΔR²	F	ΔR²	F	ΔR²	F
Depression	.06	3.59	27	23 27***	00	<1	00	<1	.03	2.41	36	6 19***
Helplessness	.08	5.19*	38	40 19***	00	<1	02	1.75	.00	<1	.47	9 93***
Functional Disability	.03	1.92	35	33.82***	00	<1	04	3.65	.00	<1	.43	8.29***

*p<.05 ***p<.001

Learned Helplessness Model

Causal attributions had only marginal effects in predicting change in depression ($p < .06$) and change in helplessness ($p < .08$;Table 25). However, the interaction between pain and attributional style predicted change in depression (see Figure 11). At low levels of pain, causal attributions were unrelated to depression. At high levels of pain, however, internal attributions were associated with an increase in depression, while external attributions were associated with a slight decrease in depression.

Summary

Whereas threat appraisals were unrelated to psychological or functional outcomes at Time Two, the interaction of threat and pain was related to a change in helplessness such that threat appraisals, at higher levels of pain, were associated with a decrease in helplessness. Although self-efficacy appraisals were related to helplessness, functional ability and (in interaction with pain) depression, only the relationship to functional ability persisted when initial outcomes were partialled. The interaction of pain and causal attributions was related to depression both before and after controlling for initial levels.

TABLE 25

Change in Outcomes at Time 2 Explained by Time 1 Pain, Causal Attributions and their Interaction

	Education		T1 Outcome		Pain		Cause		Interaction: Pain x Cause		Total	
Dependent Measure	ΔR^2	F	ΔR^2	F	ΔR^2	F	ΔR^2	F	ΔR^2	F	ΔR^2	F
Depression	.01	<1	.21	13.53***	.01	<1	.06	3.80	08	5.05*	36	5.13***
Helplessness	07	3.43	.40	35.31***	.00	<1	.04	3.21	02	1.74	.52	9.57***
Functional Disability	.02	1.17	.38	31.58***	.01	<1	.00	<1	00	<1	41	6.52***

*p<.05 ***p<.001

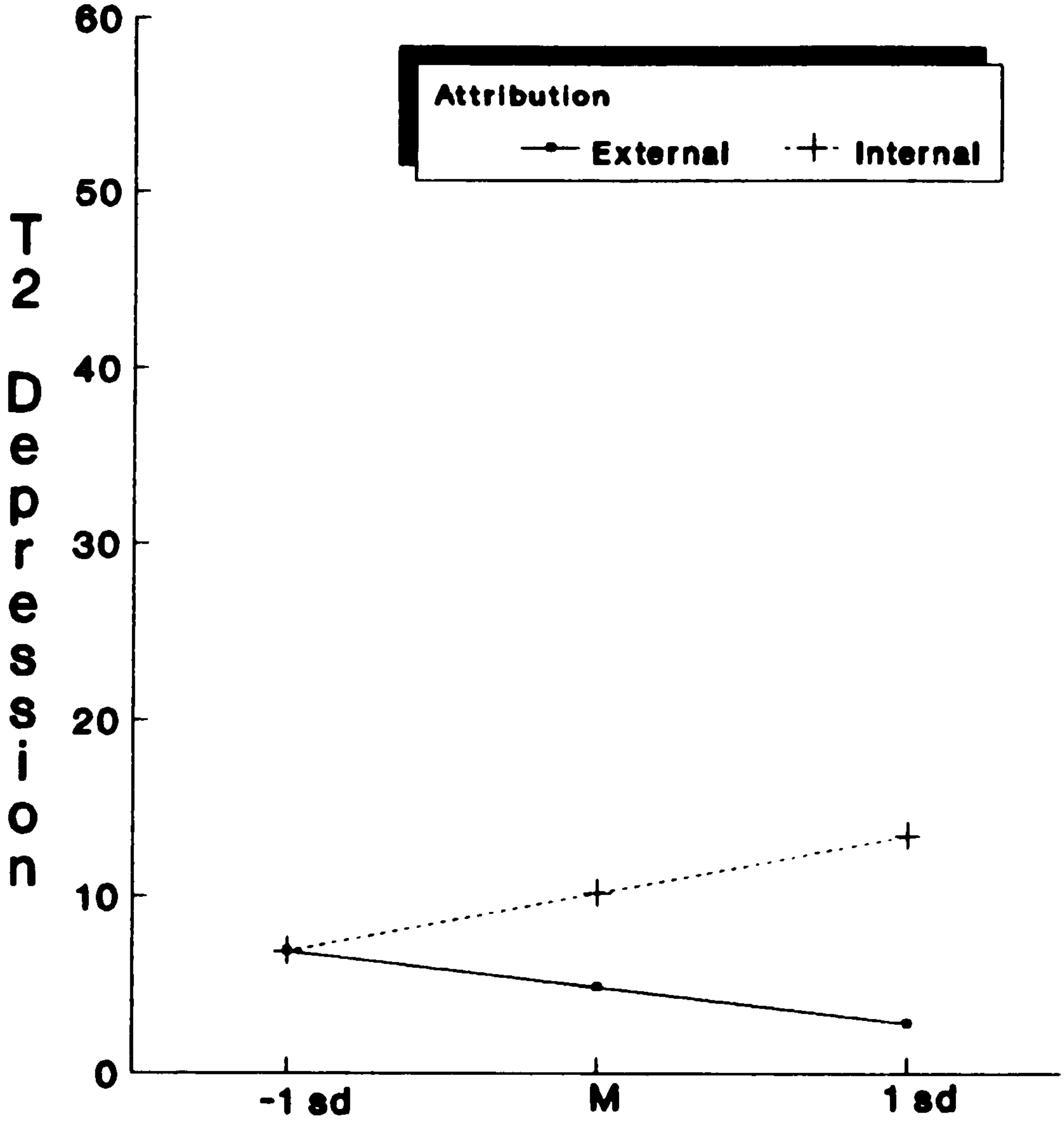

Figure 11. Interaction of Pain and Attribution on Change in Depression

Appraisals and Coping with a Recent Flare Episode

Analyses thus far have been concerned with the way that cognitive appraisals of the diagnosis of RA influence coping and adjustment both immediately and over the course of the first year after diagnosis. However, adjusting to a chronic illness like RA involves not only coping with the impact of the initial diagnosis, but also learning to deal with the symptoms associated with the illness. RA is characterized by pain, physical disability and systemic problems such as chronic fatigue. These symptoms may be relatively constant, or they may come and go unpredictably. They may be very severe, mild, or vacillate between both extremes. Thus, symptom appraisals may be quite different from appraisals of the initial diagnosis, although this distinction is seldom made clear in the literature (see Affleck et al., 1988, for one exception).

The results presented in this section concern how cognitive appraisals of a recent flare episode (i.e., a time of symptom exacerbation) are related to concurrent attempts to cope with the flare and to psychological and functional outcome concurrently and several months later. Expanding the measurement of appraisals, I examined specific illness representations which individuals hold about RA.

Stress and Coping Model

Primary and Secondary Appraisals. As primary and secondary appraisals of flare were intercorrelated (Table 26), a factor analysis was conducted to determine if the appraisal patterns found at Time One would be replicated. The resulting two-factor solution explained 59% of the variance and was identical to the Time One solution, with one exception: the "accept" appraisal loaded on the Threat factor and was included in the scale. This Threat Appraisals Scale had a mean of 2.87 (SD = .93) and an internal consistency reliability of .83. The Challenge Appraisals Scale produced a mean of 2.78 (SD = 1.15) and a correlation of .39. The two scales were correlated .22 (p < .05).

Relationship of appraisals to flare coping and outcome. Threat appraisals were positively correlated with both the use of problem-solving coping and spiritual acceptance, and were unrelated to either help-avoidance or distraction/diversion (Table 27). Challenge appraisals, on the other hand, were associated with only one of the four coping strategies: problem-focused coping.

Threat appraisals were related to higher levels of depression but were unrelated to either helplessness or functional ability. Challenge appraisals were associated with lower helplessness and lower functional disability, but were unrelated to depression. When the effect of educational level was partialled, the relationship between

Table 26

Intercorrelations Among Time Two Primary and Secondary Appraisals

	Primary Appraisals				Secondary Appraisals		
	Harm	Threat	Challenge	Loss	Change	Accept	Know More
Primary Appraisals							
Harm							
Threat	.70***						
Challenge	.37*	.20					
Loss	.52***	.64***	.26				
Secondary Appraisals							
Change	.12	.03	.39**	-.02			
Accept	.32*	.48***	-.00	.30*	-.03		
Know More	.19	.44**	.20	.36*	-.15	.26	
Hold Back	.33*	.61***	.10	.55***	.14	.44**	.35*

---

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

Table 27

Correlation of Time Two Appraisals with Time Two Coping and Outcome

	Threat	Challenge	Self-Efficacy	Causal Attribution	Causal Dimensions:		
					(I	G	S)
Coping Scales:							
Problem-focused	$.47^{**}$	$.39^{**}$	$.49^{***}$	$.31^{*}$	.17	.25	$.35^{*}$
Help avoidance	-.19	.18	-.02	-.23	-.14	-.23	-.23
Distraction/diversion	-.03	.22	.25	-.17	-.09	-.15	-.10
Spiritual acceptance	$.43^{**}$	.11	.16	$.31^{*}$	-.03	$.37^{**}$	$.33^{*}$
Outcome Scales:							
CES-D	$.58^{***}$	-.14	-.19	$.38^{**}$	.08	$.33^{*}$	$.46^{***}$
AHI	.08	$-.42^{**}$	$-.50^{**}$	.18	.08	.19	.19
Physical Functioning	.13	$-.31^{*}$	$-.52^{***}$	.09	-.19	.17	.23

$^{*}p < .05$ $^{**}p < .01$ $^{***}p < .001$

Note: CES-D = Center for Epidemiologic Studies depression scale
AHI = Arthritis Helplessness Index
I = Internal Attributional Rating
G = Global Attributional Rating
S = Stable Attributional Rating

challenge and functional disability disappeared but the other relationships remained strong.

Hierarchical multiple regression analyses were performed at Time Two following the same format used in the Time One cross-sectional analyses. The effect of educational level was controlled by entering it on the first step. Thereafter, level of pain reported in connection with the flare was entered, followed by threat appraisals of the flare; on the last step the interaction term of threat-by-pain was entered. Again, this multiple regression analysis was performed seven times using each of the four flare coping strategies and each of the three psychological and physical outcomes in turn as the dependent measure.

Threat appraisals were associated with greater use of problem-solving coping and with greater depression (Table 28). Threat appraisals were also related to spiritual coping, but the R^2 for the total equation did not reach statistical significance. There were no significant pain-by-threat interactions.

Challenge appraisals were also associated with greater use of problem-solving coping; in addition, the pain by challenge interaction term was significantly related to problem-solving (Table 29). At low levels of pain, challenge appraisals were unrelated to the use of problem-solving strategies; at high levels of pain, however, individuals high in challenge appraisals engaged in significantly more problem-solving coping, while individuals who were low in challenge appraisals engaged in even less

TABLE 28

Outcomes at Time 2 Explained by Time 2 Pain, Threat Appraisals and their Interaction

	Education			Pain			Threat			Interaction: Pain x Threat		Total	
Dependent Measure	ΔR^2	F	β	ΔR^2	F	β	ΔR^2	F	β	ΔR^2	F	ΔR^2	F
Coping													
Problem-solving	.00	< 1	01	.03	1.28	-.17	.33	21.83***	.61	.02	1 60	.39	6.42***
Help-avoidance	.04	1.75	.19	.00	<1	.00	.01	<1	-.09	.02	<1	.07	<1
Distraction/diversion	.02	<1	-.14	.01	<1	.07	.00	<1	- 03	.03	1.31	.06	<1
Spiritual acceptance	.04	1.93	-.20	.02	<1	.13	.12	6.43*	.37	.01	<1	.19	2.41
Adjustment													
Depression	.08	4.09*	-.28	.14	7.94**	.37	.18	12.92***	.44	.04	2.86	.43	8.22***
Helplessness	.09	4.44*	-.30	.20	12.63***	.45	.01	<1	-.10	.00	<1	.30	4.53**
Functional Disability	.03	1.53	- 18	34	24.84***	.59	.01	<1	-.12	.00	<1	.38	6.87***

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

TABLE 29

Outcomes at Time 2 Explained by Time 2 Pain, Challenge Appraisals and their Interaction

										Interaction:			
	Education			Pain			Challenge			Pain x Challenge		Total	
Dependent Measure	ΔR^2	F	B	ΔR^2	F	B	ΔR^2	F	B	ΔR^2	F	R^2	F
Coping													
Problem-solving	.00	<1	.06	.01	<1	-.11	.14	6.03*	.39	.16	7.80**	.32	3.94**
Help avoidance	.06	2.28	.24	.00	<1	.05	.02	<1	.14	.00	<1	.08	<1
Distraction/diversion	.04	1.38	-.19	.00	<1	.00	.08	3.05	.28	.01	<1	.12	1.15
Spiritual acceptance	.04	1.48	-.19	.01	<1	.10	.02	<1	.14	.05	1.80	.11	1.09
Adjustment													
Depression	.11	4.95*	-.34	.15	7.69**	.40	.01	<1	-.08	.00	<1	.27	3.36*
Helplessness	.12	5.55*	-.35	.19	10.49**	.45	.13	8.66**	-.37	.00	<1	.44	7.20***
Functional Disability	.03	1.06	-.16	.34	20.42***	.60	06	4.18*	-.26	.00	<1	.43	6.93***

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

problem-solving (see Figure 12). Challenge appraisals were related to less helplessness and less functional disability, but were unrelated to depression.

Self-efficacy Model

Self-efficacy appraisals.

The pattern of intercorrelations observed among the three self-efficacy items was quite similar to that observed at Time One. Factor analysis produced the same single factor solution, explaining 62.9% of the variance in the items; the 3-item scale had an internal reliability of .71 (M = 3.80; SD = .77).

Relationship of Self-efficacy with coping and outcome.

Self-efficacy was positively correlated with the use of problem-focused coping, but was unrelated to the other three strategies (Table 27). It was strongly related to lower helplessness and less functional disability, but was unrelated to depression. These relationships persisted when educational level was controlled. In the regression analyses, self-efficacy was related to greater problem-solving coping, lower helplessness and less functional disability (Table 30). There were no significant interactions.

Learned Helplessness Model

Causal Attributions.

Examination of the intercorrelation matrix for the three attributional dimensions revealed a strong relationship between the global and stable dimensions ($r = .70$, $p < .001$) and weaker relationships between these dimensions and internality

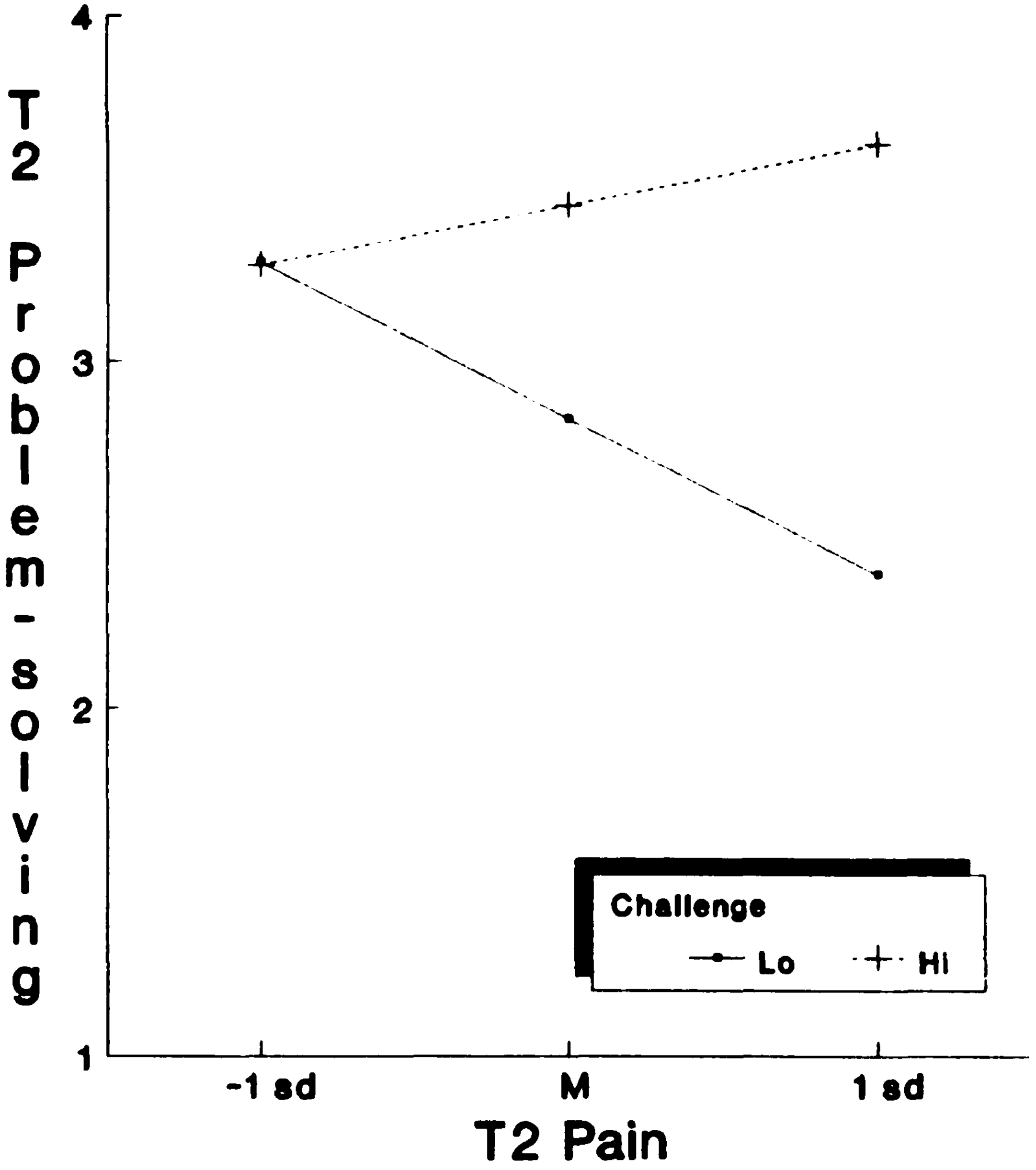

Figure 12. Interaction of T2Pain and Challenge on T2 Problem-Solving

TABLE 30

Outcomes at Time 2 Explained by Time 2 Pain, Self-efficacy Appraisals and their Interaction

	Education			Pain			Efficacy			Interaction: Pain x Efficacy		Total	
Dependent Measure	ΔR^2	F	β	ΔR^2	F	β	ΔR^2	F	β	ΔR^2	F	R^2	F
Coping													
Problem-solving	.00	<1	.02	.02	<1	-.15	.22	11.55**	.50	.01	<1	.26	3.27*
Help avoidance	.06	2.47	.24	.00	<1	.00	.00	<1	-.05	.00	<1	.06	<1
Distraction/diversion	.03	1.10	-.16	.00	<1	.07	.09	4.17*	.32	.04	1.73	.16	1.85
Spiritual acceptance	.04	1.81	-.20	.01	<1	.11	.06	2.56	.25	.00	<1	.11	1.23
Adjustment													
Depression	.09	4.12*	-.29	.13	7.27**	.37	.00	<1	-.04	.01	<1	.23	3.03*
Helplessness	.09	4.31*	-.30	.18	10.71**	.43	.11	7.67**	-.36	.00	<1	.39	6.46***
Functional Disability	.03	1.49	-.18	.34	23.35***	.59	.11	8.45**	-.35	.01	<1	.48	9.60***

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

(internality-globality, $r = .26$, $p < .10$; internality-stability, $r = .24$, ns). However, these three dimensions are commonly found to be interrelated and have been treated as a single dimension in recent research (Peterson et al., 1988).

A principal components analysis produced a one-factor solution explaining 59% of the variance. Stability and globality had higher loadings (.88 and .85, respectively) on this factor than internality (.53). Internal consistency reliability for the factor was .64. This suggests that the internal/external component may be at least partially separate from the other two dimensions; thus analyses will be conducted with both the total Causal Attribution Index and the separate dimensions. Higher scores on the causal attribution index indicate a tendency to make internal, global, stable attributions.

Relationship of attributions to coping and outcome. The total attribution index scale was positively correlated with the use of one of the four strategies: problem-focused coping (Table 27). Upon examination of the individual dimensions, however, it was seen that this relationship could be accounted for by the global and stable dimensions alone, and that internality explained almost no variance in coping. Causal attributions were also associated with higher levels of depression, but once again this association was attributable to globality and stability. When educational level was partialled out, the relationship between attributions and depression was marginal ($r = .36$,

$p < .06$), but the relationship with problem-solving persisted.

The set of multiple regression analyses were performed (Table 31). Only one of the seven equations revealed a significant contribution of causal attributions and the total R^2 for that equation was only marginally significant ($p < .06$): internal, global, stable attributions were related to a greater use of problem-solving coping. No other main effects were significant, nor were any pain-by-attribution interactions.

Causal attributions may only associated with negative outcomes if the uncontrollability of the event has been recognized (Affleck et al., 1988; Bradley, 1985). Attributing the cause of something which is uncontrollable to oneself should result in feelings of helplessness and depression. The Implicit Models of Illness Questionnaire contained one item specifically assessing the individual's perception about the controllability of RA, "RA is controllable". This item was used to explore the possible interaction between controllability and causal attribution. The set of seven multiple regression equations were modified so that educational level was entered on the first step, with RA controllability entered next, followed by the causal attribution scale, and then by the product term for controllability-by-causal attribution on the last step.

The control-by-attribution interaction was related only to depression. As predicted, when RA was seen as uncontrollable, internal/stable/global attributions were

TABLE 31

Outcomes at Time 2 Explained by Time 2 Pain, Causal Attributions and their Interaction

	Education			Pain			Cause			Interaction: Pain x Cause		Total	
Dependent Measure	ΔR^2	F	β	ΔR^2	F	β	ΔR^2	F	β	ΔR^2	F	ΔR^2	F
Coping													
Problem-solving	.00	<1	.06	.02	<1	- 13	.16	7.33**	.44	.03	1.38	.21	2.43
Help-avoidance	.00	<1	.02	.00	<1	-.05	.05	1.99	-.24	.01	<1	.06	<1
Distraction/diversion	.00	<1	.03	.01	<1	.09	.04	1.70	-.22	.03	1.05	.08	<1
Spiritual acceptance	.01	<1	-.11	02	<1	.14	.06	2.43	.26	.00	<1	.09	<1
Adjustment													
Depression	.10	4.65*	-.32	.11	5.96*	.34	.05	2.60	.24	.02	1.35	.29	3.92**
Helplessness	.07	3.24	- 27	.21	12.23***	.46	.00	<1	-.04	.00	<1	.29	3.91**
Functional Disability	.02	1.01	- 15	.41	29.42***	.64	.02	1.69	-.16	.02	1.15	.47	8.65***

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

associated with higher levels of depression (Table 32, Figure 13).

To summarize the cross-sectional results for flare appraisals, all of the appraisal constructs were related to use of problem-solving coping; no other coping behaviors were associated with appraisal.

Responding to an episode of flare with threat appraisals was associated with higher levels of depression, but was unrelated to helplessness or functioning. In contrast, responding to the flare with challenge appraisals was associated with less helplessness and less disability, but was unrelated to depression. Self-efficacy beliefs showed the same pattern of relationships to outcomes as challenge appraisals. Causal attributions were unrelated to helplessness, depression or functional disability, either by themselves or in conjunction with pain. However, internal, stable, global attributions were related to depression under conditions of perceived non-controllability.

Comparison of Appraisal Constructs Across the Models

The relationship of primary appraisal to secondary appraisal was consistent with that found at Time One. At Time One, however, the expected relationship between secondary appraisal of coping options and self-efficacy did not emerge. At Time Two, with all items assessing appraisals of symptom flare, a relationship was found only between secondary appraisals that one could do something to change the situation and self-efficacy (see Table 33).

TABLE 32

Outcomes at Time 2 Explained by Time 2 Control, Causal Attributions and their Interaction

Dependent Measure	Education			Control			Cause			Interaction: Control x Cause		Total	
	ΔR^2	F	β	ΔR^2	F	β	ΔR^2	F	β	ΔR^2	F	ΔR^2	F
Coping													
Problem-solving	.00	<1	.06	.11	4.67*	.37	.08	3.42	.28	.04	1.72	.22	2.61*
Help avoidance	.00	<1	.02	.03	1.21	.19	.07	3.02	-.28	.00	<1	.10	1.05
Distraction/diversion	.00	<1	.03	.00	<1	.00	.03	1.10	-.17	.17	7.77**	.20	2.28
Spiritual acceptance	.01	<1	-.11	.00	<1	.02	.08	3.18	.29	.01	<1	.10	1.01
Adjustment													
Depression	.10	4.65*	-.32	.10	4.96*	-.34	.15	9.49**	.41	.07	4.94*	.42	7.17***
Helplessness	.07	3.24	-.27	.27	16.63***	-.56	.06	3.68	.25	.00	<1	.40	6.38***
Functional Disability	.02	1.01	-.15	.13	6.45*	-.39	.02	1.08	.16	.01	<1	.19	2.24

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

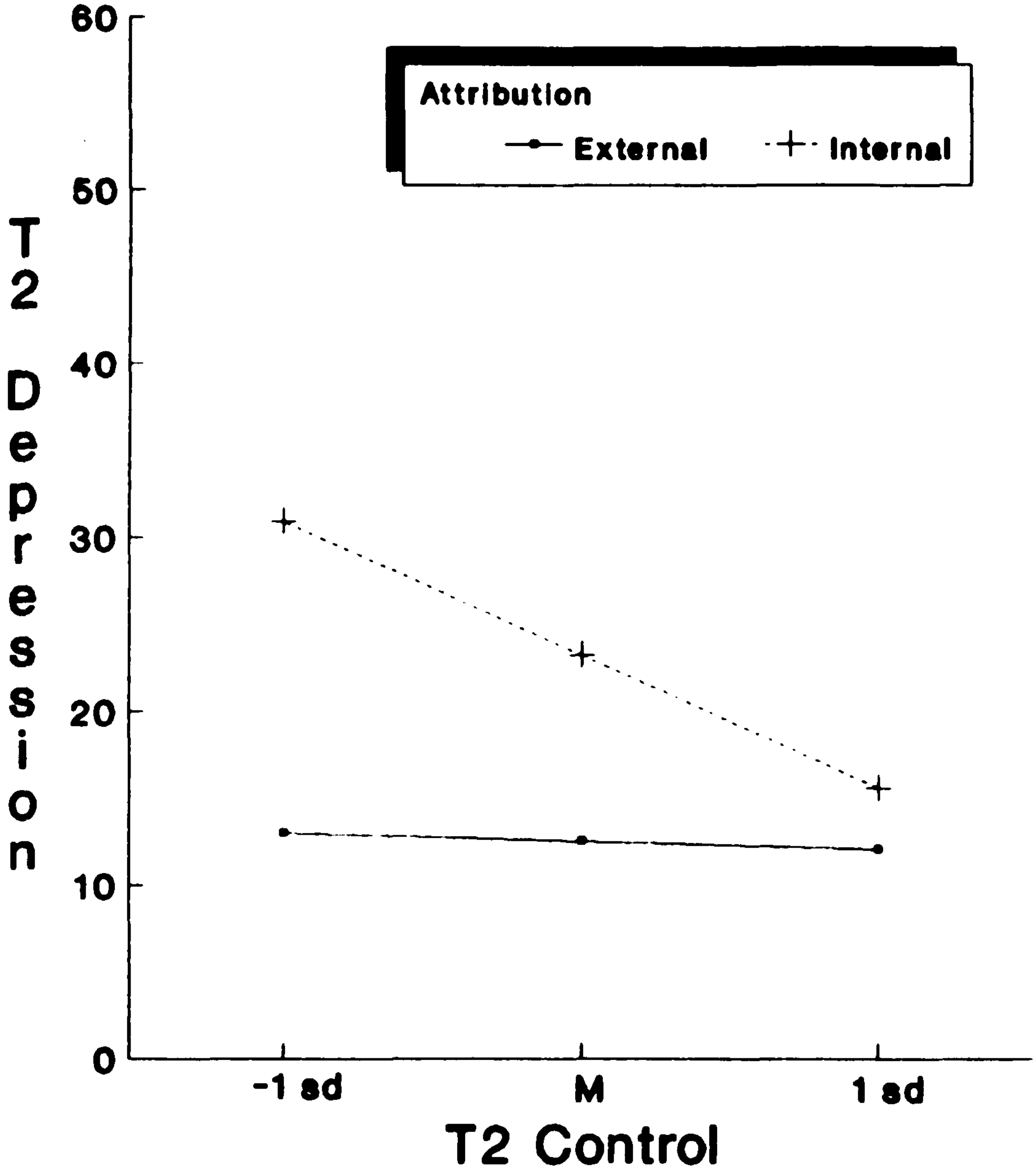

Figure 13. Interaction of T2 Control and Causal Attribution on T2 Depression

Table 33

Correlation of Secondary Appraisals with Self-efficacy Appraisals at Time Two

	Self-efficacy Appraisals:		
	Deal with Pain	Manage Limitations	Continue Activities
Secondary Appraisals:			
Change	.41**	.28	.37**
Accept	.03	-.15	.07
Know More	-.12	-.10	.05
Hold Back	.21	-.20	.25

---

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

Challenge appraisals were also related to self-efficacy ($r = .32$, $p < .05$). The causal attribution index was positively related to threat appraisals. However, examination of the separate dimensions revealed that this relation was primarily due to the globality ($r = .47$, $p < .01$) and stability ($r = .46$, $p < .01$) dimensions.

The Cognitive Representations of Illness Model

The Cognitive Representations of Illness Model was explored to see how this approach can contribute to our understanding of the processes described thus far. The Implicit Models of Illness Questionnaire (IMIQ) was included at Time Two as the measure of illness representations. The individual items of the IMIQ can also help us understand the relationship between these illness representations and the cognitive appraisals considered so far. For example, one would expect that individuals who make threat appraisals would describe the illness as serious; people making internal attributions would be more likely to think the cause of the RA had something to do with themselves.

Comparison of Appraisals and Illness Representations

Greater self-efficacy was associated with beliefs that RA is controllable ($r = .47$, $p < .001$).[6] Threat appraisals were associated with the seriousness of the illness ($r = .49$, $p < .001$) and the seriousness of its consequences ($r = .41$, $p < .01$). Challenge appraisals were also associated with recognizing the RA as serious ($r = .40$, $p < .01$).

The stability dimension of causal attributions was correlated with belief that the RA was related to one's own behavior ($r = .39$, $p < .01$). Internality was associated with the belief that RA requires medical attention ($r = .41$, $p < .01$).

Respondents with higher levels of depression described RA as having more serious consequences ($r = .37$, $p < .01$). Only the belief that RA is controllable was associated with lower levels of depression ($r = -.33$, $p < .01$). Lower levels of helplessness were also related to seeing RA as controllable ($r = -.45$, $p < .001$), controllable by one's self ($r = -.41$, $p < .001$), affected by stress ($r = -.32$, $p < .01$), and related to behavior ($r = -.31$, $p < .01$). Individuals with better levels of functioning were more likely to believe that RA is controllable ($r = -.36$, $p < .01$) and curable ($r = -.34$, $p < .01$).

Relationship of Illness Representation Scales to Coping and Outcome

When the five constructed illness representation scales (causes, RA label, chronicity, curability, controllability) were correlated with flare coping (Table 34), controllability was associated with greater use of problem-solving coping. RA Label was marginally related to help-avoidance ($p < .06$). None of the other illness representation scales were related to any of the other coping strategies. When level of education was partialled, the relationship of RA Label to help-avoidance was significant ($r = -.29$, $p < .05$).

Controllability was also associated with less functional disability and less helplessness. Ascribing to

Table 34

Correlation of Time Two Illness Representations with Time Two Outcomes

	Cause	Cure	Chronicity	Label	Control
Coping Scales:					
Problem-focused	-.02	.14	.03	.17	.36**
Help avoidance	-.17	-.00	-.11	-.23	.18
Distraction/diversion	.17	.14	.12	.03	-.04
Spiritual acceptance	-.08	-.04	.01	.08	.01
Outcome Scales:					
Depression	.08	.06	.16	.28*	-.19
Helplessness	-.00	.03	-.13	.15	-.52***
Functional Disability	.03	-.18	.06	.07	-.38**

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

the RA label was associated with higher levels of depression. No other relationships were found between the illness representation scales and outcomes. These same relationships persisted when educational level was partialled out, and no new relationships emerged.

To test the Illness Representation Model, a series of seven multiple regression analyses were performed as before, with educational level entered on the first step, pain entered on the second step, and the components of the illness representation (controllability, cause, cure, label and chronicity) entered as a set on the last step. Since I wanted to know not only if the set of illness representations as a whole contributed significantly to outcomes, but also which aspects of illness representations accounted for the findings, the illness representations were entered in the set using a forward stepwise regression procedure, in which each variable scale is entered into the equation only if it makes a significant additional contribution to the equation (criteria for entry = $p < .05$). Variables with the largest correlation with the dependent variable are entered first.

Three of the seven equations produced a total R^2 which was statistically significant. RA label was related to higher depression ($\Delta R^2 = .07$, $F = 5.02$, $p < .05$). Controllability was related to greater use of problem-solving ($\Delta R^2 = .12$, $F = 6.50$, $p < .01$) and less helplessness ($\Delta R^2 = .12$, $F = 10.81$, $p < .01$). No significant contribution to the equations was made by any of the other illness representation components.

Based on these results, only the two illness representations of RA controllability and RA label were used in analyses testing the relationship of the illness representations to coping and psychological and functional outcomes. Two sets of seven equations were constructed. In the first set, educational level was entered first, followed by pain, then the RA label, and finally the interaction term created from the product of pain-by-RA label. In the second group of equations controllability and a corresponding pain-by-controllability interaction term were substituted on the third and fourth steps.

There were no main effects for RA label (Table 35). There was one significant interaction, between pain and RA label in relation to depression (see Figure 14). At low levels of pain, ascribing to the RA label was unrelated to depression. At high levels of pain, patients who acknowledged the RA label reported higher levels of depression than those who didn't use the label.

Controllability was significantly related to greater use of problem-solving coping, in both a direct and interactive fashion (see Table 36 and Figure 15)[7]. For individuals in little pain, low illness controllability was related to slightly less use of problem-solving. For individuals in greater pain, low controllability was associated with a further decrease in problem-solving coping, while high controllability was associated with an

TABLE 35

Outcomes at Time 2 Explained by Time 2 Pain, RA Label and their Interaction

	Education			Pain			RA Label			Interaction: Pain x Label		Total	
Dependent Measure	ΔR^2	F	B	ΔR^2	F	B	ΔR^2	F	B	ΔR^2	F	ΔR^2	F
Coping													
Problem-solving	.01	<1	-.09	.03	1.74	-.19	.03	1.72	.19	.00	<1	.08	<1
Help avoidance	.03	1.44	.17	.01	<1	-.07	.04	2.19	-.21	.00	<1	.08	<1
Distraction/diversion	.03	1.56	-.17	.01	<1	.08	.00	<1	-.00	.00	<1	.04	<1
Spiritual acceptance	.02	<1	-.13	.03	1.30	.16	.00	<1	.05	.00	<1	.05	<1
Adjustment													
Depression	.06	3.60	-.25	.14	9.61**	.37	.05	3.54	.22	.06	4.31*	.31	5.84***
Helplessness	.10	6.51**	-.32	.21	16.54***	.46	.01	<1	.07	.00	<1	.32	6.16***
Functional Disability	.03	1.55	-.16	.33	27.75***	.57	.00	<1	-.00	.00	<1	.35	7.25***

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

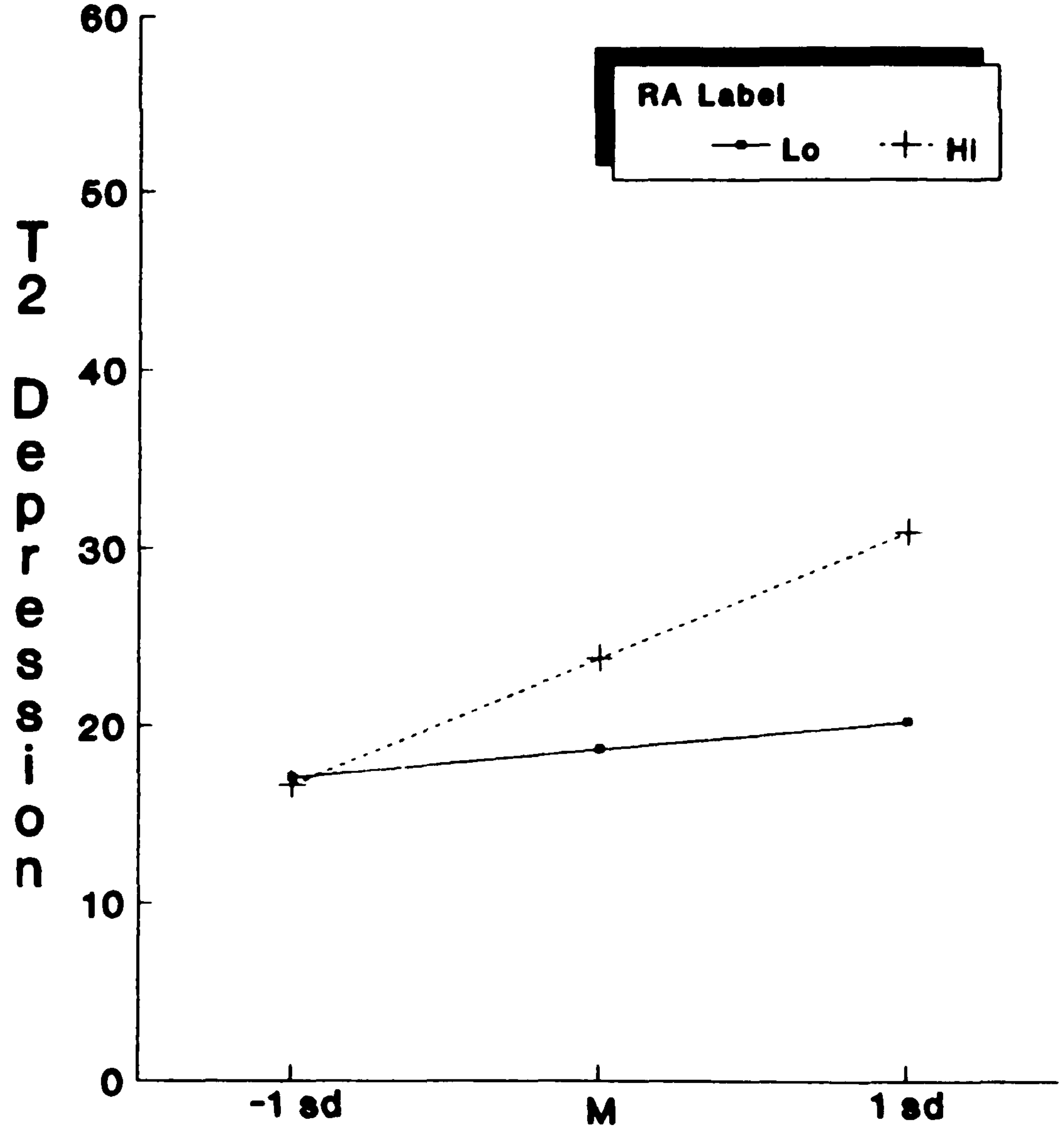


Figure 14. Interaction of T2 Pain and RA Label on Depression

TABLE 36

Outcomes at Time 2 Explained by Time 2 Pain, Controllability and their Interaction

	Education			Pain			Control			Interaction: Pain x Control		Total	
Dependent Measure	ΔR^2	F	β	ΔR^2	F	β	ΔR^2	F	β	ΔR^2	F	ΔR^2	F
Coping													
Problem-solving	.01	<1	-.08	.03	1.54	- 17	.13	7.95**	.41	.08	5.28*	.25	4.05**
Help avoidance	.01	<1	.10	.00	<1	-.04	.02	1.22	.17	.00	<1	.04	<1
Distraction/diversion	.02	<1	-.14	.00	<1	.05	.00	<1	.02	.02	<1	.04	<1
Spiritual acceptance	.04	1.99	- 19	.03	1.55	17	.02	1.30	.17	.01	<1	.10	1.35
Adjustment													
Depression	.07	4 26*	-.26	.14	10.42**	37	.00	<1	-.01	.00	<1	.21	3.81**
Helplessness	.09	5 61*	-.29	.20	16.76***	.45	.11	10.08 **	-.36	.01	<1	.40	9.52***
Functional Disability	.04	2 65	- 20	.32	30.41***	.57	.03	3.03	-.20	.00	<1	.40	9.49***

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

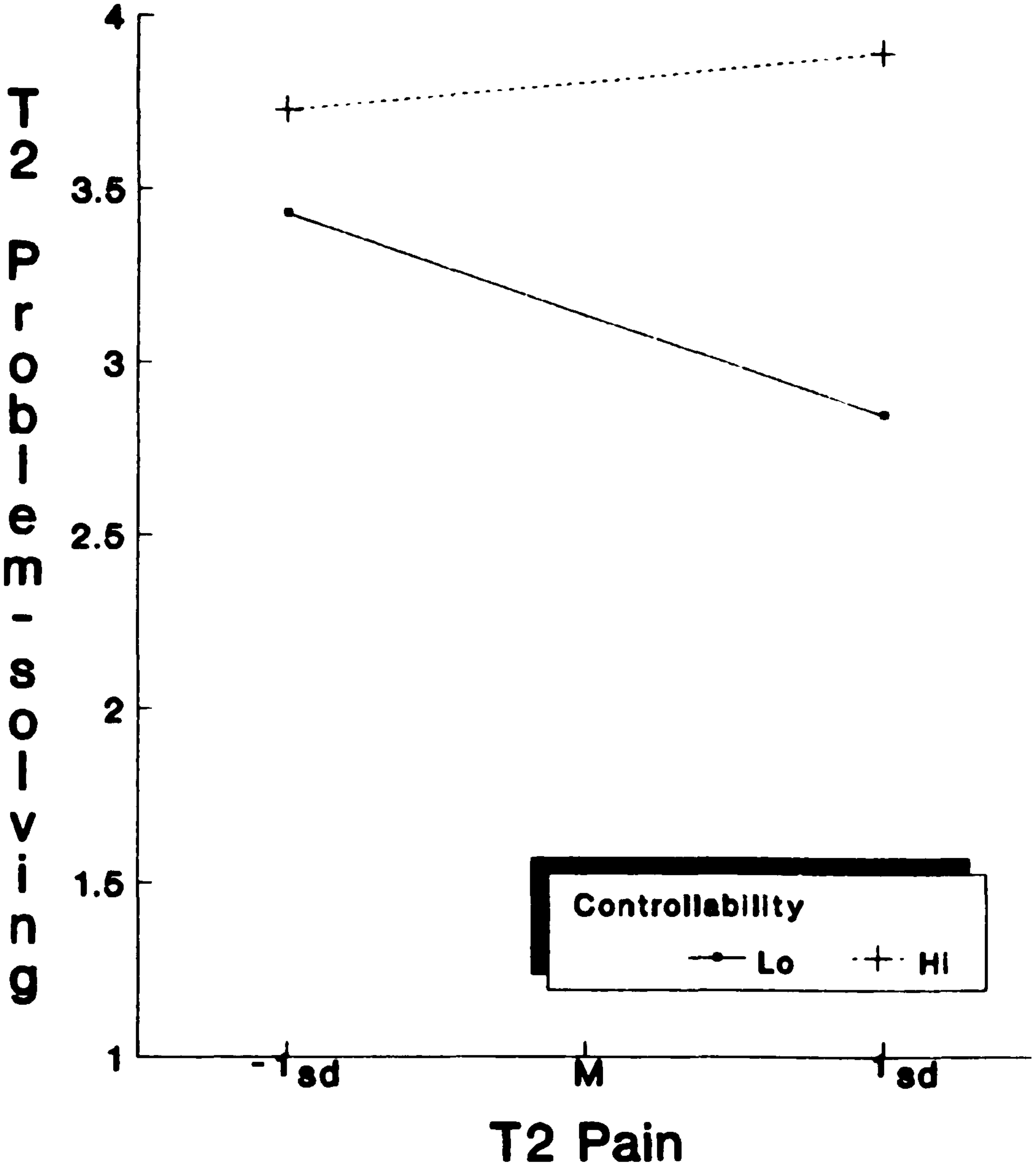


Figure 15. Interaction of T2 Pain and Controllability on T2 Problem-solving

increase in problem-solving. Moreover, controllability was directly related to lower helplessness, but was unrelated to depression or functional disability.

Summary of Cross-sectional Analysis of Flare Appraisals

Responding to an episode of illness flare with feelings of threat was associated with greater use of problem-solving coping and greater depression; responding to the flare with a sense of challenge was associated with problem-solving coping, less helplessness and less functional disability.

Believing in one's own abilities (self-efficacy) to deal with the flare was also associated with problem-solving, less helplessness and better functioning. The tendency to make internal, stable, global attributions about the cause of the flare was associated with problem-solving coping. In addition, there was an interaction between control and causal attributions in relation to depression, indicating that making internal attributions when one believes the RA to be uncontrollable is associated with greater depression.

Illness representations of the consequences of RA as described in the RA label interacted with level of pain in relation to depression; illness representations of RA as controllable were associated with problem-solving coping and reduced helplessness.

Summary of Findings

To clarify the relationships which have been found between the various outcomes and appraisals of diagnosis and appraisals of flare, I will summarize these findings as they apply to each outcome domain separately: coping behavior, depression, helplessness and physical functioning.

Appraisals and Coping Behavior

Illness diagnosis. Appraisals of illness diagnosis were most strongly related to the use of prayer as a coping strategy. Both challenge appraisals and self-efficacy beliefs were associated with spiritual coping at Time One. Threat appraisals and self-efficacy beliefs were associated with spiritual coping at Time Two. Self-efficacy was related to tension-reduction at Time One and problem-solving at Time Two.

Flare appraisals. All of the appraisals and representations, except for RA label, were associated with the use of problem-solving coping.

Appraisals and Depression

Illness diagnosis. Threat appraisals were marginally related to greater depression at Time One only. The interaction of self-efficacy and pain was related to higher levels of depression one year later, suggesting that the beneficial effects of self-efficacy deteriorate in the face of greater pain. The interaction of pain and causal attributions was also related to higher depression one year later, such that internal attributions were associated with greater depression at high levels of pain only. This interaction persisted even when initial levels of depression were controlled and only the change in depression over the course of the year was considered.

Flare appraisals. Threat appraisals were related to depression. The interaction of control and causal attribution was related to depression as expected: Internal/global/stable attributions accompanied by recognition that RA is uncontrollable were related to higher depression. Ascribing to the RA label and its message of seriousness, pain, and disability, was associated with higher concurrent depression only when level of pain was also high.

Appraisals and Helplessness

Illness diagnosis. At the time of diagnosis, self-efficacy was associated with less helplessness. Internal, global, stable attributions were associated with greater helplessness, but only when the attribution occurs in the presence of high levels of pain. Self-efficacy at Time One was also associated with lower helplessness one year later, although this relationship did not persist when initial levels of helplessness were partialled out. At high levels of pain, threat appraisals were associated with the change in helplessness, such that these threat appraisals predicted reduced helplessness one year later. On the other hand, there was a marginal relationship between causal attributions and change in helplessness, but in this case internal/global/stable attributions at high levels of pain predicted an increase in helplessness.

Flare appraisals. Challenge appraisals and self-efficacy beliefs were associated with lower helplessness assessed concurrently. Illness representations reflecting belief in the controllability of RA were also associated with lower helplessness.

Functional Disability

Illness diagnosis. Threat appraisals were associated with less functional disability, but only when assessed concurrently. Self-efficacy beliefs were strongly related to less functional disability concurrently and one year later.

Flare appraisals. Challenge appraisals and self-efficacy beliefs were accompanied by less functional disability.

Discussion

A diagnosis of rheumatoid arthritis has serious implications for the future of the patient. The patient is told that the illness has no cure, may cause significant physical limitations, and is often accompanied by almost constant pain. In the face of this diagnosis, people may worry about the plans they had held for their future before this crisis occurred; they may wallow, for a time, in self-pity filled with "what if's" and "if only's" and "why me's." They may also, very quickly, decide that they can "handle" this, just like they have handled all the other little surprises of life which have come their way thus far. This brings to mind a recent TV commercial for a national airline in which an employee is instructed to travel to four disparate cities in a short period of time. His response, "I can do that...I can do that...I can do that...How am I going to do that?" neatly summarizes what appears to be the primary adaptive mechanism of newly diagnosed RA patients. First, they decide they can handle it; then, they figure out how. In the present study, the model which has best embodied this adaptive process is the self-efficacy model.

Self-efficacy appraisals were consistently related to less helplessness and less functional disability. This was true with reference to appraisals of diagnosis and appraisals of flare and it was true when the impact of self-efficacy on outcome was assessed both concurrently and over time. Perhaps these findings merely reflect the reality that patients with less serious illness feel confident about their ability to "handle" their relatively minor levels of pain and limitations, while patients with severe pain and limitations express no such confidence. However, when the interaction of pain and self-efficacy was assessed, it was seen that the relationship of self-efficacy to helplessness and functional ability persisted independent of the level of pain -- even for persons in great pain, self-efficacy was associated with less helplessness and less functional disability.

Anticipated Findings

The relationship of threat appraisals to greater depression had been predicted based on findings by Lazarus and his colleagues in reference to primary appraisals (Folkman et al., 1986). The strong and persistent relationship of self-efficacy with better functional status and less helplessness was expected, based on theory and on research conducted with the Arthritis Self-Management Program (Lorig et al., 1984; O'Leary et al., 1989; Shoor & Holman, 1984). Similarly, the relationship of attributions in interaction with pain or control to greater depression and helplessness was quite consistent with theory (Abramson et al., 1978; Bradley, 1985).

The expectation that the appraisals would demonstrate distinct patterns of relationships to the outcomes was supported. Primary appraisals of threat contributed to depression in RA patients, whereas beliefs in one's ability to handle the pain and limitations of RA were associated with better functional status and less helplessness. Internal, stable, global attributions related to greater depression and helplessness. These patterns suggest that, at the earliest stages of treatment, there are things which patients can be encouraged to do (e.g., believe in their own ability to manage their illness). At the same time, there are responses which patients can be helped to avoid or quickly get beyond (e.g. feeling threatened or feeling personally responsible for the onset of the illness).

The collection of illness representations which described the nature of RA - the RA label - were associated with greater depression. The components of this RA label are consistent with the information a patient might reasonably receive from the physician at time of diagnosis (i.e., RA is chronic, painful and requires treatment). This message may be further reinforced by family and friends who have prior experience with RA. The goal of intervention, given this collection of findings, would be to help the patient acknowledge and get beyond the initial threat and depression, and find some aspect of the illness experience which they <u>can</u> handle.

Unanticipated Findings

The stress and coping model. There were only modest relationships between the appraisals one makes and coping efforts. Individuals who responded to the diagnosis of RA with appraisals of challenge also described a characteristic tendency to use spiritual coping in response to the pain and limitations which they had experienced over the course of the illness, pointing to the importance of religious beliefs as a coping mechanism. Conversely, all of the appraisals of a recent flare were associated with problem-solving coping in response to that flare, suggesting that, after a year or so of experience with RA, most people may have worked out a plan of action in response to a flare regardless of the types of appraisals they are making or have made of either diagnosis or flare. Because the coping measures at Times One and Two differed in their stressor -- pain vs. flare -- and in their time referent -- characteristic coping style vs. strategies used in response to a specific episode -- comparisons must be interpreted carefully.

The relationship between threat appraisals and lower functional disability at the time of diagnosis seemed counter-intuitive as did the finding that threat appraisals, when accompanied by severe pain, predicted a decrease in helplessness. Given the number of analyses conducted, isolated relationships such as these can only be treated with caution and kept in mind for future study.

The failure of challenge appraisals of the diagnosis to contribute to better outcomes at Time One was unexpected. Recall that the Challenge Scale included both primary appraisals of challenge and secondary appraisals of change; Folkman & Lazarus (1980) have reported that problems which respondents felt could be changed were related to instrumental coping. However, challenge appraisals of arthritis flare _were_ related to better physical functioning and less helplessness. Perhaps the concept of challenge, when considered in relation to abstract events (e.g., diagnosis) is not predictive, but when considered in relationship to a more concrete stressor like flare becomes more central.

The self-efficacy model. The finding that self-efficacy appraisals regarding diagnosis, when accompanied by high levels of pain, predicted depression a year later was surprising. It is certainly understandable that belief in one's ability to handle the situation may deteriorate in the face of constant pain and lead to feelings of depression. However, the fact that self-efficacy was associated with depression in only this one circumstance suggests that caution should be taken when interpreting this result.

The learned helplessness model. One unexpected but intriguing finding of this study was the almost negligible _role of internality_ in appraisals of RA. The relationships found between control and causal attributions seem to suggest a conflict between believing _I_ did something to cause this and at the same time believing _no one_ can do anything about this. The "I" component suggests that internality is a fundamental part of this attributional process. However, these relationships were, in every case, a result of the contributions of the stability and globality dimensions, with no significant contributions from the internality component. Recall that the stability and globality dimensions were more strongly related to each other than either one was to internality. Thus it was the stable and global aspects of the illness which contributed to the patient's helplessness and depression; the question of who or what is to blame seems to be less important, or at least unresolved. The failure to find any meaningful relationships between internality and related components at Time One was not necessarily due to the fact that the causal attribution in question concerned the diagnosis of illness. Even in relation to the occurrence of a flare episode, whether or not people thought the occurrence of the flare had something to do with themselves had little impact.

A recent review of attributional style as one example of multifaceted constructs in personality (Carver, 1989) may clarify the possible meaning of these findings. Carver returns to the original reformulation of the learned helplessness paradigm (Abramson et al., 1978) to remind us that each attributional dimension was originally hypothesized as playing a unique role regarding depression. Stability was believed to predict the time course of a depression, globality would predict its diffuseness, and internality was responsible for loss of self-esteem. Therefore, the absence of a relationship between internality and depression in this study is consistent with the reformulation.

Most research has used only the composite measure of attributional style, as recommended by Peterson and his associates (Peterson et al., 1988). Carver argues for the importance of presenting both composite scores and separate dimensions in attributional style research in an effort to resolve the debate over use of one composite score vs. separate dimensions in studies of depression. The present study makes an important contribution by presenting both the composite scores and the separate dimensions. The findings suggest that, at least for certain unpredictable chronic illnesses, internality is not a pivotal dimension. Future research which similarly presents data on the separate dimensions could replicate this finding and consider the relative contribution of each dimension for acute illnesses and for a variety of other stressors.

Abstract vs. Concrete Stressors: Diagnosis vs. Symptoms

It had been assumed that perceptions of self-efficacy were akin to what the Stress and Coping Model conceptualizes as secondary appraisal of coping options (Lazarus & Folkman, 1984). This convergence of constructs was not found for appraisals of illness diagnosis, but was somewhat stronger in terms of recent flare. The failure to find a relationship between assessmen s of self-efficacy and secondary appraisals at Time One may reflect a difference in focus: at Time One self-efficacy was assessed in terms of ability to handle the symptoms and concrete problems associated with the illness, whereas secondary appraisals were assessed in terms of the individual's ability to make sense of the illness diagnosis itself.

This distinction between the global concept of "illness" and the more specific concept of "symptoms" represents an important area of research which has only begun to be addressed (e.g., Affleck et al., 1987; Leventhal et al., 1984; Nerenz & Leventhal, 1983). Symptoms are specific, recurring events which can be thought about in a concrete fashion. The diagnosis of an illness, on the other hand, is highly abstract and may require extensive information processing in order to understand. In an acute illness, the relief of symptoms indicates "removal" of illness; in the case of chronic illnesses, such as RA, the illness is constant while symptoms may be periodic, or simply disappear. How patients think about the <u>illness</u> and how they think about their <u>symptoms</u> may be quite distinct.

Affleck et al. (1987) have touched on the same point in their study of RA patients. Patients thought they had more control over symptoms than over the course of the disease. Moreover, perceiving personal control over symptoms was associated with positive mood in patients with moderate and severe symptoms, but with negative mood and less positive global adjustment in patients with severe disease. As the authors conclude, "This pattern of findings is consistent with the theory that the maintenance of a belief in personal control over a chronic illness in the face of evidence to the contrary (i.e., a severe disease) poses a threat to adaptation. But a belief in personal control over daily symptoms could aid adaptation when symptoms flare" (Affleck et al., 1987, p. 278). In the present study, challenge appraisals of an episode of flare were related to better physical functioning and less helplessness, while challenge appraisals of illness diagnosis were unrelated to outcome.

Importance of Control

The importance of control to the adjustment process was demonstrated in another way in this study: internal, stable, global attributions for the cause of a flare, accompanied by a recognition that RA is uncontrollable, were associated with higher depression concurrently and several months later. On the other hand, believing in the controllability of RA (that RA is controllable and it is controllable by one's self) was associated with decreased helplessness concurrently and over time. Controllability was not directly related to depression.

Given the unpredictable nature of this illness, the "illusion of control" gained from believing a flare is the result of something one has done may be less depressing than the alternative of accepting that one is at the mercy of flares which can occur for no reason at all. Taylor has given considerable attention to the cognitive strategies which individuals use to maintain a sense of well-being (Taylor, 1983; Taylor & Brown, 1988). She concludes that "...a great deal of research in social, personality, clinical, and developmental psychology documents that normal individuals possess unrealistically positive views of themselves, an exaggerated belief in their ability to control their environment, and a view of the future that maintains that their future will be far better than the average person's. Furthermore, individuals who are moderately depressed or low in self-esteem consistently display an absence of such enhancing illusions" (Taylor & Brown, 1988, p. 197). In the present study, people who were functioning well and avoiding helplessness and depression tended to believe that RA was controllable and that they could manage the pain and limitations associated with RA, despite any evidence to the contrary in the form of medical information or serious pain.

Building a Comprehensive Model

The relatively distinct and non-redundant pattern of relationships which has emerged among the appraisal and outcome measures suggests the possible usefulness of an overarching theoretical framework within which one might place causes, consequences, and perceptions of self-efficacy in an effort to understand the whole cognitive appraisal process. The cognitive representation of illness model was included at Time Two as such a framework. This model provides a context for considering the way in which the patient is defining the illness, its symptoms and its impact on his or her life.

Research conducted with reference to a large contextual model offers several advantages: it can more accurately represent the "real world" with its many variables in complex interaction and with continual feedback, or it can be used to direct a multi-stage course of research in which specific sections of the model are tested, and these findings are used to structure consideration of the next portion of the model. Further, the development of psychosocial interventions benefits from the existence of a contextual model which can point to where one should intervene to affect outcomes.

The results of this study suggest some ways that future studies might be designed. For example, research concerned with helplessness as an outcome would benefit by considering the relative contributions of the illness cognition of controllability and challenge appraisals and self-efficacy beliefs, rather than by limiting itself to one model such as learned helplessness. Research concerned with understanding the experience of depression which often accompanies chronic illness would hopefully assess the formation and maintenance of threat appraisals, the interaction of control and causal attribution, and the interaction of pain and the RA label. If, however, the focus is on predictors of functional disability, the study would assess both self-efficacy and challenge appraisals.

The patterns of relationships which emerged between specific appraisal components and specific outcomes can be compared and contrasted within the context of a comprehensive cognitive representations model. The present study represents a first step in the implementation of such a model by exploring the similarities, differences, and interactions of several cognitive appraisal constructs which are central to research on coping with illness.

Limitations of the Study

A number of methodological limitations should be noted. The sample for this study included recently diagnosed rheumatoid arthritis patients. It did not include individuals with serious disability or illness of long duration, as the intent of the parent study was to focus on the process of adaptation to illness in the two years following diagnosis (Revenson, 1985). A body of research concerned with adaptation to RA of long duration already exists (Affleck et al., 1987; Dobbins & Wallston, 1987; Regan et al., 1988). This literature does not distinguish, however, between appraisals of discrete phases of the illness; the tendency has been to consider appraisals, coping, and adaptation in a general fashion, independent of the stage of the illness. The present findings suggest that appraisal and coping vary as a function of the particular illness stressor (i.e., diagnosis vs. flare). Future research might explore appraisal patterns for other critical stages, such as impending joint replacement surgery or the reemergence of illness after a long period of remission.

Care was taken to enter sequentially every new RA patient from participating physicians during the early stages of this study. While it is impossible to know how effective this strategy was, there was no evidence of systematic differences between referrals who refused to participate in the study as compared to those who agreed to participate. Of greater concern are the differences in amount of pain and functional status between the full sample at Time One and the longitudinal sample which participated in both assessments. Because of these differences, it is particularly reassuring that the pattern of relationships between physical functioning and self-efficacy is consistent at all points. It is possible, however, that the failure to find any pattern of appraisals associated with poorer functional status is in part due to the fact that the longitudinal sample was functioning at a fairly high level. On the other hand, this makes even more compelling the findings of significant levels of depression among participants making threat appraisals and internal attributions.

This study relied on self-report data, which is vulnerable to intentional and unintentional memory and social desirability biases. An attempt was made to control for these biases by offering the subjects complete anonymity and confidentiality. In addition, the Marlowe-Crowne Social Desirability Scale was administered and showed that a social desirability response set did not affect the variables under consideration.

A second concern of self-report methods is the accuracy of patients' descriptions of their health status. In this study, ratings of patients' health status made by their physicians were strongly correlated with patients' self-reports. In addition, considerable evidence exists from other studies which confirms the reliability of self-report functional status measures when compared to traditional clinical assessments of joint count, walking time and ARA functional classification (Pincus et al., 1989; Spiegel et al., 1988). Thus, there is every reason to believe that patients described their functional status and the severity of their illness accurately.

One of the key measures, the Arthritis Helplessness Index, was weak, having low internal consistency reliability at Time One (alpha = .53). Such low internal consistency means that the correlation of this scale with others might be attenuated, and that it would be more difficult to find significant relationships between helplessness and key independent variables. For example, at Time One the correlation of threat appraisals with helplessness was .14; when a correction for attenuation was performed (estimating the correlation if the AHI had an internal consistency reliability of .80), the correlation between threat appraisals and helplessness increased to a significant level ($r = .22$, $p < .05$). Thus, a more reliable measure might have revealed stronger relationships with helplessness.

In a recent manuscript the developers of the AHI suggest that the scale may actually consist of two factors: an internality factor and a helplessness factor (Stein, Wallston & Nicassio, 1987). Although the suggestion that the AHI might comprise two scales raises serious questions for the interpretation of a total scale score, the full scale was used for two reasons. First, the proposed two-factor structure is relatively new. Second, our attempt to replicate the proposed factor structure were unsuccessful, as were attempts by another investigator with a sample similar in medical status to ours (Newman, 1989, personal communication). Clearly, in future research it will be essential to test for the presence of this factor structure when measuring helplessness.

Future Research Directions

Several directions for future research are suggested by these findings. If initial appraisals of illness diagnosis can have an impact on psychological and physiological adjustment as long as a year later, it would be important to explore the interaction between patient and health professionals during the early stages of the diagnostic process. Is there any aspect of the patient-physician interaction or the patient-therapist interaction which might facilitate feelings of self-efficacy or minimize reactions of threat? To what extent might information provided by self-help organizations provide cognitive control?

The present study considered four theories of coping and adaptation which are primarily cognitive in their formulations and implementations. Individuals do not always respond to crises in a conscious and cognitive fashion, however. The study described here did not consider the ways in which people handle stress by <u>not</u> dealing with it -- by denying the problem exists, for example. Caplan and his associates (Caplan et al., 1984) have attempted to assess the ways in which coping efforts and defensive behaviors interact to influence adaptation. The "defense-like" strategies which they assess are analogous to Lazarus' emotion-focused strategies, including prayer, withdrawal, and cognitive change. Lazarus and Folkman (1984) have also described "denial-like" processes, reminding us that such processes are not inherently good or bad, but should instead be considered in terms of the context.

Future research might explore the self-illness relationship proposed in the Illness Representations Model. This relationship may provide a focus for understanding the complexity of the search for meaning in appraisals of illness. We are reminded that the individual is appraising the illness in terms of the characteristics of their own self structure, which is in turn a reflection of sociocultural roles and values and fundamental individual differences in temperament and personality. This self structure influences the formation of the illness representation which leads in turn to the formation of the self-illness relationship which can either facilitate or impede successful adaptation. Research directed towards understanding this self-illness relationship would allow us to consider the "reaction" of individuals to the illness, the adjustments which they make in their lives based on this reaction and the cost of these adjustments to their sense of self. For this reason, future research should address the impact of the diagnosis of chronic illness on self-esteem, and the changes which occur in the self structure as a result of this experience.

Of particular interest to the study of rheumatoid arthritis is the way that serious deformity may affect one's view of self and the way that the possibility of deformity influences initial appraisals. For patients with a family history of RA, illness representations would be more likely to include deformity as an anticipated consequence, whereas patients who were relatively unfamiliar with RA until their diagnosis may be less aware of this future potential. The present study reported on a sample of recently diagnosed RA patients who had not yet experienced deformities as a result of the illness (only a small portion of the sample reported a family history of RA). Future research might attempt to replicate the observed appraisal-outcome relationships using a sample for which the stressors of deformity and significant disability were salient.

Finally, the patterns of relationships which emerge from this and future research should be used to guide the creation of patient interventions directed at facilitating successful adjustment while minimizing psychological strain. Arthritis interventions have generally targeted cognitive strategies, such as cognitive restructuring and relaxation training, information and education about the nature of the illness and its treatments, and behavior change, such as range of motion exercises to maintain mobility, or modifications of activities of daily living to minimize pain and disability (O'Leary et al., 1988; Parker et al., 1988, Regan, et al., 1988). It is usually assumed that the information and/or cognitive strategies will lead to behavior change which will, in turn, contribute to better physical and psychological status. However, in some cases cognitions have been related to outcomes, independent of behavior change (O'Leary et al., 1988; Shoor & Holman, 1984). In the present study, self-efficacy has been consistently related to better physical functioning, while showing no unique relationship to coping behavior.

The data here suggest that interventions aimed at increasing perceptions of self-efficacy will best contribute to better functioning and reduced feelings of helplessness. On the other hand, interventions directed at reducing depression would best target two components: threat appraisals and internal, stable, global attributions. Cognitive restructuring aimed at <u>not</u> seeing the RA as an enduring harm or loss affecting every aspect of one's life should offer the most hope of reducing depression.

Conclusions

Several conclusions emerge from this study:

1. If one was primarily interested in finding out what factors influence a patient's ability to manage in the face of RA, assessing appraisals of self-efficacy alone would be sufficient. This single construct has proven to be a powerful predictor of functional status. This finding has significant implications for patient intervention efforts.

2. From a strictly theoretical perspective, the findings regarding the learned helplessness model have been most compelling. Although the perception of uncontrollability prior to causal attribution is an essential component of the theory, many studies have either ignored this aspect or replaced it with a perception of the event as negative. The findings reported here support the importance of assessing perceptions of control when testing the learned helplessness paradigm.

In addition it was seen, both in relation to diagnosis and to flare, that the internal-external component of the attribution was not related to outcomes. The importance of using both a total score and component scores in research on causal attributions was recently noted by Carver partially in response to a move away from emphasis on the separate dimensions towards study of attributional style which relies on the total score only.

3. Finally, the assessment of the cognitive representations of illness model presented here constitutes

an exploratory effort. Taken as a whole, sufficient evidence seems to exist to justify continued consideration of this model. In addition to providing a structure within which to study the relative contributions of primary appraisals, causal attributions, and self-efficacy beliefs, it has introduced two facets of its own - the illness label and illness controllability.

Within the cognitive representations framework, we can begin to focus on the likelihood that some patients may hear the illness label described by their physician or family and respond immediately with feelings of threat and depression, decide that the cause of the RA was some internal, stable, global factor, and experience continued depression and helplessness a year later. Other patients may respond with threat and initial depression followed by a determination that they can "manage" their illness and this belief in their own self-efficacy will contribute to less helplessness and better functioning independent of the initial depression. After all, appraisals that led to better functioning did not necessarily lead to decreased depression. These appear to be quite independent processes.

Physicians and patients, confronted with the need to understand RA and cope with it daily, cannot afford to focus on one piece of the adaptation process at a time. A comprehensive research model will help us understand which parts of this illness experience are important for patients at various points in time and which appraisals and coping strategies best help them manage the experience. This information will be useful, not only to the physician as a guide for interactions with patients, but will also contribute to the development of patient education interventions which are responsive to the ways patients are actually thinking about their illness.

Footnotes

[1] This longitudinal study of Psychosocial Adaptation to Onset of RA was conducted by Dr. Tracey Revenson of the Graduate Center of the City University of New York in conjunction with the Hospital for Special Surgery. Dr. Revenson's study was funded by NIH (Grant# R15 AM36679), by the New York City Chapter of the Arthritis Foundation, and by a PSC-CUNY grant.

[2] The presence of another chronic illness was not a criteria for exclusion. Many patients, paricularly older individuals, have more than one chronic illness. Co-morbidity, however, was assessed and analyses took into consideration the possible influence of multiple chronic illnesses on patient outcome. At issue here is the existence of a particular crisis or experience in the individual's life of such enormity that the issues of coping with arthritis pain or disability becomes irrelevant by comparison.

[3] Because attributional style is concerned with consistent beliefs which individuals hold, rather than with their capacity to accurately recall facts, there is some difficulty in coding causes of illness (C. Peterson, personal communication, October 15, 1988). Causes which merely repeat the information given to a patient by his or her physician may not be helpful to the researcher concerned with attributional style. Fortunately, many of the participants in this study reported multiple causes; most typically, a patient would say that the doctor said the the cause of RA was unknown, but then describe some causal belief held despite this information.

[4] Physicians' ratings of clinical status were obtained for 79 of the 101 participants. These 79 patients did not differ significantly from the remaining 22 patients in self-report of physical functioning.

[5] When interaction effects are tested by creating a product term, it is possible that correlations between the interaction term and its constituent parts will result in multicollinearity in the regression analyses. Using deviation scores in product-term regression has been recommended as a cure for this multicollinearity problem and to facilitate correct interpretation of the main effect in the presence of a significant interaction (Finney, Mitchell, Cronkite & Moos, 1984). Therefore, deviation scores were created for moderator variables by subtracting the raw scores from their means, a process known as centering. Centering the constituent variables in this fashion provides a better picture of the nature of the main effects, because they are not distorted by the multicollinearity in the interaction term. The interaction effect (i.e., the change

in R^2 and significance tests) remains the same for raw scores or centered deviation scores, although the constant (A) and unstandardized regression coefficients (B's) have changed.

[6] Because the 45 items in the Implicit Models of Illness Questionnaire) were correlated with six appraisals (threat, challenge, self-efficacy, internality, globality and stability), 14 out of the resulting 280 correlations could be significant by chance alone. To reduce the contribution of chance, only correlations significant at .01 or better will be discussed.

[7] The interpretation of a main effect changes in the presence of a significant interaction. The main effect, given a significant interaction effect, is interpreted as the average effect of the variable across all observed scores of the moderator (i.e., pain).

Appendix

ID Number ________

COPING WITH A FLARE

Think back to your most recent "flare-up" -- that is, the last time when your arthritis symptoms were a good deal worse than they usually are. Please describe that situation in a couple of sentences. Describe what it felt like, when it happened, where you were, and any problems that resulted.

____

____

____

____

____

____

1. What do you think caused this flare-up?

____

____

____

____

2. Is the cause of this flare-up something about you or something about other people or circumstances? (circle the correct number)

Something about other people or circumstances	1	2	3	4	5	6	7	Something about me

3. In the future, will the cause of this flare-up again be present?

Will never again be present	1	2	3	4	5	6	7	Will always be present

4. Is the cause of this flare-up something that affects many areas of your life?

Affects just one particular area of my life	1	2	3	4	5	6	7	Affects many areas of my life

5. When you had this flare, did you feel:	Not at all	A little b	Somewhat	Quite a b	A great d
a. Harmed because it had occurred?	1	2	3	4	5
b. Threatened by something that might occur in the future?	1	2	3	4	5
c. Challenged by the situation?	1	2	3	4	5
d. Did you feel that something had been lost or taken away?	1	2	3	4	5
6. Did you think that this flare was something:					
a. that you could change or do something about?	1	2	3	4	5
b. that you had to accept?	1	2	3	4	5
c. which you needed to know more about before you could act?	1	2	3	4	5
d. where you had to hold yourself back from doing what you wanted to do?	1	2	3	4	5
7. How much ability do you think you have to:					
a. manage your flare?	1	2	3	4	5
b. continue activities despite the flare?	1	2	3	4	5
c. follow your treatment regimen?	1	2	3	4	5

When you turn this page, you will find on the left-hand page a list of different ways that people handle flare, and next to it on the right-hand page will be several columns of boxes. For each item in the list, remember the flare situation you've just described. Place a check in the box under the heading that best describes how you handled that flare. For example:

How did you handle the flare situation you just described?

	DID NOT USE	USED A LITTLE	USED SOMEWHAT	USED A GREAT DEAL
Exercising	☐	☐	☑	☐

This would mean that you used this way of handling flare somewhat.

Please turn the page to continue

Here are the 11 different strategies (or ways) of handling flare:

1. I diverted attention away from my flare by thinking about other things or engaging in some activity.
2. I tried to see my flare in a different light that made it seem more bearable.
3. I thought about solutions to handle my flare.
4. I gathered information.
5. I actually did something to try to handle my flare.
6. I expressed emotions in response to my flare to reduce tension, anxiety, or frustration.
7. I accepted the fact that the flare was there, but that nothing could be done.
8. I sought or found emotional support from loved ones or friends.
9. I sought help from professionals (e.g., doctors, nurses, psychotherapists, counselors).
10. I did something with the explicit intention of relaxing.
11. I sought or found spiritual comfort.

For the flare situation you just described . . .

How much did you use/not use these 11 strategies? For each one, check the box under the column that best fits your answer.

	DID NOT USE	USED A LITTLE	USED SOMEWHAT	USED A GREAT DEAL
1.	☐	☐	☐	☐
2.	☐	☐	☐	☐
3.	☐	☐	☐	☐
4.	☐	☐	☐	☐
5.	☐	☐	☐	☐
6.	☐	☐	☐	☐
7.	☐	☐	☐	☐
8.	☐	☐	☐	☐
9.	☐	☐	☐	☐
10.	☐	☐	☐	☐
11.	☐	☐	☐	☐

When you have checked one box for each of the 11 strategies, please turn the page and continue. The next questions will look the same, but are actually a bit different.

Here are the 11 different strategies (or ways) of handling flare:

1. I diverted attention away from my flare by thinking about other things or engaging in some activity.
2. I tried to see my flare in a different light that made it seem more bearable.
3. I thought about solutions to handle my flare.
4. I gathered information.
5. I actually did something to try to handle my flare.
6. I expressed emotions in response to my flare to reduce tension, anxiety, or frustration.
7. I accepted the fact that the flare was there, but that nothing could be done.
8. I sought or found emotional support from loved ones or friends.
9. I sought help from professionals (e.g., doctors, nurses, psychotherapists, counselors).
10. I did something with the explicit intention of relaxing.
11. I sought or found spiritual comfort.

For the flare situation you just described . . .

How much did these 11 strategies help? Once again, please check the box under the appropriate column for each strategy on the left.

	DID NOT HELP	HELPED A LITTLE	HELPED A LOT
1.	☐	☐	☐
2.	☐	☐	☐
3.	☐	☐	☐
4.	☐	☐	☐
5.	☐	☐	☐
6.	☐	☐	☐
7.	☐	☐	☐
8.	☐	☐	☐
9.	☐	☐	☐
10.	☐	☐	☐
11.	☐	☐	☐

Now please complete the next section of this Health Diary, the Illness Questionnaire.

ID Number ___

ILLNESS QUESTIONNAIRE

For this part of our study, we would like to find out how people with rheumatoid arthritis (RA) describe this illness. The questions which you will see on the next page were originally designed with many different kinds of illnesses in mind, so don't be surprised if some questions seem very obvious or very silly when applied to RA.

Please answer the questions based on <u>your own personal beliefs about RA</u>. Answer by circling the number (1-5) under the appropriate choice. (Even if you have a different kind of arthritis, like lupus, please answer for RA.)

Before you turn the page, please answer the following question by circling the appropriate choice:

How familiar are you with rheumatoid arthritis (RA)?

Very familiar	1	2	3	4	5	Not at all familiar

Please turn the page

Please answer the following questions by circling the number under the best choice.

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
1. RA is controllable.	1	2	3	4	5
2. RA requires medical attention.	1	2	3	4	5
3. RA is chronic (long-lasting) rather than acute (short-lived).	1	2	3	4	5
4. RA is affected by stress or nerves.	1	2	3	4	5
5. A symptom of RA is fever.	1	2	3	4	5
6. RA is disabling.	1	2	3	4	5
7. The symptoms of RA seem to be located in the stomach or intestinal tract.	1	2	3	4	5
8. RA is cured by medication.	1	2	3	4	5
9. RA has serious consequences for the individual.	1	2	3	4	5
10. RA is influenced by germs or virus.	1	2	3	4	5
11. RA is caused by changes in weather.	1	2	3	4	5
12. The symptoms of RA seem to be on the surface of the skin.	1	2	3	4	5
13. RA is painful.	1	2	3	4	5
14. RA is related to one's behavior.	1	2	3	4	5
15. The symptoms of RA are similar to the common cold.	1	2	3	4	5

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
16. RA requires hospitalization.	1	2	3	4	5
17. RA is permanent rather than temporary.	1	2	3	4	5
18. RA is influenced by changes in weather.	1	2	3	4	5
19. RA is cured by reduced stress.	1	2	3	4	5
20. RA is caused by stress or nerves.	1	2	3	4	5
21. RA goes away on its own.	1	2	3	4	5
22. RA is caused by one's behavior.	1	2	3	4	5
23. The symptoms of RA are constant.	1	2	3	4	5
24. RA is cured by proper eating habits.	1	2	3	4	5
25. RA is affected by lack of rest.	1	2	3	4	5
26. RA is controllable by the individual.	1	2	3	4	5
27. RA is cured by rest.	1	2	3	4	5
28. The presence of RA relates to something the individual did.	1	2	3	4	5
29. RA is contagious.	1	2	3	4	5
30. The symptoms of RA change seasonally.	1	2	3	4	5
31. RA is caused by germs or virus.	1	2	3	4	5
32. RA is caused by lack of rest.	1	2	3	4	5
33. RA can be avoided.	1	2	3	4	5
34. RA is serious.	1	2	3	4	5
35. RA often comes back.	1	2	3	4	5

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
36. No one is responsible for the onset of RA.	1	2	3	4	5
37. RA is changeable.	1	2	3	4	5
38. RA is caused by poor diet.	1	2	3	4	5
39. RA is curable.	1	2	3	4	5
40. RA is related to a poor diet.	1	2	3	4	5
41. RA changes over time.	1	2	3	4	5
42. The symptoms of RA seem to be located in the head or nervous system.	1	2	3	4	5
43. RA affects many parts of the body.	1	2	3	4	5
44. RA is cured by physical exercise.	1	2	3	4	5
45. RA is terminal.	1	2	3	4	5

Now please complete the last section of this Health Diary, the Personal Feelings Checklist (in pink).

PERSONAL FEELINGS CHECKLIST

Please answer the following questions by circling the number (0-3) under the appropriate choice

During the past week:	Rarely (less than 1 day)	Some of the time (1-2 days)	Occasionally (3-4 days)	Most o (5-7 d
1. I was bothered by things that don't usually bother me.	0	1	2	3
2 I did not feel like eating; my appetite was poor	0	1	2	3
3 I felt that I could not shake off the blues even with help from my family or friends.	0	1	2	3
4. I felt that I was just as good as other people.	0	1	2	3
5. I had trouble keeping my mind on what I was doing.	0	1	2	3
6. I felt depressed.	0	1	2	3
7. I felt that everything I did was an effort.	0	1	2	3
8. I felt hopeful about the future.	0	1	2	3
9. I thought my life had been a failure.	0	1	2	3
10. I felt fearful.	0	1	2	3
11. My sleep was restless.	0	1	2	3
12. I was happy.	0	1	2	3
13. I talked less than usual.	0	1	2	3
14. I felt lonely.	0	1	2	3
15. People were unfriendly.	0	1	2	3
16. I enjoyed life.	0	1	2	3
17. I had crying spells.	0	1	2	3
18. I felt sad	0	1	2	3
19. I felt that people disliked me.	0	1	2	3
20. I could not get "going".	0	1	2	3

Please answer the following questions by circling the number under the best choice.

YOUR ARTHRITIS	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
1. Arthritis is controlling my life.	1	2	3	4	5
2. Managing my arthritis is largely my own responsibility.	1	2	3	4	5
3. I can reduce my pain by staying calm and relaxed.	1	2	3	4	5
4. Too often, my pain just seems to hit me out of the blue	1	2	3	4	5
5 If I do all the right things, I can successfully manage my arthritis.	1	2	3	4	5
6. I can do a lot of things to cope with my arthritis.	1	2	3	4	5
7. When it comes to managing my arthritis, I feel that I can only do what my doctor tells me to do.	1	2	3	4	5
8 When I manage my personal life well, my arthritis doesn't flare up as much.	1	2	3	4	5
9. I have considerable ability to control my pain.	1	2	3	4	5
10. I would feel helpless if I couldn't rely on other people for help with my arthritis.	1	2	3	4	5
11. Usually, I can tell when my arthritis will flare up	1	2	3	4	5
12. No matter what I do, or how hard I try, I just can't seem to get relief from my pain.	1	2	3	4	5
13. I am coping effectively with my arthritis.	1	2	3	4	5
14. It seems as though fate and other factors beyond my control affect my arthritis	1	2	3	4	5
15. I want to learn as much as I can about arthritis	1	2	3	4	5

PERSONAL HEALTH UPDATE

The first part of this questionnaire has been designed to tell us about your pain: What your pain feels like, how it changes with time, and how strong it is

1. First, when did you last take any arthritis medication, including aspirin?

Day __________ Time ____________ a.m./p.m

1a. What time is it now? ____________ a.m./p.m.

2. What medication did you take? [Please write in name of drug(s) and dosage]

____________________ ____________________

Circle one number for each of the following questions:

3. During the **past month**, how would you describe the arthritis pain you usually have?

Very severe	1
Severe	2
Moderate	3
Mild	4
Very Mild	5
None	6

4. During the past month how often have you had **severe** pain from your arthritis?

Always	1
Very Often	2
Fairly Often	3
Sometimes	4
Almost Never	5
Never	6

5. During the past month, how long has your morning stiffness usually lasted from the time you wake up?

Over four hours	1
Two to four hours	2
One to two hours	3
Thirty minutes to an hour	4
Less than thirty minutes	5
Do not have morning stiffness	6

6. During the past month, how often have you had pain in two or more joints at the same time?

Always	1
Very Often	2
Fairly Often	3
Sometimes	4
Almost Never	5
Never	6

7. The following words represent pain of increasing intensity. Which word describes your pain **right now**?

1	2	3	4	5	6
NO PAIN	MILD	DISCOMFORTING	DISTRESSING	HORRIBLE	EXCRUCIATING

8. In the past week or so - **not** including the day you just spoke of - how **frequently** have you experienced this degree of pain?

Rarely (less than 1 day)	1
Some of the time (1 - 2 days)	2
A moderate amount of the time (3 - 4 days)	3
Almost all of the time (5 - 6 days)	4
Every day	5

9. Which work descirbes your pain at its **worst** during the **past week**?

1	2	3	4	5	6
NO PAIN	MILD	DISCOMFORTING	DISTRESSING	HORRIBLE	EXCRUCIATING

10. Which word describes your pain at its **least** during the **past week**?

1	2	3	4	5	6
NO PAIN	MILD	DISCOMFORTING	DISTRESSING	HORRIBLE	EXCRUCIATING

11. Considering all the ways your arthritis affects you, **mark an X on the scale** for how well you are doing

0	25	50	75	100
Very Well	Well	Fair	Poor	Very Poor

ID _ _ _ 1-3/
• 4/

Arthritis Impact Measurement Scales

Instructions: **Please answer the following questions about the way your arthritis affects your health. Circle the appropriate number to indicate your answer. Try to answer every question.**

1. When you travel around your community, does someone have to assist you because of your health? (circle one number)

Yes	1	5/
No	2	

2. Are you able to use public transportation?

No, because of my health	1	6/
No, for some other reason	2	
Yes, able to use public transportation	3	

3. Do you have to stay indoors most or all of the day because of your health?

Yes	1	7/
No	2	

4. Are you in bed or in a chair for most or all of the day because of your health?

Yes	1	8/
No	2	

5. Does your health limit the kind of vigorous activities you can do such as running, lifting heavy objects or participating in strenuous sports?

Yes	1	9/
No	2	

6. Do you have any trouble either walking several blocks or climbing a few flights of stairs because of your health?

Yes	1	10/
No	2	

7. Do you have trouble bending, lifting or stooping because of your health?

Yes	1	11/
No	2	

(circle one number for each question)

8. Do you have any trouble either walking one block or climbing one flight of stairs because of your health?

Yes 1 12/
No 2

9. Are you unable to walk unless you are assisted by another person or by a cane, crutches, artificial limbs, or braces?

Yes 1 13/
No 2

10. Can you easily write with a pen or pencil?

Yes 1 14/
No 2

11. Can you easily button articles of clothing?

Yes 1 15/
No 2

12. Can you easily turn a key in a lock?

Yes 1 16/
No 2

13. Can you easily tie a pair of shoes?

Yes 1 17/
No 2

14. Can you easily open a new jar of food?

Yes 1 18/
No 2

15. If you had the necessary transportation:
Could you go shopping for groceries or clothes...

Without help (taking care of all shopping needs yourself) 1 19/
With some help (need someone to go with you to help on all shopping trips) 2
Or are you completely unable to do any shopping 3

(circle one number for each question)

16. If you had a kitchen:
Could you prepare your own meals...

Without help (plan and cook full meals yourself)	1	20/
With some help (can prepare some things but unable to cook full meals yourself)	2	
Or are you completely unable to prepare any meals	3	

17. If you had household tools and appliances (vacuum, mops, etc.):
Could you do your own housework...

Without help (can clean floors, windows, refrigerator, etc.)	1	21/
With some help (can do light housework, but need help with some heavy work)	2	
Or are you completely unable to do any housework	3	

18. If you had laundry facilities (washer, dryer, etc.):
Could you do your own laundry...

Without help (take care of all laundry yourself)	1	22/
With some help (can do small items only)	2	
Or are you completely unable to do any laundry	3	

19. If you had to take medicine:
Could you take all your own medicine...

Without help (in the right doses at the right time)	1	23/
With some help (able to take medicine if someone prepares it for you and/or reminds you to take it)	2	

20. Do you handle your own money?

Without help (write checks, pay bills, etc.)	1	24/
With some help (day to day, but need help budgeting, etc.)	2	
Or are you completely unable to handle any money	3	

21. If you had a telephone would you be able to use it?

Without help	1	25/
With some help (can answer phone or dial operator in an emergency, but need a special phone or help in getting the number or dialing)	2	
Or are you completely unable to use the telephone	3	

(circle one number for each question)

22. During the past month, about how often did you get together with friends or relatives?

Every day	1	26/
Several days a week	2	
About once a week	3	
Two or three times in the past month	4	
Once in the past month	5	
Not at all in the past month	6	

23. During the past month, about how often have you had friends or relatives over to your home?

Every day	1	27/
Several days a week	2	
About once a week	3	
Two or three times in the past month	4	
Once in the past month	5	
Not at all in the past month	6	

24. During the past month, how often have you visited with friends, or relatives at their homes?

Every day	1	28/
Several days a week	2	
About once a week	3	
Two or three times in the past month	4	
Once in the past month	5	
Not at all in the past month	6	

25. About how often were you on the telephone with close friends or relatives during the past month?

Every day	1	29/
Several days a week	2	
About once a week	3	
Two or three times in the past month	4	
Once in the past month	5	
Not at all in the past month	6	

26. When you bathe, either a sponge bath, tub or shower, how much help do you need?

No help at all	1	30/
Help with bathing one part of your body, like back or leg	2	
Help in bathing more than one part of your body	3	

(circle one number for each question)

27 How much help do you need in getting dressed?

No help at all	1	31/
Only need help in tying shoes	2	
Need help in getting dressed	3	

28. How much help do you need to use the toilet?

No help at all	1	32/
Only need help in getting to or using the toilet	2	
Not able to get to the bathroom at all	3	

29. How well are you able to move around?

Able to get in and out of bed or chairs without the help of another person	1	33/
Need the help of another person to get in and out of bed or chair	2	
Not able to get out of bed	3	

30. During the past month, how would you describe the arthritis pain you usually have?

Very severe	1	34/
Severe	2	
Moderate	3	
Mild	4	
Very mild	5	
None	6	

31. During the past month how often have you had severe pain from your arthritis?

Always	1	35/
Very often	2	
Fairly often	3	
Sometimes	4	
Almost never	5	
Never	6	

32. During the past month, how long has your morning stiffness usually lasted from the time you wake up?

Over four hours	1	36/
Two to four hours	2	
One to two hours	3	
Thirty minutes to an hour	4	
Less than thirty minutes	5	
Do not have morning stiffness	6	

(circle one number for each question)

33. During the past month, how often have you had pain in two or more joints at the same time?

Always	1	37/
Very often	2	
Fairly often	3	
Sometimes	4	
Almost never	5	
Never	6	

34. During the past month, how much of the time have you enjoyed the things you do?

All of the time	1	38/
Most of the time	2	
A good bit of the time	3	
Some of the time	4	
A little of the time	5	
None of the time	6	

35. During the past month, how much of the time have you felt tense or "high strung"?

All of the time	1	39/
Most of the time	2	
A good bit of the time	3	
Some of the time	4	
A little of the time	5	
None of the time	6	

36. How much have you been bothered by nervousness or your "nerves" during the past month?

Extremely so, to the point where I could not take care of things	1	40/
Very much bothered	2	
Bothered quite a bit by nerves	3	
Bothered some, enough to take notice	4	
Bothered just a little bit by nerves	5	
Not bothered at all by this	6	

37. How often during the past month did you find yourself having difficulty trying to calm down?

Always	1	41/
Very often	2	
Fairly often	3	
Sometimes	4	
Almost never	5	
Never	6	

(circle one number for each question)

38. During the past month, how much of the time have you been in low or very low spirits?

All of the time	1	42/
Most of the time	2	
A good bit of the time	3	
Some of the time	4	
A little of the time	5	
None of the time	6	

39. How much of the time during the past month did you feel relaxed and free of tension?

All of the time	1	43/
Most of the time	2	
A good bit of the time	3	
Some of the time	4	
A little of the time	5	
None of the time	6	

40. How much of the time during the past month have you felt downhearted and blue?

All of the time	1	44/
Most of the time	2	
A good bit of the time	3	
Some of the time	4	
A little of the time	5	
None of the time	6	

41. How often during the past month did you feel that nothing turned out the way you wanted it to?

Always	1	45/
Very often	2	
Fairly often	3	
Sometimes	4	
Almost never	5	
Never	6	

42. How much of the time during the past month have you felt calm and peaceful?

All of the time	1	46/
Most of the time	2	
A good bit of the time	3	
Some of the time	4	
A little of the time	5	
None of the time	6	

(circle one number for each question)

43 During the past month, how often did you feel that others would be better off if you were dead?

Always — 1 47/
Very often — 2
Fairly often — 3
Sometimes — 4
Almost never — 5
Never — 6

44. How much of the time during the past month were you able to relax without difficulty?

All of the time — 1 48/
Most of the time — 2
A good bit of the time — 3
Some of the time — 4
A little of the time — 5
None of the time — 6

45. How often during the past month have you felt so down in the dumps that nothing could cheer you up?

Always — 1 49/
Very often — 2
Fairly often — 3
Sometimes — 4
Almost never — 5
Never — 6

46 In general would you say your health is excellent, good, fair or poor?

Excellent — 1 50/
Good — 2
Fair — 3
Poor — 4

47. Thinking about the past month, how much of the time has your health kept you from doing the kinds of things that you should be able to do?

All of the time — 1 51/
Most of the time — 2
Some of the time — 3
None of the time — 4

(circle one number for each question)

48. During the **past month** how active has your arthritis been?

Very active	1	52/
Moderately active	2	
Mildly active	3	
Not at all active	4	

Note: In answering the next four questions, please circle the number that best describes how you feel about each statement.

49. I seem to get sick a little easier than other people.

Definitely true	1	53/
Mostly true	2	
Don't know	3	
Mostly false	4	
Definitely false	5	

50. I never worry about my health.

Definitely true	1	54/
Mostly true	2	
Don't know	3	
Mostly false	4	
Definitely false	5	

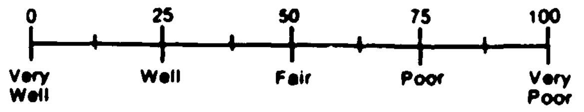
51. My body seems to resist illness very well.

Definitely true	1	55/
Mostly true	2	
Don't know	3	
Mostly false	4	
Definitely false	5	

52. When there is something going around, I usually catch it.

Definitely true	1	56/
Mostly true	2	
Don't know	3	
Mostly false	4	
Definitely false	5	

53. Considering all the ways your arthritis affects you, mark an X on the scale for how well you are doing.



57-58/

(circle one number for each question)

54. During the past month how often have you had to take medication for your arthritis?

Always	1	59/
Very often	2	
Fairly often	3	
Sometimes	4	
Almost never	5	
Never	6	

55. Is your health currently affected by any of the following medical problems? (please circle yes or no for each one)

	1	2	
High blood pressure	Yes	No	60/
Heart disease	Yes	No	61/
Mental illness	Yes	No	62/
Diabetes	Yes	No	63/
Cancer	Yes	No	64/
Alcohol or drug abuse	Yes	No	65/
Lung disease	Yes	No	66/
Kidney disease	Yes	No	67/
Liver disease	Yes	No	68/
Stomach or blood disease	Yes	No	69/

56. Do you take medicine every day for any problem other than your arthritis?

Yes	1	70/
No	2	

57. Did you see a doctor more than three times last year for any problem other than arthritis?

Yes	1	71/
No	2	

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