

The Mediating Role of Secular Coping Strategies in the  
Relationship between Religious Beliefs and Adjustment to Chronic Pain:  
The Middle Road to Damascus

BY

Copyright 2008  
Stacy C. Parenteau

Submitted to the graduate degree program in Psychology  
and the Graduate Faculty of the University of Kansas  
in partial fulfillment of the requirements for the degree of  
Doctor of Philosophy

Committee Members

---

Nancy A. Hamilton, Ph.D.  
Committee Chairperson

---

Douglas Denney, Ph.D.

---

Stephen S. Ilardi, Ph.D.

---

Robert K. Twillman, Ph.D.

---

Shirley A. Hill, Ph.D.

Date defended: 6/27/2008

The Dissertation Committee for Stacy C. Parenteau certifies  
that this is the approved version of the following dissertation:

The Mediating Role of Secular Coping Strategies in the  
Relationship between Religious Beliefs and Adjustment to Chronic Pain:  
The Middle Road to Damascus

---

Nancy A. Hamilton, Ph.D.  
Committee Chairperson

---

Douglas Denney, Ph.D.

---

Stephen S. Ilardi, Ph.D.

---

Robert K. Twillman, Ph.D.

---

Shirley A. Hill, Ph.D.

Date approved: 6/27/2008

## Abstract

The study sought to determine the relationship between both positive and negative religious beliefs and adjustment to chronic pain, as measured by pain severity, disability, depression, anger, and positive and negative affect. This study also sought to identify specific secular coping strategies that mediate the proposed relationship between religious beliefs and adjustment to chronic pain. Chronic pain patients (N= 29) completed the Coping Strategies Questionnaire (CSQ), Visual Analogue Scale (VAS), the Oswestry Disability Scale, the Beck Depression Inventory-II (BDI-II), the Positive and Negative Affect Scale (PANAS), the Trait Anger subscale from the State-Trait Anger Expression Inventory-II (STAXI-II), and 3 scales from the RCOPE (Benevolent Religious Reappraisal, Punishing God Reappraisal, and Demonic Reappraisal). Benevolent religious appraisals were significantly related to the secular coping strategies of diverting attention, ignoring pain sensations, reinterpreting pain sensations, and using coping self-statements. Benevolent religious appraisals were also related to positive affect. Coping self-statements did not mediate this relationship. A significant positive relationship was found between punishing God appraisals and depression, with catastrophizing mediating this relationship. Demonic appraisals were significantly related to disability.

## Introduction

Since ancient times, individuals have filtered the meaning of pain through specific belief systems. The ancient civilizations of Babylonia, Egypt, India, China, Greece, and Rome all maintained distinctive beliefs regarding the causes of pain (Bonica & Loeser, 2001). Many beliefs regarding the causes of pain are infused with religious and spiritual undertones. In this regard, it is possible for individuals to perceive pain as a punishment from God for their sins, with such punitive ideology tracing back to beliefs infused in Greek mythology (Morris, 2001). Despite the rich theoretical soil in which the relationship between religious beliefs and the pain experience is embedded, few empirical studies have been produced to provide solid support for the idea that religious beliefs can affect adjustment to chronic pain. In an attempt to fill this void, the present study was designed to evaluate the relationship between religious beliefs and pain and also to identify mediators of this relationship.

### *Overview*

Before these concepts can be examined, it will first be necessary to review several divergent literatures. I will begin by providing a brief overview of chronic pain and will review literature focusing on the relationship between psychological variables related to the experience of chronic pain. A general discussion of religious coping will then be presented, followed by a section on religious beliefs and adjustment to medical illnesses. Next, I will present an overview of secular coping processes and adjustment to medical illness. Finally, the goals and hypotheses of the present study will be explained.

### *Chronic Pain*

Chronic pain is a widespread condition; chronic pain prevalence has been estimated to affect between 2% and 40% of the population (Verhaak, Kerssens, Dekker, Sorbi, & Bensing, 1998). There exist specialized subgroups of pain patients. For example, it is estimated that 2-5% of the population in the United States experiences a disabling low back pain (LBP) condition at any given time (Andersson, 1979; Klein, Jensen, & Sanderson, 1984; Frymoyer & Cats-Baril, 1987). Low back pain is a pernicious condition leading approximately 1 in 25 individuals to change his or her work or even to retire early due to disability (Taylor, 1976). Furthermore, chronic pain can result from chronic illness or a medical condition. In this regard, it has been documented that up to 80% of advanced disease cancer patients experience pain as a result of the actual medical condition, while 30-60% of patients undergoing active treatment experience pain (Cherny, 1998; Cleeland et al., 1994).

Pain has been defined as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage” (Merskey & Bugduk, 1994). Loeser (1980) described pain as a multidimensional construct comprised of four different dimensions: nociception, pain, suffering, and pain behavior. Nociception is defined as a mechanical, thermal, or chemical process in which A-delta and C fibers are activated by nerve endings, and in turn, send a signal to the central nervous system that noxious events are occurring. Pain is conceptualized as a sensation, occurring with or without nociception. Furthermore, suffering is described as an affective or emotional response in the

central nervous system, arising as a result of nociception or other antagonistic processes. Finally, pain behavior is defined as behavior that individuals display in response to experiencing pain.

### *Pain Theories*

Gate Control Theory (Melzack & Wall, 1965) contends that the brain controls the flow of pain and the degree of pain an individual experiences by way of two competing pathways: fibers that carry messages quickly with intense pain (A-delta fibers) and fibers that carry longer term chronic pain (C fibers). Most significantly, the Gate Control Model proposed that cognitive processes such as attention and past experience influence transmission of pain signals from the body to the brain by way of the dorsal horns of the spinal cord that act as a gating mechanism.

Congruent with the Gate Control Theory, the rise of the biopsychosocial model of illness generated another conceptualization of pain. Within this model, pain can be described as a phenomenon resulting from the interaction between biological, psychological, and social factors (Turk, 1996). In this regard, biological factors are believed to instigate a physical reaction, while psychological factors modulate pain perception and experience. Finally, social variables mediate the behavior displayed by the patient as a reaction to the pain. Thus, both of these influential models highlight the role of social cognition and its relationship to adjustment.

### *Chronic Pain and Psychological Adjustment*

Pain has been conceptualized as having sensory, affective, and evaluative dimensions (Hardy et al, 1952; Beecher, 1957; Melzack & Casey, 1968). As such,

chronic pain has several psychological dimensions, including emotional, cognitive, and spiritual underpinnings. The role of each of these factors will be described below.

The role of emotion has been examined in studies of chronic pain. Specifically, many studies have documented a relationship between anger and chronic pain. In this regard, female chronic pain patients were found to have a higher degree of state anger compared with healthy controls (Amir et al., 2002). In a study of acute pain, judges' ratings of facial expressions of patients undergoing venepuncture were used to assess the emotional dimensions of pain (Hale & Hadjistavropoulos, 1997). Expressions of anger predicted the frequencies, but not the intensities, of pain expressions. This finding is consistent with previous studies showing that individuals with chronic pain inhibited angry feelings (Fernandez & Turk, 1995; Kerns, Rosenberg, & Jacob, 1994). Patterns of anger expression, however, also have been examined in regard to the pain experience, with increasing evidence that direct anger expression exacerbates responses to both chronic and experimentally-induced pain (Bruehl, Chung, & Burns, 2006). Finally, Wade and colleagues (1990) found that anger was an important component of the depression experienced by chronic pain patients, and that anger and frustration were important dimensions of the pain experience, including emotional unpleasantness. This study will examine the relationship between global anger and religious meaning-making within the context of chronic pain.

In addition to anger, other negative emotions, such as depression, have also been found to have a strong relationship to chronic pain. Romano and Turner (1985),

in a review of the literature, found support for the idea that depression and chronic pain co-exist, but cautioned that it is difficult to delineate whether depressive symptoms preceded pain symptoms, and vice versa. As the authors note, it is difficult to disentangle the confounding symptoms indicative of both depression and chronic pain. In this regard, it may be difficult to determine if an individual's depression preceded his or her pain, or vice versa, since depression and chronic pain share similar symptoms.

Pain-related cognition also is an important determinant of the pain experience. In regard to chronic pain, some individuals may assimilate "the pain into a larger life schema in which they define themselves as innocent victims in a cruel world" (Chapman & Turner, 2001, pp. 187). Indeed, some studies have established a relationship between perceived punishing responses from others and both perceived pain (Conant, 1998; Summers et al., 1991) and feelings of guilt (Conant, 1998). These punitive beliefs have atavistic overtones; in ancient Egypt, for example, it was believed that gods or spirits of the dead caused painful afflictions (Bonica & Loeser, 2001). Thus, it is likely that one's religious world-view may also affect one's experience of pain.

By delineating their theory of stress and coping, Lazarus and Folkman (1984) provided the conceptual template for research on the coping processes individuals use when confronted by a stressor. Lazarus and Folkman influentially defined stress in terms of the "transaction" between a person and his or her environment, specifying that an event is only stressful to the extent that it is defined as such and also exceeds

an individual's adaptive resources. These researchers dichotomized two processes that mediate the effect of a stressor on an individual and his or her well-being: cognitive appraisal and coping. Cognitive appraisal describes the process by which an individual evaluates whether a particular stressor or environmental encounter is relevant to his or her well-being. Cognitive appraisal is comprised of both primary appraisal, whereby the individual evaluates the encounter in terms of potential harm or benefit, and secondary appraisal, whereby the individual evaluates what can be done to overcome or prevent harm or to maximize the prospects for benefit. Coping is the second process that comprises the overarching model of stress and coping described by Lazarus and Folkman (1984). Coping can be described as emotion-focused, or designed to regulate stressful emotions, or problem-focused, employed with the purpose of altering or modifying the person-environmental interaction that is producing distress.

Theories about the function of religion suggest that one's religious beliefs may have an overarching influence on how stressors are appraised (see Pargament, Koenig, & Perez, 2000 for summary). For example, Geertz (1966) suggests that religion can provide meaning for individuals facing distressing life experiences. Fromm (1950), on the other hand, opines that religion provides a conduit for the individual to gain a sense of mastery and control when confronted with stressful and overwhelming events. As another possible function of religion, Freud (1927/1961) theorized that religion provides a sense of comfort by reducing the individual's anxiety about living in an unpredictable and dangerous world. In contrast, Durkheim

(1915) suggested that religion might facilitate social cohesiveness and engender social solidarity and social identity. A modern theorist, Pargament (1997), contends that religion may facilitate the process of making major life transformations. Although conceptualized in radically different ways, each of these theories emphasizes that religious beliefs play an organizing role in how individuals face adversity.

Each of these theories emphasizes a positive role for religiosity. However, religious world-views are not uniformly positive. Although there is evidence that religiosity is in general beneficial (Worthington, Kuru, McCullough, & Sandage, 1996), it has been suggested that religious coping can be detrimental in some cases (Pargament, 1997; Pargament et al., 1998). Of particular interest is the finding that a belief that “one has been punished by God” is related to lower self-esteem, as well as greater anxiety and negative mood (Pargament et al., 1998). Collectively this theoretical literature suggests that there are differences in religious beliefs and these differences may have special relevance to adjustment to pain.

#### *Religious Beliefs and Mental Health Outcomes*

Efforts to investigate the relationship between religion or spirituality and biopsychosocial outcomes have operationalized religiosity or religious beliefs in a variety of ways. Although a full review of this methodology is beyond the scope of this paper (see for a review: Worthington et. al, 1996), it may be useful to distinguish related but distinct constructs. For instance, religiosity has been defined in terms of the belief in God (gods), and behaviorally (e.g., church attendance, frequency of

prayer). More central to the purposes of this study, other researchers have focused on individual differences in the nature of one's religious beliefs. For instance, religious and spiritual beliefs can be categorized as positive appraisals (i.e. belief in a benevolent God) or negative appraisals (i.e. belief in a punishing God) (Pargament, Koenig, & Perez, 2000). In the next sections, I will present empirical data illustrating the relationship between these constructs and biopsychosocial outcomes.

Studies have illuminated the effect of both positive and negative religious beliefs on mental health outcomes. In a longitudinal study of 48 young adults diagnosed with schizophrenia or bipolar disorder, punishing God reappraisals and reappraisals of God's power at Time 1 significantly predicted sense of personal loss from mental illness and psychological distress one year later (Phillips & Stein, 2007). Benevolent religious reappraisals did not significantly predict mental health outcome measures at one-year follow-up. Thus, in this mentally ill population, negative religious beliefs (or appraisals) were an important predictor of distress.

Studies of religiosity have produced less clear results. Using an unidentified measure of religiosity, one study found that religious beliefs related to less psychosocial dysfunction in 100 recently widowed women (Gass, 1987), while other findings have identified a relationship between strength of religious beliefs and less fear of death in 16 terminally ill cancer patients (Gibbs & Achterberg-Lawlis, 1978). In a study of 147 individuals with multiple sclerosis, belief in a supreme being was related to less suicidal ideation (Long & Miller, 1991). Not all studies examining the relationship between religious beliefs and mental health outcomes have yielded

positive results. In this regard, no relationship was found between belief in God and depression in a study of 96 male inmates (Koenig, 1995). However, a study of 167 gay men with AIDS found a significant relationship between belief in God and perception of death as threatening (Bivens et al., 1994-1995). These data hint that merely measuring the strength of one's belief in God (gods) may miss individual differences in one's appraisals of God (gods).

### *Religious Beliefs and Physical Health*

A burgeoning body of research looking at the influence of religious and spiritual beliefs on adjusting to chronic illness has evolved in recent years (McCullough, Hoyt, Larson, Koenig, & Thoresen, 2000; Powell, Shahabi, & Thoresen, 2003; Thoresen, 1999; Ellison & Levin, 1998). For example, in a study of 268 elderly patients followed over two years, Pargament, Koenig, Tarakeshwar, and Hahn (2004) found that appraisals that God is benevolent were associated with improvement in health. Furthermore, negative religious processes, including reappraisal of God as wrathful and punishing, predicted declines in health. In a cross-sectional study examining the effect of religious reappraisals on physical and psychological outcomes in patients with end-stage lung disease who were being considered for lung transplant, punishing God reappraisals were significantly associated with depression and anxiety (Burker, Evon, Sedway, & Egan, 2005).

Other studies, however, have found no relationship between religiosity and physical health outcomes. Belief in God, for example, was not related to number of physical symptoms or severity of illness in a sample of 96 male inmates (Koenig,

1995). Here again is evidence that belief itself may not be as important as how one' believes.

Many studies examining the relationship between religiosity and physical health have focused on church/service attendance as a measure of religiosity in predicting various health outcomes (Oman, Kurata, Strawbridge, & Cohen, 2002; Colantonio, Kasl, & Ostfeld, 1992). In a study of 2, 676 participants aged 17 to 65 over a 29-year period, Strawbridge, Shema, Cohen, and Kaplan (2001) found evidence linking religious attendance to good health behaviors, mental health, and positive social relationships. Each of these is a potential mediating factor linking religious attendance and survival.

In addition to assessing religiosity and general beliefs about God (gods), other researchers have focused on specific aspects of mostly Judeo-Christian belief systems. McClain-Jacobson et al. (2004) examined the role of a specific component of spirituality- belief in an afterlife- in the presence of end-of-life despair in patients with advanced cancer. The authors found that belief in an afterlife was associated with lower levels of end-of-life despair, defined by desire for death, hopelessness, and suicidal ideation, but was not related to levels of depression or anxiety in these cancer patients. Moreover, it was discovered that, after controlling for spirituality levels, the effects of afterlife beliefs became non-significant. In regard to psychological adjustment in these cancer patients, the authors concluded that spirituality overrides beliefs held about an afterlife.

Other researchers have focused on the role of faith in daily life. In a study of

40 heart transplant recipients followed 2 and 12 months post-transplant, degree to which patients believed religious beliefs influence his/her life was related to better physical functioning, less anxiety, higher self-esteem, fewer health worries, and less difficulty with regime (Harris et al., 1995).

#### *How are religious beliefs beneficial?*

Researchers have attempted to answer this question via qualitative and quantitative methods. For instance, Siegel and Schrimshaw (2002) identified nine benefits of religious and spiritual beliefs and practices through interviews with 63 older HIV-infected adults. The benefits discussed by these individuals include the evocation of comforting emotions and feelings, offering of strength, empowerment and control, mitigation of emotional burden of the illness, facilitation of social support and a sense of belonging, offering of spiritual support through a personal relationship with God, understanding of meaning of illness, preservation of health, allaying fear and uncertainty of death, and finally, fostering of self-acceptance and reduction of self-blame. This qualitative approach suggests an important link between religious beliefs and transactions between an individual and his or her environment.

#### *Religious Beliefs and Chronic Pain*

Similar to the more general health literature, there have been relatively few studies examining religious beliefs and chronic pain. This is a glaring omission because as noted earlier individuals may assign meaning to pain in a manner that reflects their religious beliefs (Morris, 2001). Some studies have examined the effect of religious and spiritual beliefs specifically on individuals' experience of pain. For

example, negative religious and spiritual coping has been found to be significantly related to pain experience but not psychological distress (Buechler, 2004). A study of 71 advanced cancer patients also found a relationship between religious coping and low pain levels, but not to presence of pain (Yates et al., 1981). Rippentrop et al. (2005) examined the relationship between religiosity/spirituality and physical health, mental health, and pain in patients with chronic musculoskeletal pain. In contrast to findings by Bueschler (2004), it was found that negative religious processes such as feeling punished and abandoned by God were associated with poor mental health. However, religiosity/spirituality did not significantly predict pain intensity or pain interference in daily life. Other studies have provided evidence for a significant effect of positive religious coping on adjustment to chronic pain. For instance, positive religious coping, defined as drawing strength or comfort through reliance on God or religion, was found to co-vary with positive affect in a sample of pain patients (Bush et al., 1999).

To summarize thus far, empirical data suggest that there is a link between religion/spirituality and outcomes related to mental and physical health. However, it is clear that it is more informative to measure how one believes (religious beliefs) than to simply measure whether one believes (religiosity). Moreover, although these and other studies suggest that there is a link between religious beliefs and health, it is not clear exactly how religious beliefs affect mental and physical health.

### *Secular Coping Processes*

Previous research has documented that religious coping relates to adjustment

to pain (Buechler, 2004; Yates et al., 1981; Rippentrop et al. 2005; Bush et al., 1999). However, the mechanism linking religious appraisals to adjustment remains unclear. To better understand this relationship, it may be fruitful to contain this research within the theory of person-environment transactions. The transactional model of stress suggests that appraisals should influence decisions about how to cope with a stressor (Lazarus & Folkman, 1984; Folkman et al., 1986). Before framing this model explicitly, it may be useful to review the literature linking coping practices with adjustment to illness and pain.

The work by Lazarus and Folkman influenced an outgrowth of research examining specific coping strategies individuals use in response to a stressor, as well as the relationship between stressful events, coping, and adaptational outcomes. Carver, Scheier, and Weintraub (1989) outlined several dimensions of coping that formed the theoretical and empirical foundation for the development of an instrument to assess coping strategies: the COPE, which is comprised of several scales assessing the degree to which an individual utilizes specific coping strategies, including denial, behavioral disengagement, acceptance, mental disengagement, and planning.

#### *Coping Processes and Illness*

There has been an abundance of research assessing the effect of various coping strategies on adjustment to chronic illness. For example, Goodkin et al. (1992a &b) found that an active coping strategy was associated with better immune status in HIV-seropositive men. Moreover, active coping has been associated with longer survival for patients with melanoma (Fawzy et al., 1993). It also has been

documented that use of denial strategy following diagnosis was associated with more rapid disease progression in HIV- seropositive gay men (Ironson et al., 1994), and avoidance coping has been associated with lower numbers of T cells and reduced NK cytotoxicity in law school students (Segerstrom, Taylor, Kemeny, & Fahey, 1998). In a study of individuals coping with one of four different chronic illnesses, two of which are responsive to efforts to control (hypertension and diabetes) and two of which are less amenable to control efforts (rheumatoid arthritis and cancer), Felton and Revenson (1984) found that information-seeking had beneficial effects on adjustment, while wish-fulfilling fantasy was related to deleterious consequences. However, Cohen and Lazarus (1973) found that patients who revealed vigilant coping behavior, as opposed to avoidant coping behavior, prior to surgery experienced the most complicated postoperative recovery, as evidenced by the recovery variables of days in hospital and minor complications. Thus, some coping strategies have been shown to have highly variable relationships to adjustment across illness categories.

Although some coping strategies have been shown to have inconsistent relationships to outcomes, coping strategies that have been termed “avoidant” have shown remarkably consistent negative relationships to psychosocial outcomes (Ebata & Moos, 1991; Seiffge-Krenke & Klessinger, 2000). For instance, Manne and Sandler (1984) found that negative thoughts, as well as wishful thinking and characterological self-blame, significantly predicted poor psychological adjustment.

#### *Pain-Specific Coping Strategies*

Some studies have examined the relationship between coping strategies and

the experience of chronic pain. For example, Gil, Abrams, Phillips, and Keefe (1989) found, in a study of patients with sickle cell disease pain, that coping strategies such as negative thinking and passive adherence were related to increased pain severity, less activity, and a greater degree of stress; on the other hand, individuals who reported the use of more coping attempts were more active during painful episodes of their illness. Turner and Clancy (1986), moreover, discovered a significant negative relationship between pain intensity and use of both praying and hoping strategies. In a study of 61 chronic low back pain patients, factor analysis identified three distinct factors on which various coping strategies loaded (Rosenstiel & Keefe, 1983). The first factor, labeled cognitive coping and suppression, encompassed the coping strategies of reinterpreting pain sensations, coping self-statements, and ignoring pain sensations. It was found that the use of these active coping strategies was related to greater functional impairment. The second factor, labeled as helplessness, which included catastrophizing and increasing activity level, was related to higher levels of depression and anxiety. The third factor, labeled as diverting attention and praying, was associated with increased pain and functional impairment.

Although it might be assumed that strategies such as “diverting attention” reflect a pathological or avoidant style of coping, research on this coping strategy has produced mixed findings. Rosenstiel and Keefe (1983), for example, identified diverting attention as a maladaptive coping strategy in the sense that patients who engaged frequently in such coping strategies reported more pain and functional impairment. Other studies have found diverting strategies to have a positive effect on

the pain experience. One study employing the cold pressor task found that, among individuals with high pretest pain thresholds, use of a relevant diversion strategy predicted a greater increase in threshold comparable to both a control group and subjects using an irrelevant strategy to divert themselves from pain, with subjects who reported being highly involved in imagined situations evidencing greater increases in pain threshold compared to subjects less involved (Spanos, Horton, & Chaves, 1975). Other studies also have provided evidence for the beneficial effect of diverting attention on experimental pain (Kanfer & Goldfoot, 1966; Barber & Calverley, 1969), as well as pain of longer duration (Rybstein-Blinchik, 1979).

Similar in nature to diverting attention, ignoring pain sensations predicted less severe pain during mammography (Asghari & Nicholas, 2004). Other studies have identified a relationship between ignoring pain sensations and less pain severity in patients with rheumatoid arthritis (Hagglund, Haley, Reveille, & Alarcon, 1989; Parker et al., 1989). Thus, in the context of chronic pain, distraction and diversion of attention may have beneficial psychosocial outcomes.

Other pain strategies also have received a fair amount of attention in the pain coping literature. It has been found, for example, that training in reinterpretation strategies showed greater effectiveness in decreasing reported pain and pain behaviors compared to a distraction method (Rybstein-Blinchik, 1979). Other studies also have lent support to the relationship between reinterpreting pain sensations and decreased pain (Barber & Calverley, 1969; Kanfer & Goldfoot, 1966).

Perhaps the most widely studied avoidant coping strategy is catastrophizing.

Catastrophizing has been defined as a cognitive-affective response encompassing components of magnification, helplessness, pessimism, and rumination (Sullivan, Tripp, & Santor, 2001). The process of catastrophizing has been associated with negative pain adjustment (Edwards et al., 2004; Covic et al., 2003; Haythornthwaite et al., 2003), emotional distress (Sullivan et al., 2001), and depression (Turner, Jensen, & Romano, 2000).

Many studies have focused on the relationship between catastrophizing and sensory pain experience. Using a prospective framework, researchers have identified an association between catastrophizing and increased sensitivity to and reduced tolerance for thermal pain (Edwards et al., 2004). Investigation of sex differences in the relationship between catastrophizing and pain experience indicate catastrophizing mediates the sex difference in recent daily pain but exerts no influence on larger sex differences in pain threshold and tolerance (Edwards, Haythornthwaite, Sullivan, & Fillingim, 2004).

Interestingly, some studies have examined catastrophizing within the communal coping model. In this model, catastrophizing serves to solicit support or empathy within the social environment (Keefe et al., 2000; Sullivan et al., 2000). Relatedly, it has been found that the relationship between catastrophizing and both pain-related disability and depression was partially mediated by perceived punishing responses from significant others in individuals reporting low levels of perceived social support (Buenaver, Edwards, & Haythornthwaite, 2007). Furthermore, catastrophizing evidenced the strongest relationship with perceived punishing

responses from others among patients who perceived lower social support; likewise, catastrophizing was found to be more strongly associated with greater perceived solicitous responses from others for patients experiencing relatively short pain duration. The authors concluded that perceived social responses exert a minimal mediating effect in the relationship between catastrophizing and both depression and disability. The present study will examine catastrophizing as a mediator between perceived punishing responses within a religious context and pain-related outcomes.

### *Summary*

Chronic pain is a widespread phenomenon and there is a tremendous amount of individual difference in how people adjust to chronic pain. One important individual difference may stem from one's world-view, and specifically one's understanding of the relationship between humans and the divine. The belief in a benevolent God, or conversely punishing God and/or the devil, may influence one's attributions about the nature and cause of one's pain. Depending on one's appraisals of God, one may choose coping strategies accordingly.

### *Present Study*

This study examined religious beliefs, secular coping strategies, and adjustment to chronic pain within the traditional model of stress, appraisal, and coping (Lazarus & Coping, 1984). This study was conducted to answer the following three questions: Are positive and negative religious beliefs related to severity of pain and psychological adjustment to pain? Do positive and negative religious beliefs predict specific secular coping strategies? Furthermore, do specific coping strategies

mediate the relationship between religious beliefs and both severity of pain and psychological adjustment to pain?

Specifically, this study was designed to test four hypotheses:

- 1) It was hypothesized that religious beliefs would predict adjustment to chronic pain. In particular, negative religious beliefs (punishing God, demonic appraisals) were expected to predict indices of poor adjustment such as higher levels of pain, depression, anger, disability, and increased negative affect. Conversely, it was expected that a more positive appraisal of God would be associated with indices of positive adjustment, including less pain severity, depression, anger, disability, and increased positive affect.
- 2) It was hypothesized that religious appraisals would be related to secular coping strategies. It was expected that positive religious beliefs (i.e. benevolent religious appraisals) would be associated with the secular coping strategies of diverting attention, reinterpreting pain sensations, ignoring pain sensations, using coping self-statements, and increasing behavioral activities. On the other hand, it was predicted that negative religious beliefs (i.e. punishing God reappraisals; demonic reappraisal) would be associated with the secular coping strategy of catastrophizing.
- 3) Consistent with a large body of extant research, we expected secular coping strategies to be correlated with pain related outcomes.
- 4) Finally, we predicted that the relationship between religious appraisals and

adjustment would be mediated by secular coping strategies. Following logically from the first three hypotheses, we expected the relationship between negative religious appraisals and adjustment to be mediated by the secular coping strategy of catastrophizing. Also, the relationship between benevolent religious appraisals and adjustment was expected to be mediated by ignoring pain sensations, diverting attention from pain, reinterpreting pain sensations, using coping self-statements, and increasing behavioral activities.

## Methods

### *Participants*

Outpatients who have experienced pain for at least 6 months were recruited in the Department of Rheumatology at University of Kansas Medical Center-West Campus (KU Med West), the Facial Pain Center in the University of Florida (UF) College of Dentistry, and the UF Shands Psychology Clinic. Patients were excluded if they reported experiencing pain for less than 6 months, were under age 18, appeared too cognitively impaired to consent to participate, or reported non-Judeo-Christian belief systems. One participant was excluded after identifying herself as agnostic/atheist, suggesting lack of a religious belief system. The final sample consisted of 29 patients (mean age = 50.07, SD = 15.8) with chronic pain.

### *Procedure*

Recruitment took place at the Rheumatology Clinic at the University of Kansas Medical Center, the Shands Psychology Clinic at the University of Florida,

and the Facial Pain Center at the University of Florida College of Dentistry. At KUMC, patients learned about the study via a flyer placed in the patient waiting room. Patients at the University of Florida were approached by the primary researcher and asked to participate in the study following a psychological evaluation.

After signing the consent form, the patients were given a packet of questionnaires that included a Patient Demographic Questionnaire, the RCOPE, the Coping Strategies Questionnaire, Visual Analogue Scale, the Oswestry Disability Inventory (ODI), the Positive Affect and Negative Affect Schedule (PANAS), the Beck Depression Inventory- II (BDI-II), and the Trait Anger Expression Inventory-2 (STAXI-2) to complete. Patients at KUMC were supplied with a stamped addressed envelope in which to return the questionnaires to the lead researcher. Patients did not receive compensation for their responses.

### *Measures*

*Patient Demographic Questionnaire*- This questionnaire was developed by the primary author in order to collect demographic information from subjects, including age, gender, ethnicity, employment status, education level, religious affiliation, duration of chronic pain problem, cause of chronic pain, location of pain, type and dosage of pain medication, alternative treatment for chronic pain, and attribution of blame for circumstances causing chronic pain (blaming self; blaming another; blaming both self and another; blaming neither self nor other).

*RCOPE* (Pargament, Koenig, & Perez, 2000). Measure of religious beliefs comprised of 21 subscales. Items include benevolent and punishing religious

appraisals, spiritual connection and discontent, and spiritual support. All subscales for the RCOPE yielded acceptable alpha coefficients of .80 or higher, with the exception of the Reappraisal of God's Powers (.78) and Marking Religious Boundaries (.61) subscales. For this study, only the Benevolent Religious Reappraisal, Punishing God Reappraisal, and the Demonic Reappraisal subscales were used.

*Coping Strategies Questionnaire* (Rosenstiel & Keefe, 1983). This questionnaire assesses various coping strategies individuals use in response to chronic pain. Questionnaire consists of 6 cognitive coping subscales and 2 behavioral coping subscales. Each subscale consists of 6 questions tapping a specific coping strategy. Using a 7-point scale, subjects rate how frequently each strategy is used (0 = never, 3 = sometimes, 6 = always). Subjects also are asked to rate on a 7-point scale how much control they felt they had over pain and how much they were able to decrease pain (0 = no control/cannot decrease it at all, 3 = some control/can decrease it somewhat, and 6 = complete control/can decrease it completely). When given to patients, this inventory was labeled as CSQ.

*Visual analogue scale* (Huskisson, 1983). The patient rates the overall intensity of pain on a 10-cm visual-analogue scale with anchors ranging from *no pain* to *worst possible pain*. When given to patients, this inventory was labeled as VAS.

*Revised Oswestry Disability Inventory* (ODI) (Hudson-Cook, Tomes-Nicholson, & Breen, 1989). This is a 10-item slightly revised inventory of the original Oswestry Disability Inventory developed by Fairbank, Couper, Davies, & O'Brien (1980). Items on the ODI tap functional activities including lifting, personal care,

walking, sleeping, and social life. The revised version used for this study eliminated one item pertaining to sexual activity and added an item assessing fluctuating degrees of pain. When given to patients, this inventory was labeled as ODI.

*PANAS* (Watson, Clark, and Tellegen, 1988). The Positive and Negative Affect Schedule consists of 20 items tapping positive and negative affect, with each item rated on a scale with anchors ranging from *very slightly or not at all* to *extremely*. The PANAS has demonstrated sound internal consistency, with coefficient alphas ranging from .86 to .90 for the Positive Affect scale and .84 to .87 for the Negative Affect scale. When given to patients, this inventory was labeled as the PANAS.

*Beck Depression Inventory-II* (Beck, Steer, & Brown, 1996). This measure is widely used in assessing the presence and degree of depressive symptoms in adolescents and adults. The inventory consists of 21 items each designed to measure a specific symptom or attitude that is characteristic of depression. Specific symptoms being measured include sadness, sense of failure, guilt, self-dislike, and loss of interest. Each item is presented as four self-evaluative statements graded in intensity, assessed on a scale of 0-3. Questions 16 and 18, which assess changes in sleep pattern and appetite, respectively, are presented as seven self-evaluative statements. Studies of internal consistency have found a coefficient alpha of .92 for the outpatient population.

*State-Trait Anger Expression Inventory-2* (Spielberger, 1988/1999). This is a 57-item inventory that measures two aspects of anger. First, it taps anger as a

transient emotional state (State Anger). Second, it measures a global disposition to experience annoyance in situations and to respond to these situations by expressing state anger (Trait Anger). The inventory also includes four anger expression and anger control scales: (a) expression of anger toward other persons or objects in the environment (Anger Expression-Out); (b) holding in or suppressing angry feelings (Anger Expression-In); (c) controlling angry feelings by preventing the expression of anger toward other persons or objects in the environment (Anger Control-Out); and (d) controlling suppressed angry feelings by calming down or cooling off (Anger Control-In). Alpha values for state anger, trait anger, anger-in, and anger-out are .91, .91, .76, and .75, respectively, for women and .99, .94, .74, and .78 for men.

Observed internal consistency data as well as means and standard deviations for all measures used in this study can be seen in Table 1.

#### *Data Analytic Strategy*

The current sample size ( $n = 29$ ) is small, but sufficiently powered to detect large effects ( $r^2 > .30$ ) with a small number of predictors (Soper, 2008). Equations with up to three predictors are estimated to be powered at the .79 level and equations with up to four predictors are estimated to be powered at the .73 level.

*Missing Data.* A small number of missing values were imputed to ensure that this small data set was not biased through exclusion of relevant cases. A total of 11 datapoints (3%) were imputed using the EM (expectation-maximization) algorithm (Dempster, Laird, & Rubin, 1977). This imputation procedure assumes missing data were missing at random (MAR), which involves a less rigorous methodological

threshold than the assumption that data were missing completely at random (MCAR) (Schafer & Olsen, 1998). Consistent with this assumption, EM imputation found no sources of bias for missing data ( $\chi^2 = 146.539$ ,  $DF = 162$ ,  $p = .802$ ). In this regard, it has been concluded that imputing the missing data would produce less biased results than merely excluding such data (Azen, Van Guilder, & Hill, 1989; Graham & Donaldson, 1993).

Because of the small “n” and limited power, a conservative approach to data analysis was taken to maximize power and to simultaneously minimize the risk of a Type II error. The latter problem was considered to be an important issue because of the likelihood that extreme cases can unduly affect outcomes in small samples.

Bivariate correlations were first used to identify predictors with a significant relationship to outcomes of interest and potential covariates. Significant zero-order relationships between religious appraisals and pain related outcomes were further examined using Ordinary Least Squares (OLS) equations, controlling for relevant covariates. Categorical variables containing more than two groups (i.e., religious affiliation and marital status) were recoded into dichotomous variables. Religious groups were classified as either Catholic or Protestant. Marital status was collapsed into “married” or “not married.” Each equation followed the same format; demographic correlates were entered in Set 1 and religious appraisals were entered in Set 2.

Bivariate correlations were also used to identify those variables that were potential mediators of this relationship. These equations built on OLS regression

equations described above, with potential mediators entered in Set 3. Tests of mediation were only performed if the data in question met the prerequisite criteria for mediation (Baron and Kenny 1986): The 4 criteria are as follows:

- I. Predictor variable significantly predicts mediator variable.
- II. Mediator variable significantly predicts outcome variable.
- III. Predictor variable significantly and independently predicts outcome variable.
- IV. The relationship between the predictor variable and outcome variable is attenuated when mediator is introduced into the model. This fourth criterion was evaluated using the sobel test (Preacher & Leonardelli, 2001).

## Results

### *Descriptive Data*

As can be seen in Table 2, participants were mostly female, middle-aged, and primarily Caucasian. Most participants had graduated high school and had completed some college. Most participants endorsed Protestant/Other Christian religious affiliation. Although there were a number of pain conditions represented in these data, the majority of participants suffered from temporomandibular joint disorder and fibromyalgia/arthritis.

### *Hypothesis 1*

Correlations between study variables can be seen in Table 3. As expected, benevolent religious appraisals were correlated with positive affect ( $r = .53, p < .01$ ). A significant relationship also was found between punishing God appraisals and depression ( $r = .49, p < .01$ ) and negative affect ( $r = .48, p < .01$ ). Finally, demonic

religious appraisals were significantly related to both depression ( $r = .48, p < .05$ ) and disability ( $r = .56, p < .01$ ). Thus, a preliminary examination of the data suggests that religious appraisals have a moderate to large relationship with mental health outcomes, but not to pain perception.

Significant zero-order correlations between appraisals and outcomes were further examined using OLS regression. Only those demographic characteristics that correlated with outcomes of interest were included as covariates.

*Depression.* As can be seen in Table 3, both demonic appraisals and punishing God appraisals were significant correlates of depression. Table 4 indicates that it would be appropriate to control for the effects of experience with pain. Thus, depression was regressed on experience with pain (entered in set 1) and demonic religious appraisals and punishing God appraisals (entered in set 2). Table 5 indicates that years with pain was a significant predictor of depression, accounting for 14% of the variance in depression  $F(1,28) = 4.452, p = .044$ . After controlling for years with pain, punishing God appraisals and demonic appraisals were significantly related to depression, accounting for an additional 30% of the variance in depression  $F(3,28) = 6.459, p = .002$ .

*Disability.* As can be seen in Table 3, demonic appraisals were a significant correlate of disability. Table 4 indicates that it would be important to co-vary for religious affiliation and years with pain. Thus, disability was regressed on religious affiliation and years with pain (entered in set 1) and demonic religious appraisals (entered in set 2). As can be seen in Table 6, religious affiliation and years with pain

were both associated with higher disability, collectively accounting for 47% of the variance in disability  $F(2,28) = 11.42, p = .001$ . Protestants reported a higher level of disability and those with a longer history with pain also reported more disability. After controlling for these variables, demonic appraisals accounted for an additional 14% of the variance in  $F(3,28) = 13.03, p = .000$ .

*Positive Affect.* As can be seen in Table 3, benevolent religious appraisals were significantly related to positive affect. However, Table 4 indicates that there were no demographic variables that significantly related to positive affect, thus eliminating the need to control for any demographic variables. Thus, positive affect was regressed on benevolent religious appraisals (set 1). Benevolent religious appraisals accounted for 28% of the variance in positive affect  $F(1,28) = 10.32, p = .003$ . These data are reported in Table 7.

### *Hypothesis 2*

Zero order correlations were used to identify correlates of secular coping strategies. Of particular note is the moderate to large relationships between benevolent religious reappraisals and diverting attention ( $r = .72, p < .001$ ), reinterpreting pain sensations ( $r = .48, p < .01$ ), coping self-statements ( $r = .51, p < .01$ ), and ignoring pain sensations ( $r = .47, p < .01$ ). These data can be seen in Table 3.

### *Hypothesis 3*

Zero order correlations were also used to identify expected relationships between coping strategies and outcomes. In regard to the relationship between secular

coping strategies and outcome variables, positive affect was related to both coping self-statements ( $r = .40, p < .05$ ) and increasing behavioral activities ( $r = .51, p < .01$ ). Furthermore, catastrophizing positively related to depression ( $r = .62, p < .001$ ), disability ( $r = .37, p < .05$ ), and pain severity ( $r = .59, p < .01$ ). Finally, a positive relationship was found between diverting attention and both anger ( $r = .38, p < .05$ ) and disability ( $r = .39, p < .05$ ).

#### *Hypothesis 4*

The final goal was to evaluate possible mediators of the relationship between religious appraisals and pain related outcomes. The results of these analyses can be found in the last set of data reported in Tables 5-7. It should be noted that the standardized betas for religious appraisals reported in Tables 5-7 are taken from the regression equation before coping strategies are entered into the model.

*Depression.* As can be seen in Table 5, we tested the hypothesis that the relationship between punishing God appraisals and depression was mediated by the secular coping strategy of catastrophizing. All of the necessary preconditions for testing mediation (Barron and Kenney, 1986) were satisfied with preliminary analyses: I: As noted in Table 3, the predictor variable (punishing God appraisals) was significantly correlated with the mediator variable (catastrophizing). II: Table 5 confirms that the mediator variable (catastrophizing) was significantly correlated with the outcome variable (depression), and accounted for an additional 19% of the variance  $F(1, 28) = 9.999, p = .000$ . III: Table 5 also confirms that prior to the inclusion of catastrophizing, the predictor variable (punishing God appraisals)

significantly co-varied with the outcome variable (depression). IV: The final test of mediation is that the relationship between the predictor variable and outcome variable must be attenuated when mediator is introduced into the model. After entering catastrophizing into the equation, punishing God appraisals was no longer a significant correlate of depression ( $B = .23, p > .05$ ). The Sobel test was conducted to determine if the effect of catastrophizing on the relationship between punishing God appraisals and depression is statistically significant. The reduction in variance was found to be marginally significant ( $1.82, p = .07$ ).

*Positive Affect.* As can be seen in Table 7, we tested the hypothesis that the relationship between benevolent religious appraisals and positive affect was mediated by the secular coping strategy of coping self-statements. Again, all of the necessary preconditions for testing mediation (Barron and Kenney, 1986) were satisfied with preliminary analyses: I. As noted in Table 3, the predictor variable (benevolent religious appraisals) was significantly correlated with the mediator variable (coping self-statements). II. Although coping self-statements were significantly correlated with positive affect, that relationship was not maintained after controlling for the variance accounted for by benevolent religious appraisals. Moreover, after coping self-statements was entered into the equation, the predictor variable (benevolent religious appraisals) continued to co-vary with the outcome variable (positive affect) ( $B = .44, p < .05$ ). Thus, the relationship between benevolent religious appraisals and positive affect does not appear to be mediated through coping self-statements or any of the other secular coping strategies measured here.

## Discussion

Studies have applied inconsistent definitions of religiosity in an attempt to disentangle religious beliefs, coping, and behaviors (Ojima et al., 2005; Woods, Antoni, Ironson, & Kling, 1999; Keefe et al., 2001). The present study utilized a circumscribed conceptualization of religiosity, focusing specifically on positive and negative religious beliefs, and examining secular coping strategies through which such beliefs may exert their effects. As predicted, religious appraisals have moderate to large relationships with dimensions of mental health, but not perceptions of pain itself. Further, there was limited evidence that such relationships may be mediated by secular strategies for coping with pain.

### *Religious Appraisals*

Lazarus and Folkman (1984) proposed that an event is stressful only to the extent that it is viewed as harmful, threatening or associated with a loss. Appraisal of a stressor, then, is dependent upon one's world view, which for many people includes divine influence. Consequently, it is important to understand whether one perceives his/her pain as either a beneficial or punitive response from God, as such appraisals are likely associated with pain outcomes.

Consistent with this theoretical formulation, benevolent religious appraisals were correlated with higher levels of positive affect. This indicates that for patients with chronic pain, belief in a loving and benevolent God was related to maintaining high levels of positive affect, suggesting that patients who perceive beneficial aspects of their pain experience more positive mood. Although many studies focus on

outcomes such as depression, recent research highlights the importance of positive affect for those with chronic pain. In particular, high levels of positive affect in women with rheumatoid arthritis were associated with a disconnection between negative affect and pain (Zautra, Smith, Affleck, & Tennen, 2001).

Interestingly, benevolent religious appraisals were associated with positive affect, but not less depression or anger, in this chronic pain population. This finding parallels other study results indicating a significant relationship between positive religious coping strategies and positive affect (Bush et al., 1999). Moreover, these results are consistent with a large body of coping literature showing that maladaptive coping strategies correlate with indices of negative affect and that more adaptive processes like coping self-statements relate most consistently to indices of positive affectivity (Zautra, 2003). It has been suggested that this pattern of findings is linked to lateralized hemispheric processing of positive and negative affect.

Unexpectedly, however, the relationship between benevolent religious appraisals and positive affect was not related to coping self-statements; in other words, benevolent religious appraisals do not appear to be associated with positive mental health outcomes through the use of coping self-statements. In this regard, patients who attach positive religious meaning to their pain may not necessarily “take it a step further” and cope with the use of self-statements that in turn are related to positive affect. Rather, there potentially exists a third factor that mediates the link between positive appraisal of pain within a religious context and positive affect.

Consistent with other study findings (Rippentrop et al., 2005), negative

religious appraisals were associated with negative mental health outcomes, adding support to findings from other studies establishing a relationship between punitive responses from others and negative adjustment to chronic pain (Conant, 1998; Summers et al., 1991). The present study found, for example, that both punishing God appraisals and demonic appraisals, indicating belief that one's pain is caused by the devil, were associated with higher levels of depressive symptoms, suggesting that punitive ideology is linked to depressed affect, irrespective of the perceived source of "otherworldly" punishment. However, the relationship between demonic appraisals and depression was reduced to marginal significance after controlling for years patient has experienced pain.

Study results illuminate the mediating role of catastrophizing in the relationship between negative religious beliefs- specifically punishing God appraisals- and depression. The relationship between beliefs in a punishing God and depression was mediated by catastrophizing. It is likely that patients who retain the belief they are being punished by God also engage in negative cognitions characterized by feelings of helplessness, magnification, and rumination, which in turn are related to negative psychological adjustment. The relationship between catastrophizing and negative adjustment to pain has been widely substantiated in the literature (Edwards et al., 2004; Covic et al., 2003; Haythornthwaite et al., 2003).

Another noteworthy finding is the positive relationship between demonic appraisals and disability, which holds after controlling for both years patient has experienced pain and religious affiliation. Interestingly, punishing God reappraisals

were not related to disability, suggesting that perceptions of demonic interference are imbued with especially salient connotations that interfere with functioning in chronic pain patients.

The present study failed to find a relationship between pain severity and either positive or negative religious beliefs, consistent with results from other studies (Rippentrop et al., 2005). Other studies, however, have documented a relationship between religious beliefs and pain levels (Yates et al., 1981). These findings suggest that positive and negative religious beliefs may affect psychological and emotional adjustment to pain but not somatic aspects of pain, although the inconsistent findings pertaining to this aspect of pain adjustment warrant further research.

Although of secondary importance, the results of this study indicated that how individuals conceptualized their relationship to God provided some insight into how they coped with their pain. It was expected that benevolent religious appraisals, defined in terms of deriving positive religious meaning from the pain experience, would be associated with the use of specific secular coping strategies, namely such strategies that assist the individual in living a fruitful life. Consistent with that prediction, it was found that benevolent religious appraisals were related to the use of the secular coping strategies of diverting attention, ignoring pain sensations, reinterpreting pain sensations, and using coping self-statements. Thus, participants who saw their relationship with God in positive terms also seemed capable of employing coping strategies that facilitated getting on with life despite the pain. For Christian patients, it has been suggested that pain can have a “divine” or

“redemptive” quality (Morris, 1999). Many patients with Christian beliefs may indeed adhere to the axiom: *God never gives us more than we can handle.*

### *Secular Coping Strategies*

Although of tertiary importance, the data reported here add to the body of research on coping with chronic pain. Consistent with a large body of research, catastrophizing, a maladaptive pain coping strategy (Edwards et al., 2004; Covic et al., 2003; Haythornthwaite et al., 2003) was related to depression, pain severity, and disability in the present study. Diverting attention from pain was positively associated with both anger and disability, consistent with other findings that have labeled this particular strategy as maladaptive in nature (Rosenstiel & Keefe, 1983). On the positive spectrum, the use of coping self-statements was related to positive affect.

Studies examining the effectiveness of coping strategies such as diverting attention, ignoring pain sensations, reinterpreting pain sensations, and using coping self-statements on adjustment to chronic pain have yielded inconsistent findings (Barber & Calverley, 1969; Kanfer & Goldfoot, 1966; Rybstein-Blinchik, 1979; Rosenstiel & Keefe, 1983). For example, while ignoring pain sensations has been identified as an effective strategy in decreasing pain (Asghari & Nicholas, 2004), this particular coping strategy also has been found to hinder adjustment (Rosenstiel & Keefe, 1983). Furthermore, some studies have established a relationship between diverting attention and poor adjustment to chronic pain (Rosenstiel & Keefe, 1983), while others have highlighted the adaptive benefits of diverting attention from acute pain (Kanfer & Goldfoot, 1966; Barber & Calverley, 1969), as well as pain of longer

duration (Rybstein-Blinchik, 1979). The present study provides support for the beneficial influence of coping self-statements, as well as the possible maladaptive nature of diverting attention.

#### *Limitations and future directions*

Although this study makes a contribution to the literature about the nature of religious beliefs and their relationship to adjustment to chronic pain, interpretation of the study results is somewhat limited by the small sample size. Specifically, this study was adequately powered to detect large effects. Thus, it is possible that smaller, but nonetheless important, effects were not identified. Moreover, the study was limited in terms of the nature of the sample. For instance, it should not be assumed that these results could be generalized to a non-Christian sample. Nor could it be assumed that the results would be similar in other pain populations, such as those with cancer-related pain. Adding a component of existential dread might change the relationship between one's view of God and pain. Thus, the primary limitations of this study were low power and limited generalizability.

Additionally, the cross-sectional research design hinders inferences regarding the causal nature of the relationship between religious beliefs and adjustment to chronic pain. For instance, the true causal order of the relationships reported here could indicate that a) poor mental health is associated with viewing God as a punishing entity (consistent with internal stable global attributions), b) viewing God as threatening may predispose individuals to dysphoria or c) a third variable caused both of these relationships. There are several potential variables that may account for

the variance in pain outcomes. In this regard, studies examining the relationship between neuroticism and catastrophizing, which, as previously discussed, has been associated with poor adjustment to chronic pain, have produced inconsistent findings (Goubert, Crombez, Van Damme, 2004; Asghari & Nicholas, 2006).

Future research should also consider other mediators. For instance, optimism and pessimism may serve as moderating factors in the relationship between religious beliefs and pain outcomes. It is possible that negative religious beliefs are ensconced in a global negative worldview in which some individuals assimilate “the pain into a larger life schema in which they define themselves as innocent victims in a cruel world” (Chapman & Turner, 2001, pp. 187).

The finding that punitive beliefs are associated with poorer adjustment to chronic pain gives rise to an interesting question: Are the punitive beliefs congruent with an individual’s self-esteem? Perhaps some individuals, and in this case, pain patients, are not comfortable with “keeping the faith.” For example, a patient with high self-esteem may not believe he/she deserves divine punishment in the form of pain and may consequently engage in strategies to distance him/herself from it. Future studies could explore whether patients with high self-esteem who hold punitive religious beliefs employ the coping strategies of diverting attention, ignoring pain sensations, reinterpreting pain sensations, and using coping self-statements.

Finally, the process of forgiveness is an integral component of many religious belief systems (Marty, 1998; Dorff, 1998). A relationship between forgiveness and pain sensation has been tentatively supported (Carson et al., 2005), though more

research is needed to substantiate this finding. It is possible that forgiveness moderates the relationship between both positive and negative religious beliefs and the pain experience.

Although it is customary to attempt to identify the causal precedence of relationships, this goal may be less important than the use of these data in a clinical context. There are many important clinical applications that can be derived from the research findings. There has been an outgrowth of literature illuminating the importance of religious and spiritual beliefs and coping processes in clinical settings (Gorsuch & Miller, 1999; Shafranske, 1996). In this regard, there is considerable evidence that patients use religious and spiritual coping in adjusting to pain (Rippentrop, 2005). These data indicate that it would be important for therapists to understand the nature of those religious coping strategies. If a patient's religious world view involves a punishing God or demonic entity, he/she may be more likely to employ ineffective or potentially damaging pain coping strategies.

This study illuminates the importance of understanding how a patient's worldviews within a religious context may influence his/her adjustment to chronic pain. It may be advantageous for clinicians to be attuned to patients' religious beliefs and the effect of such beliefs on adjustment to chronic pain. However, given the potential recalcitrant nature of patient's religious beliefs and the personal importance of such beliefs to the individual patient, intervention at the level of secular coping strategies is warranted and likely more feasible.

## References

- Amir, M., Neumann, L., Bor, O., Shir, Y., Rubinow, A., & Buskila, D. (2000). Coping styles, anger, social support, and suicide risk of women with fibromyalgia syndrome. *Journal of Musculoskeletal Pain, 8*(3), 7-20.
- Andersson, G. B. J. (1979). Low back pain in industry: Epidemiologic aspects. *Scandinavian Journal of Rehabilitation Medicine, 11*, 163-168.
- Asghari, A., & Nicholas, M. K. (2004). Pain during mammography: the role of coping strategies. *Pain, 108*, 170-179.
- Asghari, A., & Nicholas, M. K. (2006). Personality and pain-related beliefs/coping strategies: A prospective study. *Clinical Journal of Pain, 22*, 10-18.
- Azen, S. P., Van Guilder, M., & Hill, M. A. (1989). Estimation of parameters and missing values under a regression model with non-normally distributed and non-randomly incomplete data. *Statistics in Medicine, 8*, 217-228.
- Barber, T. X., & Calverley, D. S. (1969). Multidimensional analysis of 'hypnotic' behavior. *Journal of Abnormal Psychology, 74*, 209-220.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173-1182.
- Beck, A. T., Steer, R. A., & Brown, G. (1996). Beck Depression Inventory (2<sup>nd</sup> ed.). San Antonio, TX: Psychological Corporation.
- Beecher, H. K. (1957). The measurement of pain: prototype for the quantitative study of subjective responses. *Pharmacological Review, 9*, 59-209.

- Billings, A. G., & Moos, R. H. (1981). The role of coping responses and social resources in attenuating the stress of life events. *Journal of Behavioral Medicine, 4*, 139- 157.
- Bivens, A. J., Neumeier, R. A., Kirchberg, T. M., & Moore, M. K. (1994-1995). Death concern and religious beliefs among gays and bisexuals of variable proximity to AIDS. *Omega, 30*, 105-120.
- Bonica, J. J., & Loeser, J. D. (2001). History of pain concepts and therapies. In J. D. Loeser, S. H. Butler, C. R. Chapman, D. C. Turk (Eds.), *Bonica's Management of Pain, 3<sup>rd</sup> Edition* (pp. 3-16). Baltimore: Lippincott Williams & Wilkins.
- Bruehl, S., Chung, O. Y., & Burns, J. W. (2006). Anger expression and pain: An overview of findings and possible mechanisms. *Journal of Behavioral Medicine, 29*, 593-606.
- Bush, E. G., Rye, M. S., Brant, C. R., Emery, E., Pargament, K. I., & Riessinger, C. A. (1999). Religious coping with chronic pain. *Applied Psychophysiology and Biofeedback, 24*, 249-260.
- Buechler, J. L. (2004). Religious and spiritual coping patterns among individuals with chronic low back pain. *Dissertation Abstracts International: Section B: The Sciences and Engineering, 65(1-B)*, 429.
- Buenaver, L. F., Edwards, R. R., & Haythornthwaite, J. A. (2007). Pain-related catastrophizing and perceived social responses: Inter-relationships in the context of chronic pain. *Pain, 127*, 234-242.

- Burker, E. J., Evon, D. M., Sedway, J. A., & Egan, T. (2005). Religious and non-religious coping in lung transplant candidates: Does adding God to the picture tell use more? *Journal of Behavioral Medicine*, 28, 513-526.
- Bush, E. G., Rye, M. S., Brant, C. R., Emery, E., Pargament, K. I., & Reissinger, C. A. (1999). Religious coping with chronic pain. *Applied Psychophysiology and Biofeedback*, 24, 249- 260.
- Carson, J. W., Keefe, F. J., Goli, V., Fras, A. M., Lynch, T. R., Thorp, S. R., & Beuchler, J. L. (2005). Forgiveness and chronic low back pain: A preliminary study examining the relationship of forgiveness to pain, anger, and psychological distress. *Journal of Pain*, 6, 84-91.
- Carver, C. S. (1997). You want to measure coping but your protocol's too long: Consider the Brief COPE. *International Journal of Behavioral Medicine*, 4, 92-100.
- Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology*, 56, 267-283.
- Chapman, R. C., & Turner, J. A. (2001). Psychological aspects of pain. In J. D. Loeser, S. H. Butler, C. R. Chapman, D. C. Turk (Eds.), *Bonica's Management of Pain, 3<sup>rd</sup> Edition* (pp. 180-190). Baltimore: Lippincott Williams & Wilkins.
- Cherny, N. I. (1998). Cancer pain: Principles of assessment and syndromes. In A. Berger, R. K. Portenoy, & D. E. Weissman (Eds.), *Principles and practice of*

- supportive oncology* (pp. 3-42). Philadelphia: Lippincott.
- Cleeland, C. S., Gonin, R., Hatfield, A. K., Edmonson, J. H., Blum, R. H., Stewart, J. A., & Pandya, K. J. (1994). Pain and its treatment in outpatients with metastatic cancer. *New England Journal of Medicine*, *330*, 592-596.
- Cohen, F. & Lazarus, R. S. (1973). Active coping processes, coping dispositions, and recovery from surgery. *Psychosomatic Medicine*, *35*, 375-389.
- Colantonio, A., Kasl, S. V., & Ostfeld, A. M. (1992). Depressive symptoms and other psychosocial factors as predictors of stroke in the elderly. *American Journal of Epidemiology*, *136*, 884-894.
- Conant, L. L. (1998). Psychological variables associated with pain perceptions among individuals with chronic spinal cord injury pain. *Journal of Clinical Psychology in Medical Settings*, *5*(1), 71-90.
- Covic, T., Adamson, B., Spencer, D., & Howe, G. (2003). A biopsychosocial model of pain and depression in rheumatoid arthritis: a 12-month longitudinal study. *Rheumatology (Oxford)*, *42*, 1287-1294.
- Dempster, A. P., Laird, N. M., and Rubin, D. B. (1977). Maximum likelihood from incomplete data via the EM Algorithm. *Journal of the Royal Statistical Society, Series B*, *39*, 1-38.
- Dorff, E. N. (1998). The elements of forgiveness: A Jewish approach. In E. L. Worthington, Jr. (Ed.), *Dimensions of forgiveness: Psychological research and theological perspectives* (pp. 29-55). Philadelphia, PA: Templeton Foundation Press.

- Durkheim, E. (1915). *The elementary forms of religious life*. New York: Free Press.
- Ebata, A. T., & Moos, R. H. (1991). Coping and adjustment in distressed and healthy adolescents. *Journal of Applied Developmental Psychology, 12*, 33-54.
- Edwards, R. R., Fillingim, R. B., Maixner, W., Sigurdsson, A., & Haythornthwaite, J. (2004). Catastrophizing predicts changes in thermal pain responses after resolution of acute dental pain. *Journal of Pain, 5*, 164-170.
- Edwards, R. R., Haythornthwaite, J. A., Sullivan, M. J., & Fillingim, R. B. (2004). Catastrophizing as a mediator of sex differences in pain: differential effects for daily pain versus laboratory-induced pain. *Pain, 111*, 335-341.
- Ellison, C. G., & Levin, J. S. (1998). The religion-health connection: Evidence, theory, and future directions. *Health Education and Behavior, 24*, 700-720.
- Fairbanks, J. C., Couper, J., Davies, J. B., & O'Brien, J. P. (1980). The Oswestry low back pain disability questionnaire. *Physiotherapy, 66*, 271-273.
- Fawzy, F. I., Fawzy, N. W., Hyn, C. S., Elashoff, R., Guthrie, D., Fahey, J. L., & Morton, D. L. (1993). Malignant melanoma: Effects of an early structured psychiatric intervention, coping, and affective state on recurrence and survival six years later. *Archives of General Psychiatry, 50*, 681-689.
- Felton, B. J., & Revenson, T. A. (1984). Coping with chronic illness: a study of illness controllability and the influence of coping strategies on psychological adjustment. *Journal of Consulting and Clinical Psychology, 52*, 343-53.
- Fernandez, E., & Turk, D. C. (1995). The scope and significance of anger in the experience of chronic pain. *Pain, 61*, 165-175.

- Folkman, S., Lazarus, R. S., Dunkel-Schetter, C., DeLongis, A., & Gruen, R. J. (1986). Dynamics of a stressful encounter: Cognitive appraisal, coping, and encounter outcomes. *Journal of Personality and Social Psychology*, *50*, 992-1003.
- Freud, S. (1961). *The future of an illusion*. New York: Norton. (Original work published 1927).
- Fromm, E. (1950). *Psychoanalysis and religion*. New Haven: Yale University Press.
- Frymoyer, J., & Cats-Baril, W. (1987). Predictors of low back pain disability. *Clinical Orthopedics and Related Research*, *221*, 88-98.
- Gass, K. A. (1987). The health of conjugally bereaved older widows: The role of appraisal, coping, and resources. *Research in Nursing and Health*, *10*, 39-47.
- Geertz, C. (1966). Religion as a cultural system. In M. Banton (Ed.), *Anthropological approaches to the study of religion* (pp. 1-46). London: Tavistock.
- Gibbs, H. W., & Achterberg-Lawlis, J. (1978). Spiritual values and death anxiety: Implications for counseling with terminal cancer patients. *Journal of Counseling Psychology*, *25*, 563-569.
- Gil, K. M., Abrams, M. R., Phillips, G., & Keefe, F. J. (1989). Sickle cell disease pain: Relation of coping strategies to adjustment. *Journal of Consulting and Clinical Psychology*, *57*, 725-731.
- George, L. K., Ellison, C. G., & Larson, D. B. (2002). Explaining the relationships between religious involvement and health. *Psychological Inquiry*, *13*, 190-200.

- Goodkin, K., Blaney, N. T., Feaster, D., Fletcher, M. A., Baum, M. K., Mantero-Atienza, E., Klimas, N. G., Millon, C., Szapocznik, J., & Eisdorfer, C. (1992a). Active coping style is associated with natural killer cell cytotoxicity in asymptomatic HIV-1 seropositive homosexual men. *Journal of Psychosomatic Research, 36*, 635-650.
- Goodkin, K., Fuchs, I., Feaster, D., Leeka, M. A., & Rishel, D. D. (1992b). Life stressors and coping style are associated with immune measures in HIV-1 infection- a preliminary report. *International Journal of Psychiatry in Medicine, 22*, 155-172.
- Goubert, L., Crombez, G., & Van Damme, S. (2004). The role of neuroticism, pain catastrophizing and pain-related fear in vigilance to pain: a structural equations approach. *Pain, 107*, 234-241.
- Gorsuch, R. L., & Miller, W. R. (1999). Assessing spirituality. In W. R. Miller (Ed.), *Integrating spirituality into treatment* (pp. 47-64). Washington, DC: American Psychological Association.
- Graham, J. W., & Donaldson, S. W. (1993). Evaluating interventions with differential attrition: The importance of nonresponse mechanisms and use of follow-up data. *Journal of Applied Psychology, 78*, 119-128.
- Hagglund, K. J., Haley, W. E., Reveille, J. D., & Alarcon, G. S. (1989). Predicting individual differences in pain and functional impairment among patients with rheumatoid arthritis. *Arthritis & Rheumatism, 32*, 851-858.
- Hale, C. J., & Hadjistavropoulos, T. (1997). Emotional components of pain. *Pain*

*Research Management*, 2(4), 217-225.

Hardy, J. D., Wolff, H. G., & Goodell, H. (1952). *Pain sensations and reactions*.

Baltimore: Williams and Wilkins.

Harris, R. C., Dew, M. A., Lee, A., Amaya, M., Buches, L., Reetz, D., & Coleman, G.

(1995). The role of religion in heart-transplant recipients' long-term health and well-being. *Journal of Religion and Health*, 34, 17-32.

Haythornthwaite, J. A., Clark, M. R., Pappagallo, M., & Raja, S. N. (2003). Pain

coping strategies play a role in the persistence of pain in post-herpetic neuralgia. *Pain*, 106, 453-460.

Helm, H. M., Hays, J. C., Flint, E. P., Koenig, H. G., & Blazer, D. G. (2000). Does private religious activity prolong survival? A six-year follow-up study of 3,851 older adults. *Journal of Gerontology: MEDICAL SCIENCES*, 55A, M400-M405.

Hudson-Cook N., Tomes-Nicholson, K., & Breen, A. (1989). A revised Oswestry disability questionnaire. In M. O. Roland, J. R. Jenner (Eds.), *Back pain: New approaches to rehabilitation and education* (pp. 187-204). New York: NY: Manchester University Press.

Huskisson, E. C. (1983). Visual analogue scales. In R. Melzack (Ed.), *Pain measurement and assessment* (pp. 33-37). New York: Raven Press.

Ironson, G., Friedman, A., Klimas, N., Antoni, M., Fletcher, M. A., LaPerriere, A., Simoneau, J., & Schneiderman, N. (1994). Distress, denial, and low adherence to behavioral intentions predict faster disease progression in gay men infected

- with human immunodeficiency virus. *International Journal of Behavioral Medicine*, 1, 90-105.
- Kanfer, F. H. & Goldfoot, D. A. (1966). Self-control and tolerance of noxious stimulation. *Psychological Reports*, 61, 85-89.
- Keefe, F. J., Affleck, G., Lefebvre, J., Underwood, L., Caldwell, D. S., Drew, J., Egert, J., Gibson, J., & Pargament, K. (2001). Living with rheumatoid arthritis: The role of daily spirituality and daily religious and spiritual coping. *The Journal of Pain*, 2, 101-110.
- Keefe, F. J., Lefebvre, J., Egert, J. R., Affleck, G., Sullivan, M. J., & Caldwell, D. S. (2000). The relationship of gender to pain, pain behavior, and disability in osteoarthritis patients: the role of catastrophizing. *Pain*, 87, 325-334.
- Kerns, R. D., Rosenberg, R., & Jacob, M. C. (1994). Anger expression and chronic pain. *Journal of Behavioral Medicine*, 17, 57-67.
- Klein, M., Jensen, R., & Sanderson, L. (1984). Assessment of workers compensation claims for back strain/sprain. *Journal of Occupational Medicine*, 26, 443-448.
- Koenig, H. G. (1995). Religion and older men in prison. *International Journal of Geriatric Psychiatry*, 10, 219-230.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer.
- Loeser, J. D. (1980). Perspectives on pain. In *Proceedings of the First World Conference on Clinical Pharmacology and Therapeutics* (pp. 313-316). London: MacMillan.

- Long, D. D., & Miller, B. J. (1991). Suicidal tendency and multiple sclerosis. *Health and Social Work, 16*, 104-109.
- Manne, S., & Sandler, I. (1984). Coping and adjustment to genital herpes. *Journal of Behavioral Medicine, 7*, 391-410.
- Marty, M. E. (1998). The ethos of Christian forgiveness. In E. L. Worthington, Jr. (Ed.), *Dimensions of forgiveness: Psychological research and theological perspectives* (pp. 9-28). Philadelphia, PA: Templeton Foundation Press.
- McClain-Jacobson, C., Rosenfeld, B., Kosinski, A., Pessin, H., Cimino, J. E., Breitbart, W. (2004). Belief in an afterlife, spiritual well-being and end-of-life despair in patients with advanced cancer. *General Hospital Psychiatry, 26*, 484-486.
- McCullough, M. E., Hoyt, W. T., Larson, D. B., Koenig, H. G., & Thoresen, C. (2000). Religious involvement and mortality: A meta-analytic review. *Health Psychology, 19*, 211-222.
- Melzack, R., & Casey, K. L. (1968). Sensory, motivational and central control determinants of pain: a new conceptual model. In D. R. Kenshalo (Ed.), *The skin senses* (pp. 423-443). Springfield, IL: Charles C Thomas.
- Melzack, R., & Wall, P. D. (1965). Pain mechanisms: a new theory. *Science, 150*, 971-979.
- Merskey, H., & Bugduk, N. (1994). Classification of chronic pain. *Descriptions of chronic pain syndromes and definitions of pain terms, 2<sup>nd</sup> Edition*. Seattle, WA: IASP Press.

- Morris, D. B. (1999). Sociocultural and religious meanings of pain. In Gatchel and Turk (Eds.), *Psychosocial aspects of pain* (pp. 118-131). New York, NY: Guilford Press.
- Ojinga, H. M., Edwards, C. L., Koenig, H. G., Bosworth, H. B., Decastro, L., & Wood, M. (2005). Religiosity/spirituality and pain in patients with sickle cell disease. *Journal of Nervous and Mental Disease, 193*, 250-257.
- Oman, D., Kurata, J. H., Strawbridge, W. J., & Cohen, R. D. (2002). Religious attendance and cause of death over 31 years. *International Journal of Psychiatry in Medicine, 32*, 69-89.
- Pargament, K. I. (1997). *The psychology of religion and coping: Theory, research, practice*. New York: Guilford Press.
- Pargament, K. I., Koenig, H. G., & Perez, L. M. (2000). The many methods of religious coping: Development and initial validation of the RCOPE. *Journal of Clinical Psychology, 56*, 519-543.
- Pargament, K. I., Koenig, H. G., Tarakeshwar, N., & Hahn, J. (2004). Religious coping methods as predictors of psychological, physical, and spiritual outcomes among medically ill elderly patients: A two-year longitudinal study. *Journal of Health Psychology, 9(6)*, 713-730.
- Pargament, K. I., Zinnbauer, B. J., Scott, A. B., Butter, E. M., Zerowin, J., & Stanik, P. (1998). Red flags and religious coping: Identifying some religious warning signs among people in crisis. *Journal of Clinical Psychology, 54*, 77-89.
- Parker, J.C., Smarr, K.L., Buescher, K.L., Philips, L.R., Frank, R.G., Beck, N.C.,

- Anderson, S.K., & Walke, S.E. (1989). Pain control and rational thinking: implications for rheumatoid arthritis. *Arthritis & Rheumatism*, 32, 984–990.
- Philips, R. E. III, & Stein, C. H. (2007). God's will, God's punishment, or God's limitations? Religious coping strategies reported by young adults living with serious mental illness. *Journal of Clinical Psychology*, 63, 529-540.
- Powell, L. H., Shahabi, L., & Thoresen, C. E. (2003). Religion and spirituality: Linkages to physical health. *American Psychologist*, 58, 36-52.
- Preacher, K., & Leonardelli, G. J. (2001). Calculation for the sobel test: An interactive calculation tool for medication tests [Computer software]. Available from <http://www.people.ku.edu/~preacher/sobel/sobel.htm>.
- Rippentrop, E. A. (2005). A review of the role of religion and spirituality in chronic pain population. *Rehabilitation Psychology*, 50, 278-284.
- Rippentrop, E. A., Altmaier, E. M., Chen, J. J., Found, E. M., & Keffala, V. J. (2005). The relationship between religion/spirituality and physical health, mental health, and pain in a chronic pain population. *Pain*, 116, 311-321.
- Romano, J. M., & Turner, J. A. (1985). Chronic pain and depression: Does the evidence support a relationship? *Psychological Bulletin*, 97(1), 18-34.
- Rosenstiel, A. K., & Keefe, F. J. (1983). The use of coping strategies in chronic low back pain patients: Relationship to patient characteristics and current adjustment. *Pain*, 17, 33-44.
- Rybstein-Blinchik, E. (1979). Effects of different cognitive strategies on the chronic pain experience. *Journal of Behavioral Medicine*, 2, 93-102.

- Seegerstrom, S. C., Taylor, S. E., Kemeny, M. E., & Fahey, J. L. (1998). Effects of optimism and coping on stressor-related mood and immune changes. *Journal of Personality and Social Psychology, 74*, 1646-1655.
- Seiffge-Krenke, I., & Klessinger, N. (2000). Long-term effects of avoidant coping on adolescents' depressive symptoms. *Journal of Youth and Adolescence, 29*, 617-630.
- Schafer, J. L., & Olsen, M. K. (1998). Multiple imputation for multivariate missing-data problems: A data analyst's perspective. *Multivariate Behavioral Research, 33*, 545-571.
- Shafranske, E. P. (1996). *Religion and the clinical practice of psychology*. Washington, DC: American Psychological Association.
- Siegel, K., & Schrimshaw, E. W. (2002). The perceived benefits of religious and spiritual coping among older adults living with HIV/AIDS. *Journal for the Scientific Study of Religion, 41*, 91-102.
- Soper, D.S. (2008) "The Free Statistics Calculators Website", *Online Software*, <http://www.danielsoper.com/statcalc/>
- Spanos, N. P., Horton, C., & Chaves, J. F. (1975). The effects of two cognitive strategies on pain threshold. *Journal of Abnormal Psychology, 84*, 677-681.
- Spielberger, C. D. (1988). *Manual for the state-trait anger expression inventory*. Odessa, FL.: Psychological Assessment Resources.
- Spielberger, C. D. (1999). *Professional manual for the state-trait anger expression inventory-2*. Lutz, FL: Psychological Assessment Resources.

- Strawbridge, W. J., Shema, S. J., Cohen, R. D., & Kaplan, G. A. (2001). Religious attendance increases survival by improving and maintaining good health behaviors, mental health, and social relationships. *Annals of Behavioral Medicine, 23*, 68-74.
- Sullivan, M. J., Thorn, B., Haythornthwaite, J. A., Keefe, F., Martin, M., Bradley, L. A., et al. (2001). Theoretical perspectives on the relation between catastrophizing and pain. *Clinical Journal of Pain, 17*, 52-64.
- Sullivan, M. J. L., Tripp, D. A., & Santor, D. (2000). Gender differences in pain and pain behavior: The role of catastrophizing. *Cognitive Therapy & Research, 24*, 121-134.
- Summers, J. D., Rapoff, M. A., Varghese, G., Porter, K., & Palmer, R. E. (1991). Psychosocial factors in chronic spinal cord injury pain. *Pain, 47*, 183-189.
- Taylor, D. G. (1976). The costs of arthritis and the benefits of joint replacement surgery. *Proceeding of the Royal Society of London, 192*, 145-155.
- Tennen, H., & Affleck, G. (2002). Benefit-finding and benefit-reminding. In C. R. Snyder & S. J. Lopez (Eds.), *Handbook of positive psychology* (pp. 584-597). London: Oxford University Press.
- Thoresen, C. E. (1999). Spirituality and health: Is there a relationship? *Journal of Health Psychology, 4*, 291-300.
- Turk, D. C. (1996). Biopsychosocial perspective on chronic pain. In R. J. Gatchel & D. C. Turk (Eds.), *Psychological approaches to pain management: A practitioner's handbook* (pp. 3- 32). New York: Guilford Press.

- Turner, J. A., & Clancy, S. (1986). Strategies for coping with chronic low back pain: Relationship to pain and disability. *Pain, 24*, 355-364.
- Turner, J. A., Jensen, M. P., & Romano, J. M. (2000). Do beliefs, coping, and catastrophizing independently predict functioning in patients with chronic pain? *Pain, 85*, 115-125.
- Verhaak, P. F. M., Kerssens, J. J., Dekker, J., Sorbi, M., & Bensing, J. M. (1998). Prevalence of chronic benign pain disorder among adults: A review of the literature. *Pain, 77*, 231-239.
- Wade, J. B., Price, D. D., Hamer, R. M., Schwartz, S. M., & Hart, R. P. (1990). An emotional component analysis of chronic pain. *Pain, 40*, 303-310.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54*, 1063-1070.
- Woods, T. E., Antoni, M. H., Ironson, G. H., & Kling, D. W. (1999). Religiosity is associated with affective and immune status in symptomatic HIV-infected men. *Journal of Psychosomatic Research, 46*, 165-176.
- Worthington, E. L., Kurusu, T. A., McCullough, M. E., & Sandage, S. J. (1996). Empirical research on religion and psychotherapeutic processes and outcomes: A 10-year review and research prospectus. *Psychological Bulletin, 119*, 448-487.
- Yates, J. W., Chalmer, B. J., St. James, P., Follansbee, M., & McKegney, F. B. (1981). Religion in patients with advanced cancer. *Medical and Pediatric*

*Oncology*, 9, 121-128.

Zautra, A. J. (2003). *Emotions, Stress, and Health*. New York: Oxford University Press.

Zautra, A. J., Smith, B., Affleck, G., & Tennen, H. (2001). Examinations of chronic pain and affect relationships: Application of a dynamic model of affect. *Journal of Consulting and Clinical Psychology*, 69, 786-795.

**Table 1***Descriptive Statistics for Religious, Secular Coping, and Adjustment Measures*

<b>RCOPE Subscales</b>	<b>M (range)</b>	<b>SD</b>	<b>Alpha</b>
<b><i>Positive Religious Beliefs</i></b>			
Benevolent Religious Reappraisals	5.48 (0-15)	4.92	.95
<b><i>Negative Religious Beliefs</i></b>			
Punishing God Reappraisals	1.45 (0-8)	2.50	.82
Demonic Reappraisals	.72 (0-7)	1.58	.71
<b>Coping Strategies Measure</b>			
	<b>M</b>	<b>SD</b>	<b>Alpha</b>
Diverting Attention	14.42 (3-27)	6.54	.76
Ignoring Pain Sensations	11.97 (0-28)	8.88	.89
Reinterpreting Pain Sensations	4.61 (0-21)	7.78	.84
Coping Self-Statements	21.54 (6-31)	6.36	.74
Increasing Behavioral Activity	14.83 (2-33)	6.03	.72
Catastrophizing	12.02 (0-28)	7.57	.87
<b>Adjustment Measures</b>			
	<b>M</b>	<b>SD</b>	<b>Alpha</b>
Depression	14.69 (3-39)	8.67	.91
VAS (in centimeters)	6.26 (1.8-9)	1.89	---
Disability (percentage)	39.69 (14-72)	17.83	.88
Positive Affect	27.97 (10-45)	8.15	.89
Negative Affect	23.17 (10-47)	7.13	.86
Trait Anger	16.65 (12-25)	3.44	.65

**Table 2***Patient Demographics*

	Percent
<b>Gender</b>	
<i>Males</i>	17%
<i>Females</i>	83%
<b>Ethnicity</b>	
<i>Caucasian</i>	76.9%
<i>Hispanic</i>	6.9%
<i>African-American</i>	3.4%
<i>Not Revealed</i>	13.8%
<b>Religious Affiliation</b>	
<i>Catholic</i>	34.5%
<i>Protestant</i>	63.2%
<i>Baptist</i>	13.3%
<i>Evangelical</i>	3.3%
<i>Episcopal</i>	3.3%
<i>Methodist</i>	3.3%
<i>Other Christian or Protestant (unspecified)</i>	40%
<i>Atheist/Agnostic</i>	3.3%
<b>Education</b>	
<i>High School</i>	17.2%
<i>College</i>	58.6%
<i>Master's</i>	24.1%

<b>Marital Status</b>	
<i>Single</i>	20.7%
<i>Married</i>	55.2%
<i>Divorced</i>	20.7%
<i>Widowed</i>	3.4%
<b>Cause of Pain</b>	
<i>Fibromyalgia</i>	3.4%
<i>Fibromyalgia/Arthritis</i>	17.2%
<i>TMJ</i>	17.2%
<i>Other Medical Condition</i>	31%
<i>Multiple Conditions</i>	17.2%
<i>Idiopathic</i>	13.8%
<b>Years Experiencing Pain</b>	
<i>6-11 months</i>	6.9%
<i>1-5</i>	47.9%
<i>6-10</i>	27.5%
<i>11-20</i>	13.7%
<i>&gt; 20</i>	3.4%
<b>Attribution of Blame</b>	
<i>Self</i>	6.9%
<i>Other</i>	13.8%
<i>Neither</i>	69%
<i>Both</i>	10.3%

**Table 3**  
Zero-order correlations among predictor, mediator, and outcome variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1. Dep		-.05	-.22	.61 <sup>†</sup>	.61 <sup>*</sup>	.44 <sup>*</sup>	.16	.06	-.13	.06	.62 <sup>*</sup>	-.04	.05	.48 <sup>*</sup>	.49 <sup>†</sup>
2. Anger			.39 <sup>*</sup>	-.03	.12	-.01	.38 <sup>*</sup>	.08	.07	.11	.19	.12	.17	.27	.26
3. PA				.11	-.20	-.09	.34	.07	.40 <sup>*</sup>	.24	-.26	.51 <sup>†</sup>	.53 <sup>†</sup>	.23	.19
4. NA					.27	.04	.02	.30	-.19	.06	.32	-.10	.18	.26	.48 <sup>†</sup>
5. Disability						.36	.39 <sup>*</sup>	-.03	-.16	-.08	.37 <sup>*</sup>	-.08	.36	.56 <sup>†</sup>	.13
6. PainSev							.25	-.03	.12	.03	.59 <sup>†</sup>	.07	-.03	.13	.16
7. DivAtt								.34	.45 <sup>*</sup>	.34	.12	.35	.72 <sup>*</sup>	.32	.15
8. RePainSen									.42 <sup>*</sup>	.54 <sup>†</sup>	-.11	.12	.48 <sup>†</sup>	.22	.18
9. Copeself										.65 <sup>*</sup>	-.35	.51 <sup>†</sup>	.51 <sup>†</sup>	.14	-.04
10. IgnPain											-.21	.15	.47 <sup>†</sup>	.06	.37 <sup>*</sup>
11. Cat												-.23	-.23	.15	.39 <sup>*</sup>
12. IncBehAct													.27	.10	-.20
13. BenRelApp														.52 <sup>†</sup>	.15
14. DemRelApp															.18
15. PunGodApp															

<sup>\*</sup> p < .001

<sup>†</sup> p < .01

<sup>\*</sup> p < .05

Dep = Depression; PA = Positive Affect; NA = Negative Affect; PainSev = Pain Severity; DivAtt = Diverting Attention; RePainSen = Reinterpreting Pain Sensations; Copeself = Coping Self-Statements; IgnSen = Ignoring Pain Sensations; Cat = Catastrophizing; IncBehAct = Increasing Behavioral Activities; BenRelApp = Benevolent Religious Reappraisals; PunGodApp = Punishing God Reappraisals; DemRelApp = Demonic Religious Reappraisals

**Table 4***Zero-order correlations among demographic and outcome variables*

	Age	Gender	Ethnicity	Religious Affiliation	Marital Status	Years Experienced Pain
Depression	.02	-.29	-.09	.20	.21	.38*
Anger	-.23	-.36	.13	.40*	.10	-.06
Positive Affect	-.21	.17	-.19	-.10	.23	-.11
Negative Affect	-.16	-.04	-.22	.18	.27	.18
Disability	.10	-.36	.06	.47*	.12	.45*
Pain Severity	-.01	-.10	.12	-.19	.09	.04

---

\*  $p < .05$

**Table 5**

*Mediating Effect of Catastrophizing on the Relationship between Negative Religious Appraisals and Depression*

<b>Predictor Variable Change</b>	<b>B</b>	<b>SE</b>	<b>t</b>	<b>R<sup>2</sup></b>
<i>Set 1</i>				
Pain Duration (years)	.38	.24	2.11*	.14
<i>Set 2</i>				
Punishing God Appraisals	.41	.53	2.68*	.30
Demonic Appraisals	.31	.86	1.98	
<i>Set 3</i>				
Catastrophizing	.47	.16	3.47**	.19

\*  $p < .05$

\*\*  $p < .01$

*Note:* The B reported here represents the slope of depression on religious appraisals and pain duration before catastrophizing was entered into the equation.

**Table 6***Effect of Demonic Appraisals and Demographic Variables on Disability*

<b>Predictor Variable Change</b>	<b>B</b>	<b>SE</b>	<b>t</b>	<b>R<sup>2</sup></b>
<i>Set 1</i>				
Religious Affiliation	.52	.77	3.58**	.47
Pain Duration (years)	.50	.40	3.51**	
<i>Set 2</i>				
Demonic Appraisals	.40	1.48	3.02**	.14

\*\* p < .01

*Note:* The B reported here represents the slope of disability on religious affiliation and pain duration before demonic appraisals was entered into the equation.

**Table 7**

*Mediating Effect of Coping Self-Statements on the Relationship between Benevolent Religious Appraisals and Positive Affect*

<b>Predictor Variable Change</b>	<b>B</b>	<b>SE</b>	<b>t</b>	<b>R<sup>2</sup></b>
<i>Set 1</i>				
Benevolent Religious Appraisals	.53	.27	3.21**	.28
<i>Set 2</i>				
Coping self-statements	.17	.25	.91	.02

\*\* p < .01

*Note:* The B reported here represents the slope of positive affect on religious appraisals before coping self-statements was entered into the equation.