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

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**Abstract** Despite an outgrowth in research examining associations between religiosity and health outcomes, there has been a lack of empirical focus on the relationship between religiosity and adjustment to chronic pain. This study investigated specific secular coping strategies that mediate the proposed relationship between religious appraisals and pain-related outcomes. Twenty-nine chronic pain patients completed measures assessing pain-related coping strategies, pain severity, disability, depression, positive and negative affect, trait anger and three types of religious appraisals- benevolent God appraisals, punishing God appraisals, and demonic appraisals. A significant positive relationship was found between punishing God appraisals and depression, with catastrophizing mediating this relationship. Demonic appraisals were significantly related to disability. Benevolent religious appraisals were related to positive affect. 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, but these coping strategies did not mediate the relationship between benevolent religious appraisals and positive affect. While this study provides no evidence that religious appraisals influence pain perception, data suggest that both positive and negative religious appraisals are related to mental health outcomes in a chronic pain population.

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## 1 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 and 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 1999). 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 appraisals and pain-related outcomes and also to identify mediators of this relationship.

### 1.1 Stress, Coping and Religiosity

In 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 such as chronic pain. 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, whereby the individual both evaluates the encounter in terms of potential harm or benefit (primary appraisal), and consequently assesses what can be done to overcome or prevent harm or to maximize the prospects for benefit (secondary appraisal). Coping, the second process, can be employed to regulate stressful emotions (emotion-focused), or to modify the person-environmental interaction causing distress (problem-focused) (Lazarus and Folkman 1984).

Theories about the function of religion suggest that one's religious beliefs may have an overarching influence on how stressors are appraised (for summary, see Pargament et al. 2000). Although there exists empirical evidence that religiosity is in general beneficial (Worthington et al. 1996), religious world-views are not uniformly positive, and in fact, can be associated with maladaptive outcomes (Pargament 1997; Pargament et al. 2003). Collectively this theoretical literature suggests that there are differences in religious appraisals and these differences may have special relevance to adjustment to pain.

### 1.2 Religiosity and Mental and Physical Health Outcomes

Efforts to investigate the relationship between religion and biopsychosocial outcomes have operationalized religiosity in a variety of ways. For instance, religiosity has been defined in terms of the belief in God (gods) (Bivens et al. 1995; Koenig 1995; Long and Miller 1991), and religious-oriented behavior (e.g., church attendance, frequency of prayer) (Contrada et al. 2004; Harrison et al. 2005; Sherkat and Reed 1992). More central to the purposes of

this study, religiosity also can be categorized as positive (i.e. belief in a benevolent God) or negative appraisals (i.e. belief in a punishing God) (Pargament et al. 2000).

Studies have illuminated the effect of both positive and negative religious appraisals on mental health outcomes across a variety of populations, with positive religious appraisals/coping found to co-vary with positive outcomes, and negative religious appraisals/coping associated with negative outcomes (Pargament et al. 1998, 2003; Phillips and Stein 2007).

A burgeoning body of research examining the influence of religiosity on adjusting to chronic illness also has evolved in recent years (McCullough et al. 2000; Powell et al. 2003; Ellison and Levin 1998). While some studies investigating the effect of religiosity on health outcomes in medical populations have focused on psychological outcomes (Ai et al. 2007; Alferi et al. 1999), others have ascertained health-specific effects of religious appraisals. For example, in a study of 268 elderly patients followed over 2 years, Pargament et al. (2004) found that benevolent God appraisals were associated with improvement in health. Furthermore, negative religious processes, including appraisal of God as wrathful and punishing, predicted declines in health. The present study aimed to identify the influence of both positive and negative religious appraisals on pain severity and disability, in addition to psychological indices of adjustment to chronic pain.

### 1.3 Religious Appraisals and Chronic Pain

In contrast to the more general health literature, there have been relatively few studies examining the effect of religiosity specifically on individuals' experience of pain, with many such studies employing discrepant operational definitions of religiosity (Rippentrop 2005; Wachholtz et al. 2007). Negative religious and spiritual coping has been found to be significantly related to pain experience, but not psychological distress (Buechler 2004). Among a small sample ($N = 71$) of advanced cancer patients, religious coping was associated with lower pain levels (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 Buechler (2004), it was found that negative religious processes such as feeling punished and abandoned by God were associated with poor mental health, but did not predict pain intensity or pain interference. Moreover, positive religious coping, defined as drawing strength or comfort through reliance on God or religion, has been found to co-vary with positive affect in chronic pain populations (Bush et al. 1999; Keefe et al. 2001).

### 1.4 Secular Coping Processes

Previous research has documented that religiosity relates to adjustment to pain (Bush et al. 1999; Buechler 2004; Keefe et al. 2001; Rippentrop et al. 2005; Yates et al. 1981). 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 and Folkman 1984; Folkman et al. 1986).

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 and Moos 1991; Seiffge-Krenke and Klessinger 2000). Perhaps the most widely studied avoidant, or passive,

coping strategy is catastrophizing. Defined as a cognitive-affective response encompassing components of magnification, helplessness, pessimism and rumination (Sullivan et al. 1995), catastrophizing has been associated with negative pain adjustment (Sullivan et al. 2001) and depression (Turner et al. 2004).

In contrast to the clear negative effect of passive coping strategies, the effects of more active coping strategies have been found to be generally positive. For instance, pain coping strategies such as diverting attention (Kanfer and Goldfoot 1966; Spanos et al. 1975; Rybstein-Blinchik 1979; Dahlquist et al. 2010; van der Hulst et al. 2010), ignoring pain sensations (Asghari and Nicholas 2004; Hagglund et al. 1989) and reinterpreting pain sensations (Kanfer and Goldfoot 1966; Rybstein-Blinchik 1979) are often related to lower levels of pain, although this finding has not been consistently reproduced (Rosenstiel and Keefe 1983).

### 1.5 Chronic Pain and Psychological Adjustment

The specific coping strategies one employs may affect his/her adjustment to chronic pain. In this regard, the chronic pain experience is imbued with an array of emotional underpinnings. For example, a wide body of empirical work has established positive and negative affect as important emotional pillars in the chronic pain framework (Keefe et al. 2001; Feldman et al. 1999; Zautra et al. 2005). Furthermore, 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 precede pain symptoms, or vice versa.

### 1.6 Present Study

This study examined religious appraisals, secular coping strategies, and adjustment to chronic pain within the traditional model of stress, appraisal, and coping (Lazarus and Folkman 1984). Specifically, this study was anchored by two hypotheses: (1) positive and negative religious appraisals would be associated with adaptive and maladaptive pain-related outcomes, respectively; (2) the relationship between positive and negative religious appraisals and pain-related outcomes would be mediated by adaptive and maladaptive secular coping strategies, respectively.

## 2 Methods

### 2.1 Participants

Outpatients who had experienced pain for at least 6 months were recruited in the Department of Rheumatology at the 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 or appeared too cognitively impaired to consent to participate. 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 = 50.41, SD = 16.01) with chronic pain. This study received IRB

approval at both the University of Kansas Medical Center and the University of Florida Health Science Center, and informed consent was attained for each participant.

## 2.2 Procedure

At KUMC, patients learned about the study via a flyer placed in the patient waiting room. After signing the consent form, the patients were supplied with a stamped addressed envelope in which to return the questionnaires to the lead researcher. Patients at the UF College of Dentistry and Shands Psychology Clinic were approached by the primary researcher following a psychological evaluation and asked to participate in the study. After signing the consent form, the patients were given the packet of questionnaires to complete.

## 2.3 Measures

### *2.3.1 Patient Demographic Questionnaire*

Participants reported on age, gender, ethnicity, employment status, education level, religious denomination affiliation, duration of chronic pain condition, cause of chronic pain, location of pain, and use of pharmacological and alternative treatments for chronic pain.

### *2.3.2 RCOPE (Pargament et al. 2000)*

Measure of religious appraisals/coping 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 .70 or higher, with the exception of Marking Religious Boundaries (.61) (Pargament et al. 2000). For this study, only the Benevolent Religious Reappraisal, Punishing God Reappraisal and Demonic Reappraisal subscales were used.

### *2.3.3 Coping Strategies Questionnaire (Rosenstiel and Keefe 1983)*

This questionnaire consists of six cognitive coping subscales and two behavioral coping subscales. Each subscale consists of 6 questions tapping a specific coping strategy. Using a 7-point scale, subjects rated how frequently each strategy is used (0 = *never* to 6 = *always*). Two additional items assess how much control patients feel they have over pain and to what extent they are able to decrease pain (0 = *no control/cannot decrease it at all* to 6 = *complete control/can decrease it completely*). Coefficient alphas for the scales range from .71 to .85 (Rosenstiel and Keefe 1983).

### *2.3.4 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*.

### *2.3.5 Revised Oswestry Disability Inventory (ODI) (Hudson-Cook et al. 1989)*

This is a 10-item, slightly revised inventory of the original Oswestry Disability Inventory developed by Fairbank et al. (1980). Items on the ODI tap functional activities; the revised

version used for this study eliminated one item pertaining to sexual activity and added an item assessing fluctuating degrees of pain.

#### *2.3.6 The Positive and Negative Affect Schedule (PANAS) (Watson et al. 1988)*

This measure 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 (Watson et al. 1988).

#### *2.3.7 Beck Depression Inventory-II (Beck et al. 1996)*

This widely used inventory consists of 21 items, each designed to measure a specific symptom or attitude characteristic of depression. 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. A coefficient alpha of .91 was found for a psychiatric outpatient population (Beck et al. 1996).

#### *2.3.8 State-Trait Anger Expression Inventory-2 (Spielberger 1988, 1999)*

This is a 57-item inventory that measures two aspects of anger: State Anger, defined as transient emotional anger responses, and Trait Anger, a global disposition to experience annoyance in situations and to respond to these situations by expressing anger. The inventory also includes four anger expression and anger control scales. Only the Trait Anger subscale was administered in the present study. Internal consistency reliability has a value ranging from .73 to .95 for the total scale scores, and from .73 to .93 for the subscales (Spielberger 1999). See Table 1 for summary of descriptive statistics for all measures.

## 3 Results

### 3.1 Missing Data and Preliminary Analyses

As can be seen in Table 2, participants were mostly female and primarily Caucasian. Most were married and had graduated high school and had completed at least some college. The majority of participants experienced pain at multiple body sites for an average of 6.8 years, caused by various conditions, most commonly arthritis and/or fibromyalgia or temporomandibular joint disorder (TMD). Most participants endorsed Protestant/Other Christian religious affiliation.

Missing data analysis revealed that 3% of the data was missing from the total dataset. Because of the relatively small "n" and limited power, a complete data set was obtained using multiple imputation technique (Schafer and Graham 2002). Based on the imputed dataset, bivariate correlations were first used to identify variables with a significant relationship to outcomes of interest and potential covariates.

**Table 1** Descriptive statistics for religious, secular coping and adjustment measures

| | M (range) | SD | Cronbach alpha | Skewness | Kurtosis |
|---|---|---|---|---|---|
| RCOPE subscales | | | | | |
| Positive religious appraisals | | | | | |
| Benevolent religious appraisals | 5.48 (*0–15*) | 4.92 | .95 | .57 | −.70 |
| Negative religious appraisals | | | | | |
| Punishing God appraisals | 1.45 (*0–8*) | 2.50 | .82 | 1.67 | 1.68 |
| Demonic appraisals | .72 (*0–7*) | 1.58 | .71 | 2.83 | 8.79 |
| Coping strategies measures | | | | | |
| Diverting attention | 14.11 (*3–27*) | 6.44 | .76 | 1.07 | .53 |
| Ignoring pain sensations | 12.54 (*0–28*) | 8.50 | .89 | .25 | −1.17 |
| Reinterpreting pain sensations | 5.57 (*0–21*) | 5.92 | .84 | 1.06 | .60 |
| Coping self-statements | 21.71 (*6–31*) | 6.40 | .74 | −.83 | .37 |
| Increasing behavioral activities | 14.83 (*2–33*) | 6.03 | .72 | .71 | 2.18 |
| Catastrophizing | 11.71 (*0–28*) | 7.52 | .87 | .31 | −.31 |
| Adjustment measures | | | | | |
| Depression | 14.67 (*3–39*) | 8.97 | .91 | 1.25 | 1.73 |
| VAS (in centimeters) | 6.27 (*1.8–9*) | 1.88 | – | −1.02 | .21 |
| Disability (percentage) | 39.69 (*14–72*) | 17.83 | .89 | .22 | −1.28 |
| Positive affect | 27.82 (*10–45*) | 8.26 | .89 | −.06 | −.40 |
| Negative affect | 23.07 (*10–47*) | 7.24 | .86 | .88 | 3.62 |
| Trait anger | 16.46 (*12–25*) | 3.36 | .65 | .91 | .61 |

Table 3 shows the correlations among the demographic and outcome variables. Categorical variables containing more than two groups were recoded into dichotomous variables (e.g. Catholic/Protestant; married/not married). Because the frequency distributions of some of the demographic variables were skewed, Kendall's tau coefficient, which does not assume any form of distribution, was used to measure the associations among the variables. Table 4 shows the correlations among continuous variables. None of the variables in Table 4 had a distribution that severely deviated from a normal distribution except for demonic appraisals (see skewness and kurtosis reported in Table 1). Thus, we reported Kendall's tau coefficient for the correlations related to demonic appraisals and Pearson correlation coefficient for the correlations related to the other variables.

Significant zero-order relationships between religious appraisals and pain-related outcomes were further examined using Ordinary Least Squares (OLS) regression equations, as well as path analysis, controlling for relevant covariates (see Table 3). Each equation followed the same format; covariates were entered in Block 1 and religious appraisals in Block 2.

Pearson correlations were also used to identify those variables that were potential mediators of the relationship between specific religious appraisals and pain-related outcomes. Mediation effects were represented as the product of the path from a predictor to a mediator and the path from the mediator to an outcome variable. The significance of a mediation effect was then directly tested by testing the significance of the product of the two pathways. Because the product of two pathways rarely follows a normal distribution, bootstrapping, which is a resampling procedure, was used for the significance test following Preacher and Hayes's (2004) suggestion (see also MacKinnon 2008). Note that

**Table 2** Patient demographics

| | Percent (%) | Number |
|---|---|---|
| Gender | | |
| Males | 17 | 5 |
| Females | 83 | 24 |
| Ethnicity | | |
| Caucasian | 76 | 22 |
| Hispanic | 7 | 2 |
| African-American | 3 | 1 |
| Not revealed | 14 | 4 |
| Religious affiliation | | |
| Catholic | 34 | 10 |
| Protestant | 66 | 19 |
| Baptist | 17 | 5 |
| Evangelical | 7 | 2 |
| Episcopal | 3 | 1 |
| Methodist | 3 | 1 |
| Presbyterian | 3 | 1 |
| Other christian or protestant (unspecified) | 31 | 9 |
| Marital status | | |
| Single | 21 | 6 |
| Married | 55 | 16 |
| Divorced | 21 | 6 |
| Widowed | 3 | 1 |
| Education | | |
| High school | 14 | 4 |
| College/some college | 62 | 18 |
| Master's | 24 | 7 |
| Years experiencing pain | | |
| 6–11 months | 7 | 2 |
| 1–10 | 76 | 22 |
| 11–20 | 14 | 4 |
| >20 | 3 | 1 |
| Location | | |
| Face/jaw/head | 38 | 11 |
| Legs | 3 | 1 |
| Multiple sites | 59 | 17 |
| Cause of pain | | |
| Temporomandibular joint disorder (TMD) | 10 | 3 |
| Fibromyalgia and arthritis | 10 | 3 |
| Fibromyalgia | 3 | 1 |
| Migraines | 7 | 2 |
| Scleroderma | 3 | 1 |
| Degenerative disc disease | 3 | 1 |
| Burning mouth syndrome | 3 | 1 |
| Spinal stindus | 3 | 1 |
| Migratory cyclic vasculitis | 3 | 1 |
| Multiple conditions | 31 | 9 |
| Idiopathic/unreported | 21 | 6 |

**Table 3** Zero-order Kendall Tau correlations between demographic and outcome variables

| | Age | Gender | Ethnicity | Religious affiliation | Marital status | Education | Pain duration (years) | Pain location | Recruitment location |
|---|---|---|---|---|---|---|---|---|---|
| Depression | .03 | −.30 | −.03 | .15 | .15 | −.20 | .34◆ | .39◆ | −.06 |
| Anger | −.17 | −.35* | .08 | .32◆ | .07 | −.17 | −.06 | −.04 | .07 |
| Positive affect | −.11 | .08 | −.10 | −.07 | .17 | .13 | −.04 | −.04 | .25 |
| Negative affect | −.15 | −.05 | −.13 | .15 | .24 | .16 | .24 | .35◆ | .11 |
| Disability | .04 | −.29 | .03 | .40◆ | .10 | −.27 | .37* | .43* | −.27 |
| Pain severity | −.01 | −.11 | .09 | −.19 | .02 | .07 | −.03 | −.10 | −.23 |

The following variables were dichotomously coded: *Gender* (Female = 0, Male = 1); *Ethnicity* (0 = Caucasian, 1 = Non-Caucasian); *Religious Affiliation* (0 = Catholic, 1 = Protestant); *Marital status* (0 = Married, 1 = Not Married); *Education* (0 = no college; 1 = some college or beyond); *Pain location* (1 = upper body, 2 = lower body/multiple site—It was assumed that patients with lower body and multiple site pain would be more disabled than those with upper body pain); *Recruitment location* (1 = KUMC, 2 = UF)

◆ $p \leq .05$; * $p \leq .01$

Baron and Kenny (1986)'s four-step approach has been widely used in the past to establish mediation effect. However, this approach has low power to detect mediation effect (MacKinnon 2008). SAS 9.2 and Mplus 5.21 were used for the analyses.

## 3.2 Religious Appraisals and Pain-Related Outcomes

As can be seen in Table 4, benevolent religious appraisals were correlated with positive affect. A significant relationship also was found between punishing God appraisals and both depression and negative affect, and also between demonic appraisals and both depression and disability.

### *3.2.1 Depression*

As shown in Tables 3 and 4, several variables had significant correlations with depression. Pain duration covaried with depression, accounting for 17% of the variance $F(1,27) = 5.49$, $p = .03$. Pain location did not provide significant unique contribution to disability above and beyond pain duration, and thus, was consequently dropped from the regression model. After controlling for pain duration, punishing God appraisals accounted for an additional 18% of the variance in depression, $F(1,26) = 7.25$, $p = .01$. Note that demonic appraisals were not significantly associated with depression with punishing God appraisals and pain duration partialled out, and thus, this variable was not included in the regression equation.

### *3.2.2 Disability*

Religious affiliation and pain location were both associated with higher disability, collectively accounting for 44% of the variance in disability $F(2,26) = 11.42$, $p < .01$.

**Table 4** Zero-order Pearson correlations among outcome, potential mediator and predictor variables

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Dep | | < .01 | −.21 | .64* | .62* | .44◆ | .19 | .04 | −.15 | .04 | .64* | −.05 | .06 | .30◆ | .50* |
| 2. Ang | | | .35 | .03 | .19 | <−.01 | .38◆ | .25 | .02 | .07 | .26 | .06 | .18 | .05 | .29 |
| 3. PA | | | | .10 | −.19 | −.07 | .33 | .18 | .42◆ | .30 | −.28 | .50* | .53* | .18 | .19 |
| 4. NA | | | | | .29 | .06 | .10 | .18 | −.25 | −.03 | .45◆ | −.10 | .19 | .03 | .49* |
| 5. Disability | | | | | | .36 | .36 | .10 | −.08 | −.03 | .35 | −.08 | .36 | .47* | .13 |
| 6. PainSev | | | | | | | .23 | .04 | .14 | .07 | .59* | .06 | −.02 | .06 | .16 |
| 7. DivAtt | | | | | | | | .69* | .51* | .47◆ | .06 | .35 | .77* | .29 | .19 |
| 8. RePainSev | | | | | | | | | .42◆ | .45◆ | .04 | .21 | .56* | .17 | .16 |
| 9. CopeSelf | | | | | | | | | | .64* | −.32 | .53* | .50* | .08 | −.06 |
| 10. IgPainSen | | | | | | | | | | | −.15 | .18 | .47* | .13 | .36 |
| 11. Cat | | | | | | | | | | | | −.25 | −.21 | .03 | .41◆ |
| 12. IncBehAct | | | | | | | | | | | | | .27 | .12 | −.20 |
| 13. Benevolent appraisals | | | | | | | | | | | | | | .50* | .15 |
| 14. Demonic appraisals[a] | | | | | | | | | | | | | | | .24 |
| 15. Punishing God appraisals | | | | | | | | | | | | | | | |

* $p \leq .01$; ◆ $p \leq .05$; [a] The correlations related to demonic appraisals are Kendall tau correlations

*Dep* Depression, *Ang* Anger, *PA* Positive affect, *NA* Negative affect, *PainSev* Pain severity, *DivAtt* Diverting attention, *RePainSen* Reinterpreting pain sensations, *Copeself* Coping self-statements, *IgPainSen* Ignoring pain sensations, *Cat* Catastrophzing, *IncBehAct* Increasing behavioral activities

Pain duration did not provide significant unique contribution to disability above and beyond religious affiliation and pain location, and thus, was consequently dropped from the regression model. Protestants and those with lower body and/or multiple site pain also reported more disability. After controlling for these variables, demonic appraisals accounted for an additional 13% of the variance in disability, $F(1,25) = 7.27$, $p = .01$.

#### *3.2.3 Negative Affect*

Pain location accounted for 17% of the variance in negative affect, $F(1,27) = 5.44$, $p = .03$. Punishing God appraisals accounted for an additional 17% of the variance in negative affect above and beyond pain location, $F(1,26) = 6.98$, $p = .014$. Those with higher levels of punishing God appraisals and those with lower body and/or multiple site pain reported more negative affect. Catastrophizing did not provide unique contribution to negative affect with punishing God appraisals and pain location partialled out, $F(1,25) = 2.44$, $p = .13$.

#### *3.2.4 Positive Affect*

As can be seen in Table 4, increasing behavioral activities was significantly associated with positive affect, and thus, this variable was controlled for in regression analyses. Increasing behavioral activities accounted for 25% of the variance in positive affect, $F(2,26) = 9.10$, $p = .006$. Benevolent religious appraisals accounted for an additional 17% of the variance in positive affect above and beyond increasing behavioral activities, $F(1,26) = 7.81$, $p < .01$. People with higher levels of benevolent religious appraisals or who increased behavioral activities more tended to have higher levels of positive affect. Coping self-statements did not provide unique contribution to positive affect with the above two variables partialled out, $F(1,25) = 0.12$, $p = .74$.

### 3.3 Secular Coping Strategies Mediating Religious Appraisals and Pain-Related Outcomes

Table 5 summarizes the final models of the regression equations, including significant covariates and mediators.

#### *3.3.1 Depression*

Punishing God appraisals were positively associated with depression, with pain duration controlled ($B = 1.50$, $p = .03$). After entering catastrophizing into the equation, punishing God appraisals did not provide unique contribution to depression beyond catastrophizing and pain duration ($B = .74$, $p = .15$). In addition, punishing God appraisals were positively associated with catastrophizing ($B = 1.23$, $p = .03$), and catastrophizing was positively associated with depression ($B = .63$, $p < .01$). These results suggest that the relationship between punishing God appraisals and depression might be completely mediated by catastrophizing. The indirect (mediation) effect was .77, with bootstrapping standard error = .36, $t = 2.16$, indicating that punishing God appraisals may increase catastrophizing, and in turn, increase depression (see Fig. 1 for a depiction of the mediation model).

**Table 5** Tests of mediation

| | B | SE[a] | t | $\Delta R^2$ |
|---|---|---|---|---|
| Depression | | | | |
| Block 1 | | | | |
| Pain duration (years) | .41 | .15 | 2.67◆ | .17 |
| Block 2 | | | | |
| Punishing God appraisals | 1.50 | .56 | 2.69◆ | .18 |
| Block 3 | | | | |
| Catastrophizing | .63 | .17 | 3.73* | .20 |
| Disability | | | | |
| Block 1 | | | | |
| Religious affiliation | 2.02 | .80 | 2.52◆ | |
| Pain location | 17.50 | 5.38 | 3.25* | .44 |
| Block 2 | | | | |
| Demonic appraisals | 4.31 | 1.60 | 2.70* | .13 |
| Negative affect | | | | |
| Block 1 | | | | |
| Pain location | 5.90 | 2.52 | 2.33◆ | .17 |
| Block 2 | | | | |
| Punishing God appraisals | 1.21 | .46 | 2.64◆ | .17 |
| Block 3 | | | | |
| Catastrophizing | .26 | .16 | 1.56 | .07 |
| Positive affect | | | | |
| Block 1 | | | | |
| Increasing behavioral activities | .68 | .22 | 3.02* | .25 |
| Block 2 | | | | |
| Benevolent religious appraisals | .71 | .25 | 2.79* | .17 |
| Block 3 | | | | |
| Coping self-statements | .08 | .23 | 0.34 | .01 |

◆ $p < .05$; * $p < .01$

[a] The standard errors are bootstrapping standard errors

### 3.3.2 *Negative Affect*

Punishing God appraisals were positively associated with negative affect, with pain location controlled (B = 1.21, $p < .01$). After entering catastrophizing into the equation, punishing God appraisals did not provide unique contribution to negative affect beyond catastrophizing and pain location (B = .89, $p = .13$). However, catastrophizing was not associated with negative affect with punishing God appraisals and pain location partialled out (see Fig. 2). Directly testing the indirect effect of punishing God appraisals on negative affect through catastrophizing also showed that the indirect effect was not statistically significant (indirect effect = .32, $p = .14$). Thus, there is no sufficient evidence that catastrophizing mediates the effect of punishing God appraisals on negative affect.

### 3.3.3 *Positive Affect*

Benevolent religious appraisals alone were positively associated with positive affect (B = .88 with $p < .01$, see Fig. 3). This effect was maintained after controlling for the

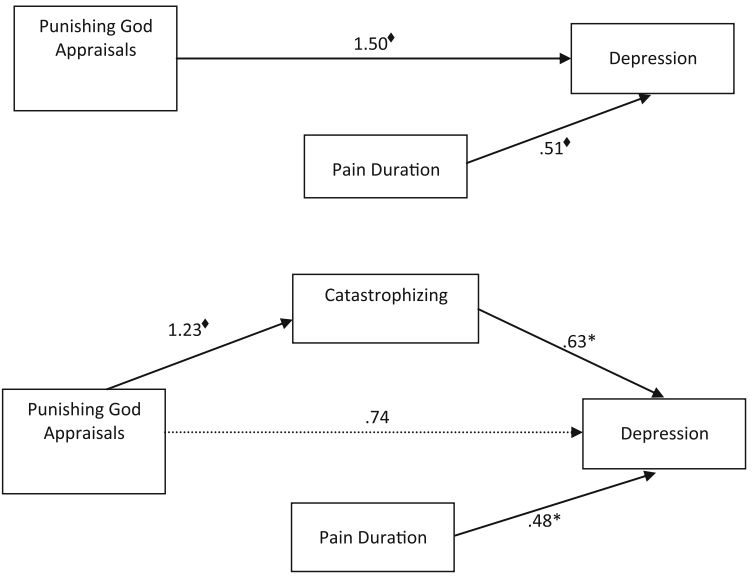


**Fig. 1** Mediation model for the effect of punishing God appraisals on depression. ♦ $p < .05$; * $p < .01$; *Dashed line* indicates non-significant pathway. Mediation effect of catastrophizing with pain duration partialled out was .78* with bootstrapping. SE = .36, $p = .03$. The reported coefficients are non-standardized regression coefficients

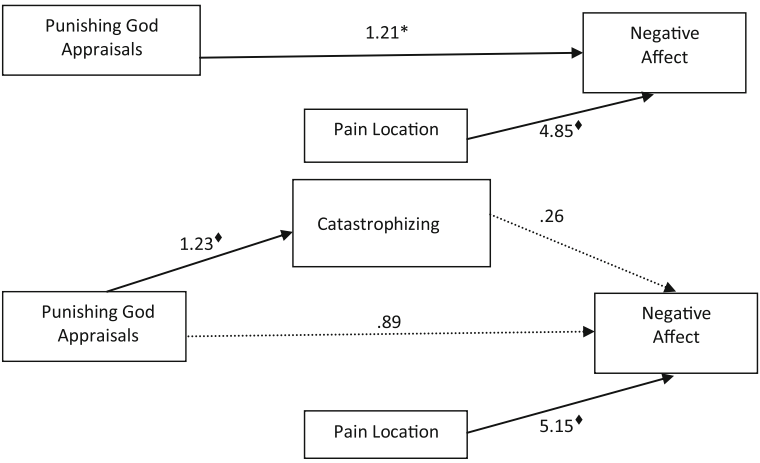


**Fig. 2** Mediation model for the effect of punishing God appraisals on negative affect. ♦ $p < .05$; * $p < .01$; *Dashed line* indicates non-significant pathway. The reported coefficients are non-standardized regression coefficients

variance accounted for by increasing behavioral activities and using coping self-statements. Benevolent religious appraisals were positively associated with using coping self-statements (B = .60, $p = .008$). However, using coping self-statements was not significantly associated with positive affect with increasing behavioral activities and benevolent religious

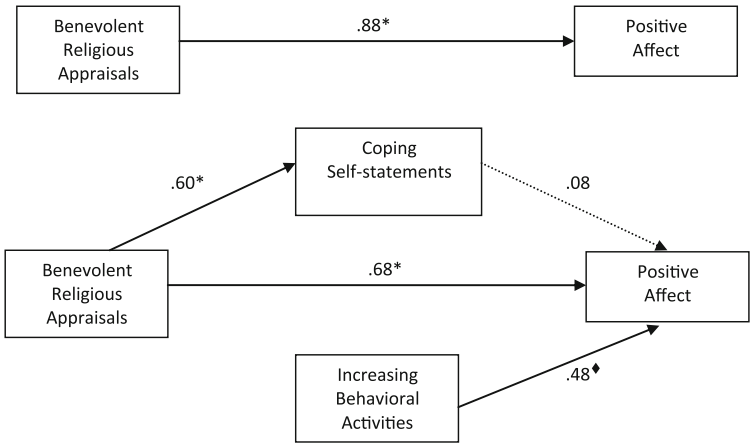


**Fig. 3** Mediation model for the effect of benevolent religious appraisals on positive affect. ♦ $p < .05$; * $p < .01$; *Dashed line* indicates non-significant pathway. The reported coefficients are non-standardized regression coefficients

appraisals controlled (see Fig. 3). Thus, there is no sufficient evidence to suggest that using coping self-statements mediates the effect of benevolent religious appraisals on positive affect.

## 4 Discussion

Studies have applied multiple definitions of religiosity in an attempt to disentangle religious beliefs, coping and behaviors (Harrison et al. 2005; Keefe et al. 2001; Woods et al. 1999). The present study utilized a circumscribed conceptualization of religiosity, focusing specifically on positive and negative religious appraisals. 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.

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 worldview, which for many people includes perception of 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-related 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 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 et al. 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 establishing a significant relationship between positive religious appraisals and/or religious coping and positive affect (Bush et al. 1999), as well as positive growth (Phillips and Stein 2007; Pargament et al. 1998) and well-being (Phillips and Stein 2007). 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, benevolent religious appraisals were not 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; Vandecreek et al. 2004), 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. 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 and Loeser 2001). It should be noted that the relationship between demonic appraisals and depression was reduced to non-significance after controlling for pain duration.

Another noteworthy finding is the positive relationship between demonic appraisals and disability, substantiating research establishing an association between demonic appraisals and deteriorating functional status and quality of life (Pargament et al. 2004). Interestingly, punishing God appraisals 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.

Study results illuminate the mediating role of catastrophizing in the relationship between punishing God appraisals and depression. It is likely that patients who retain the belief that 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 depressive symptomatology. The relationship between catastrophizing and negative adjustment to pain has been widely substantiated in the literature (Sullivan et al. 2001; Edwards et al. 2006).

The present study failed to find a relationship between pain severity and either positive or negative religious appraisals, consistent with results from other studies (Rippentrop et al. 2005). Some studies, however, have documented a relationship between religiosity and pain levels (Yates et al. 1981). These findings suggest that positive and negative religious appraisals 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 established a relationship between patients' conceptualization of God and the employment of specific secular coping strategies. In this regard, it was found that benevolent religious appraisals were related to

the use of diverting attention, ignoring pain sensations, reinterpreting pain sensations and using coping self-statements. Although not all of these strategies were associated with adaptive pain outcomes, participants who saw their relationship with God in positive terms also seemed capable of intending to live a fruitful life by employing coping strategies that facilitated getting on with life despite the pain, possibly reflecting the postulation that, for Christian patients, pain can have a "divine" or "redemptive" quality (Morris 1999). Many chronic pain patients may indeed adhere to the axiom: *God never gives us more than we can handle*.

### 4.1 Limitations and Future Directions

Although this study makes a contribution to the literature about the nature of religious appraisals and their relationship to adjustment to chronic pain, interpretation of the study results is somewhat limited by the small sample size and exclusively Christian population experiencing different types of non-malignant pain. In this regard, results cannot be generalized to a specific pain population due to the heterogeneous representation of pain conditions in this sample.

Additionally, the cross-sectional research design hinders inferences regarding the causal nature of the relationship between religious appraisals 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. More longitudinal studies would be helpful in clarifying temporal relationships between religious appraisals and pain-related outcomes. Future research also should aim to identify other mediator and moderator variables, such as self-esteem, optimism/pessimism and forgiveness, to explain the mechanisms through which religious appraisals exert an influence on pain-related outcomes.

Despite the limitations related to causal inference, 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 and Miller 1999; Shafranske 1996). In this regard, there is considerable evidence that patients use religious and spiritual coping in adjusting to pain (Rippentrop 2005). Data from the present study indicate that if a patient's religious worldview includes a punishing God, he/she may be more likely to employ ineffective or potentially damaging coping strategies that are typically associated with negative pain outcomes.

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 appraisals and the effect of such appraisals on adjustment to chronic pain. Future research also needs to explore the extent to which religious appraisals fluctuate and change over time; such research will help ascertain the degree to which such appraisals are amenable to intervention.

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