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Trauma and PTSD Symptoms: Does Spiritual Struggle Mediate the Link?

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Abstract

Because exposure to potentially traumatic events is common (Kessler, Sonnega, Bromet, & Hughes, 1995), the mechanisms through which post-traumatic stress disorder (PTSD) symptoms develop is a critical area of investigation (Ozer, Best, Lipsey, & Weiss, 2003). Among the mechanisms that may predict PTSD symptoms is spiritual struggle, a set of negative religious cognitions related to understanding or responding to stressful events. Although prominent theories emphasize cognitive factors in the development and maintenance of PTSD symptoms, they have not explicitly addressed spiritual struggle. The present prospective study tested the role of spiritual struggle in the development and maintenance of PTSD symptoms following trauma. We assessed exposure to trauma and non-trauma events during the first year of college, spiritual struggle due to the most stressful event, and PTSD symptoms resulting from the index event. Spiritual struggle partially mediated the relationship between trauma and PTSD symptoms. Interestingly, some individual subscales of spiritual struggle (specifically, Punishing God Reappraisal, Reappraisal of God's Powers, and Spiritual Discontent) partially mediated the relationship between trauma and

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¹It is important to note that some negative cognitions may reflect objective appraisals of a negative situation, such as likelihood of recurrent exposure.

²Three participants did not report the number of months since the most stressful or distressing event occurred. Although participants were invited to complete Time 2 in April, they were permitted to return responses in May; therefore, an option to indicate that the stressful event occurred nine months prior was available, and twenty students indicated that nine months had passed since their most stressful or distressing event.

³Other possible contributors to PTSD symptoms at Time 2 include female gender (Brewin, Andrews, & Valentine, 2000), prior trauma (Ozer, Best, Lipsey, & Weiss, 2003), and time since event. Bivariate correlations between gender and PTSD symptoms at Times 1 and 2 were non-significant ($r = .10, n.s.$ and $r = .07, n.s.$, respectively). Bivariate correlations indicated that total number of traumas prior to Time 1 correlated positively with PTSD symptoms at Time 1 ($r = .40, p < .001$) but not at Time 2 ($r = .09, n.s.$). Although trauma prior to Time 1 correlated positively with reporting trauma between Times 1 and 2 ($r = .24, p = .001$), PTSD symptoms at Time 1 also correlated positively with reporting trauma between Times 1 and 2 ($r = .18, p = .006$), and analyses controlled for PTSD symptoms at Time 1. Bootstrapping analyses were re-run controlling for total number of prior traumas; however, adding this additional control did not add to the total variance accounted for by the model (adjusted $R^2 = .10$). Similarly, months since event did not correlate with any of the study variables including PTSD symptoms at Time 2 ($r = -.08, n.s.$) and, when included in the bootstrapping analyses, added no explanatory power to the model with summed spiritual struggle as the mediator (adjusted $R^2 = .11$, compared to .12 without months since event controlled).

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PTSD symptoms; however, reappraisal of the event to evil forces did not relate to PTSD symptoms. These results suggest that spiritual struggle is an important cognitive mechanism for many trauma victims and may have relevance for cognitive therapy for PTSD.

Keywords

trauma; PTSD; post-traumatic cognitions; spiritual struggle

Post-traumatic stress disorder (PTSD) characterizes the reexperiencing, avoidance, hyperarousal, and emotional numbing symptoms that may persist in response to traumatic events. Because PTSD symptomatology is increasingly being conceptualized as a continuum of normal stress reactions (Ruscio, Ruscio, & Keane, 2002) to events of varying severity (Breslau & Davis, 1987; Van Hooff, McFarlane, Baur, Abraham, & Barnes, 2009) it is important to understand the precursors to PTSD symptoms in response to a range of highly stressful experiences.

Many theories of PTSD share the premise that PTSD symptoms are caused and maintained by a person's cognitive efforts to cope with the traumatic event (Keane, Fisher, Krinsley, & Niles, 1994). For example, information processing theories implicate faulty processing of and cognitions about the trauma memory in the development and maintenance of PTSD (Foa & Kozak, 1986; Resick & Calhoun, 2001). The "meaning of threat" transforms a trauma from a neutral structure to a "fear structure" in memory (Foa, Steketee, & Rothbaum, 1989, p. 166), and PTSD symptoms are sustained by a strong sense of current threat derived in part from negative appraisals of the traumatic event and/or its sequelae (Ehlers & Clark, 2000, 2008).

Social-cognitive theorists postulate that PTSD symptoms result from trauma that shatters one's basic assumptions about the invulnerability of the self and the safety of the world (Janoff-Bulman, 1989) or reinforces preexisting negative beliefs (Resick, Monson, & Chard, 2008). Faulty beliefs and misattributions, including self-blame and guilt, and over generalized problems with safety, trust, control, esteem, and intimacy, prevent the trauma from being integrated into memory (McCann & Pearlman, 1990; Resick & Calhoun, 2001). Until trauma-related information is reconciled with prior beliefs, symptoms of PTSD persist while the trauma remains in active memory (Horowitz, Wilner, & Alvarez, 1979).

The development and maintenance of PTSD symptoms have been shown to relate to particular negative cognitions after trauma exposure, including negative appraisals of the trauma and its implications (Dunmore, Clark, & Ehlers, 2001; Ehlers, Mayou, & Bryant, 1998). A range of post-traumatic cognitions have been categorized by researchers into negative beliefs about the self (e.g., I am damaged, inadequate, or unacceptable), the world (e.g., others are dangerous and untrustworthy; the event is likely to recur),¹ and self-blame (Ehlers & Clark, 2000; Foa, Ehlers, Clark, Tolin, & Orsillo, 1999). These negative cognitions have been shown to predict PTSD symptom severity better than other risk factors (Ehring, Ehlers, & Glucksman, 2006) and to predict the persistence of PTSD symptoms (Fairbrother & Rachman, 2006; Halligan, Michael, Clark, & Ehlers, 2003).

Spiritual Struggle, Trauma, and PTSD

Religious and spiritual cognitions should be considered in the context of trauma, because religious beliefs comprise a substantial part of many people's global meaning system and therefore inform their coping responses (Park, 2005), and because they address issues of existential meaning, which may be called into question by trauma (Janoff-Bulman, 1992). Most often, religious meaning systems provide a helpful vehicle for making sense of

seemingly random, nonsensical, or tragic events, by seeing them as part of a larger, more benign plan (Frazier et al., 2004; Pargament, 1997). Indeed, religion can be involved in changing the appraised meaning of a stressful situation by (a) providing a means to make more benign reattributions, (b) helping the individual to see the positive aspects of the stressful situation, and (c) facilitating perceptions of stress-related growth (Park, 2005).

While religion is often helpful in times of stress, it can also be a source of stress if religious beliefs or attributions suggest maladaptive ways of understanding an event. Although some clinical guidelines for treating PTSD acknowledge that religious beliefs intersect with maladaptive cognitions about punishment and injustice following trauma (Resick et al., 2008), cognitive theories of PTSD do not explicitly address the potential role of negative religious cognitive responses to trauma in the development and maintenance of PTSD symptoms.

Like negative post-traumatic cognitions about the self, others, and the world, the construct of *spiritual struggle* represents negative religious cognitions about the self, God, and the world, and may thereby lead to PTSD symptoms. Spiritual struggle consists of maladaptive religious cognitions about the cause of, responsibility for, and future implications of stressful events, paralleling secular cognitions known to be factors in the development and maintenance of PTSD symptoms (e.g., Brewin & Holmes, 2003). In fact, spiritual struggle has been linked to PTSD symptoms in a variety of trauma-exposed samples (e.g., Aflakseir & Coleman, 2009; Conners, Whiteside-Mansell, & Sherman, 2006; Harris et al., 2008); however, knowledge in this area thus far is limited to cross-sectional findings.

Spiritual struggle includes both reappraisals and discontent, and each of these aspects can be further broken down into distinct components. Religious reappraisals are cognitive efforts to ascribe meaning to stressful events (Pargament et al., 2000) by bringing one's perceptions of the event in line with one's global meaning system (Park, 2005). Some of these reappraisals take a negative tone, such as attributing the stressful event to punishment from God (Punishing God Reappraisal) or the work of evil forces (Demonic Reappraisal), or diminishing God's power (Reappraisal of God's Power). These attempts to make sense of the event may provide some individuals a sense of control or predictability (e.g., Gall, 2004; Pargament, Koenig, Tarakeshwar, & Hahn, 2004), yet they represent views of punishment, a malevolent world, and a cruel or absent higher power that is associated with poorer well-being (e.g., Mickley, Pargament, Brant, & Hipp, 1998).

Spiritual discontent (Pargament et al., 2000) involves anger with God, questioning God's love, or wondering whether one has been abandoned by God. Trauma victims may feel let down or betrayed and experience a sense of mistrust (for a summary, see Brewin & Holmes, 2003) or anger (e.g., Andrews, Brewin, Rose, & Kirk, 2000), and some individuals may direct these beliefs and resulting feelings toward God. Spiritual discontent has been related to higher levels of depression, suicidality, and PTSD symptoms in a variety of trauma samples (e.g., Exline, Yali, & Lobel, 1999; Harris et al., 2008).

The malevolent worldview and disrupted relationship with God characteristic of spiritual struggle may lead to the perceptions of threat or loss that cause and maintain PTSD symptoms (Ehlers & Clark, 2000). For instance, attributing the event to God's control may be an effort to reduce distress by compensating for a perceived lack of personal control; however, this attribution will only reduce anxiety if God is benevolent (Kay, Gaucher, Napier, Callan, & Laurin, 2008). In fact, negatively-valenced reappraisals of the traumatic event may fail to reduce the current perceptions of threat by merely redistributing the threat from human forces to spiritual ones.

Parallels between spiritual struggle and established (secular) negative cognitive responses to potentially traumatic events clearly exist, as does a small body of literature associating spiritual struggle with greater PTSD symptoms. However, research elucidating the character and directionality of the relationship between struggle and PTSD symptoms is needed. Prior studies have not assessed subscales of spiritual struggle separately to isolate possible differences in relationships with PTSD symptoms, and subtle differences exist among expressions of spiritual struggle, which may result in unique relationships with PTSD symptoms. Moreover, studies of spiritual struggle and PTSD to date have been cross sectional, precluding the inference of causal direction in the relationships among trauma, PTSD symptoms, and spiritual struggle (e.g., Bradley, Schwartz, & Kaslow, 2005).

The Present Study

The present study aims to advance understanding of how spiritual struggle relates to PTSD symptoms. The prospective design illuminates how spiritual struggle in response to a trauma, as compared to a non-traumatic stressful event, relates to the development and maintenance of PTSD symptoms. Specifically, struggle and its separate components are investigated as potential mediators of the relationship between trauma and PTSD. The analyses control for pre-event PTSD symptoms to allow for examination of change in PTSD symptoms in response to the index event.

Although stressful events, both those that qualify as trauma and those that do not, may lead to PTSD symptoms, traumatic events are hypothesized to lead to higher levels of symptomatology. Further, traumatic events are hypothesized to be followed by higher levels of spiritual struggle than non-traumatic events, as individuals search to make meaning of their trauma, and spiritual struggle is hypothesized to relate to higher levels of PTSD symptoms after trauma compared to stressful events that do not qualify as traumas. Finally, it is hypothesized that spiritual struggle will mediate the relationship between trauma and PTSD symptoms. Exploratory analyses are conducted to identify the strength and direction of the relationships between the subscales of spiritual struggle and PTSD symptoms.

Method

Participants and Procedures

Participants were undergraduates from a large, public university in the Northeastern United States. Prior to the start of the fall semester, all 3,238 incoming students in the first-year class (51.5% women, 61.9% White non-Hispanic, $M_{\text{age}} = 17.9$ years, age range: 17-27 years; demographic data are not available for 2.7% of the class) were emailed a URL to a series of questionnaires concerning their “first year experience” to complete online. As an incentive to participate, students were entered in a raffle to win a small cash prize or gift certificate. Parental consent was obtained for potential participants younger than 18 using electronic signature.

A total of 824 students began the survey (a 25.5% response rate) at Time 1, and 733 completed relevant study items. At the end of the spring semester of the first year (Time 2), the entire first-year class was again emailed to complete the follow-up survey. Participants who completed relevant study items at both time points were included in the present analyses ($N = 245$; 33.4% retention rate from Time 1 to Time 2, equaling 29.7% of the responders and 7.6% of the population of the complete incoming class of students). The final sample included 142 (58.0%) women and 99 (40.4%) men (data are not available for four participants) ranging in age from 17 to 23 years ($M_{\text{age}} = 17.9$). With regard to race and ethnicity, 170 (69.4%) self-identified as White non-Hispanic, 12 (4.9%) as Hispanic, 10 (4.1%) as Black, 9 (3.7%) as Asian/Pacific Islander, 2 (.8%) as American Indian/Alaska

Native, and 38 (15.5%) did not indicate race or ethnicity (data are not available for four participants). Independent samples *t*-tests were conducted to compare the responders and the final sample to the population (the complete incoming class). The responders ($N = 824$) did not differ significantly from the remainder of the population ($N = 2,414$) in age or ethnicity; however, women were more likely than men to respond to the survey ($t(1388.44) = -1.99, p = .05$). The final sample ($N = 245$) did not differ significantly from the remainder of the population ($N = 2,993$) in age; however, the sample contained a greater proportion of women ($t(311.90) = -2.25, p = .03$) and White non-Hispanic ($t(323.77) = -2.65, p = .01$) students than the remainder of the class. (See Attrition Analysis for a comparison of the final sample to those lost to follow-up.)

Measures

Baseline PTSD symptoms were assessed at Time 1 in response to a prior traumatic or stressful event. Interim traumatic and stressful events were assessed at Time 2, followed by subsequent spiritual struggle and PTSD symptoms.

Baseline event and PTSD symptoms

Traumatic events: At Time 1, participants reported their history of trauma exposure using the Traumatic Life Events Questionnaire (TLEQ; Kubany et al., 2000) in order to anchor the baseline PTSD symptoms (see below) to an event. The TLEQ assesses the occurrence of 22 potentially traumatic events (e.g., life-threatening illness) and asks participants to indicate whether they experienced fear, helplessness, or horror in response to the event, in accordance with diagnostic criteria for PTSD (American Psychiatric Association, 2000). Participants indicated the frequency with which they experienced each event from *never* to *more than five times*, and, if they endorsed an event (i.e., responded with *once* or more), they were presented with the follow-up question regarding “intense fear, helplessness, or horror when it happened” and asked to indicate *yes* or *no*.

PTSD symptoms: At Time 1, participants reported levels of psychological distress using the PTSD Checklist-Civilian (PCL; Blanchard, Jones-Alexander, Buckley, & Forneris, 1996), a widely used self-report measure that corresponds with diagnostic criteria for PTSD. The PCL contains 17 items rated on a five-point Likert scale from 1 (*not at all*) to 5 (*extremely*).

Representative items include: “*Trouble falling or staying asleep*,” “Feeling very upset when something reminded you of a stressful experience from the past,” and “Avoiding thinking about or talking about a stressful experience from the past or avoiding having feelings related to it.” Diagnostic cutoffs of 44 and 37 (Cook, Elhai, & Areán, 2005) have been recommended (Blanchard et al., 1996), and sub-clinical mean scores have been observed in college student samples (e.g., 27.8 at baseline and 24.5 at follow-up; Adkins et al., 2008). In the present study, Cronbach’s alpha value was .94 at Time 1.

Participants indicated which, if any, event on the TLEQ was most stressful or distressing from their past, then, on the PCL, indicated how much they had been bothered by symptoms of PTSD in response to the event in the past month. If they reported no trauma history, they were instructed to respond to the PCL in relation to “a stressful event from the past.”

Interim event and related spiritual struggle and PTSD symptoms

Traumatic and stressful events: At Time 2, participants indicated whether they had experienced any stressful events since coming to college. Participants were first presented with a list of 111 life events and asked to report whether any had occurred in the last eight months, using the College Students Life Events Schedule (CSLES; Sandler & Lakey, 1982), a widely used measure of the life experiences of college students (e.g., “Terminated intimate

relationship (boyfriend/girlfriend); “*Negative personal encounter with a professor*”). The CSLES has high test-retest reliability (Park, Cohen, & Carpenter, 1992; Sandler & Lakey, 1982) and has been used successfully with college students (e.g., Park, Cohen, & Herb, 1990).

Next, participants indicated whether they had experienced trauma since coming to college on a modified form of the TLEQ that contained 15 items corresponding to events that could have occurred during the first year at college (i.e., excluded childhood abuse; see Table 1). “Other trauma” refers to other events that were life threatening, caused serious injury or were highly distressing or disturbing. As at Time 1, participants indicated the frequency with which they experienced each event from *never* to *more than five times*, and, if they endorsed an event (i.e., responded with *once* or more), they were presented with the follow-up question regarding “intense fear, helplessness, or horror when it happened” and asked to indicate *yes* or *no*.

Finally, participants indicated which event, whether from the CSLES or the TLEQ, was the most stressful or distressing since coming to college. After participants identified the most stressful life event that had occurred to them since Time 1, they were asked to report how they coped with this event and their symptoms of distress (see following sections).

Spiritual struggle: Immediately after traumatic and stressful events were assessed, at Time 2, spiritual struggle in response to the event selected as most stressful or distressing since coming to college was obtained with four subscales of a widely used measure of spiritual struggle, the RCOPE (Pargament et al., 2000). Each subscale of the RCOPE used in this study contains three items, and participants were instructed to rank the frequency with which they perform or have performed the activity on a 4-point Likert scale from 1 (*not at all*) to 4 (*a lot*). Spiritual struggle in response to the event was assessed with the Punishing God Reappraisal (e.g., “*Decided that God was punishing me for my sins;*” Cronbach’s alpha = .78), Demonic Reappraisal (e.g., “*Felt the situation was the work of the Devil;*” Cronbach’s alpha = .93), Reappraisal of God’s Powers (e.g., “*Thought that some things are beyond God’s control;*” Cronbach’s alpha = .76), and Spiritual Discontent (e.g., “*Wondered whether God had abandoned me;*” Cronbach’s alpha = .82) subscales. Summed scores above 3 indicate that the participant reported using the coping behaviors and coping subscale at least “a little bit.” An overall spiritual struggle score was created by summing the subscales; Cronbach’s alpha for the overall 12-item scale was .89

A potential difficulty with measuring spiritual struggle is its relative infrequency. However, studies have shown that spiritual struggle is common among college students (Astin et al., 2004; A. N. Bryant & Astin, 2008), indicating that studying spiritual struggle, even in samples that may not identify as highly religious, is feasible. In the present sample, most students indicated they were at least slightly religious (64.1% at Time 1 and 59.2% at Time 2) and at least slightly spiritual (73.5% at Time 1 and 70.6% at Time 2).

Previous findings have indicated that the RCOPE has incremental validity over global measures of religiousness (e.g., Tarakeshwar & Pargament, 2001) and non-religious coping methods (Meisenhelder & Marcum, 2004; Mickley et al., 1998); therefore, other measures of religiousness and coping are not controlled for in our models. Because positive religious coping and struggle have been shown to coexist but function independently (Exline, Yali, & Sanderson, 2000; Harris et al., 2008; Pargament et al., 1998; Pargament et al., 2000), and because the effect of struggle exists when controlling for positive religious coping (Exline et al., 2000; Harris et al., 2008; Wortmann, Park, & Edmondson, 2010), methods of positive religious coping are not included in the models for the present study.

PTSD symptoms: Lastly, at Time 2, participants indicated on the PCL how much they had been bothered in the past month by the event which they selected as being the most stressful or distressing since coming to college. At Time 2, Cronbach's alpha value for the PCL was .92.

Data Analysis Plan

Participants were categorized into trauma and non-trauma groups based on interim trauma exposure. If a participant endorsed on the TLEQ at Time 2 having experienced an event at least one time and endorsed the follow-up question indicating fear, helplessness, or horror in response to the event, he or she was considered to have experienced trauma. If at Time 2 a participant endorsed only an event on the CSLES, or endorsed an event on the TLEQ but reported no fear, helplessness, or horror in response, he or she was categorized into the non-trauma group.

The PCL scores at Times 1 and 2 were summed into total scores. The potential mediators were created by obtaining the summed scores for the three-item subscales and the 12-item overall spiritual struggle scale. All variables were assessed for normality, and transformations were applied as merited (see below).

The spiritual struggle scale and subscales were tested separately as mediators in models with trauma group as the predictor and PTSD symptomatology as the outcome, controlling for the level of PTSD symptoms reported at Time 1. Mediation analyses were conducted using bootstrapping, a nonparametric statistical procedure that uses repeated sampling to estimate and provide a confidence interval for the indirect effect of the independent variable (IV) on the dependent variable (DV) through the mediator (M). Bootstrapping also provides coefficients and significance tests for the direct effects of the IV on the M (*a*), the M on the DV (*b*), and the IV on the DV through the M (*c'*); the total effect of the IV on the DV (*c*); and the partial effect of the control variable on the DV. Unlike null hypothesis significance testing, which derives a *p* value for the indirect effect based on the standard normal distribution, bootstrapping does not impose the assumption of normality on the sampling distribution of the indirect effect (Preacher & Hayes, 2008). Although the normal distribution is still assumed for the direct, total, and partial effects, the bootstrapping procedure does not assume the normal distribution of the indirect effect and is a well-established statistical solution for assessing mediation in the context of multivariate non-normality (Preacher & Hayes, 2008).

Results

Attrition Analysis

Independent samples *t*-tests comparing the group that completed both time points ($N = 245$) to the group lost to follow-up ($N = 488$) on demographic information and other Time 1 measures used in the study revealed only one difference: proportionately more White non-Hispanic students completed Time 2 than students of other racial or ethnic identifications ($t(548.48) = -2.68, p = .01$). There were no significant differences between participants and those lost to follow-up in gender, age, trauma exposure prior to Time 1, Time 1 PTSD symptoms, frequency of religious attendance and spiritual experiences, or self-reported religiousness and spirituality (all $ps > .10$).

Descriptive Statistics and Variable Transformations

Traumatic and stressful events—Endorsement frequencies for each interim trauma type are summarized in Table 1. Forty-eight participants reported experiencing at least one trauma between Times 1 and 2, with 16 of those endorsing two different categories of

traumatic events, and two individuals endorsing three categories. The most frequently endorsed category was experiencing the sudden or unexpected death of a friend or loved one; followed by having a loved one survive a life-threatening injury, illness, or assault; being stalked; and unwanted sexual contact. Because of the infrequency of endorsements of multiple traumatic events in this sample, a dichotomous variable was created to distinguish individuals who experienced at least one trauma ($n = 48$) from those who had experienced only a non-trauma stressful event ($n = 197$). Frequently endorsed non-trauma stressful events included “*disagreement with a friend*,” “*separation from close friend due to moving*,” “*significantly increased your level of debt*,” “*increased problem with academic performance*,” and “*decreased involvement with a hobby or task*.” Mean time since the event was 4.05 months ($SD = 3.07$) with a range from 0 to 9 months.²

Spiritual struggle—Mean spiritual struggle scores by trauma group are summarized in Table 2. Because the overall spiritual struggle score and the subscales were highly positively skewed (statistics (SE) = 3.44 (.14), 4.11 (.14), 5.73 (.14), 3.39 (.14), and 5.11 (.14), respectively), square root (for the overall scale) and log (for the subscales) transformations were applied to improve normality (resulting skew statistics: (SE) = 1.89 (.14), 1.32 (.14), 4.88 (.14), 2.38 (.14), and 1.85 (.14)). Although correlations among subscales were of moderate to large size (r 's = .45 to .68; see Table 3; Cohen, 1992), the relationships were not so large as to suggest a lack of discriminant validity among the subscales, so the subscales were considered separately in further analyses.

PTSD symptoms—Mean PCL scores by trauma group are summarized in Table 2. Because the PCL summed variables for Times 1 and 2 were positively skewed (statistics (SE) = 1.60 (.09) and 1.19 (.15), respectively), square root transformations were applied to improve normality (resulting skew statistics (SE) = 1.13 (.09) and .64 (.15)).

Differences by Trauma group

Table 2 summarizes mean differences by trauma group in potential mediator and outcome variables. Independent samples t -tests were performed to compare the group that appraised at least one event as a trauma to the group that did not on demographic and the normally-transformed study variables. The trauma and non-trauma groups did not significantly differ in age, gender, or racial/ethnic identification. The trauma group scored higher than the non-trauma group on PTSD symptoms at both time points and on spiritual struggle at Time 2. There was a trend toward a significant difference between the groups for the subscales of spiritual struggle.

Correlations among Study Variables

Bivariate correlations among study variables are summarized in Table 3. Correlations revealed small relationships (Cohen, 1992) among trauma exposure, spiritual struggle, and PTSD symptoms at Time 2. There was a trend toward a significant relationship between Spiritual Discontent subscale and trauma exposure ($r = .12$, $p = .06$), and no relationship between Demonic Reappraisal subscale and PTSD symptoms at Time 2. PTSD symptoms at Time 1 predicted experiencing trauma between Times 1 and 2 ($r = .18$, $p = .01$) and reporting greater PTSD symptoms at Time 2 ($r = .22$, $p = .001$).

Mediation Analyses

Results of mediation tests are summarized in Table 4 and Figures 1 through 5. To test whether the relationship between trauma and PTSD symptoms was mediated by spiritual struggle, bootstrapping was performed using Preacher and Hayes' SPSS macro (Preacher & Hayes, 2008) separately for each potential mediator (i.e., the overall spiritual struggle scale

and its four subscales). Unstandardized coefficients representing the direct effects of trauma on struggle, struggle on PTSD symptoms, trauma on PTSD symptoms through struggle; the total effect of trauma on PTSD symptoms; and the partial effect of baseline PTSD symptoms on subsequent PTSD symptoms; their standard errors, significance, and the overall model statistics are summarized in Figures 1 through 5. Estimates of (and confidence intervals for) the indirect effects of each mediator were based on 1,000 repeated samples and are summarized in Table 4. If the confidence interval for the estimated indirect effect contains zero, the indirect effect is not statistically significant. Results indicate that spiritual struggle partially mediated the relationship between trauma and PTSD symptoms. Three of the four subscales (specifically, Punishing God Reappraisal, Reappraisal of God's Powers, and Spiritual Discontent) also partially mediated the relationship between trauma and PTSD symptoms; Demonic Reappraisal did not serve as mediator.³

Post-Hoc Analyses

Although students were asked to report their struggle in response to their most stressful or distressing event since coming to college, the students may have reported struggle in response to the symptoms caused by the event (e.g., intrusions). Therefore, an equivalent model was tested using bootstrapping with PTSD symptoms at Time 2 as the mediator and spiritual struggle at Time 2 as the outcome. The indirect effect was significant (.05, $SE = .03$); however, global model fit statistics were not as convincing, $F(3,241) = 8.38$ versus 12.37, and the model explained less variance in spiritual struggle than the previous model did in PTSD symptoms (adjusted $R^2 = .08$ versus .12).

Discussion

These results indicate that spiritual struggle may be an important factor to consider in the cognitive and emotional responses of trauma victims, as a potential mechanism in the development and maintenance of PTSD symptoms. Given that negative post-trauma cognitions are associated with PTSD symptoms (e.g., Ehlers & Clark, 2000; Fairbrother & Rachman, 2006), negative religious responses to trauma may be predictive as well. Supporting this hypothesis, trauma exposure resulted in slightly higher levels of spiritual struggle than non-trauma events, and higher levels of spiritual struggle were related to higher levels of PTSD symptoms in a sample of students who experienced stressful or traumatic life events during their first year of college. Further, spiritual struggle partially mediated the relationship between trauma exposure and PTSD symptoms.

This study also isolated components of spiritual struggle and their individual relationships with trauma and PTSD symptoms. Reappraisals to a punishing God, reappraisals of God's powers, and expressions of spiritual discontent partially mediated the relationship between trauma exposure and PTSD symptoms. In contrast, reappraisal of the event to evil forces was unrelated to PTSD symptoms. It may be that attributing the event to evil forces provides an unsettling but satisfactory explanation for some trauma survivors, perhaps because it distributes blame away from self or God to a being already understood as malevolent (e.g., Pargament et al., 2004). This finding suggests that aspects of spiritual struggle are related but distinct constructs that should be assessed separately in future research.

In this study, reports of trauma exposure had a small relationship with PTSD symptoms, a finding also reported in other college student samples (e.g., Frazier et al., 2009). This result may in part reflect the vicarious nature of most of the traumatic events reported by these participants, but may also speak to the limitations of the current diagnostic criteria for PTSD, indicating the importance of intervening factors such as cognitive interpretations of events in determining the occurrence and severity of PTSD symptoms (e.g., Ehlers & Clark, 2000, 2008; Foa, Steketee, & Rothbaum, 1989; Resick & Calhoun, 2001).

While we believe that the present study represents an important contribution to our understanding of the intersection of trauma and spirituality, particularly given the paucity of information on this topic, it has limitations that must be considered. First, the final sample represented only a small proportion of the population of first-year students from which it was drawn, limiting the generalizability of our results. The nature of this study required casting a wide net to assess the impact of two low base rate phenomena (trauma exposure and spiritual struggle), and by approaching the entire population of first-year students, we risked a low response rate. However, we were able to compare our sample to the responders and total population in terms of demographics, and we found only that women were more likely to respond, and women and White students were more likely to complete the study, limitations that are unfortunately not unique to the present work (e.g., Graham, 1992). Further, while many studies are forced to recruit by advertising the purpose of the study, which may lead to patterns of participant self-selection, this study was able to approach the entire first-year class with a study of students' "first year experience," which likely limited self-selection. Finally, enrollment in the study in no way influenced whether a student experienced trauma during the study, ensuring that the choice of being in the study did not interact with the manipulation. For these reasons, we can be confident that the sample did not self-select based on variables related to the study questions.

Concerns about accuracy of statistical inference from the population from which the sample is drawn may be allayed by our use of bootstrapping to estimate confidence intervals around the reported parameter estimates, rather than reliance on inference based in parametric assumptions that may not have been met in these data (such as multivariate normality). Indeed, one of the primary reasons for using bootstrapping methods is to estimate parameters when the sample size is insufficient for straightforward statistical inference or multivariate non-normality is an issue. Relatedly, although relatively few individuals endorsed both criteria for trauma exposure, because the two groups exhibited similar mean scores and nearly equivalent variance in the other study variables, and trauma exposure was a predictor rather than an outcome in our models, unequal sample size was less problematic.

Perhaps the most important limitation of this study is that the types of trauma experienced by this sample of college students, and the relatively low PTSD scores that were reported in reference to those events, were not representative of the types of events and degree of PTSD seen in clinical practice. Although the present study may provide a window through which to view relations between religious cognitions and PTSD symptoms, they may be very different for a sample of combat-exposed veterans who go on to develop chronic, debilitating PTSD.

Indirect effects and variance accounted for in the present study are of small magnitude (Cohen, 1992), but the correlations between spiritual struggle and PTSD symptoms are consistent with effect sizes reported elsewhere (e.g., Ano & Vasconcelles, 2005). This study was limited by infrequent endorsement of spiritual struggle and PTSD symptoms and resulting highly positive skew of the mediator and outcome variables; however, low levels of spiritual struggle are commonly reported (e.g., Exline, Smyth, Gregory, Hockemeyer, & Tulloch, 2005; Pargament, Koenig, & Perez, 2000). We statistically addressed these limitations to the extent possible by transforming the variables and using non-parametric procedures, and results suggest that even low levels of struggle can have important implications for post-traumatic distress.

This study did not control for other possible contributors to PTSD symptoms, including type of trauma experienced and the total number of traumas experienced in the Time 1 to Time 2 interim, because there was insufficient variability to do so. Additionally, the most common trauma in the present sample was sudden, unexpected bereavement, which may be better

characterized by grief responses not fully captured by the sole outcome measure of PTSD symptoms (Gray et al., 2004).

In addition to individual differences in manifestations of spiritual struggle, cultural differences may exist in how struggle is expressed (e.g., Pargament, 1983; Rubin & Yasien-Esmael, 2004). Although this sample fairly closely mirrored the university's incoming undergraduate class, the majority of participants were White, non-Hispanic students. The lack of diverse ethnic and racial representation suggests a need for increased attention to recruitment of people of color in psychological research (see Castellanos & Gloria, 2007; Hall & Allard, 2009).

Finally, PTSD symptoms and spiritual struggle were assessed concurrently, precluding confirmation of causal direction and potentially biasing results (Maxwell & Cole, 2007). However, both PTSD and spiritual struggle were explicitly measured with reference to a specific event, and participants were responding such that their Time 2 scores on both measures were a result of an event that occurred between Time 1 and Time 2. This assumption is supported by the small correlation between PTSD symptoms at the two assessment points. Further, controlling for baseline PTSD symptoms strengthened the model by isolating PTSD symptom increase associated with the index event. The fact that participants who experienced an intervening trauma reported more PTSD symptoms at Time 1 than those who did not go on to experience a trauma in their first year suggests that the two groups may have been different in other important ways, although the lack of a relationship between Time 1 PTSD symptoms and spiritual struggle suggests that preexisting differences likely did not impact our analyses unduly.

Future studies should measure baseline spiritual struggle, to examine whether change in struggle predicts change in PTSD. Though spiritual struggle is generally thought to arise as a result of significant adversity, spiritual struggle due to non-traumatic stressful events could serve as a diathesis for PTSD to a subsequent traumatic event. Additionally, although the mean time between the index event and assessment of struggle and symptoms was four months, some participants may have experienced their event so recently that time was insufficient for the event to have observable effects (Maxwell & Cole, 2007).

The present findings suggest that trauma exposure results in PTSD symptoms in part through the negative cognitions of spiritual struggle. Spiritual struggle may relate to PTSD symptoms in complex ways, a consideration for future research evaluating causal direction. For instance, negative appraisals of the trauma could lead to initial symptoms of PTSD, and negative religious appraisals of the PTSD symptoms themselves could relate to their long-term maintenance. In support of the latter notion, theorists have speculated that psychopathology could impair religious functioning and give rise to spiritual struggles (Hill & Kilian, 2003).

Given the impact of spiritual struggle on PTSD symptoms, future research should investigate how religious and secular belief systems interact with spiritual struggle in response to trauma. For example, positive religious coping in the presence of struggle may moderate the impact of struggle on PTSD symptoms (e.g., Bjorck & Thurman, 2007), but in the absence of positive religious coping, may reflect a true absence of spiritual supports. Other cognitions that may predict spiritual struggle include pre-trauma self-appraisals (R. A. Bryant & Guthrie, 2007), attributional style (Gray et al., 2007), and coping self-efficacy beliefs (Benight & Bandura, 2004).

Because spiritual struggle only *partially* mediated the relationship between trauma and PTSD symptoms here, future models should include multiple mediators (Preacher & Hayes, 2008). Future studies should include measures such as the Post-Traumatic Cognitions

Inventory (Foa, Ehlers et al., 1999) to assess negative secular cognitions and test the assertion that negative religious coping methods are associated with negative secular cognitions about self, others, and the world. Other secular and religious coping strategies in conjunction with spiritual struggle, such as thought suppression and rumination (Ehlers & Clark, 2008) and avoidant and pleading religious coping (Pargament et al., 2000), may add to the explained variance in PTSD symptoms.

Future research should also investigate the relation of spiritual struggle to cognitive processes of coping with trauma. Discrepancy between trauma-related beliefs and prior beliefs can be reduced through assimilation (altering the trauma's meaning), accommodation (altering beliefs), and over-accommodation (extreme alterations or overgeneralizations of beliefs; Hollon & Garber, 1988; Resick et al., 2008). Pargament and colleagues described similar processes that occur in a religious or spiritual context: a threat to spiritual or religious worldview (e.g., by trauma) initiates spiritual struggling to "conserve or transform" faith (Pargament, Murray-Swank, Magyar, & Ano, 2005, p. 247). Some evidence suggests that over time struggle may resolve into a firmer faith (e.g., Exline et al., 2005); for examples, see Wortmann & Park, 2009).

The subscales of spiritual struggle parallel not only negatively-valenced cognitive content, but also cognitive processes for reducing distress after trauma. Differences in the success of the process may explain the differences among subscales in their relations with PTSD symptoms. Negative religious reappraisals may represent over-accommodation (e.g., God is no longer powerful), assimilation (e.g., God is punishing me for something I did), or accommodation (e.g., evil forces cause negative events, but God and most others are benevolent). Distinguishing adaptive accommodation from maladaptive over-accommodation and assimilation may further explain spiritual struggle's relationship to PTSD symptom development and maintenance.

Cognitive therapies are frequently used to treat symptoms of PTSD (Keane et al., 1994) by restructuring maladaptive cognitions (Ehlers & Clark, 2008; Resick et al., 2008), purporting to address the "troubling memories of the traumatic events and the personal meaning of the event and its consequences" (Ehlers & Clark, 2008, p. 12). This study presents ways in which spiritual struggle reflects negative personal meanings for stressful events and provides evidence that struggle can facilitate the development and maintenance of PTSD symptoms. Specifically, spiritual struggle may be part of victims' maladaptive cognitions and emotions about the causes and implications of traumatic events. It is a particularly interesting manifestation, in part because it functions as a means for the individual to retain many of the components of global meaning systems theorized to be "shattered" by trauma by altering perceptions of power, blame, or motivations amongst supernatural forces within a system of belief whose major pillars (e.g., the existence of interested, active deities and supernatural forces) are maintained (Edmondson et al., 2008). Future research should examine whether a meaning system that is retained but altered in this way is more adaptive than losing the meaning system altogether.

Clinicians working with trauma victims should be aware of the possible relevance of spiritual struggle in clients' interpretation of the event and subsequent recovery. Our results indicate that clinicians must recognize that religious and spiritual beliefs may be present not only as a resource but as a negative force in the face of stressful life events. Care must be taken to assess clients' personal feelings toward their spiritual struggle and support personal growth while challenging maladaptive cognitions. Some clients may benefit from treatments designed for spiritual struggles (e.g., Cole & Pargament, 1999; Murray-Swank & Pargament, 2005). Effectiveness of such treatments may lie in allowing victims to alter the

meaning of their trauma in order to view the world, themselves, and a higher power in more benevolent and flexible ways.

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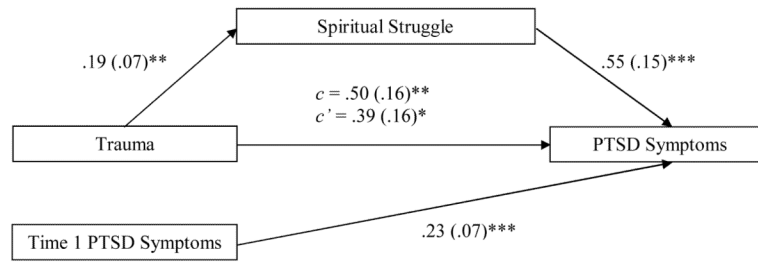


Figure 1.

Spiritual struggle as partial mediator of the relationship between trauma exposure and PTSD symptoms, controlling for baseline PTSD symptoms. Coefficients represent unstandardized parameter estimates (*SE*).

$F(3, 241) = 12.37$, Adjusted $R^2 = .12$, $p < .001$.

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

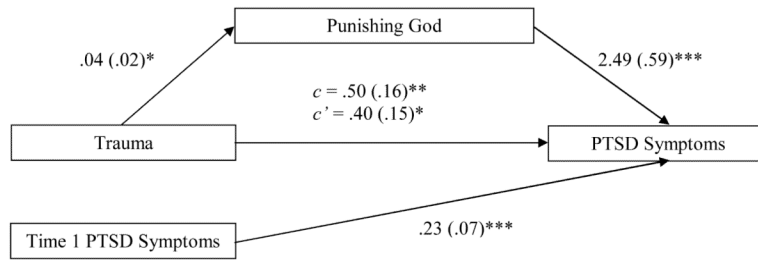


Figure 2. Punishing God Reappraisal as partial mediator of the relationship between trauma exposure and PTSD symptoms, controlling for baseline PTSD symptoms. Coefficients represent unstandardized parameter estimates (*SE*). $F(3, 241) = 14.00$, Adjusted $R^2 = .14$, $p < .001$. * $p < .05$. ** $p < .01$. *** $p < .001$.

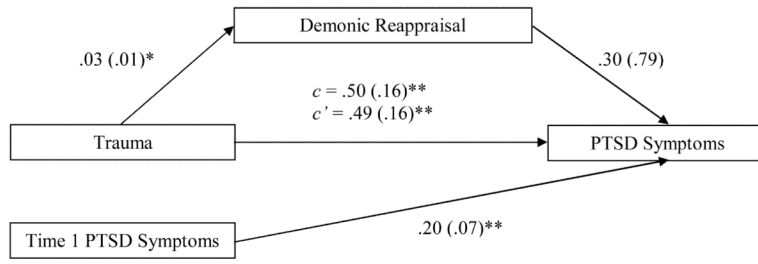


Figure 3. Demonic Reappraisal does not mediate the relationship between trauma exposure and PTSD symptoms, controlling for baseline PTSD symptoms. Coefficients represent unstandardized parameter estimates (*SE*).

$F(3, 241) = 7.47$, Adjusted $R^2 = .07$, $p < .001$.

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

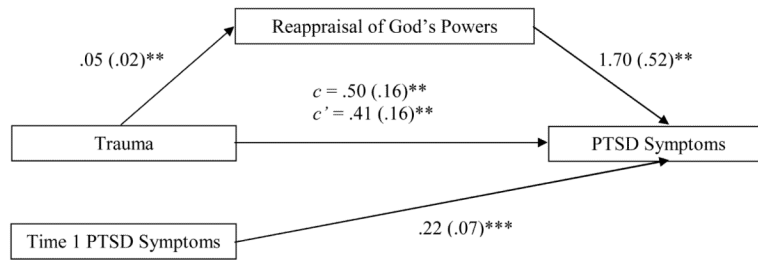


Figure 4. Reappraisal of God's Powers as partial mediator of the relationship between trauma exposure and PTSD symptoms, controlling for baseline PTSD symptoms. Coefficients represent unstandardized parameter estimates (*SE*). $F(3, 241) = 11.25$, Adjusted $R^2 = .11$, $p < .001$. * $p < .05$. ** $p < .01$. *** $p < .001$.

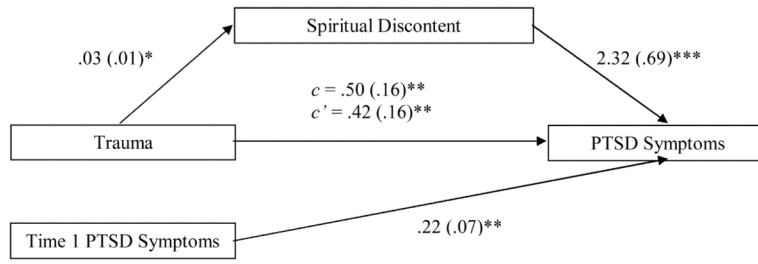


Figure 5. Spiritual Discontent as partial mediator of the relationship between trauma exposure and PTSD symptoms, controlling for baseline PTSD symptoms. Coefficients represent unstandardized parameter estimates (*SE*). $F(3, 241) = 11.55$, Adjusted $R^2 = .12$, $p < .001$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 1

Types of Traumatic Events During First Year of College

Event Type	Number of participants endorsing
1. Sudden death of a friend/loved one	24
2. Loved one survived life-threatening illness/injury	14
3. Stalked	6
4. As an adult: unwanted sexual contact	5
5. Witnessed severe assault to acquaintance/stranger	2
6. Natural disaster	4
7. You survived life-threatening illness	4
8. Threatened with death/serious harm	3
9. Physically hurt by intimate partner	3
10. Other accident	2
11. Combat or warfare	1
12. Motor vehicle accident	0
13. Assaulted by acquaintance/stranger	0
14. Armed robbery	0
15. Other trauma	0

Table 2

Mean Summed Scores (SD) on Study Variables by Trauma Group

Measures (Scale Min/Max)	Trauma group mean (SD)		
	Trauma (<i>n</i> =48)	Non-trauma (<i>n</i> = 197)	<i>t</i>
Spiritual Struggle (12/48)	14.27 (4.34)	12.94 (3.25)	-2.12*
Punishing God Reappraisal (3/12)	3.60 (1.55)	3.25 (1.00)	-1.72 [†]
Demonic Reappraisal (3/12)	3.40 (1.14)	3.12 (0.83)	-1.76 [†]
Reappraisal of God's Powers (3/12)	3.85 (1.57)	3.39 (1.23)	-1.99 [†]
Spiritual Discontent (3/12)	3.42 (1.05)	3.19 (0.96)	-1.70 [†]
PTSD Symptoms Time 1 (17/85)	29.06 (10.29)	24.84 (10.05)	-2.79**
PTSD Symptoms Time 2 (17/85)	32.79 (13.74)	26.23 (10.06)	-3.23**

Note. Mean difference calculated on transformed variables (two-tailed).

[†] $p < .10$.

* $p < .05$.

** $p < .01$.

Table 3

Intercorrelations of Study Variables

Measure	1	2	3	4	5	6	7
1. Trauma exposure between Time 1 and Time 2	—						
2. Spiritual Struggle	.16*	—					
3. Punishing God Reappraisal	.13*	.84***	—				
4. Demonic Reappraisal	.14*	.69***	.45***	—			
5. Reappraisal of God's Powers	.15*	.86***	.60***	.46***	—		
6. Spiritual Discontent	.12†	.83***	.68***	.49***	.63***	—	
7. PTSD Symptoms Time 1	.18**	-.10	-.11†	-.089	-.093	-.079	—
8. PTSD Symptoms Time 2	.23***	.23***	.25***	.035	.21**	.21**	.22**

Note. N = 245.

† p < .10.

* p < .05.

** p < .01.

*** p < .001.

Table 4

Indirect Effect of Trauma on PTSD Symptoms through Spiritual Struggle

Mediator	Bootstrap Estimate of Indirect Effect	SE	Bias Corrected and Accelerated 95% Confidence Intervals	
			Lower Bound	Upper Bound
Spiritual Struggle	.11	.06	.027	.266
Punishing God Reappraisal	.10	.07	.010	.296
Demonic Reappraisal	.01	.04	-.054	.121
Reappraisal of God's Powers	.09	.06	.016	.258
Spiritual Discontent	.07	.05	.003	.195

Note. Based on 1,000 bootstrap samples.