Social Support, Religious Coping, and Traumatic Stress Among Hurricane Katrina Survivors of Southern Mississippi: A Sequential Mediational Model

Zachary B. Wood[1], David C. Wang[1], Collin Lee[1], Haleigh Barnes[1], Tania Abouezzeddine[1], Andrea Canada[1], and Jamie Aten[2]

[1] Rosemead School of Psychology, Biola University
[2] Humanitarian Disaster Institute, Wheaton College

The scale and scope of the destruction caused by Hurricane Katrina has made it one of America's deadliest natural disasters in the last 100 years. The physical destruction caused by Katrina was enormous, as was its impact on mental health. One of the common mental health outcomes associated with natural disasters are symptoms of posttraumatic stress disorder (PTSD). Using a college sample who were living in an area struck by Hurricane Katrina in southern Mississippi, we sought to further elucidate the mechanism underlying the relationship between trauma exposure and PTSD symptomatology. We tested a double mediational path model linking trauma exposure to PTSD symptoms through the impact of trauma exposure on the engagement of religious coping and then social support. Our model demonstrated good fit to the data and indicated that negative religious coping, but not positive religious coping, significantly accounted for the relationship between trauma exposure and PTSD symptoms and that this indirect pathway was in turn accounted for by both instrumental social support as well as emotional social support. Positive religious coping was also significantly associated with instrumental support and emotional support but was unrelated to trauma exposure. Considerations for natural disaster interventions along with the impact of positive and negative religious coping on resiliency and recovery are discussed.

Keywords: PTSD, post-traumatic stress disorder, religious coping, social support, trauma exposure

Over the past 2 decades, numerous hurricanes have devastated the United States (Blake & Zelinsky, 2018; Blake et al., 2013; Graumann, 2005). In 2012, Hurricane Sandy damaged or destroyed 650,000 houses and induced blackouts affecting 8.5 million New Yorkers (Blake et al., 2013). In 2017, Hurricane Harvey, the second costliest tropical cyclone in the history of the United States, flooded over 30,000 structures across Texas and Louisiana, causing up to $125 billion in damage (Blake & Zelinsky, 2018). Just 1 month after Hurricane Harvey, Hurricanes Irma and Maria struck the Caribbean, leading to a humanitarian crisis in the island of Puerto Rico as displaced residents were left without power as well as access to clean water and food (Hinojosa & Meléndez, 2018; Zorrilla, 2017). Nonetheless, it is Hurricane Katrina, causing $161 billion of damage and over 1,800 fatalities, which remains the costliest tropical cyclone to date and one of the deadliest disasters of any kind since 1928 (Blake & Zelinsky, 2018; Graumann, 2005). Making landfall in August 2005, its devastation was vast, damaging or destroying oil rigs, casinos, bridges, and beaches, which further disrupted the lives and livelihoods of those living in the storm's wake (Knabb et al., 2011).

Tragically, it appears as though these storms may be a harbinger of what is to come. Over the past 30 years, natural disasters have more than quadrupled (Ritchie & Roser, 2019). Evidence suggests hurricanes will continue to increase in frequency and intensity as the Earth's temperature increases (Runkle et al., 2018), indicating that the odds of another Hurricane Katrina are increasing by the year. Additionally, climate change itself may be associated with deleterious impacts on individuals' mental health (see Ferreira, 2020). Beyond their physical consequences, natural disasters such as hurricanes are psychologically traumatic events that can significantly impact the mental health of those in affected areas. Individuals exposed to disasters may experience mental health consequences such as posttraumatic stress disorder (PTSD), grief, depression, anxiety, stress-related health problems, increased substance abuse, and suicidal ideation (Bonanno et al., 2010; Long et al., 2020), but these outcomes are not just limited to survivors of the trauma itself. They can extend to health-care workers who provide aid to those affected (Powell, 2020). PTSD, in particular, is a common consequence of disasters (Bistricky et al., 2019; Neria et al., 2008). Research has so far been unable to identify one single variable capable of predicting who will experience symptoms of a trauma disorder in the wake of a traumatic event. Instead, the

literature suggests a multiplicity of risk and resiliency factors at play, uniquely shaping disaster outcomes for each individual. Some of these factors concern the context of the disaster, proximal exposure during the disaster, and distal exposure post disaster (Bistricky et al., 2019; Bonanno et al., 2010; Cerdá et al., 2013; Neria et al., 2008).

Among hurricane survivors, research indicates that individuals who experience an acute hurricane-related traumatic event or secondary stressor (i.e., death of a family member, loss and damage to property, etc.) tend to experience a greater degree of initial posttraumatic stress symptoms and functional impairment, with functional impairment increasing over time (Cerdá et al., 2013). As the world grapples with the ongoing coronavirus disease (COVID-19) pandemic, research is highlighting how the impact of mass trauma may include an increased PTSD risk for both treatment providers (Carmassi, 2020) and survivors of the disease (Xiao et al., 2020). For example, one study looking the psychological impact of Hurricanes Harvey and Maria reported clinically significant levels of PTSD, anxiety, and burnout among samples of health-care and social service providers in both Texas and Puerto Rico (Powell et al., 2020). This underscores the importance of studying trauma and its impact on mental health as the world prepares for a future where mass traumas of various forms continue to become more common.

Due to the many potential short- and long-term challenges faced by trauma survivors, research has directed attention toward the identification of resources and strategies that may facilitate resilience and coping in the wake of a traumatic event. One of the most salient resources identified in the literature is social support, which is capable of shaping not only mental health outcomes post trauma, but even the severity and frequency of posttrauma stressors (Bonanno et al., 2010). Social support is broadly defined as receiving support from individuals or groups to manage the difficulties and life changes of a traumatic event (Carver, 1997). It is particularly well suited to meet the needs of natural disaster survivors because of two features: its dynamism and longevity (Middleton et al., 2002). Social support has the capacity to meet a variety of different emotional, physical, and psychological needs, which survivors of natural disasters may need in different quantities at different times. Similarly, social support can also be enduring, which enables it to handle the long-lasting challenges associated with natural disasters.

Social Support and Mental Health Outcomes Post Trauma

Social support has been shown to be predictive of improved mental health outcomes as well as reduced posttraumatic symptoms among veterans and survivors of disasters, whether the traumatic event takes the form or natural disasters or events such as war or assault (Pittman et al., 2020; Smith et al., 2014; Wilks et al., 2019). For example, within the context of traumatic stress from hurricanes, social support has also been found to be correlated with resilience and compassion satisfaction while being inversely related to burnout and anxiety (Powell et al., 2020). Rather than facing the difficulties associated with trauma alone, one can reduce the burdens, responsibilities, and stresses by receiving help, comfort, materials, or spiritual care. Individuals with low social support appear to be at greater risk for developing adverse mental health outcomes.

In another study conducted after the Great East Japan Earthquake, researchers explored the relationship between social support and psychological distress by age and gender among survivors living in temporary housing. Researchers found that after the Great East Japan Earthquake, the age and gender of an individual affected how he or she related to various forms of social support and distress. For example, Japanese men younger than 65 years who had social support had lower psychological distress, and women older than 65 years who had emotional, instrumental, and social support had lower psychological distress (Teramoto et al., 2015). This could mean that different forms of social support may be more helpful in decreasing psychological distress depending on the characteristics (e.g., gender and age) of the individual, which might help explain why some empirical studies have found that perceived social support was not significantly correlated with PTSD symptoms, even though other studies found it to be an adaptive coping strategy (Feder et al., 2013). Furthermore, social support can come in a variety of forms that reflect the nature of the support given, two of which are emotional and instrumental support.

Emotional Support

Emotional support (i.e., caring for an individual's emotional well-being through acts such as empathizing or listening) appears to offer better health and well-being benefits postdisaster than other forms of support (Banks & Weems, 2014; Matsumoto et al., 2015; Platt et al., 2016). Emotional support can come from a variety of sources such as family members, friends, neighbors, religious organizations, and community centers. The utilization of emotional support post trauma may be variable. Some research has found that coping strategies (e.g., avoidant coping) tended to be relied upon more heavily. These alternate coping strategies were also associated with lower PTSD symptomatology (Glass et al., 2009). Other researchers, on the other hand, have found that seeking social support as a means of coping during Hurricane Katrina was more salient compared to other coping strategies such as avoidance (Salloum & Lewis, 2010).

Instrumental Support

Some evidence suggests instrumental support (i.e., provisional forms of support such as services and resources) may play some role in fostering resilience in the immediate aftermath of a disaster as well (Feder et al., 2013; Smith et al., 2014). Perceived safety appears to play a role in moderating the relationship between instrumental support and PTSD symptoms such that individuals with low levels of perceived safety might have greater difficulty integrating new beliefs about the world in light of the traumatic event (Cai et al., 2014). Accordingly, receiving instrumental support might lead those with low levels of perceived safety to experience a higher degree of fear and despair as they are confronted with the reality of loss again, which may lead to reexperiencing the traumatic experience and symptoms over again. Given evidence of both positive and negative effects associated with instrumental social support, additional research on the topic is warranted.

Religious Coping and Mental Health Outcomes Post Trauma

Trauma and traumatic stress can also bear profound implications upon one's spirituality and religious beliefs (Wang et al., 2016). Notably, from the standpoint of our previous discussion on social support, one form of social support that has received less attention in the research literature vis-à-vis natural disaster trauma is religious support/coping. Previous research has already suggested theoretical and empirical links between religious coping and social support. Religion and religious coping themselves are multifaceted constructs with social aspects and social consequences (Pargament et al., 2005; Pargament & Raiya, 2007). In a validation study for one common measure of religious coping (the RCOPE), the researchers included questions directly addressing the degree to which respondents sought support from other faith practitioners. These questions demonstrated appropriate factor loadings within the context of the overall measure as well as significant correlations with stress-related growth, mental health, and positive religious changes (Pargament et al., 2000). In addition, a study by Nooney and Woodrum (2002) using a nationally representative sample from the United States found significant correlations between church-based social support and religious coping as well as between church-based social support and church attendance. A separate study examining the relationship between intrinsic religiosity and mental health found three specific subtypes of faith-based social support (e.g., tangible social support, emotional social support, and church embeddedness) to be differentially associated with hopelessness and depression (Hovey et al., 2014). Other researchers have highlighted the importance of studying social support from such a nuanced perspective, especially when trying to understand it as a mediator between religious involvement and health outcomes (George et al., 2002).

Broadly speaking, religious coping concerns how an individual applies their religion to achieve certain goals or to pursue certain ends in their lives (Pargament et al., 2000). This could involve cultivating religious meaning or significance from an occurrence in one's life and/or cultivating a greater sense of closeness to a religious power and community. In some studies, religious coping has been found to be associated with better mental health outcomes and posttraumatic growth (Mesidor & Sly, 2019; Zeligman et al., 2020). Religious coping may be used to help one find greater meaning from events such as Hurricane Katrina or get comfort from the belief that a higher power is in control even amid such life-changing circumstances. For example, one research study found that sexual assault survivors who are actively engaging in religious coping a year after the incident have reduced levels of depressive and posttraumatic stress symptoms compared to those who have not been engaging in religious coping (Bryant-Davis et al., 2015). This trend was observed among not only survivors of sexual assault but also survivors of other forms of trauma (Feder et al., 2013; Mesidor & Sly, 2019).

Religious coping, similar to social support, can have both positive and negative derivations (Pargament et al., 2000). Positive religious coping, on one hand, refers to instances when an individual's religion/spirituality enables them to manage stressors in an adaptive way. For example, someone may view a natural disaster as an opportunity for them to deepen their connection with God or to learn an important spiritual lesson. Similarly, people may seek greater closeness to God or engage in prosocial behavior toward other members of their religious community in an effort to manage their stress. Negative religious coping, on the other hand, is similar only in the sense that individuals engage in it as a response to traumatic or stressful situations. However, rather than being adaptive, negative religious coping tends to heighten experiences of stress for the individual. For example, someone who views a natural disaster as the punitive consequence of a vengeful God in response to their unfaithfulness would be engaging in negative religious coping.

When considering religious coping and its effects on natural disaster–related trauma, it has been suggested that religious or spiritual resources can serve as an important active coping strategy, enabling individuals to find support from prayer, religious commitment, and/or reading of religious texts (Salloum & Lewis, 2010). Notably, the potential benefits of religion and spirituality extend not only to survivors of trauma but also to frontline health providers who are potentially at risk for secondary and vicarious trauma (Wang et al., 2014). Chen et al. (2021) found that Columbian trauma survivors who engaged in higher amounts of positive religious coping had better overall well-being, and those who had engaged in higher amounts of negative religious coping had decreased overall well-being. Research has also shown the utilization of positive religious coping to be associated with lower risk of PTSD (Mesidor & Sly, 2019) and lower PTSD symptoms (Feder et al., 2013). As might be expected, negative religious coping has been associated with an increase in PTSD symptoms (Carroll et al., 2020). Similarly, the belief that Hurricane Katrina was a form of divine punishment was associated with increased symptoms of acute stress disorder, and the belief that God or a higher power had abandoned them was associated with higher levels of functional impairment. Interestingly, these relationships were moderated by the quantity of resources lost by the individual, whereby lower levels of resource loss were associated with increased symptomatology and impairment compared to those who had higher levels of resource loss (Park et al., 2019). That said, the link between negative religious coping and PTSD symptomatology has not always been found (Henslee et al., 2015).

In summary, negative religious coping may be a unique, culturally salient risk factor for PTSD among religious individuals—especially for survivors of trauma who are highly religious. For example, someone who views a traumatic event as punishment from God due to a lack of faith may continue to spiral downward into worse mental health outcomes. Alternatively, positive religious coping may be a unique, culturally salient protective factor for PTSD among religious individuals. Religious coping's ability to function as both a risk and protective factor make it a particularly relevant construct to study in the context of trauma (Ferreira et al., 2018).

Religious Coping and Social Support: Are They Hierarchically Related?

We suggest the possibility that the relationship between religious coping (which is oriented toward the sacred/divine) and trauma outcomes could in part be accounted for indirectly through emotional and instrumental social support (which is oriented toward help given and received from fellow human beings). For instance, negative religious coping may in fact predict greater

PTSD symptoms in part because individuals believing they are being punished by God may be hesitant to reach out to others for support and/or may feel as if they are undeserving of receiving support from others—whether this support is emotional or instrumental in nature. Conversely, feelings of guilt and shame from God may be generalized onto religious communities, who are seen as representative of God. We also suggest positive religious coping may in fact predict fewer PTSD symptoms in part because adaptive religious coping behavior, such as increased prosocial behavior toward other members of their religious community, may lead to or cultivate greater received social support (e.g., through prayer groups or other religiously-themed support groups). Likewise, social support from religious communities can be a channel through which an individual accesses much needed instrumental support (e.g., financial offerings, time, and other physical or informational resources) during a time of crisis.

The Current Study

Accordingly, the present study seeks to assess the relationships between trauma exposure, religious coping (positive and negative), social support (emotional, instrumental), and PTSD symptom severity among adult residents of southern Mississippi who are survivors of Hurricane Katrina. We propose the following:

Hypothesis 1: Emotional social support, instrumental social support, and positive religious coping will be negatively correlated with PTSD symptom severity, with emotional social support bearing the strongest negative correlation. Negative religious coping will, in turn, be positively correlated with PTSD symptom severity.

Hypothesis 2: Trauma exposure will indirectly predict PTSD symptom severity through two independent pathways mediated by positive and negative religious coping, respectively. Specifically, trauma exposure will be associated with higher utilization of both positive and negative religious coping, and although increased positive religious coping will be associated with lower PTSD symptom severity, increased negative religious coping will be associated with higher PTSD symptom severity.

Hypothesis 3: We hypothesize that trauma exposure will predict PTSD symptom severity through two hierarchical, indirect pathways: first, trauma exposure predicts increased utilization of both positive religious coping and negative religious coping; in turn, positive religious coping will predict higher levels of both emotional social support and instrumental social support, whereas negative religious coping will predict lower levels of both emotional social support and instrumental social support; and finally, emotional and instrumental social support will predict lower levels of PTSD symptom severity.

Method

Procedure

Data were collected from psychology students attending the Hattiesburg and Gulf Coast campuses of the University of Southern Mississippi 1 to 3 months after Hurricane Katrina hit the region. Participants completed a paper survey (including an informed consent form, demographic information, and study measures) by hand. They were recruited on a volunteer basis with an incentive of receiving extra credit in their psychology course for participation. IBM SPSS Statistics 26 was used to assess the study data for missing values, outliers, and normality, whereas the double mediation path model was analyzed using Stata 16.0. The study sought and received institutional review board approval.

Participants

For this study, archival data were assessed. Data were collected from students attending two college campuses in southern Mississippi (n = 656) who were living in Mississippi when Hurricane Katrina hit. The mean age of the participants was 22 years, with most identifying as single/never been married (82.3%). The majority of the sample was female (77%) and White (60.2%). However, there were 142 men and 237 Black participants (21.6% and 36.1%, respectively). The students were from several different years: freshman (14.5%), sophomore (18.6%), junior (32.2%), senior (33.8%), and graduate student (.2%). The yearly income was wide in range; nonetheless, 32% reported their annual income as $50,000 or more. Several different religious denominations were represented, with the majority of the sample identifying as Baptist (50.9%), Catholic (13.1%), or Methodist (12.2%), whereas most of the remaining sample identified with other religions (20.1%). Finally, the majority of the sample did not have children (84.1%).

Measures

Social Support Scales

Social support was measured on three subscales: Instrumental Support, Emotional Support, and Religious Support. To measure instrumental support, an adaption of the Helping Behavior Scale was used (Zemore & Kaskutas, 2004). The original version of the Helping Behavior Scale was developed through interviews with members of Alcoholics Anonymous. Three subscales were developed to measure helping behavior: Recovery Helping, Life Helping, and Community Helping. Later, Halberda and colleagues (2005) modified the Helping Behavior Scale to make it applicable to college students. In this study, the Help Given and Help Received subscales will be used in reference to instrumental support, as they assess tangible forms of help that others have been given or have provided. For the Help Given subscale, 17 items were used, with three items being omitted, as they did not meet criteria for instrumental support. In addition, for the Help Received subscale, 15 items were used, with three items being omitted, as they did not meet criteria for instrumental support. This measure had good internal consistency in the sample (α = .87). The Help Given subscale was measured using a 5-point Likert scale (ranging from A = *never* to E = *10 or more times*), and the Help Received subscale was measured using a 4-point Likert scale (ranging from 0 = *I got no help at all* to 3 = *I got a lot of help*). Both measured the frequency of participants' helping behavior.

To measure emotional support, items from various scales were used. Emotional support was measured using one item from a religious coping measure by Carver (1997); one item from a measure assessing loss and gain that has been contextualized to Hurricane Katrina (Hobfoll & Lilly, 1993); and three items from the adapted Help Received subscale (Halberda et al., 2005). All items measured various forms of emotional support, such as receiving advice, comfort, or understanding from other people. All items were rated on a 4-point Likert scale, with the four items from the religious coping measure ranging from 0 = *I haven't been doing this at all* to 3 = *I've been doing this a lot (much of the time)* and the three items from the Help Received subscale ranging from 0 = *I got no help at all* to 3 = *I got a lot of help*. Internal consistency for this scale was adequate (α = .70).

The nine-item instrument created by Krause (1999) measured religious support using three subscales: Positive Religious Support, Anticipated Support, and Negative Religious Support. For each item, participants were asked to rate themselves on a 4-point Likert scale. Both positive and negative religious support used the same frequency scale (ranging from 1 = *never* to 4 = *very often*), whereas the subscale for anticipated support was measured by how much help was expected from their congregation (1 = *none* to 4 = *a great deal*). For the purpose of this study, religious support was measured by independently assessing for positive religious support and negative religious support; therefore, only two subscales were used. Both positive and negative religious support demonstrated good internal consistency (α = .89; α = .74)

PTSD Checklist–Civilian

The PTSD Checklist–Civilian (PCL-C) is a 17-item questionnaire that assesses current symptoms of PTSD. Hurricane Katrina was specified as Criterion A1 stressor for the PCL-C items in this study. For each item, participants were asked to rate themselves on a 5-point severity scale (ranging from 0 = *not at all* to 5 = *extremely*) to determine how much they have been bothered by a symptom over the past month. A total symptom severity score (range = 17–85) is calculated, with higher scores indicating greater severity of symptomology. Blanchard et al. (1996) assessed 40 motor vehicle accident victims and sexual assault victims using the PCL-C and the Clinician Administered PTSD Scale (CAPS). The researchers found that there was a strong significant positive correlation between the PCL-C and CAPS (r = .929; p < .0001), with a diagnostic efficiency of .90 verses CAPS; therefore, the instrument showed good validity. In addition, the total scale internal consistency coefficient (α = .93) of the PCL-C demonstrated

good reliability. For the current sample, the PCL-C demonstrated good consistency (α = .94).

Katrina Exposure

Trauma exposure during Hurricane Katrina was assessed through a yes-or-no question that read, "Did you ever feel like your life was in danger during the hurricane?" A similar item was used in a study by Norris et al. (1999) examining psychological distress in the aftermath of Hurricane Andrew.

Results

A significant subset (n = 256, 39%) of the total respondents (n = 646) indicated they believed their life to be in danger at some point during the storm. PTSD symptom severity (Table 1) was less than 1 *SD* above the mean of a nonclinical sample reported by Conybeare et al. (2012). Zero-order correlations (Table 2) largely supported the first hypothesis. Emotional social support, instrumental social support, and positive religious coping were all significantly correlated with PTSD symptom severity. Similarly, negative religious coping was positively and significantly correlated with PTSD symptom severity; however, contrary to expectation, instrumental social support demonstrated a slightly larger negative correlation with PTSD symptom severity than emotional social support. Positive religious coping and negative religious coping were significantly correlated.

Indirect Effects

Hayes Process Macro (Hayes, 2017) in SPSS (v. 26) was utilized to assess whether positive and negative religious coping were indirectly related to trauma exposure and PTSD symptom severity. Results indicated partial support for the second hypothesis. When the mediator, positive religious coping, was added to the model, results showed a significant direct effect between trauma exposure and PTSD symptom severity (95% confidence interval [CI] [1.820, 6.018], p < .001); however, the indirect effect through positive religious coping was not significant (95% CI [−.108, .382]). When negative religious coping was entered as the mediator, results again indicated a significant direct effect between trauma exposure and PTSD symptom severity (95% CI [1.081, 5.300]), and a significant indirect effect was also found through negative religious coping (95% CI [.297, 1.478]).

Table 1
Descriptive Statistics of Model Variables

Variable	M	SD	Skewness	Kurtosis
Instrumental support	32.80	13.83	−0.90	−0.07
Emotional support	20.26	18.19	0.26	−1.51
Positive religious coping	2.54	1.02	−0.15	−1.19
Negative religious coping	1.27	0.46	2.13	5.35
PTSD symptom severity	30.18	13.33	1.21	1.22
Katrina exposure	1.40	0.49	0.43	−1.83

Note. PTSD = posttraumatic stress disorder; Katrina Exposure = trauma exposure due to Hurricane Katrina.
* p < .05. ** p < .01.

Table 2
Correlations of Model Variables

Variable	1	2	3	4	5	6
1. Instrumental support	—					
2. Emotional support	.62**	—				
3. Positive religious coping	.13**	.09*	—			
4. Negative religious coping	−.12**	−.07	.12**	—		
5. PTSD symptom severity	−.34**	−.31**	−.11**	.20**	—	
6. Katrina exposure	−.14**	−.11**	−.04	.16**	.15**	—

Note. PTSD = posttraumatic stress disorder; Katrina Exposure = trauma exposure resulting from Hurricane Katrina.
* $p < .05$. ** $p < .01$.

Path Models

To further elucidate the mechanism underlying the relationship between trauma exposure on PTSD symptomatology, we tested an integrative, mediational path model linking trauma exposure to PTSD symptoms through the impact of trauma exposure on the engagement of religious coping and social support. The path model demonstrated adequate fit to the data ($\chi^2(3) = 16.89$, $p < .001$; root-mean-square error of approximation [RMSEA] = .086; comparative fit index [CFI] = .97; standardized root-mean-square residual [SRMR] = .041; Figure 1). The model indicated both negative religious coping and positive religious coping exerted statistically significant direct effects on PTSD symptoms. Moreover, significant indirect effects of positive religious coping on PTSD symptoms

were also seen through the pathways of emotional support and instrumental support. Likewise, significant indirect effects of negative religious coping on PTSD symptoms were present and appear to be indirectly related through both emotional and instrumental social support. As expected, self-reported exposure to life-threatening circumstances during Hurricane Katrina significantly predicted PTSD symptom severity ($p = .047$). A significant indirect effect was also seen in the doubly mediated pathway whereby exposure to life-threatening circumstances predicted negative religious coping and negative religious coping predicted emotional support and instrumental support, as previously discussed.

Next, we tested two alternative path models with alternate orderings of associations between the variables of the study. The

Figure 1
Double Mediational Path Model of Trauma Exposure, Religious Coping, Social Support, and PTSD Symptoms
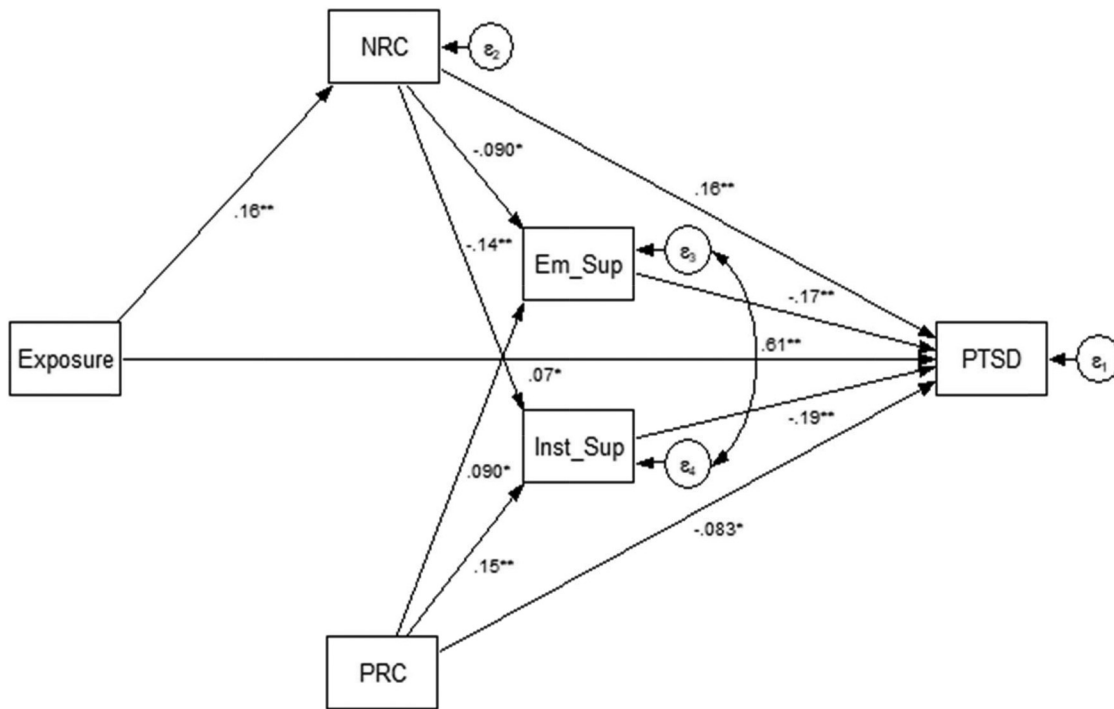
Note. Standardized coefficients are reported in the model. Exposure = trauma exposure due to Hurricane Katrina; NRC = negative religious coping; PRC = positive religious coping; Em_Sup = emotional support; Inst_Sup = instrumental support; PTSD = posttraumatic stress disorder symptoms. * $p < .05$. ** $p < .01$.

first alternative model we examined was a single-level mediational model in which negative religious coping, positive religious coping, emotional social support, and instrumental social support all directly mediated the relationship between trauma exposure and PTSD symptoms. Model fit to the data was poor, $\chi^2(6) = 326.68$, $p < .001$; RMSEA = .291; [CFI] = .31; SRMR = .15, with the χ^2 difference test indicating that the model fit of this model was significantly worse compared to the original model, $\Delta\chi^2(3) = 309.79$, $p < .001$. The second alternative model examined was a double mediation path model in which the emotional support variables were linked to PTSD symptoms indirectly through the religious coping variables. This model, too, indicated poor fit to the data, $\chi^2(6) = 328.85$, $p < .001$; RMSEA = .292; CFI = .31; SRMR = .15, with the χ^2 difference test similarly indicating a significant change in the χ^2 statistic for the worse, $\Delta\chi^2(3) = 311.96$, $p < .001$. Thus, with the hypothesized model demonstrating superior fit to the data, we concluded the analysis with it as the preferred model (Figure 1).

Discussion

The primary purpose of the study was to evaluate a theoretical model in which trauma exposure and PTSD symptom severity were related indirectly by way of social support and religious coping. To that end, our hypothesized path model was tested, demonstrating adequate fit to the data. Overall, this model supported the nuanced salience of social support and religious coping in helping explain PTSD symptom severity following exposure to a natural disaster.

To start, zero-order correlations supported our first hypothesis, with instrumental support, emotional support, and positive religious support all significantly associated with lower PTSD symptom severity, and negative religious support being significantly associated with higher PTSD symptom severity. These results were congruent with much of the existing natural disaster literature, as higher levels of social support were similarly found to be associated with lower levels of various forms of psychological distress, including PTSD symptomatology (Bonanno et al., 2010; Feder et al., 2013; Sugimoto et al., 2015).

In partial support of our second hypothesis, results also indicated that trauma exposure and PTSD symptom severity were indirectly related through negative religious coping. Although previous research had similarly reported that negative religious coping directly predicted PTSD symptoms (Feder et al., 2013; Mesidor & Sly, 2019; Stanko et al., 2018), the findings of our study suggest survivors of trauma may be more likely to experience symptoms of traumatic stress in part due to increased engagement in negative religious coping. In addition, contrary to our expectations, this indirect pathway of trauma exposure to PTSD symptom severity was not found for positive religious coping. Together, these findings suggest that for an individual who engages their religion as a means of emotional coping, the experience of traumatic or life-threatening events have the potential to activate maladaptive forms of religious coping (which may in turn exacerbate PTSD symptoms) but not necessarily adaptive forms of religious coping (which are understood to buffer the negative emotional impact of trauma).

The precise expression of negative religious coping can vary significantly from one individual to another. Notably, Pargament et al. (2003) identified a number of "red flags (p. 1335)" that might be indicative of detrimental applications of religious coping used in the wake of adverse life events. For example, the loss of interest in God, themselves, and/or the world may reflect considerable

internal turmoil or cognitive dissonance within the individual who previously held an active religious life. Steger and Park (2012) spoke of the importance of meaning making in the recovery process from trauma and of the central role of religion as providing foundational scaffolding (e.g., basic beliefs about the self, world, other people, and possibly a higher power) for an individual to find and/or make meaning and existential significance from trauma. Negative religious coping may represent maladaptive coping behavior stemming from one's previously held religious belief system becoming overwhelmed by the trauma. As such, effective therapeutic interventions might help an individual identify and become aware of ways in which their traumatic experiences are discordant with their current conceptualization of their spirituality and facilitate reappraisals that create more congruence between a client's spiritual beliefs and their personal experience.

As noted earlier, contrary to our expectations, trauma exposure was not associated with positive religious coping. These findings were consistent with Shannonhouse et al. (2019), who reported that although positive religious coping buffered the relationship between disaster-related resource loss and trauma symptoms, trauma exposure did not directly predict an individual's utilization of positive religious coping. Moreover, they also found disaster-related resource loss directly predicted negative religious coping. Together, these findings suggest the conceptualization of positive religious coping and negative religious coping as distinct constructs and practices. This idea is further bolstered by their relatively low correlation (r = .118, $p < .01$) in our study. Given previous evidence linking positive religious coping with decreased PTSD symptoms (Ano & Vasconcelles, 2005) as well as increased posttraumatic growth (Mesidor & Sly, 2019), future research targeting the practice of religious coping in trauma recovery should follow a multimodal approach—one that not only seeks to mitigate the use of negative religious coping but also facilitates the use of positive religious coping.

With the exception of the relationship between trauma exposure and positive religious coping, our third hypothesis was largely supported by the findings of our path model, which proposed that higher levels of instrumental and emotional support would be associated with a decrease in PTSD symptoms and that trauma exposure would predict PTSD symptom severity through hierarchical, indirect pathways of religious coping and social support. Speaking of the relationship between social support and trauma outcomes, our results were congruent with other studies that linked both instrumental and emotional support with fewer negative mental health outcomes, such as PTSD, post disaster (Bonanno et al., 2010; Chan et al., 2015; Glass et al., 2009; Heller et al., 2005; Salloum & Lewis, 2010; Teramoto et al., 2015). In contrast to the previous literature, our findings suggest that instrumental social support may be more strongly predictive of lower PTSD symptoms compared to emotional support (Matsumoto et al., 2015; Uchino, 2009). A couple factors may explain this discrepancy. First, given the limited financial resources of our population (i.e., college students) and the scale of the storm's destruction, instrumental support may have met more a more pressing need than emotional support by addressing highly salient basic survival needs (i.e., shelter, food, clothing, etc.). Second, the fallout from Hurricane Katrina may have impaired the ability of the individuals in our study to meaningfully engage with other members of their religious community. Church buildings may have been damaged or destroyed, forcing regular meetings to be postponed. Effort and

attention may have been more focused on the tangible effects of the storm rather than the emotional ones.

Limitations

Unaddressed by our study were cultural differences within our sample regarding the manner in which they typically receive emotional comfort. Some research indicates that the perceived comfort offered by religiously oriented messages (such as might be offered by a person's religious community) can vary by ethnicity, with African Americans rating religiously oriented comforting messages as higher in perceived comfort than their Caucasian peers (Samter et al., 2013). It may be that our predominantly Caucasian sample found nonreligious sources of emotional support to be more comforting than the emotional support offered by their religious community.

Despite finding significant and expected bivariate correlations between many of our variables of interest, most of them were small in magnitude. It is likely that one (or several) factors impacting the relationship among Katrina exposure, religious coping, social support, and PTSD symptomatology remain unexamined by the study. One potential factor is meaning making because it finds a close association with religious coping and trauma (Park, 2004; Park, 2005). Another potential consideration is the impact of time on the study variables. The relatively short (i.e., 1–3 months) timeframe between Hurricane Katrina and data collection combined with the cross-sectional design of the current study would prevent any interaction between time and the study variables from being seen. Moreover, because our data were cross-sectional, alternative interpretations concerning the directionality in which the variables of our study are interrelated may also be viable. However, because our hypothesized model demonstrated superior fit to the data compared to the two alternative models we tested, our results suggest that the ordering of variables in our model were sound. In addition, the timeline of development of PTSD symptomatology can be variable among individuals (Bonanno, 2004). Any symptoms that began or worsened after the study data were collected would be unknown to the investigation.

Furthermore, our study used a population of college students, which may limit its generalizability. This is an environment and phase of life in which religious beliefs and values may be particularly susceptible to change. Another potential limitation of our study was the adequate, but not ideal, reliability ratings for our scales of social support. Most were only marginally greater than .60, which may have limited our ability to find significant pathways in our path model. Moreover, many of the bivariate correlations between variables in our study, though statistically significant, were relatively small in magnitude, suggesting that other salient factors exist outside of those included in our model. Although previous literature has identified both social support (Matsumoto et al., 2015) and religion/spirituality (Park et al., 2019) as salient factors that contribute to psychological recovery from trauma, it is possible other dimensions of both constructs (e.g., formal social support, informal social support, religious/spiritual practices, specific religious/spiritual beliefs) may in fact play a significant role in this relationship as well. In addition, the current conceptualization of positive and negative religious coping is fairly broad. It includes assessments of thoughts and emotions directed both toward God and the individual's religious community. Although this may be theoretically cohesive with the current conceptualization, it does not seem unreasonable to think individuals may feel differently about both God and their religious communities. Ambivalence of this form may have made it challenging to reliably measure religious coping. Finally, our study was cross-sectional in nature, which limits our ability to make causal claims. It also relied on self-report measures, meaning our data might be impacted by situational factors.

Conclusion

The current study examined the indirect effects of a path model that sought to describe the relationship between trauma exposure and PTSD symptom severity by way of social support and religious coping. The study found a significant indirect effect by which trauma exposure predicted negative religious coping, negative religious coping predicted lower instrumental social support, and instrumental social support predicted lower PTSD symptom severity. Positive religious coping was found to be exogenous to the model but also predicative of lower PTSD symptomatology directly and indirectly through increased instrumental and emotional social support. This study builds upon the existing literature indicating the salience of social support and religious coping on the psychological recovery from trauma by highlighting the nuances and intricacies in the interrelationships between these variables when they are studied together. Ultimately, our results speak to the importance of developing both theoretical models as well as clinical and intervention strategies that allow the clinician to address adaptive or maladaptive uses of religious coping into some of the current evidence-based practices for the treatment of PTSD symptoms (i.e., prolonged exposure, cognitive processing therapy, etc.), knowing that the positive impact of such interventions are likely multifold—both directly as well as indirectly supporting recovery from the impact of trauma due to natural disasters and hurricanes.

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