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RS & DISASTERS

Do Religious Habits and Coping Help in the Immediate Aftermath of a Crisis? Relations With Hurricane Katrina Evacuees' Acute Stress Symptoms and Functional Impairment

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Objective: Religious coping has been shown to relate to psychological adjustment in survivors of disasters months or even years afterward. However, because very few studies have assessed coping and well-being during the immediate crisis, little is known about the role of religiousness at this critical time. **Method:** We studied a sample of 132 Hurricane Katrina evacuees (56% male, 74.2% African American, mean age of 43 years) relocated to a Red Cross emergency shelter in Austin, Texas, within 19 days of Hurricane Katrina's landfall. **Results:** Participants reported high levels of acute stress disorder (ASD) symptoms and functional impairment as well as high resource loss. Belief that God is in control and negative religious coping (perceiving punishment) were positively related to ASD symptoms while negative religious coping (perceiving abandonment) was related to higher functional impairment. The negative religious coping-ASD symptom relationship was moderated by resource loss, such that, for those with lower levels of resource loss, negative religious coping (perceiving punishment) related to even higher levels of ASD symptoms, an effect that diminished with higher resource loss. Neither positive religious coping nor pre-Katrina frequency of service attendance or private prayer related to ASD symptoms or functional impairment. **Conclusions:** At least in this sample at the height of disruption following a disaster, little evidence of salutary effects of religiousness were observed. It may be that such effects take time to emerge as people begin their recovery processes or that not all groups find help through their religious coping resources.

Clinical Impact Statement

For Hurricane Katrina survivors who had experienced high levels of loss and dislocation, neither religious habits nor religious coping were associated with less distress or functional impairment. However, some aspects of religiousness, particularly spiritual struggle and beliefs in God's control, were related to poorer adjustment. Interventions in the immediate aftermath of disasters might profitably focus on mobilizing other types of coping resources and address spiritual struggles.

Keywords: acute stress disorder, religious coping, spirituality, natural disaster, Hurricane Katrina

Hurricane Katrina dealt a tremendous blow to the entire Gulf Coast and especially affected the most highly vulnerable—poor African Americans (Curtis, Mills, & Leitner, 2007). Many of those affected were also highly religious, providing an opportunity to learn how established religious practices and beliefs as well as religious coping with the hurricane related to survivors' postdisas-

ter adjustment (Alawiyah, Bell, Pyles, & Runnels, 2011). The present study examined this issue from a transactional stress and coping perspective (Aldwin, 2007; Folkman, 2011; Lazarus, & Folkman, 1987). According to this theoretical perspective, individuals are most likely to adjust well to traumatic events when they have high levels of psychosocial resources on which to draw and use effective coping strategies to manage their distress (Aldwin, 2007). This transactional stress and coping perspective is commonly applied to studies of religious resources (e.g., practices, beliefs) and coping (e.g., Newton & McIntosh, 2010; Park, 2017; Park & Cohen, 1993).

Religion and Coping With Natural Disasters

Research suggests that religion and spirituality are especially important resources for many people coping with trauma, such as

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in high-magnitude, low-control disasters (see Park, 2016, for a review). Religion is a resource that is both communal and internal to the individual and, as such, offers many routes for coping. It is often a resource of last resort that cannot be lost or taken away. For the many survivors of Katrina who identified as religious, religiousness may be the only explanatory system that could help them to understand the disaster, regain a sense of control, and maintain a sense of self-worth (Aten, Bennett, Hill, Davis, & Hook, 2012).

Religiousness has been implicated in recovery following various disasters, but the findings are somewhat contradictory. In a sample of survivors of the 2005 Pakistani earthquake assessed 3 years later, being "religious minded" was independently related to lower posttraumatic stress disorder (PTSD) symptoms after controlling for many disaster-related and demographic variables (Ali, Farooq, Bhatti, & Kuroiwa, 2012), suggesting a salutary effect of a strong religious life. In a study of survivors of the L'Aquila (Italy) earthquake, those high in organizational religiousness and personal religiousness religiosity and low in self-identity as "spiritual" had the lowest levels of PTSD symptomatology, but higher self-identification as "spiritual" was positively related to higher levels of symptomatology (Stratta et al., 2013), suggesting a protective value for organizational and ritual aspects of religiousness but a potential liability for spirituality divorced from religion.

Religious coping, actions related to God or a higher power used by individuals to deal with stressful experiences, is very common after disasters (Marks, Cherry, & Silva, 2009) and appears to be the primary mechanism through which religiousness and spirituality influence psychological outcomes in their wake (Wadsworth, Santiago, & Einhorn, 2009). Importantly, religious coping with disasters is not just a U.S.-based phenomenon but, in fact, is a common approach to understanding and coping with disasters around the world (Gaillard & Texier, 2010). Positive religious coping, which includes coping efforts such as attempting to gain comfort, intimacy, and closeness with God, is generally associated with fewer symptoms of psychological distress and greater reports of psychological growth after traumatic events, although reports of effects are somewhat inconsistent (Pargament, Feuille, & Burdzy, 2011). On the other hand, negative religious coping, which includes reappraising the event as punishment from God and questioning God's power, is more consistently related to higher levels of distress and poorer adjustment (Pargament et al., 2011).

Some studies have demonstrated favorable relations between religious coping and postdisaster adjustment. For example, in a study of survivors of the 1993 Midwest (U.S.) flood, positive religious coping was associated with better psychological adjustment, while negative religious coping was associated with greater distress (Smith, Pargament, Brant, & Oliver, 2000).

However, religious coping with disaster is not always found to be helpful. In a sample of survivors within 2 years of the 2004 Asian tsunami, respondents' use of religious practices to cope was strongly positively associated with anxiety and diagnosed PTSD (Hollifield et al., 2008), and in a sample of survivors of the 2005 Pakistani earthquake, positive religious coping was unrelated to PTSD (Ahmad et al., 2010). Similarly, in the sample of survivors of the La'Aquila earthquake described above, negative religious coping, but not other aspects of coping, related to higher levels of PTSD symptomatology and suicidality (Stratta et al., 2012).

Thus, results of research on religion and adjustment following a disaster are decidedly mixed. It must be noted that virtually all of the research on religiousness in the context of disasters has been conducted with survivors 3, 6, or 12 months following the disaster or even several years later. Such work is important but raises the question of the interplay of these variables over time; many people may become more or less religious, perhaps depending on their mental, physical, and psychosocial well-being, so that over time, the relationships may be reciprocally influential (Park, 2016). These changes make it impossible to determine, in studies conducted many months or years later, the early relationships between religious resources and well-being. Further, much of the research in disaster recovery has been conducted with people who were only marginally affected rather than those who suffered most drastically. Thus, it remains unclear what role religiousness and religious coping may play for people in the throes of crisis.

Religious Resources in the Context of Hurricane Katrina

Hurricane Katrina, which made landfall in southeast Louisiana on August 29, 2005, was one of the deadliest in U.S. history. While Katrina left a trail of destruction along the Gulf Coast from central Florida to Texas, the greatest damage and loss of life occurred in New Orleans, Louisiana, because its levees failed. With much of New Orleans below sea level, approximately 80% of the city flooded in up to 20 feet of water, leaving thousands homeless. Many residents were able to heed warnings to evacuate before the storm, but for those unable to leave, the situation was dire. For days, the news media portrayed horrific images of New Orleans residents stranded at the Convention Center and the Superdome and on many rooftops and bridges throughout the city (Galea et al., 2007).

In the days after Katrina, those who had not evacuated before the storm were rescued from the Superdome, the Convention Center, or other areas of the city and bussed to over 470 different temporary relief shelters, most of which were located in Texas and operated in conjunction with the Red Cross (see Brodie, Weltzien, Altman, Blendon, & Benson, 2006; Mills, Edmondson, & Park, 2007). Thousands of residents were housed in these shelters for weeks following the disaster. In contrast to other recent natural disasters, many displaced by Katrina were relocated for an indefinite period of time with no knowledge of when they could return home or if, in fact, they had a home to which to return. Thus, in terms of emotional and psychological harm, Katrina's victims may have been affected more severely than people studied in other recent disasters. In particular, the emotional and psychological trauma experienced by displaced residents of New Orleans may have been the most severe, given the almost complete devastation of the city (Spence, Lachlan, & Burke, 2007). Thus, studies of survivors of Hurricane Katrina have posited that this disaster posed particularly extreme hardships for survivors, especially those who had been unable to leave before the storm hit, given the additional trauma of waiting to be rescued, the widescale dispersion of the survivors and consequential weakened community support, and the extremely high rates of property loss and essential lack of ability of many to return to their city (Galea et al., 2007; Lee, Shen, & Tran, 2009).

A small number of studies focused specifically on religiousness in survivors of Hurricane Katrina and the roles it played in their recovery. It has been noted that the area of the United States affected tends to be fairly highly religious and that religion could be expected to play an especially important part of the recovery of survivors (Alawiyah et al., 2011). However, this body of post-Katrina literature has produced mixed findings regarding whether religious resources were associated with better recovery. Some studies found no support (e.g., Pecchioni, Edwards, & Grey, 2011) or weak support for salutary relationships of religiousness and well-being in those affected by Katrina (e.g., Spence et al., 2007). A study of low-income mothers that was ongoing in New Orleans prior to Katrina was able to prospectively examine whether pre-disaster religiousness influenced recovery; this study found religiousness did not have a direct effect on postdisaster distress, although it was weakly predictive of less postdisaster distress through a heightened sense of purpose and optimism (Chan, Rhodes, & Pérez, 2012).

More consistent are reports of relations between negative religious coping and poorer post-Katrina adjustment. For example, in a study of Hurricane Katrina survivors displaced to Colorado, positive religious coping was unrelated to PTSD or depressive symptoms, while negative religious coping was positively related to PTSD symptoms (Wadsworth et al., 2009). In a sample of college students affected by Hurricane Katrina, more religious strain related to poorer mental and physical health. General religiousness was not a significant predictor in the full model of mental health, but religious comfort was (Cook, Aten, Moore, Hook, & Davis, 2013). These inconsistent findings from research on religious coping specifically with Katrina parallel those found in the broader coping literature (see Pargament et al., 2011).

The Present Study

Our question in the present study was whether religiousness served as a resource to reduce stress responses in the immediate aftermath of Hurricane Katrina. Based on previous literature, we hypothesized that it should, although given the inconsistencies in previous studies, these hypotheses were offered tentatively. We examined several different aspects of religiousness shown to be important in previous research: general religiousness pre-Katrina (frequency of service attendance and private prayer), belief in God's control over one's life, and two different positive and two different negative religious coping strategies.

We examined these aspects of religion in relation to two different indicators of adjustment, acute stress disorder (ASD) symptoms and functional impairment. ASD is the precursor to PTSD, which is only diagnosed 1 month after a trauma and is an important indicator of psychological distress. Functional impairment reflects individuals' inability to accomplish important life tasks. We also examined tangible resource loss as a potential moderator of the relationships between religiousness and adjustment, given the central role of such loss in stress responses (Hollifield et al., 2016). In particular, tangible resource loss is strongly related to distress in the context of disaster (Benight et al., 1999); given the tremendous storm damage and recent dislocation, we reasoned that our participants' tangible resource loss would likely reflect an objective level of experienced harm.

Clearly, many individuals affected by Hurricane Katrina suffered extensive losses, and these have been shown to relate to religiousness in several studies. In a sample of college students affected by hurricane, resource loss related to less religious comfort and more spiritual strain (Cook et al., 2013), and in a sample of Hurricane Katrina survivors from Mississippi Gulf Coast communities approximately 5 months after the storm, greater levels of resource loss predicted a more negative conceptual portrayal of God as well as perceptions of God as having less control over the outcome of events (Aten et al., 2012). In this sample of Hurricane Katrina survivors, there was some suggestion that finding comfort in one's religion could buffer the effects of resource loss on poststorm adjustment (Cook et al., 2013). Similar moderating effects in other populations have shown that religious coping can be particularly helpful when individuals are under higher levels of stress (e.g., Park, Cohen, & Herb, 1990; Tix & Frazier, 1998). In this study, we reasoned that the association between resource loss and distress might be buffered by high levels of religious coping (and low levels of negative religious coping), indicating religiousness might be particularly useful under conditions of high stress.

In sum, we aimed to examine the extent to which an array of religious resources might be associated with adjustment in the midst of an unfolding crisis for individuals most affected by the disaster. We hypothesized that (1) an ongoing religious practice (regular service attendance and/or private prayer) would serve as a resource and thus be related to lower levels of distress; (2) positive religious coping efforts would also be related to lower levels of distress and psychosocial functioning, while negative religious coping would be related to higher levels of distress and poorer functioning; and (3) these relationships between aspects of religion and adjustment might be moderated by the magnitude of the tangible losses experienced.

Method

Participants

In total, 132 adult evacuees (56% men, 44% women; mean age of 43 years; range, 20–80 years) from New Orleans and surrounding parishes comprised the sample. Reported racial identification was 74.2% Black, 16.7% non-Hispanic White, 3% multiracial, 1.7% Hispanic, and 2.4% "other." Eighty-one percent reported a high school diploma or higher, with 22% having completed college or an advanced degree. Participants reported income as less than \$10,000 (37%), between \$10,000 and \$30,000 (45%), and greater than \$30,000 (18%). When given a list of self- or physician-diagnosed mental health problems they may have ever experienced, 47% of all participants reported a previous psychiatric condition (depression, 33%; anxiety, 21%; bipolar disorder, 8%; schizophrenia, 4%; PTSD, 3%; other, 3%), with the distribution of diagnoses evincing a similar pattern across income levels. More than half of participants identified as Baptist (52%), with far fewer identifying as Catholic (21%), Protestant (5%), Pentecostal (2%), or Jewish (1%). Some participants reported another religion not listed (8%), being nonreligious (2%), or did not report an answer (10%). Nearly all participants (95%) waited multiple days to be evacuated from the New Orleans area ($M = 3.99$; $SD = 2.78$), resulting in high levels of traumatic exposure and loss. The sample has been described in greater detail elsewhere (Mills et al., 2007).

Sampling and Data Collection

Data collection occurred 12–19 days after Hurricane Katrina made landfall outside New Orleans. Data were collected at the Austin Convention Center, which housed approximately 1,600 Hurricane Katrina evacuees. Shelter access was granted to the researchers by the City of Austin and Travis County Emergency Medical Services. Survey booths were set up in four different locations within the shelter to increase researcher visibility and to provide a sample that best represented the shelter population. Data were obtained anonymously; therefore, written informed consent was waived. All participants received information in written and verbal form regarding the purpose, risks, and benefits of study participation in compliance with the university's institutional review board.

Measures

Pre-Katrina frequency of service attendance and private prayer were each assessed using a single item from the Brief Multidimensional Measure of Religiousness/Spirituality (R/S; Fetzer Institute/National Institute on Aging Working Group, 1999): "Before the hurricane, how often did you go to religious services?" rated 5 (*more than once a week*), 4 (*every week or more*), 3 (*one or two times a month*), 2 (*every month or so*), 1 (*one or two times a year*), or 0 (*never*) and "Before the hurricane, how often did you pray privately in places other than at church or synagogue?" rated from 7 (*several times a day*), 6 (*once a day*), 5 (*a few times a week*), 4 (*once a week*), 3 (*a few times a month*), 2 (*once a month*), 1 (*less than once a month*), or 0 (*never*).

God control was asked by a single question created for this study, "How much control do you feel God has in your life?" on a scale of 0 (*not at all*) to 4 (*extremely*).

Positive and negative religious coping were assessed with two items each from the Brief RCOPE (Pargament et al., 2011). Positive religious coping items included "I've been trying to find comfort in my religion or spiritual beliefs" and "I've been praying or meditating." Negative religious coping items included "I've been feeling that stressful situations are God's way of punishing me for my sins or lack of spirituality" and "I've wondered whether God has abandoned me." These four items were chosen from the Brief RCOPE's full set of 14 because they represented key domains of religious coping as described by Pargament, Koenig, and Perez (2000) and are items that typically load high on the positive and negative religious coping factors (Pargament et al., 2011). Participants were asked the extent to which they were using each coping method to deal with the hurricane, rated on a scale from 1 (*haven't been doing this at all*) to 4 (*been doing this a lot*). The two positive religious coping items were significantly correlated ($r = .54$), and the two negative religious coping items were significantly correlated ($r = .34$). Because these correlations were fairly low and other research has suggested that these coping methods are distinct from one another (e.g., Pargament et al., 2000), we analyzed each of the four items separately.

Loss of tangible resources was created for this study and based on a similar measure by Benight et al. (1999) developed to assess tangible resource loss after a hurricane. Participants responded to the question, "What property have you lost due to Katrina? (check all that apply)," including home, vehicle, business, furniture/ap-

pliances, and photos/documents, and a sum score was produced per Benight et al. (1999).

ASD symptoms were assessed with the Acute Stress Disorder Scale (ASDS; Bryant, Moulds, & Guthrie, 2000), a self-report inventory consisting of 19 items based on criteria for ASD as defined by the *DSM-IV-TR* (American Psychiatric Association, 2000). The ASDS contains four subscales asked in response to a specific event: Dissociation (five items; e.g., "During or after Katrina, did you ever feel numb or distant from your emotions?"), Reexperiencing (four items; e.g., "Have memories of the hurricane kept entering your mind?"), Avoidance (four items; e.g., "Have you tried not to think about Hurricane Katrina?"), and Arousal (six items; e.g., "When you are reminded of the disaster, do you sweat or tremble, or does your heart beat fast?"). Participants are asked the extent to which they experienced each item since the Hurricane Katrina disaster. All items were answered on a scale from 1 (*not at all*) to 5 (*very much*) and summed for a total score. Cronbach's alpha for the total scale in this sample was .92.

Social and occupational functional impairment was assessed using a five-item self-report scale (see Mills et al., 2007). Participants were asked to rate the degree on a scale of 0 (*not at all*) to 4 (*extremely*) to which Katrina had interfered with the ability to experience companionship, social support and community, intimacy, overall personal achievement, and achievement in career or work. The scale showed good internal reliability in the present sample (Cronbach's alpha = .80).

Statistical Analysis

While statistical tests were generally exploratory, an alpha for two-sided tests was set at .05. The PROCESS macro for SPSS was used to conduct simple slopes tests (Hayes, 2013).

Descriptive Information

Participants reported going to religious services an average of 2–3 days a week ($M = 2.6$ days, $SD = 1.8$) and engaging in private prayer 5–6 days a week ($M = 5.5$ days, $SD = 2.1$). Reported belief that God had of control over their lives was high ($M = 3.6$, $SD = 0.9$). Positive religious coping with the hurricane was fairly high (tried to find comfort in religion, $M = 3.1$, $SD = 1.1$; prayed or meditated to cope, $M = 3.2$, $SD = 1.0$). Negative religious coping levels were fairly low (perceiving the hurricane as God's punishment for their sins or lack of spirituality, $M = 1.9$, $SD = 1.2$; wondering if God has abandoned them, $M = 1.5$, $SD = 1.0$). Participants reported an average over two tangible resources lost due to Katrina ($M = 2.2$, $SD = 0.9$). Many participants reported the loss of furniture or appliances (84%), photos or documents (72%), their house (68%), or vehicle (47%) due to Katrina, with fewer reporting the loss of their business (11%). Participants were moderate to high in ASD symptoms ($M = 61.1$, $SD = 19.2$) as well as functional impairment ($M = 13.4$, $SD = 4.7$).

Covariate Testing

To determine if covariates influenced study relationships, bivariate correlations for age and t tests for gender (male/female) and race (African American/White) were conducted. Age was significantly related to attending more religious services ($r = .26$, $p =$

.01), fewer ASD symptoms ($r = -0.26, p = .005$), and less psychosocial impairment ($r = -.27, p = .01$). Gender differed only by ASD symptoms, in that men had higher scores than women (diff = -11.0, $t = -3.25, p = .002$). Race related to a number of study variables. African American participants reported significantly higher beliefs that God was in control of their lives (diff = -0.8, $t = -4.15, p < .001$) and that stressful situations were a form of God’s punishment (diff = -0.6, $t = -2.26, p = .03$). African Americans also reported a higher degree of trying to find comfort in their religion (diff = -0.7, $t = -2.66, p = .009$) and a higher frequency of coping through prayer or meditation (diff = -0.9, $t = -3.73, p < .001$). For African American participants, both the frequency of religious service attendance as well as private R/S practices were higher (diffs = -0.9 and -1.5, $ts = -2.20$ and $-3.11, ps = .03$ and $.002$, respectively) than for Whites. African Americans also reported higher levels of ASD symptoms than Whites (diff = -11.7, $t = -3.04, p = .003$).

Intercorrelations Between Study Variables

Bivariate correlations were conducted to determine relations between study variables (see Table 1). Positive religious coping items were correlated ($r = .53, p < .001$). The belief that God was in control of their lives was positively associated with both measures of positive religious coping (trying to find comfort in R/S, $r = .33, p = .002$; pray or meditate, $r = .40, p < .001$). The belief that God was in control was also directly related to frequency of prayer ($r = .30, p = .003$), loss of tangible resources ($r = .24, p = .02$), and ASD symptoms ($r = .20, p = .04$). Negative religious coping items were positively correlated ($r = .34, p = .001$), but only the negative religious coping item of perceiving God’s punishment was associated with ASD symptoms ($r = .22, p = .04$). The negative religious coping item regarding God’s abandonment was related to higher functional impairment ($r = .26, p = .02$). Trying to find comfort in R/S was moderately highly correlated with pre-Katrina frequency of attending services ($r = .39, p < .001$) and private prayer ($r = .26, p = .02$). Frequency of private prayer and service attendance were correlated ($r = .45, p < .001$). Losing tangible resources was associated with increased ASD symptoms as well as functional impairment ($rs = .27$ and $.21, ps = .002$ and $.05$, respectively). ASD symptoms and functional impairment were positively associated ($r = .25, p = .02$).

Moderation Testing

Only three relationships between religious resources and coping were significantly related to adjustment at the bivariate level. To further understand these three relationships, we conducted three multiple linear regressions to examine the role of loss of tangible resources as a moderator between each of these three bivariate relationships—that is, negative religious coping with ASD symptoms, both God control and negative religious coping (abandonment) with functional impairment, and ASD symptoms. Moderation tests were first conducted without covariates, and if the interaction term was significant, the test was then conducted again, controlling for covariates, and results were compared. Given the fairly small sample size, post hoc power analyses were computed to provide additional information regarding the probability of Type II errors (G*Power Version 3.1.9.2).

The interaction term between negative religious coping (perceiving God’s punishment) and loss was significant ($t = -1.98, p = .05$). When including age, gender, and race as covariates, the interaction term remained marginally significant ($t = -2.98, p = .10$). Post hoc power was .47 and .31, respectively ($\Delta R^2s = .042$ and $.027, ns = 84$ and 81 , respectively). The interaction terms for belief that God was in control and loss and for negative religious coping (perceiving abandonment) and loss were nonsignificant ($ts = 0.92$ and $0.88, ps = .93$ and $.38$, respectively).

Because the interaction between negative religious coping (perceiving God’s punishment) and tangible resource loss was significant, simple slopes analysis for this interaction was conducted. Graphic results are shown in Figure 1. When tangible resource loss was low (-1 SD), perceiving that stressful situations were a form of God’s punishment was strongly and positively related to ASD symptoms ($\beta = 6.95, b = 0.42, p = .005$). At mean levels of resource loss, this feeling was only marginally related to ASD symptoms ($\beta = 3.33, b = 0.20, p = .06$). When resource loss was high (+1 SD), feeling that stressful situations were a form of God’s punishment was not significantly related to ASD symptoms, although the trend does appear to become negative ($\beta = -0.30, b = -0.02, p = .91$). When including covariates, effects remained marginally significant at low loss, became nonsignificant at mean loss, and remained nonsignificant at high loss ($\beta s = 4.21, 1.35$, and $-1.51; ps = .07, .40$, and $.53$, respectively).

Table 1
Descriptive Information and Intercorrelations Between Study Variables

Variable	Mean	SD	1	2	3	4	5	6	7	8	9
1. How often do you go to religious services?	2.6	1.8									
2. How often do you pray privately in places other than at church or synagogue?	5.5	2.1	.37**								
3. Positive religious coping (finding comfort)	3.1	1.1	.39**	.26*							
4. Positive religious coping (praying)	3.2	1.0	.45**	.46**	.53**						
5. How much control do you feel God has in your life?	3.6	.9	.18	.30**	.33**	.40**					
6. Negative religious coping (punished)	1.9	1.2	-.14	.16	-.02	.15	.14				
7. Negative religious coping (abandoned)	1.5	1.0	.12	.06	.04	.12	-.04	.34**			
8. Loss of tangible resources	2.2	.9	-.02	.19	.03	.10	.24*	-.01	-.11		
9. ASD symptoms	61.1	19.2	-.06	.16	.04	.15	.20*	.22*	.03	.27**	
10. Psychosocial impairment	13.4	4.7	-.04	-.07	-.06	-.02	-.11	.09	.26*	.21*	.25**

Note. ASD = acute stress disorder. Correlations with significant p -values ($p < .05$) are emphasized in bold.
* $p < .05$. ** $p < .01$.

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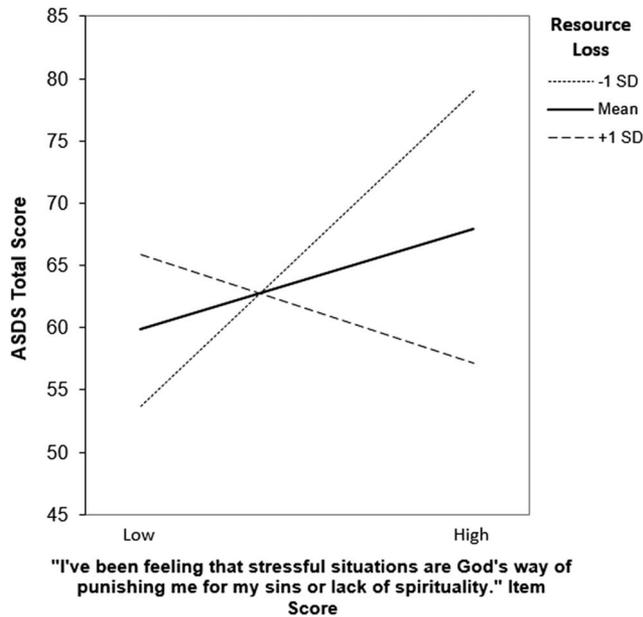


Figure 1. Simple slopes of feeling that negative religious coping (perceiving God's punishment) by acute stress disorder symptoms as moderated by loss of tangible resources, controlling for age, gender, and race. ASDS = Acute Stress Disorder Scale.

Discussion

From a transactional stress and coping perspective, we anticipated that having strong religious resources (a standing religious practice of regular service attendance and/or private prayer) might provide intrapsychic or interpersonal resources that would help to alleviate some of the distress our participants experienced in the midst of a disaster. We also anticipated that positive religious coping efforts would be related to lower levels of distress and functional impairment, while negative religious coping would be related to higher levels of distress and functional impairment. In large part, these expected relationships were not found.

Our sample was very highly stressed, with ASDS scores indicating that a full 62% of our sample met criteria for ASD (Mills et al., 2007). Trauma exposure and loss of tangible resources were quite high. Thus, our sample was clearly in distress and in need of coping resources. Yet, for the most part, religious resources were not related to better adjustment. Having a standing religious practice of either regular service attendance or private prayer was unrelated to levels of ASD or psychosocial functioning. This finding is inconsistent with studies that have shown that prayer and service attendance are associated with better psychological well-being (e.g., Koenig, 2009). It may be that the evacuation situation and shelter housing disrupted individuals' religious habits, limiting their use or even creating further distress. Our sample was also quite high in frequency of both service attendance and prayer, potentially creating a floor that limited our statistical power to detect effects.

The belief that God is in control has been shown in previous work to be related to higher levels of well-being and adjustment in stressful situations (see Aten et al., 2012). In our sample, however, belief in God's control was related to higher ASD symptoms. At

this point soon after the hurricane, people are likely still grappling to understand their situation and may blame God, a common reaction shortly after traumatic events (e.g., Exline, Yali, & Lobel, 1999). Perhaps, over time, as individuals integrate their understanding of the situation with their larger meaning system, beliefs in God's control may become more helpful (Park, 2013).

In terms of religious coping with their specific postdisaster experience, neither aspect of positive religious coping was related to levels of ASD or psychosocial functioning. This finding was not altogether surprising in that positive religious coping has been inconsistently related to adjustment following other disasters, sometimes found to be helpful (e.g., Spence et al., 2007) and other times found to be unrelated to adjustment (e.g., Stratta et al., 2012). On the other hand, negative religious coping tends to be more consistently related to poorer adjustment to trauma, including disasters (Stratta et al., 2012), and indeed we found that both of our measured types of negative religious coping were related to an aspect of poorer adjustment.

We found that although tangible resource loss was associated with more distress and dysfunction, it interacted only minimally with our religious coping variables. For those with high loss of resources, negative religious coping (perceiving punishment) was uniformly related to higher ASD symptoms, while for those lower in resource loss, this type of negative religious coping was particularly strongly related to ASD symptoms. Thus, high resource loss appears to mitigate the effects of negative religious coping, essentially washing them out. It may be that in very distressing circumstances, people are already maximally stressed, so negative religious coping cannot further exacerbate their distress.

Religious resources are often considered a compensation for the disenfranchised (e.g., Gutierrez, Park, & Wright, 2017). That is, when all else fails, people can turn to their religious life for comfort and help (Hood, Hill, & Spilka, 2016). That we found little evidence of this compensation in the present study is perhaps surprising given the extent of disenfranchisement of our sample: Over 75% were African American and over 80% reported an income of less than \$30,000. New Orleans had a history of racial disparities in income and wealth as well as institutional racial discrimination long before Katrina (Henkel, Dovidio, & Gaertner, 2006). These factors contributed to the housing patterns in New Orleans that left lower socioeconomic status African Americans exposed to disproportionate damage and distress from Hurricane Katrina (Henkel et al., 2006; Squires & Hartman, 2006). That we did not find evidence of their religious resources as providing some comfort or assistance is, perhaps, disappointing.

Limitations of our study must be noted. Given the urgent situation at the Red Cross shelter, we needed to keep the protocol very short. This led us to use measures that were suboptimal psychometrically, such as only two negative and two positive religious coping items and a single item tapping into God control. Further, our adapted tangible resource loss measure was abbreviated, and the use of a sum score of resource loss, while commonly used (e.g., Benight et al., 1999), obscures the vast differences in the types of loss experienced (e.g., loss of a home vs. valuable documents would be equally weighted) and is thus a crude measure of tangible resource loss. Our sample is relatively small, limiting our statistical power. We were initially hoping to conduct a longitudinal study, but the chaotic situation precluded following participants over time. Thus, our study has the usual limitations of cross-

sectional study designs: We could not determine causality or even temporal ordering of the relationships observed. We did not have a random sample, although the high degree of correspondence on both demographic and event-related data between our sample and others suggests that our sample is representative of the larger population of Katrina survivors who were evacuated to emergency out-of-state shelters (see Mills et al., 2007). Current analyses were also somewhat underpowered, and smaller effects may have gone undetected. Moreover, the sample included mainly Christians, so it is not clear how these findings would generalize to individuals with other religious affiliations (e.g., Muslims, Jews) coping with disasters.

Despite these limitations, the data are unique in accessing evacuees of a major disaster very shortly after its occurrence. We were unable to locate any similar data on coping with any type of disaster. Such a closeup look at how people respond in the first few weeks of an unfolding, long-term major community disruption is useful in providing a more complete picture of coping. We did not find evidence that predisaster or peridisaster religiousness was helpful in coping with acute disaster, leaving us to speculate that somewhere in the postdisaster period, some of these relationships begin to manifest. Future longitudinal research is needed in which people are followed from close to their disaster until recovery to truly understand the interplay of these processes.

References

- Ahmad, S., Feder, A., Lee, E. J., Wang, Y., Southwick, S. M., Schlackman, E., . . . Charney, D. S. (2010). Earthquake impact in a remote South Asian population: Psychosocial factors and posttraumatic symptoms. *Journal of Traumatic Stress, 23*, 408–412.
- Alawiya, T., Bell, H., Pyles, L., & Runnels, R. C. (2011). Spirituality and faith-based interventions: Pathways to disaster resilience for African American Hurricane Katrina survivors. *Journal of Religion & Spirituality in Social Work: Social Thought, 30*, 294–319.
- Aldwin, C. M. (2007). *Stress, coping, & development*. New York, NY: Guilford.
- Ali, M., Farooq, N., Bhatti, M. A., & Kuroiwa, C. (2012). Assessment of prevalence and determinants of posttraumatic stress disorder in survivors of earthquake in Pakistan using Davidson Trauma Scale. *Journal of Affective Disorders, 136*, 238–243. <http://dx.doi.org/10.1016/j.jad.2011.12.023>
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text revision). Washington, DC: Author.
- Aten, J. D., Bennett, P. R., Hill, P. C., Davis, D., & Hook, J. N. (2012). Predictors of God concept and God control after Hurricane Katrina. *Psychology of Religion and Spirituality, 4*, 182–192. <http://dx.doi.org/10.1037/a0027541>
- Benight, C. C., Ironson, G., Klebe, K., Carver, C. S., Wynings, C., Burnett, K., . . . Schneiderman, N. (1999). Conservation of resources and coping self-efficacy predicting distress following a natural disaster: A causal model analysis where the environment meets the mind. *Anxiety, Stress & Coping: An International Journal, 12*, 107–126. <http://dx.doi.org/10.1080/10615809908248325>
- Brodie, M., Weltzien, E., Altman, D., Blendon, R. J., & Benson, J. M. (2006). Experiences of hurricane Katrina evacuees in Houston shelters: Implications for future planning. *American Journal of Public Health, 96*, 1402–1408. <http://dx.doi.org/10.2105/AJPH.2005.084475>
- Bryant, R. A., Moulds, M. L., & Guthrie, R. M. (2000). Acute Stress Disorder Scale: A self-report measure of acute stress disorder. *Psychological Assessment, 12*, 61–68. <http://dx.doi.org/10.1037/1040-3590.12.1.61>
- Chan, C. S., Rhodes, J. E., & Pérez, J. E. (2012). A prospective study of religiousness and psychological distress among female survivors of Hurricanes Katrina and Rita. *American Journal of Community Psychology, 49*, 168–181. <http://dx.doi.org/10.1007/s10464-011-9445-y>
- Cook, S. W., Aten, J. D., Moore, M., Hook, J. N., & Davis, D. E. (2013). Resource loss, religiousness, health, and posttraumatic growth following Hurricane Katrina. *Mental Health, Religion & Culture, 16*, 352–366. <http://dx.doi.org/10.1080/13674676.2012.667395>
- Curtis, A., Mills, J. W., & Leitner, M. (2007). Katrina and vulnerability: The geography of stress. *Journal of Health Care for the Poor and Underserved, 18*, 315–330. <http://dx.doi.org/10.1353/hpu.2007.0029>
- Exline, J. J., Yali, A. M., & Lobel, M. (1999). When god disappoints: Difficulty forgiving god and its role in negative emotion. *Journal of Health Psychology, 4*, 365–379. <http://dx.doi.org/10.1177/135910539900400306>
- Fetzer Institute/National Institute on Aging Working Group. (1999). *Multidimensional measurement of religiousness/spirituality for use in health research: A report of a national working group*. Kalamazoo, MI: Fetzer Institute.
- Folkman, S. (2011). *The Oxford handbook of stress, health, and coping*. New York, NY: Oxford University Press.
- Gaillard, J. C., & Texier, P. (2010). Religions, natural hazards, and disasters: An introduction. *Religion, 40*, 81–84. <http://dx.doi.org/10.1016/j.religion.2009.12.001>
- Galea, S., Brewin, C. R., Gruber, M., Jones, R. T., King, D. W., King, L. A., . . . Kessler, R. C. (2007). Exposure to hurricane-related stressors and mental illness after Hurricane Katrina. *Archives of General Psychiatry, 64*, 1427–1434. <http://dx.doi.org/10.1001/archpsyc.64.12.1427>
- Gutierrez, I. A., Park, C. L., & Wright, B. R. (2017). When the divine defaults: Religious struggle mediates the impact of financial stressors on psychological distress. *Psychology of Religion and Spirituality, 9*, 387–398. <http://dx.doi.org/10.1037/rel0000119>
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York, NY: Guilford.
- Henkel, K. E., Dovidio, J. F., & Gaertner, S. L. (2006). Institutional discrimination, individual racism, and Hurricane Katrina. *Analyses of Social Issues and Public Policy, 6*, 99–124.
- Hollifield, M., Gory, A., Siedjak, J., Nguyen, L., Holmgren, L., & Hobfoll, S. (2016). The benefit of conserving and gaining resources after trauma: A systematic review. *Journal of Clinical Medicine, 5*, 104. <http://dx.doi.org/10.3390/jcm5110104>
- Hollifield, M., Hewage, C., Gunawardena, C. N., Kodituwakku, P., Bopagoda, K., & Weerathnege, K. (2008). Symptoms and coping in Sri Lanka 20–21 months after the 2004 tsunami. *British Journal of Psychiatry, 192*, 39–44. <http://dx.doi.org/10.1192/bjp.bp.107.038422>
- Hood, R. W., Jr., Hill, P. C., & Spilka, B. (2016). *The psychology of religion: An empirical approach* (5th ed.). New York, NY: Guilford.
- Koenig, H. G. (2009). Research on religion, spirituality, and mental health: A review. *Canadian Journal of Psychiatry, 54*, 283–291. <http://dx.doi.org/10.1177/070674370905400502>
- Lazarus, R. S., & Folkman, S. (1987). Transactional theory and research on emotions and coping. *European Journal of Personality, 1*, 141–169. <http://dx.doi.org/10.1002/per.2410010304>
- Lee, E. K. O., Shen, C., & Tran, T. V. (2009). Coping with Hurricane Katrina: Psychological distress and resilience among African American evacuees. *Journal of Black Psychology, 35*, 5–23. <http://dx.doi.org/10.1177/0095798408323354>
- Marks, L. D., Cherry, K. E., & Silva, J. L. (2009). Faith, crisis, coping, and meaning making after Katrina: A qualitative, cross-cohort examination. In K. E. Cherry (Ed.), *Lifespan perspectives on natural disasters* (pp. 195–215). New York, NY: Springer. http://dx.doi.org/10.1007/978-1-4419-0393-8_10

- Mills, M. A., Edmondson, D., & Park, C. L. (2007). Trauma and stress response among Hurricane Katrina evacuees. *American Journal of Public Health, 97*(Suppl. 1), S116–S123. <http://dx.doi.org/10.2105/AJPH.2006.086678>
- Newton, A. T., & McIntosh, D. N. (2010). Specific religious beliefs in a cognitive appraisal model of stress and coping. *International Journal for the Psychology of Religion, 20*, 39–58. <http://dx.doi.org/10.1080/10508610903418129>
- Pargament, K., Feuille, M., & Burdzy, D. (2011). The Brief RCOPE: Current psychometric status of a short measure of religious coping. *Religions, 2*, 51–76. <http://dx.doi.org/10.3390/rel2010051>
- Pargament, K. I., Koenig, H. G., & Perez, L. M. (2000). The many methods of religious coping: Development and initial validation of the RCOPE. *Journal of Clinical Psychology, 56*, 519–543. [http://dx.doi.org/10.1002/\(SICI\)1097-4679\(200004\)56:4<519::AID-JCLP6>3.0.CO;2-1](http://dx.doi.org/10.1002/(SICI)1097-4679(200004)56:4<519::AID-JCLP6>3.0.CO;2-1)
- Park, C. L. (2013). Religion and meaning. In R. F. Paloutzian & C. L. Park (Eds.), *Handbook of the psychology of religion and spirituality* (2nd ed., pp. 357–379). New York, NY: Guilford.
- Park, C. L. (2016). Meaning making in the context of disasters. *Journal of Clinical Psychology, 72*, 1234–1246. <http://dx.doi.org/10.1002/jclp.22270>
- Park, C. L. (2017). Spiritual well-being after trauma: Correlates with appraisals, coping, and psychological adjustment. *Journal of Prevention & Intervention in the Community, 45*, 297–307. <http://dx.doi.org/10.1080/10852352.2016.1197752>
- Park, C. L., & Cohen, L. H. (1993). Religious and non-religious coping with the death of a friend. *Cognitive Therapy and Research, 17*, 561–577.
- Park, C., Cohen, L. H., & Herb, L. (1990). Intrinsic religiousness and religious coping as life stress moderators for Catholics versus Protestants. *Journal of Personality and Social Psychology, 59*, 562–574. <http://dx.doi.org/10.1037/0022-3514.59.3.562>
- Pecchioni, L. L., Edwards, R., & Grey, S. H. (2011). The effects of religiosity and religious affiliation on trauma and interpretations following Hurricanes Katrina and Rita. *Journal of Communication and Religion, 34*, 37–58.
- Smith, B. W., Pargament, K. I., Brant, C., & Oliver, J. M. (2000). Noah revisited: Religious coping by church members and the impact of the 1993 Midwest flood. *Journal of Community Psychology, 28*, 169–186. [http://dx.doi.org/10.1002/\(SICI\)1520-6629\(200003\)28:2<169::AID-JCOP5>3.0.CO;2-I](http://dx.doi.org/10.1002/(SICI)1520-6629(200003)28:2<169::AID-JCOP5>3.0.CO;2-I)
- Spence, P. R., Lachlan, K. A., & Burke, J. M. (2007). Adjusting to uncertainty: Coping strategies among the displaced after Hurricane Katrina. *Sociological Spectrum, 27*, 653–678. <http://dx.doi.org/10.1080/02732170701533939>
- Squires, G. D., & Hartman, C. W. (2006). Pre-Katrina, post-Katrina. In G. D. Squires & C. W. Hartman (Eds.), *There is no such thing as a natural disaster: Race, class, and Hurricane Katrina* (pp. 1–11). New York, NY: Routledge.
- Stratta, P., Capanna, C., Riccardi, I., Carmassi, C., Piccinni, A., Dell'Osso, L., & Rossi, A. (2012). Suicidal intention and negative spiritual coping one year after the earthquake of L'Aquila (Italy). *Journal of Affective Disorders, 136*, 1227–1231. <http://dx.doi.org/10.1016/j.jad.2011.10.006>
- Stratta, P., Capanna, C., Riccardi, I., Perugi, G., Toni, C., Dell'Osso, L., & Rossi, A. (2013). Spirituality and religiosity in the aftermath of a natural catastrophe in Italy. *Journal of Religion and Health, 52*, 1029–1037. <http://dx.doi.org/10.1007/s10943-012-9591-z>
- Tix, A. P., & Frazier, P. A. (1998). The use of religious coping during stressful life events: Main effects, moderation, and mediation. *Journal of Consulting and Clinical Psychology, 66*, 411–422. <http://dx.doi.org/10.1037/0022-006X.66.2.411>
- Wadsworth, M. E., Santiago, C. D., & Einhorn, L. (2009). Coping with displacement from Hurricane Katrina: Predictors of one-year post-traumatic stress and depression symptom trajectories. *Anxiety, Stress & Coping: An International Journal, 22*, 413–432. <http://dx.doi.org/10.1080/10615800902855781>

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