



Divine forgiveness protects against psychological distress following a natural disaster attributed to God

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ABSTRACT

It is common to attribute natural disasters to 'acts of God' yet the implications of doing so for victims of such disasters is relatively underexplored. Relevant data on the association between attributing a natural disaster to God and psychological well-being are contradictory and cross-sectional. A longitudinal study ($N = 269$) was therefore conducted to examine whether attributing Hurricane Michael to God predicted later psychological distress over and above pre-hurricane levels of distress. Controlling for religiosity and hurricane impact, the relation between God attribution and distress was found to depend on perceptions of divine forgiveness. Relatively higher levels of divine forgiveness buffered the relation between later psychological distress and seeing God as playing a role in causing the hurricane. The significance of this finding is discussed and its heuristic value for both spiritually oriented disaster psychology and research on forgiveness is emphasized.

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Hurricane Michael was the first Category 5 hurricane to strike the contiguous United States since Hurricane Andrew in 1992. It made landfall at Mexico Beach, near Tallahassee the state capital of Florida, on 10 October 2018. The strong winds from this Category 5 hurricane downed many trees and power lines in the capital leaving approximately 90% of the city without power, and 'making commuting almost impossible' (FSU; Emergency Management, 2018). The university closed for 5 days suspending operations until power was restored. Although classes resumed on October 15, instructors were advised to handle absences on an 'individual basis' (Dobson, 2018a).

In the wake of such disasters, researchers have typically examined their impact on physical and mental health. For example, it is well documented that in the wake of these events psychological well-being decreases (e.g., King et al., 2007; Mills, Edmondson, & Park, 2007; Mills et al., 2012). This decline in well-being is generally associated with the extent to which people experience the loss of essential resources (e.g. Johnson, Aten, Madson, & Bennett, 2006). There is increasing recognition, however, that natural disasters and traumatic events more generally can also impact a source of resilience, victims' religious and/or spiritual beliefs (Aten, Bennett, Hill, Davis, & Hook, 2012; Aten, Moore, Denny, Bayn, et al., 2008). For example, Aten et al., (2012) showed that loss of food and water following Hurricane Katrina was inversely related to

a positive conception of God and positively related to a negative conception of God. In the latter case, additional resource loss accounted for variance over and beyond loss of food and water. Such research suggests that just as natural disasters can affect physical and mental health, they can affect spiritual/religious beliefs. This is important for positive psychologists to investigate because victim's religious/spiritual beliefs influence their resilience or 'the ability to achieve good outcomes in one's life after experiencing significant hardships or adversities' (Hartling, 2008, p. 53) following a natural disaster (e.g., Gianisa & Le De, 2018).

It is therefore not surprising that the well documented role religion plays in coping and adjustment following stressful events (see Koenig, 2006; Pargament, 2011) has gained attention in the context of natural disasters (see Gaillard & Texier, 2010) with Aten and colleagues drawing attention to the need for a 'spiritually oriented disaster psychology' (Aten, O'Grady, Milstein, Boan, & Schrubba, 2014, p. 20). The timeliness of this call is emphasized by the fact that people have long used religious beliefs to interpret uncontrollable and stressful events like hurricanes (Grandjean, Rendu, MacNamee, & Scherer, 2008). One way they may do so is through appraisals that lead to successful coping efforts and resilience following a disaster. For instance, Newton and McIntosh (2009) found that general religiousness was related to appraisals of Hurricanes Katrina and Rita

and to the belief that God was in control which, in turn, was related to coping (Newton & McIntosh, 2010). However, findings on the relation between religion and adjustment following a natural disaster are mixed with some studies showing a positive relation (e.g., Ali, Farooq, Bhatti, & Kuroiwa, 2012; Stratta et al., 2012) whereas others document a negative relationship (e.g., Levy et al., 2009) and some find no relationship (e.g., Pecchioni, Edwards, & Grey, 2011). In any event, such findings emphasize the importance of controlling for general religiousness when examining issues relating to the divine in the context of natural disasters.

Given the fact that both researchers (e.g., Koenig, 2006; Pargament, 1997) and lay entities such as the insurance industry often attribute or account for natural disasters by referring to the divine, “acts of God,” one might expect to find a robust literature on supernatural attributions for natural disasters and post disaster adjustment. This is not the case although some, albeit limited, attention has been devoted to this topic. Religious attributions are frequently made after disasters. In a study of two natural disasters, Hurricane Katrina and the Chilean earthquake of 2010, attributing the disaster to an act of God was the most frequent explanation among survivors who experienced extreme hardship and was one of the most common explanations found across both cultural contexts (Stephens, Fryberg, Markus, & Hamedani, 2013). According to Parke’s (2010) meaning making model, invoking God as the cause of a disaster transforms the event into something that has purpose or meaning that can influence experienced outcomes.

An extensive literature on attribution theory and research also shows that the explanation or attribution made for an event has important implications for responses to the event (see Weiner, 1986). Attributing an outcome to God has been shown to be effective for alleviating psychological distress when confronted with uncertainty (e.g., Kay, Gaucher, McGregor, & Nash, 2010; O’Grady et al., 2018). From this theoretical perspective, viewing God as the cause of a disaster should promote resilience. Surprisingly, however, there are limited data on how attributions for natural disasters relate to subsequent adjustment. Controlling for numerous relevant variables (impact of disaster, demographics, social support, depression, psychological counseling), Levy, Slade, and Ranasinghe (2009) showed that a pessimistic explanatory style and a belief in karma were independently related to poor health following a tsunami caused by an earthquake in Sri Lanka. In a similar vein, attributing natural disasters to God’s anger or punishment is associated with poorer outcomes in both Western (the 1993 Midwest flood; Smith, Pargament, Brant, & Oliver, 2000)

and Asian cultures (the 2005 Pakistani earthquake; Feder et al., 2013).

In contrast to the above findings, an equal number of studies show that supernatural attributions are associated with better post disaster outcomes. For example, Banford, Wickrama, and Ketring (2014) studied women 3 years after the 2004 Indonesian Tsunami and found that attributing the event to karma was inversely related to PTSD and depressive symptoms. In a similar vein, among undergraduates with homes in areas affected by Hurricanes Katrina or Rita attributing the hurricane to ‘God’s plan’ was associated with slightly, but significantly, lower levels of trauma symptoms. Finally, attributing the 1993 Midwest Flood to God’s love or reward was related to better psychological adjustment (Smith et al., 2000).

The above conflicting results suggest that the link between attributing a disaster to God and the impact of doing so on psychological functioning may be more nuanced than originally anticipated or posited by attribution theory. Specifically, it appears that the extent to which the divine is viewed in a positive light may play a role in how attributing the disaster to God and subsequent well-being are related. Thus, belief in a merciful, forgiving God is likely to promote resilience when a disaster is attributed to God but to be less critical in the absence of divine attribution. This possibility is consistent with the more general findings that relational spirituality predicts supernatural attributions for a disaster (Davis et al., 2018) and that post disaster functioning is buffered by benevolent theodicies or views of suffering (McElroy-Heltzel, Davis, Davis et al., 2018).

In light of the above observations, it is reasonable to argue that the extent to which a person experiences God as forgiving will be important for understanding the relation between making a divine attribution for Hurricane Michael and post hurricane well-being. Specifically, attributing Michael to a forgiving God will be associated with greater post hurricane resilience/wellbeing. Conversely, to the extent that a victim attributes Michael to an unforgiving God, the less resilience/wellbeing she or he will show. That is, the extent to which a person experiences God as forgiving is likely to moderate the relation between making a divine attribution for the disaster and their post disaster well-being. The present study therefore addresses this possibility using a measure of psychological distress to index well-being.

Davis, Aten, Van Tongeren et al. (2018) in specifying how to advance scientific research on disasters, religion and spirituality, emphasize the need for longitudinal research. The present study therefore uses a longitudinal

design to examine whether attributing Hurricane Michael to God predicts later psychological distress over and above pre-hurricane levels of distress. The mixed findings relating supernatural attributions to post disaster functioning do not support hypothesizing a direct relationship between attributions and post disaster outcomes. Instead, as argued earlier, we hypothesize that experiencing God as forgiving will moderate that impact of attributing a natural disaster (Hurricane Michael) to God and subsequent psychological distress.

Method

Participants

Participants were from a larger project that examined various aspects of college life, including romantic relationships and academic stress. Undergraduate students ($n = 269$, female = 254) enrolled in courses offered by the College of Human Sciences participated in the project. Participants averaged 20.09 ($SD = 2.65$) years of age and showed the following ethnic distribution: 69.9% European-American, 10.8% African-American, 14.5% Hispanic, 3.3% Asian 4.1%, other. One participant (.4%) preferred not to disclose their racial/ethnic identification.

Procedure

Students were recruited from classes in which professors offered opportunities to earn extra credit. One of the opportunities involved the present study. The institutional review board approved the study before data collection began. Prior to participation, subjects signed informed consent forms. They then completed three online surveys during the course of the semester. The interval between each survey was five weeks. The first survey was completed approximately 3.5 weeks before the hurricane, the second survey was completed within two weeks after the hurricane, and the third survey occurred five weeks after the second survey.

Measures

Psychological distress

The Depression, Anxiety and Stress Scale (DASS-21; Lovibond & Lovibond, 1995) served as a measure of psychological distress at Time 1 and Time 3. Participants rated how much each of 21 statements applied to them in the past week on a scale of 0 (did not apply to me at all) to 3 (applied to me very much or most of the time). The statements assessed depressive symptoms (e.g., 'I couldn't seem to experience any positive feelings at all'), anxiety symptoms (e.g., 'I experienced breathing

difficulty, e.g., excessively rapid breathing, breathlessness in the absence of physical exertion'), and stress (e.g., 'I tended to overreact to situations'). Responses were summed across items to yield an overall index of psychological distress with higher scores indicating greater distress. In the current study, Cronbach's alpha was .94 at Time 1 and .96 at Time 3.

At Time 2, respondents completed the following measures.

Divine forgiveness

Four items assessed God's forgiveness at Time 2, 'How often have you felt that God forgives you?' (4-point scale from 'never' to 'many times'), 'I am certain that God forgives me when I seek his forgiveness' (answered on a 4-point scale ranging from 'strongly disagree' to 'strongly agree'), 'How often do you experience situations in which you have the feeling that God is merciful to you,' and 'How often do you experience situations in which you have the feeling that God delivers you from a debt' (both answered on a 4-point scale ranging from "never" to 'very often'). A principal components factor analysis using varimax rotation yielded a single factor that accounted for 71.86% of the variance with all items loading above .70 on the factor. The total score for the four items was computed with higher scores indicating greater divine forgiveness. Coefficient alpha was .86.

God attribution

To assess the extent to which respondents saw God as the cause of the hurricane they answered the following question, 'Back when you experienced Hurricane Michael: Did you think that God had some role in causing the hurricane?' Responses were indicated on a five-point scale ranging from 1, 'no, not at all' to 5, 'totally.'

Hurricane impact

To assess the impact of the hurricane on the respondent they answered the following question, 'How much did Hurricane Michael affect you?' Respondents indicated their answers on a 7-point scale ranging from 'Not at all' to 'It totally disrupted my life.'

Religiosity

Religiosity was also assessed at Time 2 with two items ('How committed are you to your beliefs about religion?'; 'How often do you attend religious/spiritual services or meetings?'). Responses were given on an 8-point scale that ranged for the first item from 'not very committed' to 'extremely committed' and for the second item from 'never' to 'about once a day.' Responses to the items correlated $r = .63$ so they were summed to provide an

index of religiosity with higher scores indicating greater religiosity.

Results

The correlations among the variables, their means and standard deviations appear in Table 1. As expected, religiosity was related to seeing God as a cause of the hurricane, $r = .48$, $p < .001$, and to reports of divine forgiveness, $r = .66$, $p < .001$, emphasizing the importance of controlling for this covariate. In addition, as expected, there was a substantial correlation between psychological distress at the two different time points, $r = .62$, $p < .001$.

To test whether divine forgiveness buffered the relation between attributing the hurricane to God and later psychological distress at Time 3, Hayes (2012) SPSS PROCESS macro was used. In this analysis, religiosity, hurricane impact (both measured at Time 2), and initial levels of psychological distress (Time 1) were statistically controlled.

Table 1. Means, standard deviations and inter-correlations among study variables.

Variables	1	2	3	4	5	6
1. God attribution	1.00					
2. Divine forgiveness	.48*	1.00				
3. Religiosity	.45*	.66*	1.00			
4. Hurricane impact	.07	.01	-.07	1.00		
5. Time 1 distress	-.11	-.05	-.05	.05	1.00	
6. Time 3 distress	.01	-.02	.02	.08	.57*	1.00
Mean	2.08	12.75	7.81	2.51	4.33	2.80
Standard deviation	1.27	3.50	3.30	1.19	2.80	3.43

Note. * = $p < .01$

This analysis supported the hypothesis that divine forgiveness would moderate the relation between attributing the hurricane to God and later psychological distress, $\beta = -.41$, $t = -2.28$, $p = .025$, 95% CI $[-.77, -.06]$. Figure 1 shows the simple slopes for divine forgiveness of those scoring one standard deviation below the mean, at the mean, and one standard deviation above the mean. It can be seen that psychological distress increased significantly with increases in God attribution for those one standard deviation below the mean of divine forgiveness, $t = 2.58$, $p = .011$, 95% CI $[.72, 5.41]$ and at the mean, $t = 2.23$, $p = .027$, 95% CI $[.17, 2.65]$ but not for those one standard deviation above the mean ($p > .10$). Stated differently, divine forgiveness did not buffer psychological distress at low levels of God attribution but became more relevant as the role of God in causing the hurricane increased. The Johnson-Neyman technique showed that the point at which the moderating effect of divine forgiveness transitions from being statistically significant to nonsignificant at the .05 level was 13.68. This indicated that divine forgiveness benefitted 48.70% of the sample whose psychological distress did not increase as a function of viewing God as playing a causal role in the hurricane.

Discussion

The present study offers new insights on the likely impact of natural disasters such as hurricanes on later well-being when attributing such events to a supernatural agent, God. Specifically, the current results show that the relation between attributing a hurricane to God and later psychological distress is not as straightforward as previously thought. Consistent with previous findings relating post disaster

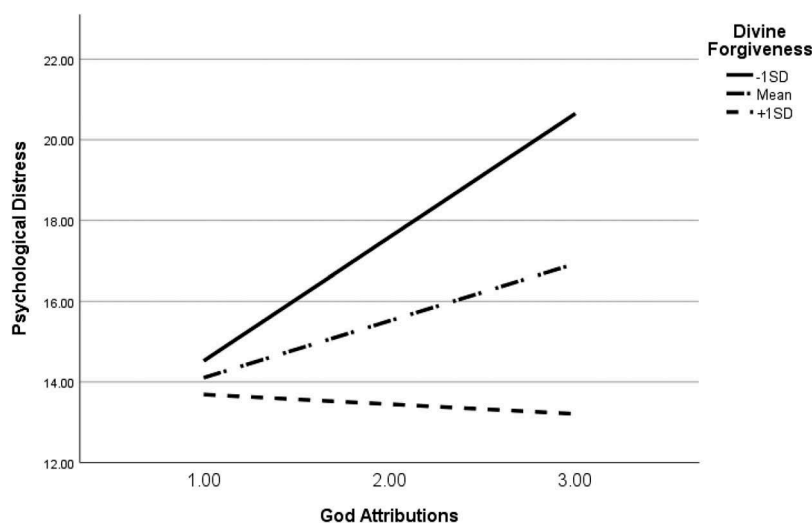


Figure 1. Simple slopes of attributing the hurricane to God in predicting later psychological distress for divine forgiveness scores 1 SD below the mean, at the mean, and 1 SD above the mean.

outcomes to benevolent views of the divine (e.g., Smith et al., 2000), we found that divine forgiveness served a protective function against psychological distress thereby promoting resilience following a natural disaster attributed to God. The buffering effect of divine forgiveness was evident for nearly half the sample whose psychological distress levels were unrelated to viewing God as the cause of the hurricane. In contrast, for those with relatively lower scores on divine forgiveness psychological distress increased significantly the more they viewed God as playing a causal role in producing the hurricane.

Our findings relating to temporal relationships are instructive when compared to previous work that has largely consisted of examining concurrent relationships. As noted, we found a more nuanced relationship than the simple direct associations reported in past studies. This suggests that concurrent and longitudinal covariates of natural disasters may be quite different. If this is indeed the case, it has important implications for the literature on post disaster functioning that, with a few notable exceptions (e.g., Norris, Perilla, Riad, Kaniasty, & Lavizzo, 1999; Smith et al., 2000; Van Tongeren et al., 2018), comprises largely cross-sectional data. The need for greater use of longitudinal data in this domain is apparent. In pursuing such longitudinal work, it will be important to determine whether results obtained from studies conducted at different temporal lags after a disaster are comparable. Temporal design or determining intervals between measurements ideally reflect knowledge of the speed at which the process examined unfolds.

Similarly instructive is comparison with Aten et al.'s (2012) finding that loss of resources caused by Hurricane Katrina influenced religious/spiritual outcomes, specifically conceptions of God. Unlike Aten et al. (2012), however, we did not find any association between hurricane impact and the (positive) view of God as forgiving. This inconsistency may reflect differences in the level of impact of the two hurricanes. Aten et al.'s (2012) study showed that only a severe loss of resources, loss of food and water, was negatively related to positive conceptions of God. More general object resource loss was unrelated to a positive view of God, but it was related to seeing God as wrathful. Given the poor response to Hurricane Hermine that hit Tallahassee two years before Hurricane Michael, hurricane preparedness levels in Tallahassee and the county in which it is situated, Leon county, were high. Free food, water and supplies were available in the wake of the hurricane and hence scarcity of water or food in the Tallahassee community following Hurricane Michael was relatively uncommon even though extended disruption of electricity might have led to loss of refrigerated food in some homes (Dobson, 2018b). It is quite possible that an

increase in negative feelings towards God is triggered at a lower threshold than a decrease in positive feelings towards God.

In addition to impact severity, it is also the case that our questions about divine forgiveness referred to general experiences and thus were more 'trait like' rather than being evaluative judgments (though they likely reflect a positive experience of God). The extent to which this might account for the different findings is unclear. In any event, it is clear that the impact of a natural disaster such as a hurricane needs to be considered when examining its effect on post disaster outcomes.

The above noted differences may also account for the absence of an association between hurricane impact and later psychological distress. This finding is inconsistent with a substantial literature showing increased rates of psychological problems in the wake of these events (e.g., King et al., 2007; Mills et al., 2007, 2012) which are generally associated with the extent to which people experience the loss of essential resources (e.g. Johnson et al., 2006). Two further factors that might account for our different findings. First, most prior demonstrations of the association use cross-sectional data as compared to our longitudinal data. Second, we measured impact with a single overall judgment of impact, which may not have captured important ways in which respondents' lives may have been affected by the hurricane. A more thorough assessment of the impact of Hurricane Michael would have been beneficial.

Notwithstanding its contribution, the findings of the present study need to be interpreted in the light of the following limitations. The sample comprised emerging adults attending college rather than a diverse community sample. In addition, the sample is relatively small and may not be representative of undergraduate students as a whole. Further limits regarding generalizability stem from the sample comprising largely female undergraduate college students and therefore it provides little information on how emerging adult males responded to the hurricane. It will be necessary to study a random sample of community residents varying in age to determine whether the present findings are specific to a particular developmental period. Such a study will ideally include more thorough assessments than the one and two item measures in the present study because these measures likely did not capture the entire domain of the constructs investigated. In addition, a single index of psychological functioning was used which begs the question of how other areas of psychological functioning might have been impacted by the hurricane. Finally, not all measures were administered at each time point, and all data comprised self-

reports pointing to the need for other sources of data in future studies.

Notwithstanding the above limitations, the present study has, if nothing else, important heuristic value. Given that more than eight in ten people in the world identify with a religious group (Pew Forum, 2012), it behooves researchers to understand how attributing events to God is related to concurrent and future behavior. In doing so, it will be important to identify the boundary conditions of, and mechanisms that account for, the relationship between such attributions and outcomes. The present study is among the first to do so using longitudinal data. It showed that the degree to which respondents attributed Hurricane Michael to God was related to later psychological distress but only for respondents who experienced relatively less divine forgiveness. The buffering effect found for divine forgiveness speaks not only to spiritually oriented disaster psychology but also to the burgeoning field of forgiveness research that has largely ignored divine forgiveness (Fincham, 2019). Hopefully, the present study will help stimulate research on attributing events to supernatural agents such as God and research on divine forgiveness, both of which are areas that have thus far not received the attention they deserve.

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