

# Religious Coping, Posttraumatic Stress, Psychological Distress, and Posttraumatic Growth Among Female Survivors Four Years After Hurricane Katrina

Christian S. Chan<sup>1</sup> and Jean E. Rhodes<sup>2</sup>

<sup>1</sup>Department of Psychology, University of Hong Kong, Hong Kong, China

<sup>2</sup>Department of Psychology, University of Massachusetts Boston, Boston, Massachusetts, USA

Positive and negative religious coping strategies and their relation with posttraumatic stress (PTS), psychological distress, and posttraumatic growth (PTG) were examined in the context of Hurricane Katrina. Positive religious coping was hypothesized to be associated with PTG, whereas negative religious coping was hypothesized to be associated with PTS and psychological distress. Low-income mothers ( $N = 386$ , mean age = 25.4 years,  $SD = 4.43$ ) were surveyed before, and 1 and 4 years after the storm. Results from structural regression modeling indicated that negative religious coping was associated with psychological distress, but not PTS. Positive religious coping was associated with PTG. Further analysis indicated significant indirect effects of pre- and postdisaster religiousness on postdisaster PTG through positive religious coping. Findings underscore the positive and negative effect of religious variables in the context of a natural disaster.

Hurricane Katrina and its aftermath have had both short- and long-term impact on survivors' mental health (e.g., Galea et al., 2007; Paxon, Rhodes, Waters, & Fussell, 2012). Although pervasive, the impact of natural disasters on psychological functioning is neither consistent nor inevitable (Norris et al., 2002). Researchers have identified a range of protective factors and coping strategies that may help attenuate the psychological impact of natural disasters (Acierno, Ruggiero, Kilpatrick, Resnick, & Galea, 2006; Bokszczanin, 2008), including personal faith and involvement in religious communities (e.g., Chan, Rhodes, & Perez, 2012; Gibbs, 1989; Smith, Pargament, Brant, & Oliver, 2000). Importantly, however, not all forms of religious coping are conducive to recovery in the aftermath of a natural disaster (Smith et al., 2000). In this study, we examined religious coping strategies and their relationship with self-reported posttraumatic stress (PTS), general psychological distress (GPD), and posttraumatic growth (PTG) 4 years after Hurricane Katrina.

## Religious Involvement in the Context of Adversity

Religious involvement and practice have been shown to be associated with well-being (Koenig, McCullough, & Larson, 2001; Powell, Shahabi, & Thoresen, 2003; Smith, McCullough, & Poll, 2003), particularly in the context of adversity (Ai & Park, 2007; Linley & Joseph, 2004). Religious involvement can help mitigate the impact of natural disaster by increasing psychosocial resources (Chan et al., 2012; Smith et al., 2000). Relative to their nonreligious counterparts, religious people tend to be more socially active and have higher levels of perceived social support and optimism (Ai & Park, 2007; Chan et al., 2012; Krause, Ellison, Shaw, Marcum, & Boardman, 2001).

Religion can also promote coping after stressful events, especially when other resources are limited in supply and effectiveness (Oman & Reed, 1998; Pargament, 1997; Smith et al., 2003). There are many forms of religious coping, including seeking spiritual support, expressing gratitude and contentedness, benevolent appraisal, and establishing and maintaining feelings of connection with God (Harrison, Koenig, Hays, Eme-Akwari, & Pargament, 2001). A meta-analysis found that **across various stressful life situations, religious coping methods are consistently associated with improved psychological outcomes, including acceptance, hope, optimism, life satisfaction, spiritual growth, and stress-related growth** (Ano & Vasconcelles, 2005).

It is important to note, however, that not all religious coping strategies are the same, and their influence on postdisaster functioning can vary. Pargament and colleagues (Harrison et al., 2001; Pargament, 1997; Pargament, Feuille, & Burdzy, 2011)

This study was funded by National Institutes of Health (R01HD046162), the National Science Foundation, the MacArthur Foundation, the Princeton Center for Economic Policy Studies, and the Society for the Psychology of Religion and Spirituality (APA Division 36).

Correspondence concerning this article should be addressed to Christian S. Chan, Department of Psychology, University of Hong Kong, Pokfulam Road, Hong Kong, China. E-mail: shaunlyn@hku.hk

Copyright © 2013 International Society for Traumatic Stress Studies. View this article online at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)  
DOI: 10.1002/jts.21801

draw distinctions between positive and negative religious coping. Negative religious coping strategies include demonic religious reappraisals (e.g., “the devil was responsible for my situation”), spiritual discontent (e.g., “God had abandoned me”), and punitive religious reappraisals (e.g., “God was punishing me for my sins”). Such reappraisals can be salient in the context of a natural disaster, particularly if survivors interpret the disaster as divine punishment for transgressions or shortcomings. By contrast, positive religious coping strategies include seeking spiritual support (e.g., “Looked for God’s strength, support, and guidance”), benevolent religious reappraisals (e.g., “God might be trying to strengthen me in this situation”), and religious forgiveness (e.g., “Asked God to help me overcome my bitterness”). Negative religious coping strategies have been found to be associated with mental health problems, especially depression (e.g., Harrison et al., 2001; Pargament, Smith, Koenig, & Perez, 1998) and posttraumatic stress disorder (PTSD; Gerber, Boals, & Schuettler, 2011). On the other hand, there is some evidence suggesting that positive religious coping can help explain why religious individuals have better psychological outcomes after a natural disaster (Smith et al., 2000). Moreover, positive religious coping has been found to be associated with PTG (Gerber, Boals, & Schuettler, 2011; Harris et al., 2008).

## PTG

Although traumatic events can lead to psychological distress, they can also provide opportunities for survivors to thrive psychologically (Linley & Joseph, 2004). People can view stressful circumstances as opportunities for personal growth (Park, Cohen, & Murch, 1996). PTG—subjective psychological changes following, and because of, a traumatic event (Tedeschi & Calhoun, 1996; Zoellner & Maercker, 2006)—may occur when adaptive interpretations and coping strategies are deployed. PTG encompasses perceived changes in self, interpersonal relationships, outlook on life, spirituality, and new possibilities (Tedeschi & Calhoun, 1996). Meta-analytic studies have found that in the context of various types of traumatic events PTG is related to acceptance coping, positive reappraisal coping, and lower levels of denial (Helgeson, Reynolds, & Tomich, 2006; Prati & Pietrantonio, 2009). The distinctions between positive and negative religious coping may be a reason why some survivors succumb to psychological distress while others experience disasters as opportunities for growth.

## Current Study

In this study, we examined the religiousness and religious coping of low-income mothers. Researchers have shown that religious coping is more common among women (Ferraro & Koch, 1994; Hood, Spilka, Hunsberger, & Gorsuch, 2003; Koenig, 1998), especially women of color (Bourjolly, 1998). Louisiana is one of the most religious states in the United States, with 78% of its residents reporting that religion plays an important part of their daily lives, compared to national averages of 65%

(Gallup, 2008). Hence, religion may have been a particularly important resource for women in Louisiana in their postdisaster coping and recovery.

The current study drew on a longitudinal dataset with predisaster and long-term postdisaster data. We investigated whether postdisaster religious coping was protective against the long-term negative effects of the disaster, above and beyond perceived social support and optimism, two of the more extensively studied psychosocial protective factors (Koenig et al., 2001; Smith et al., 2000). We also controlled for predisaster level of GPD and peridaster level of exposure to hurricane-related stressors. Whereas positive religious coping was hypothesized to be associated with PTG, negative religious coping was expected to be associated with PTS and GPD. We also hypothesized that religious coping is predicted by predisaster religiousness. In addition, we hypothesized an indirect effect between religiousness and on PTS, GPD, and PTG via religious coping.

## Method

### Sample and Procedure

This study is a secondary data analysis with three waves of data from a larger multiwave longitudinal study of Hurricane Katrina survivors (Paxson et al., 2012). The participants were from two community colleges in New Orleans and were enrolled in Opening Doors, an education intervention program, prior to Hurricane Katrina (Brock & Richburg-Hayes, 2006). In the months preceding Hurricane Katrina, the Wave 1 survey was administered ( $N = 492$ ). Approximately 1 year after the hurricane, 402 (81.7%) participants were successfully contacted and surveyed by trained interviewers by phone between May 2006 and March 2007 (Wave 2). A follow-up wave (Wave 3) was conducted by phone between April 2009 and March 2010, approximately 4 years after the hurricane. Most (348; 86.6%) participants included in the Wave 2 survey also completed the Wave 3 survey.

The final sample consisted of all the female participants ( $N = 386$ ) who completed both pre- and post-Katrina surveys (Waves 1 & 2). The male participants were excluded in the current study due to the relatively small sample size ( $n = 16$ ; 4.0%). At baseline, the average age was 25.4 years ( $SD = 4.43$ ), and most participants were unmarried and were not living with a partner (72.8%). Many participants (82.1%) were Black, whereas 9.8% were White, and 2.8% were Hispanic. Most participants had one (42.5%) or two children (32.1%), with 72.0% receiving some type of government assistance (e.g., food stamps, supplemental security income [SSI]). The average monthly income of was \$1,617 ( $SD = \$1,092$ ). No difference was found between those who completed only the Wave 1 survey and those who completed the Wave 2 and/or Wave 3 surveys on any of the baseline variables. Similarly, no differences were found between those who completed only the Wave 2 survey and those who also

completed the Wave 3 survey on any variables included in the current study.

## Measures

**GPD (Waves 1 and 3).** Assessed using the K6 scale (Kessler et al., 2002), GPD was measured using the 6-item measure of nonspecific psychological distress and has been shown to have good psychometric properties (Furukawa, Kessler, Slade, & Andrews, 2003). It includes items such as “During the past 30 days, about how often did you feel so depressed that nothing could cheer you up?” Respondents answered on a 5-point scale ranging from 1 = *all the time* to 5 = *none of the time* ( $\alpha_1 = .70$ ,  $\alpha_3 = .81$ ).

**PTS (Wave 3).** The Impact of Event Scale-Revised (IES-R), a 22-item self-report inventory of symptoms of PTSD (Weiss & Marmar, 1997), was used to measure PTS symptoms as a result of hurricane experiences. The IES-R assesses the intensity of intrusion, hyperarousal, and avoidance reactions, with sample items including “Any reminders brought back feelings about it,” “Pictures about it popped into my mind,” and “I was jumpy and easily startled.” The scale was rated in a 5-point scale, ranging from 0 = *not at all* to 4 = *extremely*. Cronbach’s  $\alpha$  for the intrusion, hyperarousal, and avoidance subscales were .92, .88, and .87, respectively.

**PTG (Wave 3).** PTG (Wave 3) was measured with the Posttraumatic Growth Inventory (Tedeschi & Calhoun, 1996), a 21-item instrument with five subscales. Sample items include “I changed my priorities about what is important in life” and “I have a greater appreciation for the value of my own life.” The scale was rated in a 5-point scale, ranging from 1 = *not at all* to 5 = *extremely*. To avoid confounding with the other religious variables, the two items in the spiritual change subscale were removed in analysis. The remaining 19 items were added to create a total PTG score ( $\alpha_3 = .92$ ).

**Religiousness (Waves 1 & 2).** This was measured with two single-item questions inquiring about the frequency of attending religious services and the importance of religion to the participant. Report of religious attendance was based on a 5-point scale ranging from 1 = *never* to 5 = *several times per week*. Religious importance was measured with an item asking participants to rate the level of importance of religion in their lives using a 5-point scale. Responses ranged from 1 = *not at all important* to 5 = *very important*.

**Religious coping (Wave 3).** Brief-RCOPE (Pargament et al., 1998, 2011; Tedeschi & Calhoun, 1996) was administered at Wave 3 to assess postdisaster religious coping. Two subscales: positive RCOPE (e.g., “I sought God’s love and care”) and negative RCOPE (e.g., “I wondered whether God had abandoned me”), each containing seven items, adapted from a larger RCOPE scale. The items were rated in a 4-point

scale, ranging from 1 = *a great deal* to 4 = *not at all*. A higher score on the positive subscale indicates a higher level of positive coping, whereas a higher score on the negative subscale indicates a lower level of negative religious coping (positive RCOPE  $\alpha_3 = .94$ , negative RCOPE  $\alpha_3 = .87$ ).

**Perceived social support (Wave 1).** Predisaster perceived social support was assessed with an abbreviated form (8-item) of the Social Provisions Scale (SPS; Cutrona & Russell, 1987). Sample questions included “I have people in my life who value me.” Response options were given in a 4-point scale ranging from 1 = *strongly disagree* to 4 = *strongly agree* ( $\alpha_1 = .82$ ).

**Optimism (Wave 1).** The Life Orientation Test-Revised (LOT-R) is a self-report measure of optimism that consists of six items (Scheier, Carver, & Bridges, 1994). Each item was rated on a 4-point that ranges from 1 = *strongly disagree* to 4 = *strongly agree*. Three of the six items were framed positively (e.g., “I am always optimistic about my future”), and the remaining three were framed negatively (e.g., “If something can go wrong for me, it will”) ( $\alpha_1 = .70$ ).

**Hurricane exposure (Wave 2).** This was measured with a checklist designed by the *Washington Post*, the Kaiser Family Foundation, and the Harvard School of Public Health (Brodie, Weltzien, Altman, Blendon, & Benson, 2006). Participants were asked in Wave 2 to indicate if they experienced any of the nine following events as a result of Hurricane Katrina: no fresh water to drink, no food to eat, felt their life was in danger, lacked necessary medicine, lacked necessary medical care, had a family member who lacked necessary medical care, lacked knowledge of safety of their children, lacked knowledge of safety of their other families members, and whether there was any death among family and friends. Participants were also asked whether they had lost a house, a vehicle, and whether a family pet had died or been lost due to the hurricane and its aftermath. All responses were dichotomous and a composite score (possible range = 0–12) was created with the count of affirmative responses.

**Demographic characteristics (Wave 1).** Demographic questions including age and number of children were collected.

## Statistical Analysis

To test the effects of positive and negative religious coping on PTS, GPD, and PTG, a measurement model and a structural regression model were estimated. An alternative model, in which positive and negative religious coping were regressed on PTS, GPD, and PTG, was also estimated. Second, a structural regression model predicting positive and negative religious coping was estimated. Third, an indirect effect model, in which the effects of pre- and postdisaster religiousness religious on the outcome variables were partially explained by coping, was tested using bootstrapping.

Table 1  
Mean, Standard Deviation, and Zero-Order Correlation of Variables

Variable	Wave	M	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. Age	1	25.4	4.4	–													
2. No. of children	1	1.9	1.1	.33	–												
3. Church attendance	1	2.3	1.2	.09	-.02	–											
4. Importance of religion	1	3.6	0.8	.09	.01	.47	–										
5. Social support	1	18.3	3.9	.06	-.09	.08	-.01	–									
6. Optimism	1	12.9	2.9	.01	.03	.16	.15	.23	–								
7. GPD	1	5.5	4.1	.04	.06	-.12	-.09	-.27	-.38	–							
8. Exposure	2	4.7	2.7	.18	.17	-.06	.11	-.15	.04	.13	–						
9. Church attendance	3	2.1	1.3	.07	.04	.52	.38	.03	.09	.05	-.09	–					
10. Importance of religion	3	3.6	0.8	.07	-.01	.35	.58	.00	.15	.03	.09	.42	–				
11. POS RCOPE	3	16.4	5.8	.03	.03	.31	.30	-.07	-.01	.39	.15	.28	.39	–			
12. NEG RCOPE	3	19.1	4.0	-.04	-.06	-.07	-.02	.00	.07	-.00	-.13	-.05	-.00	-.15	–		
13. PTS	3	26.6	21.3	.18	.05	.12	.15	-.06	-.05	.13	.19	.04	.14	.18	-.17	–	
14. GPD	3	5.6	4.9	.04	.04	-.01	-.00	-.06	-.16	.03	.36	.05	.03	.02	-.23	.37	–
15. PTG	3	54.4	15.8	-.00	.01	.08	.15	.10	.10	.19	.02	.08	.19	.38	-.06	.26	-.02

Note. N = 386. PTS = posttraumatic stress symptoms; GPD = general psychological distress; PTG = posttraumatic growth; POS RCOPE = positive religious coping; NEG RCOPE = negative religious coping.

r = .10–.13, p < .05. r = .14–.16, p < .01. r ≥ .17 p < .001.

The overall level of missing variables was 8.89%. Multiple imputation was performed with *Mplus* 6.11 statistical package (Muthén & Muthén, 2011) to create 20 datasets with no missing variables. All models reported were analyzed with the *Mplus* using maximum likelihood estimation with robust standard errors, to account for non-normality in dependent variables. The confirmatory fit index (CFI) and root mean square error of approximation (RMSEA) were used to measure the fit of the structural regression models. Following the recommendations of Hu and Bentler (1998), the cutoff of acceptable model fit was set at <.08 for RMSEA and >.95 for CFI.

## Results

### Measurement Model

Means, standard deviations, and bivariate correlations of all variables prior to multiple imputation are reported in Table 1. Eight latent factors were specified in the model. The three predisaster latent variables were GPD, social support, and optimism. The five postdisaster latent variables were positive religious coping, negative religious coping, PTS, GPD, and PTG. For each of these latent variables, three domain-representative parcels were created from the measured items of each scale resulting in three parcels per latent construct (Little, Cunningham, Shahar, & Widaman, 2002). In the measurement model, all latent factors, along with the measured covariates—age, number of children, exposure severity—were freely correlated. The model was of an adequate fit with the data, CFI = .956,

RMSEA = .046. The correlations between all variables in the model are presented in Table 2.

### Religious Coping and Mental Health

Next, a structure regression model predicting Wave 3 PTS, GPD, and PTG with positive and negative religious coping were tested. The models included Wave 1 GPD and psychosocial resources (perceived social support and optimism) as covariates, in addition to age, number of children, and peridistaster exposure severity. The model was of a good fit with the data, CFI = .950, RMSEA = .047. Results of the standardized regression coefficients in the model are presented in Table 3. The results indicate that negative religious coping was associated with GPD ( $\beta = -.182, p < .01$ ), but not PTS ( $\beta = -.086$ , not significant). On the other hand, positive religious coping was associated with PTG ( $\beta = .402, p < .001$ ). The alternative model with the directionality between religious coping and the three outcome variables reversed yielded a worse fit, CFI = .936, RMSEA = .053, sample-size adjusted bayesian information criterion = 17189.939 (vs. 17125.042).

### Religiousness and Religious Coping

Two structural regression models predicting Wave 3 positive and negative religious coping were estimated. The two models included Wave 1 religiousness and Wave 2 religiousness as predictors, respectively. Wave 1 age, number of children, perceived social support, optimism, GPD, and Wave 2 exposure severity were included as covariates. Results indicate that both pre- and postdisaster frequency of attendance (predisaster:  $\beta =$

Table 2  
Correlations Between Variables in Measurement Model

Variable	Wave	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Age	1	–									
2. No. of children	1	.33	–								
3. Social support	1	.08	-.10	–							
4. Optimism	1	.03	.04	.32	–						
5. GPD	1	.05	.06	-.33	-.58	–					
6. Exposure	2	.18	.17	-.16	.02	.15	–				
7. POS RCOPE	3	.04	.03	-.08	-.01	.09	.16	–			
8. NEG RCOPE	3	-.05	-.06	-.00	.10	-.16	-.18	-.16	–		
9. GPD	3	.03	.03	-.08	-.24	.46	.23	.01	-.27	–	
10. PTS	3	.20	.06	-.08	-.07	.20	.43	.16	-.18	.42	–
11. PTG	3	.01	.01	.13	.10	-.01	.21	.41	-.07	-.04	.23

Note. *N* = 386. GPD = general psychological distress; POS RCOPE = positive religious coping; NEG RCOPE = negative religious coping; PTS = posttraumatic stress symptoms; PTG = posttraumatic growth.

*r* = .10–.13, *p* < .05. *r* = .14–.16, *p* < .01. *r* ≥ .17, *p* < .001.

.240, *p* < .001; postdisaster: β = .167, *p* < .01) and importance of religion (pre-disaster: β = .195, *p* < .001; postdisaster: β = .318, *p* < .001) were predictive of positive religious coping. No significant relationships were found with negative religious coping (Table 4).

**Indirect Effect Analysis**

Next, two indirect-effect models were estimated to test the indirect path from religiousness and the three outcome via positive religious coping. Full information maximum likelihood (FIML) was used to handle missing data. Following Shrout and Bolger

(2002), 2,000 bootstrap samples were drawn from the dataset. Then, the path coefficients of the indirect effect model were estimated 2,000 times. The estimates of each path coefficient were then used to calculate mean and standard error of the indirect effects across the 2,000 bootstrap samples. If the 95% confidence interval (CI) of the mean indirect effect did not include zero, the indirect effect was considered statistically significant at the .05 level.

Results indicated that positive religious coping partially explained the relationship between the two pre-disaster religiousness variables and PTG, but not GPD and PTS. Similarly, positive religious coping partially explained the influence post-disaster frequency of church attendance and importance of religion had on PTG (Table 5).

Table 3  
Standardized Regression Coefficients in a Structural Regression Model Predicting PTS, GPD, and PTG Four Years After Hurricane Katrina

Variable	Wave	PTS		GPD		PTG	
		β	SE	β	SE	β	SE
Age	1	.139**	.052	-.021	.058	-.046	.055
No. of children	1	-.059	.054	-.019	.055	-.003	.055
Social support	1	.014	.062	-.098	.074	.188**	.065
Optimism	1	-.016	.096	-.013	.107	.044	.102
GPD	1	.126	.085	.440***	.096	.021	.085
Exposure	2	.383***	.053	.189**	.057	.183***	.048
POS RCOPE	3	.073	.053	-.086	.060	.397***	.055
NEG RCOPE	3	-.081	.059	-.181**	.059	.017	.053

Note. *N* = 386. *R*<sup>2</sup> = .21 for PTS = posttraumatic stress; *R*<sup>2</sup> = .27 for GPD = general psychological distress; *R*<sup>2</sup> = .22 for PTG = posttraumatic growth; POS RCOPE = positive religious coping; NEG RCOPE = negative religious coping.

\*\**p* < .01. \*\*\* *p* < .001.

Table 4  
Standardized Regression Coefficients in a Structural Regression Model Predicting Religious Coping Four Years After Hurricane Katrina

	POS RCOPE		NEG RCOPE	
	$\beta$	SE	$\beta$	SE
Model 1: Predisaster (Wave 1)				
Church attendance	.240***	.057	-.091	.062
Importance	.195**	.071	.009	.061
Model 2: Postdisaster (Wave 2)				
Church attendance	.167**	.057	-.094	.058
Importance	.318***	.068	.045	.068

Note.  $N = 386$ . Wave 1 age, number of children, perceived social support, optimism, GPD, and Wave 2 exposure severity were included as covariates. POS RCOPE = positive religious coping; NEG RCOPE = negative religious coping. \*\* $p < .01$ . \*\*\* $p < .001$ .

### Discussion

We examined the role of religiousness and religious coping in the lives of low-income women 4 years after Hurricane Katrina. Confirming our hypothesis, those who engaged in negative religious coping presented higher level of GPD, after controlling for their baseline functioning. Consistent with past research on the role of religious beliefs (Pargament et al., 1998), when the adversity was interpreted as resulting from the wrath or punishment of God directed to oneself or from demonic involvement, or if the adversity led to spiritual tension, questioning, or discontent, there was a higher risk for psychological disturbance. It will be important for future studies to determine whether the

higher levels of psychological disturbance are the cause or the consequence of negative attributions, as GPD may negatively bias survivors' beliefs and attitudes. Likewise, GPD and negative religious attributions may both be proxy indicators of additional, unmeasured variables (e.g., chronic stressors). We found no associations between religious coping and longer-term PTS after controlling for baseline GPD and other covariates. This lack of association is consistent with another study of Hurricane Katrina (Wadsworth, Santiago, & Einhorn, 2009).

On the other hand, positive religious coping was associated with PTG after Hurricane Katrina above and beyond the protective effects of social support and optimism. This association is consistent with past studies (Gerber et al., 2011). Furthermore, positive religious coping seems to underlie the association between earlier religious involvement and later PTG. Those who remained engaged in their churches and committed to their religion tended to experience psychological growth, and this association appears to have been conditioned at least in part by the extent to which they made positive attributions. By contrast, religiousness, either before or soon after the storm, was not associated with later negative religious coping.

In our sample, PTG was positively associated with PTS, but not with GPD. This is consistent with previous studies, which have found that PTG and PTS are positively correlated (Solomon & Dekel, 2007). Other studies, however, have found negative associations (Frazier, Conlon, & Glaser, 2001) or no association between PTG and PTS (Salsman, Segerstrom, Brechting, Carlson, & Andrykowski, 2009). Recent studies suggest that the two constructs do not necessarily lie at opposite ends of the spectrum (Ano & Vasconcelles, 2005; Gerber et al., 2011; Harris et al., 2008). Rather, they are qualitatively distinctive outcomes that can co-occur.

Table 5  
Indirect Effect of Religiousness on Post-Disaster Psychological Outcomes Through Positive and Negative Religious Coping

Path	Standardized coefficient	SE	95% CI
Pre-Katrina			
Church attendance → POS RCOPE → PTS	.015	.012	[-.009, .039]
Church attendance → POS RCOPE → GPD	-.013	.014	[-.040, .013]
Church attendance → POS RCOPE → PTG	.082*	.027	[.030, .133]
Importance → POS RCOPE → PTS	.015	.013	[-.011, .041]
Importance → POS RCOPE → GPD	-.013	.014	[-.040, .014]
Importance → POS RCOPE → PTG	.080*	.037	[.008, .151]
Post-Katrina			
Church Attendance → POS RCOPE → PTS	.009	.009	[-.008, .026]
Church Attendance → POS RCOPE → GPD	-.009	.010	[-.029, .010]
Church Attendance → POS RCOPE → PTG	.051*	.026	[.001, .102]
Importance → POS RCOPE → PTS	.026	.020	[-.013, .065]
Importance → POS RCOPE → GPD	-.027	.024	[-.075, .020]
Importance → POS RCOPE → PTG	.150*	.040	[.071, .228]

Note.  $N = 386$ . CI = confidence interval; PTS = posttraumatic stress; GPD = general psychological distress; PTG = posttraumatic growth; POS RCOPE = positive religious coping; NEG RCOPE = negative religious coping.

\* $p < .05$ .



PTG was also positively associated with level of exposure to hurricane-related stressors. In fact, level of exposure is a shared predictor of PTS, GPD, and PTG. Past studies have found that different disaster experiences are differentially related to psychopathology and growth (Harville, Xiong, Buekens, Pridjian, & Elkind-Hirsch, 2010). It would be of interest for future studies to examine the specific events that contribute to the three different outcomes.

Interestingly, neither social support nor optimism was predictive of PTS and GPD. This suggests that unmeasured religious coping variables may have fueled previously found associations among support, optimism, and disaster outcomes (e.g., Chan et al., 2012; Smith et al., 2000). This might be particularly true among more religious individuals, who in the face of disaster, may be particularly likely to cope with the support of their faith and religious communities. For these individuals, their social support network and sense of optimism may be inseparable from their religious contexts and ethos. Indeed, a recent meta-analysis of PTG, suggested that **the effect size of religious coping was stronger (.38) than that of social support and optimism .26 and .23, respectively** (Prati & Pietrantonio, 2009). Particularly in the context of communities such as ours, studies that do not include measures of religious coping may be missing an important dimension of survivors' responses. Another possible reason for the discrepancies found between our studies and previous ones is the timing of measurement. Again, **social support and optimism in the current study were measured prior to Hurricane Katrina and psychological distress was measured 4 years after the storm.**

## Limitations

It should be noted that religious coping was measured concurrently with the outcome variables. The direction of their causal relationship thus requires further examination. Likewise, the generalizability of the findings is limited by the fact that the participants in this study were not representative of the entire population affected by Hurricane Katrina. Nonetheless, the findings can potentially provide important insights about the resourcefulness of a particularly vulnerable group (Bolin & Bolton, 1986; Jones-DeWeever & Hartman, 2006; Kessler et al., 2008).

There are also limitations in the particular measures that were used in this study. First, our reliance on self-report measures rendered our findings susceptible to subjective biases. Second, religiousness was measured with two global, single-item questions. Although religious importance and attendance are important dimensions of the construct that have been found to be associated with health and mental health outcomes (e.g., Koenig, 2001; Koenig et al., 2001), many aspects and forms of religious beliefs and experiences were left unexamined, such as religious activities outside of the church context (e.g., prayers), denomination, level of commitment, and religious attribution (e.g., Gorsuch, 1984; Hill & Pargament, 2003). Our study find-

ings might also be limited to members of organized religions who participate in church-based activities.

## Conclusions

In this study, **positive religious coping was associated with PTG, whereas negative religious coping was associated with higher levels of postdisaster psychological distress.** Although relief workers and mental health care providers should take note of the protective role of religion in the lives of survivors, and make efforts to restore faith-based organizations (e.g., to provide a place for and means to worship and practice one's faith), they should be aware of the potential risk that negative religious coping might pose for long-term symptomatology.

## References

- Acierno, R., Ruggiero, K., Kilpatrick, D., Resnick, H., & Galea, S. (2006). Risk and protective factors for psychopathology among older versus younger adults after the 2004 Florida hurricanes. *American Journal of Geriatric Psychiatry, 14*, 1051–1059. doi:10.1097/01.JGP.0000221327.97904.b0
- Ai, A., & Park, C. (2007). Psychosocial mediation of religious coping styles: A study of short-term psychological distress following cardiac surgery. *Personality and Social Psychology Bulletin, 33*, 867–882. doi:10.1177/0146167207301008
- Ano, G. G., & Vasconcelles, E. B. (2005). Religious coping and psychological adjustment to stress: A meta-analysis. *Journal of Clinical Psychology, 61*, 461–480. doi:10.1002/jclp.20049
- Bolin, R., & Bolton, P. (1986). Race, religion, and ethnicity in disaster recovery (Monograph No. 42). Boulder: University of Colorado, Institute of Behavioral Science.
- Bokszczanin, A. (2008). Parental support, family conflict, and overprotectiveness: Predicting PTSD symptom levels of adolescents 28 months after a natural disaster. *Anxiety, Stress and Coping, 21*, 325–335. doi:10.1080/10615800801950584
- Bourjolly, J. N. (1998). Differences in religiousness among black and white women with breast cancer. *Social Work in Health Care, 28*, 21–39. doi:10.1300/J010v28n01\_02
- Brock, T., & Richburg-Hayes, L. (2006). *Paying for persistence: Early results of a Louisiana scholarship program for low-income parents attending community college*. New York: MDRC.
- Brodie, M., Weltzien, E., Altman, D., Blendon, R., & Benson, J. (2006). Experiences of Hurricane Katrina evacuees in Houston shelters: Implications for future planning. *American Journal of Public Health, 96*, 1402–1408. doi:10.2105/AJPH.2005.084475
- Chan, C. S., Rhodes, J. E., & Perez, 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. doi:10.1007/s10464-011-9445-y
- Cutrona, C. E., & Russell, D. W. (1987). The provisions of social relationships and adaptation to stress. In W. H. Jones & D. Perlman (Eds.), *Advances in Personal Relationships* (Vol. 1, pp. 37–67). Greenwich, CT: JAI Press.
- Ferraro, K. F., & Koch, J. R. (1994). Religion and health among black and white adults: Examining social support and consolation. *Journal for the Scientific Study of Religion, 33*, 362–375. doi:10.2307/1386495
- Frazier, P., Conlon, A., & Glaser, T. (2001). Positive and negative life changes following sexual assault. *Journal of Consulting and Clinical Psychology, 69*, 1048–1055. doi:10.1037/0022-006X.69.6.1048

- Furukawa, T. A., Kessler, R. C., Slade, T., & Andrews, G. (2003). The performance of the K6 and K10 screening scales for psychological distress in the Australian National Survey of Mental Health and Well-Being. *Psychological Medicine, 33*, 357–362. doi:10.1017/S0033291702006700
- Galea, S., Brewin, C., Gruber, M., Jones, R., King, D., King, L., McNally, R., Kessler, R. C. (2007). Exposure to hurricane-related stressors and mental illness after Hurricane Katrina. *Archives of General Psychiatry, 64*, 1427–1434. doi:10.1001/archpsyc.64.12.1427
- Gallup. (2008). *Religion*. Retrieved from <http://www.gallup.com/poll/1690/Religion.aspx>
- Gerber, M. M., Boals, A., & Schuettler, D. (2011). The unique contributions of positive and negative religious coping to posttraumatic growth and PTSD. *Psychology of Religion and Spirituality, 3*, 298–307. doi:10.1037/a0023016
- Gibbs, M. (1989). Factors in the victim that mediate between disaster and psychopathology: A review. *Journal of Traumatic Stress, 2*, 489–514. doi:10.1002/jts.2490020411
- Gorsuch, R. L. (1984). Measurement: The boon and bane of investigating religion. *American Psychologist, 39*, 228–236.
- Harris, J. I., Erbes, C. R., Engdahl, B. E., Olson, R. H. A., Winkowski, A. M., & McMahlill, J. (2008). Christian religious functioning and trauma outcomes. *Journal of Clinical Psychology, 64*, 17–29. doi:10.1002/jclp.20427
- Harrison, M. O., Koenig, H. G., Hays, J. C., Eme-Akwari, A. G., & Pargament, K. I. (2001). The epidemiology of religious coping: A review of recent literature. *International Review of Psychiatry, 13*, 86–93. doi:10.1080/09540260120037317
- Harville, E., Xiong, X., Buekens, P., Pridjian, G., & Elkind-Hirsch, K. (2010). Resilience after Hurricane Katrina among pregnant and postpartum women. *Women's Health Issues, 20*, 20–27. doi:10.1016/j.whi.2009.10.002
- Helgeson, V. S., Reynolds, K. A., & Tomich, P. L. (2006). A meta-analytic review of benefit finding and growth. *Journal of Consulting and Clinical Psychology, 74*, 797–816. doi:10.1037/0022-006X.74.5.797
- Hill, P. C., & Pargament, K. I. (2003). Advances in the conceptualization and measurement of religion and spirituality: Implications for physical and mental health research. *American Psychologist, 58*, 64–74. doi:10.1037/0003-066X.58.1.64
- Hood, R. W. Jr., Spilka, B., Hunsberger, B., & Gorsuch, R. (1996). *The psychology of religion: An empirical approach*. New York: Guilford Press.
- Hu, L., & Bentler, P. M. (1998). Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification. *Psychological Methods, 3*, 424–453. doi:10.1037/1082-989X.3.4.424
- Jones-DeWeever, A. (2008). Women in the wake of the storm: Examining the post-Katrina realities of the women of New Orleans and the Gulf Coast. Washington, DC: Institute for Women's Policy Research.
- Kessler, R. C., Andrews, G., Colpe, L. J., Hiripi, E., Mroczek, D. K., Normand, S. L. et al. (2002). Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychological Medicine, 32*, 959–976.
- Kessler, R. C., Galea, S., Gruber, M. J., Sampson, N. A., Ursano, R. J., & Wessely, S. (2008). Trends in mental illness and suicidality after Hurricane Katrina. *Molecular Psychiatry, 13*, 374–384.
- Koenig, H. G. (1998). *Handbook of religion and mental health*. New York, NY: Academic Press.
- Koenig, H. (2001). Religion and medicine II: Religion, mental health, and related behaviors. *International Journal of Psychiatry in Medicine, 31*, 97–109. doi:10.2190/BK1B-18TR-X1NN-36GG
- Koenig, H. G., McCullough, M. E., & Larson, D. B. (2001). *Handbook of religion and health*. New York: Oxford University Press. doi:10.1093/acprof:oso/9780195118667.001.0001
- Krause, N., Ellison, C., Shaw, B., Marcum, J. P., & Boardman, J. D. (2001). Church based social support and religious coping. *Journal for the Scientific Study of Religion, 40*, 637–665. doi:10.1111/0021-8294.00082
- Little, T. D., Cunningham, W. A., Shahar, G., & Widaman, K. F. (2002). To parcel or not to parcel: Exploring the question, weighing the merits. *Structural Equation Modeling, 9*, 151–173. doi:10.1207/S15328007SEM0902\_1
- Linley, P., & Joseph, S. (2004). Positive change following trauma and adversity: A review. *Journal of Traumatic Stress, 17*, 11–21. doi:10.1023/B:JOTS.0000014671.27856.7e
- Muthén, L. K. & Muthén, B. O. (2011). *Mplus, the comprehensive modeling program for applied researchers user's guide*. Los Angeles, CA: Author.
- Norris, F. H., Friedman, M. J., Watson, P. J., Byrne, C. M., Diaz, E., & Kaniasty, K. (2002). 60,000 disaster victims speak: Part I. An empirical review of the empirical literature, 1981–2001. *Psychiatry, 65*, 207–239. doi:10.1521/psyc.65.3.207.20173
- Oman, D., & Reed, D. (1998). Religion and mortality among the community-dwelling elderly. *American Journal of Public Health, 88*, 1469–1475.
- Pargament, K. I. (1997). *The psychology of religion and coping: Theory, research, practice*. New York: Guilford Press.
- Pargament, K. I., Feuille, M., & Burdzy, D. (2011). The Brief RCOPE: Current psychometric status of a short measure of religious coping. *Religions, 2*, 51–76. doi:10.3390/rel2010051
- Pargament, K. I., Smith, B., Koenig, H., & Perez, L. (1998). Patterns of positive and negative religious coping with major life stressors. *Journal for the Scientific Study of Religion, 37*, 710–724. doi:10.2307/1388152
- Park, C. L., Cohen, L. H., & Murch, R. L. (1996). Assessment and prediction of stress-related growth. *Journal of Personality, 64*, 71–105. doi:10.1111/j.1467-6494.1996.tb00815.x
- Paxson, C., Rhodes, J. E., Waters, M., & Fussell, E. (2012). Five years later: Recovery from post traumatic stress and psychological distress among low-income mothers affected by Hurricane Katrina. *Social Science and Medicine, 74*, 150–157. doi:10.1016/j.socscimed.2011.10.004
- Powell, L. H., Shahabi, L., & Thoresen, C. E. (2003). Religion and spirituality: Linkages to physical health. *American Psychologist, 58*, 36–52. doi:10.1037/0003-066X.58.1.36
- Prati, G., & Pietrantonio, L. (2009). Optimism, social support, and coping strategies as factors contributing to posttraumatic growth: A meta-analysis. *Journal of Loss and Trauma, 14*, 364–388. doi:10.1080/15325020902724271
- Salsman, J. M., Segerstrom, S. C., Brechting, E. H., Carlson, C. R., & Andrykowski, M. A. (2009). Posttraumatic growth and PTSD symptomatology among colorectal cancer survivors: A 3-month longitudinal examination of cognitive processing. *Psycho-Oncology, 18*, 30–41. doi:10.1002/pon.1367
- Scheier, M. F., Carver, C. S., & Bridges, M. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): A re-evaluation of the Life Orientation Test. *Journal of Personality and Social Psychology, 67*, 1063–1078. doi:10.1037/0022-3514.67.6.1063
- Shrout, P., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods, 7*, 422–445. doi:10.1037/1082-989X.7.4.422



- Smith, B., Pargament, K., Brant, C., & Oliver, J. (2000). Noah revisited: Religious coping by church members and the impact of the 1993 Midwest flood. *Journal of Community Psychology, 28*, 169–186. doi:10.1002/(SICI)1520-6629(200003)28:2<169::AID-JCOP5>3.0.CO;2-I
- Smith, T. B., McCullough, M. E., & Poll, J. (2003). Religiousness and depression: Evidence for a main effect and the moderating influence of stressful life events. *Psychological Bulletin, 129*, 614–636. doi:10.1037/0033-2909.129.4.614
- Solomon, Z., & Dekel, R. (2007). Posttraumatic stress disorder and post-traumatic growth among Israeli ex-pows. *Journal of Traumatic Stress, 20*, 303–312. doi:10.1002/jts.20216
- Tedeschi, R. G., & Calhoun, L. G. (1996). The Posttraumatic Growth Inventory: Measuring the positive legacy of trauma. *Journal of Traumatic Stress, 9*, 455–471. doi:10.1002/jts.2490090305
- 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, 22*, 413–432. doi:10.1080/10615800902855781
- Weiss, D. S., & Marmar, C. R. (1997). The impact of events scale-revised. In J. P. Wilson & T. M. Kean (Eds.), *Assessing psychological trauma and PTSD: A practitioner's handbook* (pp. 399–411). New York: Guilford Press.
- Zoellner, T., & Maercker, A. (2006). Posttraumatic growth in clinical psychology—A critical review and introduction of a two component model. *Clinical Psychology Review, 26*, 626–653. doi:10.1016/j.cpr.2006.01.008