Optimism and Hope After Multiple Disasters: Relationships to Health-Related Quality of Life

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ABSTRACT

Natural and technological disasters are devastating events for individuals and communities. The authors examined the role of optimism and hope in predicting health indicators in a sample of disaster survivors who were exposed to Hurricanes Katrina and Rita in 2005. Participants were noncoastal residents, current coastal residents, and current coastal fishers who were also economically impacted by the 2010 BP Deepwater Horizon oil spill. All participants completed measures of optimism, hope, and the SF-36 Health Survey, which provides summary scores for mental and physical health. Logistic regressions indicated that optimism and hope were independently and positively associated with better mental health (OR = 1.21; 95% CI: 1.10, 1.32 and OR = 1.11; 95% CI: 1.05, 1.17 respectively). Neither optimism nor hope were significantly associated with physical health when considered alone. However, optimism interacted with prior lifetime trauma, where optimism only significantly predicted physical health for those with higher previous trauma scores. These results provide new evidence of optimism and hope as protective factors that may positively impact mental health after multiple disasters.

On August 29, 2005, Hurricane Katrina made landfall on the U.S. Gulf Coast with catastrophic destruction and widespread loss of life. Four weeks later, on September 25, 2005, Hurricane Rita struck southwestern Louisiana and eastern Texas, directly causing seven deaths and forcing thousands of Katrina-displaced Gulf Coast residents to relocate again (Cherry, 2009). On the heels of these events came the BP Deepwater Horizon oil spill off of the Louisiana coast, which has been called the worst human-made environmental disaster in U.S. history. The BP oil spill threatened the economy, commercial fishing industry, and cultural heritage of those who depend on natural renewable resources for a livelihood (Lyon, Nezat, Marks, & Cherry, 2015). This catastrophic environmental event has also introduced significant new life

stresses for coastal residents still struggling with long-term hurricane recovery (Cherry, Lyon, et al., 2015; Osofsky & Osofsky, 2013).

There is a voluminous literature on disasters and mental health (for reviews, see Neira, Galea, & Norris, 2009; Norris & Elrod, 2006). However, relatively few studies have examined health outcomes after multiple back-to-back disasters in the years after the events occurred (Benight, 2004; Cherry, Sampson, et al., 2015; Osofsky, Osofsky, Weems, Hansel, & King, 2014). In our prior work (Cherry, Sampson, et al., 2015), we compared former coastal residents who relocated permanently with current residents who returned to rebuild storm-damaged homes and communities after Katrina. We found that low income and being a commercial fisher were associated with increased risk of depression. A follow-up study on commercial fishers' strategies for coping with oil spill stressors revealed that storm-related stressors and lifetime traumatic events predicted different styles of coping, although only avoidant coping was associated with increased risk of depression and posttraumatic stress (Cherry et al., in press). Together, these reports suggest that multiple disaster exposures are devastating for coastal residents, particularly those in the commercial fishing industry with recent trauma related to the 2010 BP oil spill.

Our primary objective in the present study was to understand the role that dispositional optimism (Scheier, Carver, & Bridges, 1994) plays in postdisaster health. Optimism has been defined as one's expectation for positive outcomes despite obstacles. Prior research indicates that optimism is related to traumatic stress and coping (Dougall, Hyman, Hayward, McFeeley, & Baum, 2001), health and lifestyle (Conversano et al., 2010), and healthy aging (Steptoe, Wright, Kunz-Ebrecht, & Iliffe, 2006), although few studies have considered optimism in a natural disaster context (van der Velden et al., 2007). Here we focus on optimism while controlling for the known influences of age, gender, education, income, and lifetime trauma (e.g., Galea, Tracy, Norris, & Coffey, 2008; Norris et al., 2002; Tracy & Galea, 2006) to permit more precise inferences on the role that optimism plays in health-related quality of life in the years after natural and technological disaster. Prior research has shown that optimism is associated with posttraumatic growth, flexible and adaptive coping, and perceived ability to manage potentially traumatic events (see Prati & Pietrantoni, 2009, for review). Therefore, we expected optimism to be associated with postdisaster health in this study.

Our secondary objective in this study was to examine state hope (Snyder et al., 1996) as a potential protective factor for health-related quality of life after multiple disaster exposures. State hope, a conceptually distinct personal characteristic, is comprised of agency (i.e., one's capacity to initiate and carry out personal goals) and pathways (i.e., one's ability to construct routes to obtain goals). Hope is recognized as a dynamic process that varies in response to stress and challenging circumstances (Folkman, 2010). In a study with

Hurricane Katrina survivors, Glass, Flory, Hankin, Kloos, and Turecki (2009) found that state hope was negatively associated with symptoms of posttraumatic stress, implying that hope may foster postdisaster well-being. On the basis of theory and prior literature, we hypothesized that optimism and hope are both important to health outcomes in the years after natural and technological disaster. To test this hypothesis in the present research, participants' current health was estimated based on their responses to the SF-36 Health Survey (Ware & Sherbourne, 1992), which includes summary scores for mental and physical health. Evidence showing that optimism and hope account for unique variance in the SF-36 composite scores would demonstrate that these variables matter for current health outcomes in disaster survivors after multiple catastrophic disaster exposures.

Method

Participants and procedure

A total of 219 individuals participated in this study. These persons were recruited from the greater metropolitan Baton Rouge area and the coastal communities of St. Bernard and Plaquemines parishes (counties), which were severely devastated by the 2005 hurricanes. A recruitment flyer seeking research volunteers, and also prestamped, mail-in postcards, were distributed widely by the first author to church groups and civic organizations. Those who returned the postcards were contacted and scheduled. Others self-selected to participate based on word-of-mouth referrals. We intentionally sampled a wider age range compared to our earlier reports, which were confined to middle-aged, older, and oldest-old adults in the immediate impact phase of the 2005 hurricanes (Cherry et al., 2011; Silva Brown et al., 2010). The rationale for the current sampling strategy was to improve representation of adults in early to mid-life to increase the breadth of inferences warranted on variables important to long-term health outcomes across the lifespan. All participants were visually and auditorily capable, and were free of known neurologic impairment due to stroke or dementia. All provided written informed consent prior to participation. The materials and procedures used in this study were reviewed and approved by the Institutional Review Board of Louisiana State University.

Thirty indirectly affected Baton Rouge area residents did not differ from the directly affected former coastal residents who relocated permanently to this area on nearly all response measures (Cherry, Sampson, et al., 2015), so we combined these groups for the analyses reported in this article (M age $= 59.0$ years, $SD = 17.6$ years, age range 18–91 years; 35 males, 57 females). Current coastal residents were 63 persons who experienced catastrophic property damage and storm-related displacement, but returned to rebuild

and restore their lives in their original communities (M age = 60.7 years, SD = 15.0 years, age range 20–83 years; 26 males, 37 females). Current coastal fishers were 64 commercial fishers and their family members (M age = 54.7 years, SD = 15.7 years, age range 21–90 years; 34 males, 30 females). Fishers were similar to the coastal residents in that they were also displaced and returned to rebuild after Katrina; however, they were also economically impacted by the BP oil spill and could not work in the commercial fishing industry for up to a year or more (Cherry, Lyon, et al., 2015; Lyon et al., 2015). Job loss related to this technological disaster has added an additional layer of life stress for these individuals (Cherry, Marks, Adamek, & Lyon, 2015).

Data collection began in March of 2010 to coincide with the five-year Hurricane Katrina and Rita anniversaries. In the first year of data collection, only nonresidents or former coastal residents and current coastal residents groups were tested. Coastal fishers were added to the study design in the second year of data collection (Cherry et al., in press), with all testing across the three groups completed in November of 2012. All were told that the purpose of the study was to learn about factors that predict resilience and long-term recovery after a natural disaster. They were tested individually in their home or in a community location in two sessions that lasted approximately 90 min.

Independent measures

Dispositional optimism was assessed using the Life Orientation Test–Revised (LOT-R; Scheier et al., 1994), which is comprised of 10 items: 3 positive, 3 negative (reverse scored), and 4 filler items. Item responses range from 0 (*strongly disagree*) to 4 (*strongly agree*). Scores ranged from 0 to 24, with higher scores indicating greater optimism. We selected the LOT-R for this study based on prior work that documents adequate predictive and discriminant validity (Scheier et al., 1994). Cronbach's alpha reliability coefficient for the six items in this study was somewhat lower (0.683) than the alpha value reported in Scheier et al. (0.78), possibly due to a more culturally diverse sample here relative to the original sample upon which the psychometric qualities of the LOT-R were based.[1]

The State Hope Scale (SHS; Snyder et al., 1996) is a 6-item measure of goal-directed thinking, defined as a cognitive set comprised of agency (defined as belief in one's capacity to act) and pathways (belief in one's capacity to generate routes to achieve goals). Item responses range from 1 (*definitely false*) to 8 (*definitely true*). The SHS possesses internal consistency reliability and concurrent and discriminant validity (Snyder et al., 1996). Cronbach's alpha reliability coefficient here was 0.864.

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[1]With respect to self-reported ethnicity, most of the sample listed their race as Caucasian (79.5%). Others reported Isleño (14.2%), Croatian (3.2%), African-American (2.3%), and Hispanic or Latino (<1.0%).

Dependent measures

Table 1 presents a summary of the sociodemographic and self-reported health characteristics of the sample. The lifetime trauma total score is a composite variable based on participants' responses to five potentially traumatic events (PTEs). This index includes trauma experience and reported fear for life

Table 1. Sociodemographic characteristics, predictor, and outcome variables.

	Noncoastal and former coastal residents	Current coastal residents	Current coastal fishers		
	N (%)			χ^2	p
Gender					
Male	35 (38.0%)	26 (41.3%)	34 (53.1%)	3.66	0.161
Female	57 (62.0%)	37 (58.7%)	30 (46.9%)		
Education					
High school or less	10 (10.87%)	18 (28.6%)	33 (51.6%)	51.00**	< 0.001
Some college or specialized training	33 (35.9%)	32 (50.8%)	23 (35.9%)		
College degree	21 (22.8%)	8 (12.7%)	6 (9.4%)		
Master's, doctorate, professional degree	28 (30.4%)	5 (7.9%)	2 (3.1%)		
Income				11.83+	0.066
$2,000/month or less	21 (22.8%)	19 (30.2%)	23 (35.9%)		
$2,000 to $4,000/month	19 (20.7%)	18 (28.6%)	20 (31.3%)		
$4,000 to $6,000/month	28 (30.4%)	9 (14.3%)	11 (17.2%)		
$6,000/month or more	24 (26.1%)	17 (27.0%)	10 (15.6%)		
Chronic conditions[a]				2.04	0.728
None	35 (38.0%)	19 (30.2%)	21 (32.8%)		
1	26 (28.26)	16 (25.40%)	17 (26.56%)		
2 or more	31 (33.70%)	28 (44.44%)	26 (40.63%)		
Self-perceived health				10.00**	0.007
Excellent/good	76 (82.6%)	57 (90.5%)	44 (68.8%)		
Fair/poor	16 (17.4%)	6 (9.5%)	20 (31.3%)		
Health compared to others				7.75*	0.021
Better	47 (51.1%)	38 (60.3%)	23 (35.9%)		
Worse or same	45 (48.9%)	25 (39.7%)	41 (64.1%)		
Health stands in the way				1.33	0.514
No	39 (42.4%)	28 (44.4%)	33 (51.6%)		
Yes	53 (57.6%)	35 (55.6%)	31 (48.4%)		
	M (SD)			F	P
Optimism[b]	17.13 (3.72)	17.02 (4.01)	16.00 (3.50)	1.92	0.150
Hope[c]	38.64 (6.33)	39.83 (6.01)	39.41 (6.56)	0.71	0.495
Health-related quality of life[d]					
SF-36 MCS	51.78 (7.28)	52.20 (11.32)	49.69 (9.56)	1.39	0.250
SF-36 PCS	47.15 (9.48)	46.96 (11.57)	44.07 (10.87)	1.86	0.158
Lifetime trauma total[e]	2.09 (1.43)	2.94 (1.84)	2.44 (2.07)	4.38*	0.014

Note. $+ p > 0.05$ and ≤ 0.10, $*p \leq 0.05$, $**p \leq 0.01$.

Notes. [a]Based on the presence of 6 chronic conditions (high cholesterol, hypertension, diabetes, arthritis, cancer, and heart problems). [b]Optimism was based on LOT-R (Scheier, Carver, & Bridges, 1994). [c]State Hope Scale (Snyder et al., 1996). [d]F-36 Health Survey (Ware & Sherbourne, 1992). [e]Based on the sum of 5 events where each is scored as 0 (no), 1 (yes, but no fear), or 2 (yes, with fear of injury or death during trauma). Traumas include: other natural disaster, serious accident, attacked with a gun/knife/other weapon, attacked without weapon but with intent to kill/injure, and experienced military combat or war zone (Cherry, Sampson, et al., 2015).

and safety during trauma, which was assessed using the structured storm questionnaire (SSQ) reported elsewhere (Cherry, Sampson, et al., 2015). The Medical Outcomes Study Short Form-36 Health Survey (SF-36; Ware & Sherbourne, 1992) is comprised of eight indicators of general health, including physical functioning (PF), role limitations due to physical health problems (RP), bodily pain (BP), perceptions of general health (GH), vitality (VT), social functioning (SF), role limitations due to emotional health problems (RE), and mental health (MH). The psychometric qualities of the SF-36 include construct validity (McHorney, Ware, & Raczek, 1993) and high internal consistency reliability for the eight subscales (McHorney, Ware, Lu, & Sherbourne, 1994). Subscales are combined to form composite mental (MCS) and physical component scores (PCS) where scores range from 0 (lowest functioning) to 100 (highest functioning). Normative data yield a mean of 50 and a standard deviation of 10 for the mental and physical health composite scores (Ware, Kosinski, & Keller, 1994). We dichotomized these scores at 50 for the logistic regressions reported here to permit inferences on health indicators in this sample that were above and below a norm-referenced average (Ware et al., 1994).

Statistical analyses

All statistical analyses were carried out using an SAS version 9.4 statistical software system. For categorical variables, frequencies and percentages (%) are reported; χ^2 tests and corresponding p values were used to show group differences. For noncategorical variables, means and standard deviations are reported; F tests and corresponding p values reported for differences among groups (see Table 1). Bivariate logistic regression analyses were run on all potentially confounding variables that might impact health (not shown). Based on the outcomes of the bivariate analyses and prior literature, age, gender, education, income, and lifetime trauma were selected for inclusion as covariates in multivariate regression models.

Results

Analyses of sociodemographic and health characteristics

Inspection of Table 1 reveals that gender composition was comparable across groups; however, group membership was significantly associated with reported educational attainment by a χ^2 test ($p < 0.001$). More than half of the fishers reported having a high school degree or less, while noncoastal and former coastal residents reported holding a college degree or master's degree more often than expected. Participants' self-reported income level was not significantly associated at a 0.05 level with group by a χ^2 test

($p = 0.066$). An objective health measure was created using the number of current chronic conditions the respondent reported, including high cholesterol, hypertension, diabetes, arthritis, cancer, heart problems, and "other" (scored as 0, 1, or 2+). This variable was dichotomized in the logistic regression analyses.

Participants' responses to three self-perceived health questions from the Older American Resources and Services Multidimensional Functional Assessment Questionnaire (Duke University Center for the Study of Aging and Human Development, 1975) indicated that most were generally in good health. Analyses of ratings for self-perceived health at the present time and group yielded a significant association by a χ^2 test ($p = 0.007$), owing to the fishers who rated their health as fair to poor more often than expected. Ratings of health compared to others and group was also significant ($p = 0.021$), due to the fishers who rated their health the same as or worse than others more often than expected. Health troubles standing in the way of usual activities were not significantly associated with group ($p = 0.514$).

Lifetime trauma was based on the sum of five events (other natural disaster, serious accident, attacked with a gun, knife, or other weapon, attacked without weapon but with intent to kill or injure, and experienced military combat or war zone), which were scored as 0 (no), 1 (yes, but no fear), or 2 (yes, with fear of injury or death during trauma), taken from Cherry et al. (2015).

Because the groups significantly differed in educational attainment ($p < 0.001$) and lifetime trauma total scores ($p = 0.014$), we included the group variable and lifetime trauma as covariates in the logistic regressions to permit clearer inferences on optimism and hope as psychosocial factors hypothesized to impact health-related quality of life.

Analyses of optimism and hope

Odds ratios from regressions with six covariates appear in Table 2 for the predictor variables of central interest, optimism, and hope. Separate models were carried out for the PCS and MSC scores with optimism as the predictor variable (see Table 2, leftmost columns). Results indicated that group (current coastal residents OR = 0.35) and age (OR = 0.91) were significantly associated with the SF-36 PCS scores, although optimism was not. Income was significantly inversely associated with the SF-36 MCS scores (OR = 0.23 for the middle income group), while optimism was positively predictive of the SF-36 MCS scores (OR = 1.21), indicating a 21% increased likelihood of above-average mental health for each additional one-point increase on the LOT-R. For the two models with hope as the predictor variable (Table 2, rightmost columns), the results for physical health indicated that group (i.e., current coastal fishers, OR = 0.33) and age (OR = 0.91) were significantly

Table 2. Logistic regression analyses predicting PCS and MCS with optimism and hope as predictors.

	Optimism		Hope	
	SF-36 PCS 50+OR (95% CI)	SF-36 MCS 50+OR (95% CI)	SF-36 PCS 50+OR (95% CI)	SF-36 MCS 50+OR (95% CI)
Group				
Nonresidents and former coastal residents	1.00	1.00	1.00	1.00
Current coastal residents	2.16 (0.88, 5.28)+	1.46 (0.64, 3.35)	2.01 (0.82, 4.91)	1.23 (0.54, 2.83)
Current coastal fishers	0.35 (0.14, 0.91)*	0.66 (0.29, 1.51)	0.33 (0.13, 0.85)*	0.55 (0.24, 1.27)
Gender				
Female	1.00	1.00	1.00	1.00
Male	0.80 (0.40, 1.60)	1.59 (0.82, 3.07)	0.72 (0.36, 1.46)	1.20 (0.62, 2.30)
Age	0.91 (0.88, 0.93)**	1.01 (0.99, 1.03)	0.91 (0.88, 0.94)**	1.02 (1.00, 1.04)+
Lifetime trauma total	0.89 (0.72, 1.09)	0.91 (0.76, 1.10)	0.87 (0.71, 1.07)	0.87 (0.71, 1.05)
Education				
High school or less	0.71 (0.21, 2.35)	1.82 (0.54, 6.13)	0.71 (0.21, 2.23)	1.81 (0.54, 6.07)
Some college or specialized training	0.92 (0.33, 2.61)	1.10 (0.38, 3.23)	0.94 (0.33, 2.66)	1.15 (0.39, 3.35)
College degree	1.19 (0.37, 3.77)	0.86 (0.27, 2.73)	1.14 (0.36, 3.61)	0.80 (0.25, 2.52)
Master's, doctorate, or professional degree	1.00	1.00	1.00	1.00
Income				
$2,000/month or less	0.40 (0.13, 1.19)+	0.52 (0.19, 1.43)	0.37 (0.13, 1.09)	0.46 (0.17, 1.24)
$2,000 and $4,000/month	1.54 (0.59, 3.99)	0.23 (0.09, 0.61)**	1.57 (0.60, 4.07)	0.27 (0.11, 0.68)**
$4,000 and $6,000/month	1.07 (0.41, 2.78)	1.28 (0.44, 3.72)	1.03 (0.98, 2.68)	1.44 (0.49, 4.22)
$6,000/month or more	1.00	1.00	1.00	1.00
Optimism	1.06 (0.97, 1.17)	1.21 (1.10, 1.32)**		
Hope			1.03 (0.98, 1.09)	1.11 (1.05, 1.17)**

Note. + $p > 0.05$ and ≤ 0.10 *$p \leq 0.05$ **$p \leq 0.01$.

associated with the SF-36 PCS scores, but not hope. Low income (i.e., < $2,000 per month, OR = 0.27) was significantly associated with the SF-36 MCS scores. Importantly, hope was positively predictive of a higher SF-36 MCS score (OR = 1.11), indicating an 11% increased likelihood of above-average mental health per point increase of state hope (both agency and pathways).

The results presented so far indicate that optimism and hope predicted SF-36 MCS scores. To rule out the possibility that optimism and hope are accounting for the same variance, we entered these variables simultaneously in two separate regressions on the MCS and PCS scores, respectively (Table 3). Inspection of Table 3 indicates that the same pattern of results obtained with optimism (OR = 1.17) and hope (OR = 1.09) positively predictive of the SF-36 MCS scores. Thus, even when accounting for each other, optimism and hope still independently predict mental health after multiple disaster exposures, consistent with our hypothesis.

Lastly, we were concerned that prior lifetime trauma might interact with optimism and hope to determine health outcomes in the years after disaster exposures. To address this possibility, we stratified the sample into high scores ($\geq$ 3) versus low scores ($\leq$ 2) based on participants' lifetime trauma responses. Separate logistic regressions were carried out with optimism and hope (in the same models) for the PCS and MCS scores stratified by prior lifetime trauma. As can be seen in Table 4, logistic regressions with PCS as the criterion variable yielded a significant odds ratio for optimism (OR = 1.30),

Table 3. Logistic regression analyses predicting PCS and MCS with optimism and hope as predictors together.

	SF-36 PCS 50+OR (95% CI)	SF-36 MCS 50+OR (95% CI)
Group		
Nonresidents and former coastal residents	1	1
Current coastal residents	2.03 (0.83, 4.99)	1.23 (0.53, 2.89)
Current coastal fishers	0.34 (0.13, 0.88)*	0.58 (0.25, 1.36)
Gender		
Female	1	1
Male	0.75 (0.37, 1.52)	1.36 (0.69, 2.68)
Age	0.91 (0.88, 0.94)**	1.02 (1.00, 1.04)+
Lifetime trauma total	0.88 (0.72, 1.09)	0.88 (0.72, 1.07)
Education		
High school or less	0.74 (0.22, 2.46)	2.21 (0.63, 7.72)
Some college or specialized training	0.96 (0.34, 2.72)	1.30 (0.43, 3.94)
College degree	1.22 (0.38, 3.92)	1.00 (0.30, 3.29)
Master's, doctorate, or professional degree	1	1
Income		
$2,000/month or less	0.40 (0.13, 1.20)+	0.53 (0.19, 1.50)
$2,000 and $4,000/month	1.58 (0.61, 4.10)	0.24 (0.09, 0.63)*
$4,000 and $6,000/month	1.05 (0.95, 2.76)	1.40 (0.45, 4.30)
$6,000/month or more	1	1
Optimism	1.05 (0.95, 1.16)	1.17 (1.06, 1.29)*
Hope	1.03 (0.97, 1.09)	1.09 (1.03, 1.15)*

Note. + $p > 0.05$ and ≤ 0.10 *$p \leq 0.05$ **$p \leq 0.01$.

Table 4. Logistic regression analyses predicting PCS with optimism and hope as predictors together, stratified by lifetime trauma level.

	SF-36 PCS 50+among those with a lifetime trauma score of 3 or more ($n = 90$) OR (95% CI)	SF-36 PCS 50+among those with a lifetime trauma score of 2 or less ($n = 128$) OR (95% CI)
Group		
Nonresidents and former coastal residents	1	1
Current coastal residents	1.17 (0.20, 6.87)	2.72 (0.72, 10.17)
Current coastal fishers	0.18 (0.02, 1.39)+	0.51 (0.15, 1.78)
Gender		
Female	1	1
Male	0.45 (0.11, 1.77)	0.74 (0.28, 1.94)
Age	0.89 (0.83, 0.95)*	0.92 (0.89, 0.95)**
Education		
High school or less	1.21 (0.11, 12.82)	0.25 (0.04, 1.44)
Some college or specialized training	0.23 (0.02, 2.18)	1.46 (0.40, 5.38)
College degree	1.01 (0.07, 14.01)	1.11 (0.28, 4.49)
Master's, doctorate, or professional degree	1	1
Income		
$2,000/month or less	0.15 (0.01, 1.76)	0.81 (0.20, 3.32)
$2,000 and $4,000/month	2.14 (0.33, 13.78)	1.50 (0.41, 5.45)
$4,000 and $6,000/month	2.21 (0.31,15.78)	0.86 (0.23, 3.22)
$6,000/month or more	1	1
Optimism	1.30 (1.05, 1.60)*	0.96 (0.84, 1.10)
Hope	1.07 (0.97, 1.18)	1.04 (0.95, 1.13)

Note. $+ p > 0.05$ and ≤ 0.10 *$p \leq 0.05$ **$p \leq 0.01$.

indicating a 30% increased likelihood of above-average physical health for each additional 1-point increase on the LOT-R, which was confined to those with higher lifetime trauma.

Discussion

The purpose of this study was to examine the roles that optimism and state hope play in determining health-related quality of life after a decade of disasters. These disasters included both acts of nature (the two catastrophic hurricanes in rapid succession, Katrina and Rita in August and September of 2005), and a man-made technological disaster, the BP Deepwater Horizon oil spill five years later. Our findings and their implications for research and clinical practice are discussed more fully next.

We found that optimism was positively associated with mental health. Importantly, these results were obtained after controlling for the known influences of group and other demographic variables. Conceivably, optimistic expectancies may be helpful for survivors in the years after disaster through sustained and engaged coping efforts, such as benefit finding and looking for possible silver linings despite disaster-related losses (Hatch, Cherry, Lu, & Marks, 2015; Stanko et al., 2015). Alternatively, optimistic appraisals of

one's postdisaster circumstances may deter ruminative thought or other cognitive behaviors that increase the likelihood of distress or despair, a potentially useful direction for future research in the wake of multiple consecutive disasters. It is also possible that optimism, as a core aspect of personality, is developmentally prior to one's disaster experiences and subsequent health in adulthood. That is, one may face natural and technological disasters with optimistic expectancies honed in childhood. Longitudinal research incorporating at least three points of measurement would be desirable before firm conclusions would be warranted, however.

We also found that state hope was significantly associated with mental health. Our findings are compatible with those of Glass et al. (2009), who found that hope was negatively related to PTSD symptoms and psychological distress in Katrina survivors less than a year after the 2005 storm. Theoretically, it seems likely that persons who exhibit high levels of hope would enact goal-directed behaviors and coping strategies to effectively manage disaster stressors and the myriad challenges that accompany catastrophic loss of homes and property (see Folkman, 2010, and Snyder, Sigmon, & Feldman, 2002, for related discussions). While a social cognitive perspective emphasizes agency and pathways, hope has also been conceptualized as a theological virtue along with faith and charity (Emmons, 2005). From this perspective, state hope may perpetuate religious coping to overcome postdisaster adversities by reducing fatalistic appraisals and enlarging one's resolve to never disengage or give up completely. Further, positive religious coping has been linked to posttraumatic growth (e.g., Chan & Rhodes, 2013; Prati & Pietrantoni, 2009). A potentially important question for future research relates to possible associations among state hope, religiousness, growth, and long-term health outcomes. Conceivably, hope, as a theological virtue despite one's circumstances, may facilitate engagement with interdenominational faith-based disaster relief efforts, which in turn may promote individual- and community-level psychological resilience (Lowe, Sampson, Gruebner, & Galea, 2015), an interesting possibility that awaits further research. Whether the protective effect of state hope on mental health is ultimately due to behavioral or religious factors is a matter of theoretical debate and may be an important direction for future research on disaster preparedness and response.

On a broader note, group membership was controlled for in the regressions reported here to permit a more precise estimate of optimism and hope effects on postdisaster health status, although the group variable itself merits further comment. From a statistical point of view, it seems unlikely that the comparison groups in this study are mutually exclusive. Virtually all residents of the U.S. Gulf Coast were exposed to winds and rain, along with media reports and television coverage of the 2005 hurricanes (Weems, Scott, Banks, & Graham, 2012). The 2010 BP oil spill was also covered extensively (Cherry, Lyon, et al., 2015). We have also found that noncoastal, former coastal, and current coastal

residents were more alike than different across many psychosocial variables (Cherry, Sampson, et al., 2015; Stanko et al., 2015). In contrast, current coastal fishers' self-reported health and SF-36 PCS scores observed here were lower than their coastal resident and nonresident or former coastal resident counterparts, suggestive of potential vulnerability. From a clinical point of view, the present findings underscore the need for continued research and services to address the long-term effects of multiple disaster exposures for those who are economically dependent on renewable natural resources. Fishers in particular warrant special consideration, given the traumatic stress associated with the oil spill and ongoing threats to lifestyle and cultural heritage (Cherry, Lyon, et al., 2015; Cherry, Marks, et al., 2015).

Finally, we note the potential clinical significance of prior lifetime trauma as an aspect of participants' developmental history. In particular, optimism interacted with lifetime trauma in the follow-up regressions, where optimism positively and significantly predicted SF-36 PCS scores, but only for those with higher prior trauma scores. This result can be interpreted to suggest that prior trauma or PTEs may strengthen optimistic expectancies for recovery and positive appraisals of physical health, possibly incrementally over time, although further research is necessary. Taken together, the present results imply that optimism may only matter for reported physical health among disaster survivors with previously experienced trauma, while both optimism and hope matter for mental health.

The present results should be interpreted in light of at least five methodological limitations. First, our sample size is small and may be biased in the direction of vitality. Individuals who are faring poorly may not be willing to serve as a research participant. Second, we did not inquire as to whether participants were currently or had previously been in counseling or sought treatment for disaster-related mental health challenges, a potentially important consideration for future research. Third, our estimate of internal consistency reliability for the LOT-R was low, possibly due to a more diverse sample than the majority population on which the psychometric qualities of the LOT-R were based. Fourth, we used a cross-sectional design, so causal inferences based on the relationships observed here are not warranted. Mental and physical health are dynamic processes that likely vary over time as people adapt to environmental changes and challenging life circumstances. Future research that includes longitudinal comparisons of health outcomes is needed to track potential changes in responses over time. Fifth, we assessed health using self-report surveys, which are susceptible to bias and unintended distortions. Future research that incorporates biological indicators of stress responses would be valuable, allowing a more precise estimate of the long-term health consequences after a decade of disasters.

In closing, people who reside in coastal areas prone to severe weather have most likely developed certain adaptive capacities that build on personal and

social resources that foster well-being when destructive hurricanes strike. The present findings extend the literature by confirming the independent and beneficial roles of optimism and hope in shaping health outcomes after multiple disaster exposures. These results also underscore the value of adopting a lifespan developmental perspective on postdisaster health (Cherry, 2009). Future research to explore the generality of these findings seems warranted.

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