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Changes in Psychosocial Resources as Predictors of Posttraumatic Growth: A Longitudinal Study of Low-Income, Female Hurricane Katrina Survivors

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This study examined how well the Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996) corresponds with self-reported pre- to posttrauma changes in related constructs, including sense of purpose in life, religiosity, and social support. Participants were 328 low-income mothers (85.2% non-Hispanic Black) who survived Hurricane Katrina and completed surveys approximately 1 year pre-disaster (Time 1), 4 years postdisaster (Time 2), and 12 years postdisaster (Time 3). PTG was assessed at Time 2 and Time 3, and related constructs were assessed at all waves. Pre- to postdisaster changes in the following related constructs were significantly associated with the corresponding PTGI subscales: purpose in life with Relating to Others, Personal Strength, and New Possibilities; religiosity with Spiritual Change; and perceived social support with Relating to Others. The results demonstrate a link between a number of self-reported pre- to posttrauma psychological changes measured over time and the PTGI. Replication of these results using measures more closely aligned to the PTGI subscales, among more representative samples and in the aftermath of other traumatic events, is warranted.

Keywords: posttraumatic growth, natural disasters, social support, purpose in life, religiosity


Research on survivors of traumatic events has shifted from a focus on adverse mental health outcomes to a broader range of psychological consequences (Norris et al., 2009). Within this context, researchers have increasingly investigated the phenomenon of posttraumatic growth (PTG), defined as self-reported positive psychological changes induced by the experience and processing of a traumatic event and its aftermath (Tedeschi & Calhoun, 1995). Positive changes have been posited to occur in at least five


psychosocial resource domains: relating to others, personal strength, a sense of new possibilities, appreciation for life, and spirituality (Tedeschi & Calhoun, 1995). PTG has been investigated in the aftermath of a vast array of traumatic events, including natural disasters (Helgeson et al., 2006; Xu & Liao, 2011), with the large majority of participants reporting at least some degree of PTG.


Although research has shown that PTG is common among trauma survivors, it remains unclear whether the five domains of self-reported PTG are associated with pre- to posttrauma changes in related psychosocial resources and whether the strength of these associations varies in the short- versus long-term aftermath of trauma. This study draws from a large-scale dataset from survivors of Hurricane Katrina to examine whether the five domains of PTG are associated with pre- to posttrauma changes in related constructs at 4 years and 12 years after the disaster.

PTG and Pre- to Posttrauma Changes

Previous research suggests that PTG is associated with changes in a number of psychosocial resources (Triplett et al., 2012; Zhou et al., 2017), but relevant studies often have been conducted cross-sectionally or have included only posttrauma data. Hence, investigative efforts have relied on retrospective assessment of perceived change. As a result, it is unclear whether PTG corresponds to pre- to posttrauma changes in related constructs. For instance, some have suggested that any growth captured by PTG is merely a reflection of personal growth that occurs as part of normative development (McAdams & Olson, 2010). Meanwhile, others have described PTG as merely an illusory growth that is confounded by

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an individual's optimism and openness toward the trauma (Zoellner et al., 2008). Pre- and posttrauma data are needed to overcome this limitation by prospectively examining whether PTG corresponds to changes in levels of psychosocial constructs from before to after the significant life event.

To our knowledge, only two studies have drawn on pre- and post-trauma data to show how changes in psychosocial resources relate to PTG. First, Frazier et al. (2009) surveyed 1,281 undergraduate students (85% female; 77% White) at baseline and 8 weeks later, with both timepoints including measures of three psychosocial resources: positive relationships, meaning in life, and religiosity. In addition, they completed a "current standing" PTG inventory of psychosocial resources, with items corresponding to the Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996) and reflecting participants' experiences over the prior two weeks without reference to a particular event (e.g., one item of the "current standing" PTG inventory reads, "I have appreciated each day," whereas the corresponding PTGI item reads, "I can better appreciate each day"). Participants who reported a traumatic event between baseline and follow-up that caused at least considerable distress ($n = 122$) completed the PTGI in reference to that event. The researchers found a significant positive relationship between changes in religiosity and the PTGI Spiritual Change subscale as well as significant positive relationships between changes in the "current standing" PTG inventory and corresponding PTGI subscales.

Second, Yanez et al. (2011) assessed a sample of 152 undergraduates (83% female, 45% Asian, 23% White) at baseline and 6 weeks later, with each timepoint containing a measure of psychosocial resources (termed "personal attributes"). Those items, like the ones in the "current standing" PTG inventory of Frazier et al. (2009), corresponded to the PTGI but were phrased in reference to a participant's life in general, rather than in reference to a traumatic event (e.g., "I appreciate the value of my own life"). At follow-up, participants also completed the PTGI in reference to the event they considered to be the "most stressful" during the prior six weeks. The authors found that pre- to postevent changes in the personal attributes measure were not significantly related to PTGI scores.

The two studies assessing relationships between pre- to post-trauma changes in psychosocial resources and PTG produced mixed results, and suggest that patterns of significance may depend in part on the particular resource assessed (e.g., religiosity) versus other resources. The mixed results, along with the small number of studies, indicate that more research is needed on this topic. The extant research is further limited in at least five ways. First, participants completed assessments at a maximum of 2 months after the traumatic or stressful event. Given that constructive PTG is thought to develop over a longer time frame (Gangstad et al., 2009; Powell et al., 2007); participants' experiences of PTG might have been underestimated. Second, each study contained a wide range of reference events that likely varied in several dimensions, including their severity and duration, and these dimensions were not controlled in the analyses. Because the degree of trauma exposure has been found to significantly predict PTG, variability in events could have biased the results toward the null. Third, although the reference events in the study by Frazier et al. (2009) were drawn from a standard traumatic events inventory, some of the stressors experienced by participants assessed by Yanez et al. (2011) appeared to be of lower severity and might not qualify as traumatic events (e.g., academic difficulties). As such, these might

not have triggered the significant life disruption thought necessary for the development of PTG (Tedeschi & Calhoun, 2004). Finally, both samples consisted of mostly White and Asian undergraduate students and replication is needed in other populations.

PTG Domains and Related Constructs

Although research on whether PTG corresponds to pre-to-post changes in psychosocial resources is therefore limited, the existing empirical and theoretical literature suggest that PTG would be related to changes in at least three constructs, although the associations vary across the five domains of PTG. First, the literature suggests that changes in survivors' sense of life purpose would be related to PTG, both globally and in relation to all PTG domains. As the occurrence of a traumatic event shatters assumptions about the self and the world, survivors are presented with the challenge of reconstructing these assumptions and finding new meaning (Joseph & Linley, 2005). In this process, the individual may gain clarity toward life's meaning and personal values and priorities, thus leading to the various domains of PTG, and in particular experience an increased sense of purpose. Indeed, cross-sectional research has shown that PTG following adversity is positively associated with self-reported meaning in life (Triplett et al., 2012).

Second, the literature suggests that increases in religiosity would be associated with increased spirituality, a core component of PTG. As the individual attempts to make meaning from the traumatic event, they may turn to religious beliefs and practices to seek consolation and wisdom. This could result in development or strengthening of spiritual beliefs (Siegel & Schrimshaw, 2000), which can be helpful in the individual's recovery process (Shaw et al., 2005). Research has shown that religiosity and religious coping are positively associated with global PTG in survivors of natural disasters (Chan & Rhodes, 2013); cancer survivors (Bellizzi et al., 2010); and persons bereaved by a violent loss (Currier et al., 2013). Research by Currier et al. (2013) also highlighted that the associations between indicators of religiosity and the spirituality component in the PTGI are particularly prominent.

Third, prior research suggests that increases in social support would correspond to an increased valuing of and reliance on relationships, another core component of PTG. In the time of crisis, social support is an important protective factor that buffers future psychological distresses (Paul et al., 2015). Cross-sectional studies have found that PTG is associated with perceived social support in a number of populations, including survivors of natural disaster (Zhou et al., 2017) and those who are chronically ill (McDonough et al., 2014). Notably, the relationship between social support and PTG is particularly prominent when the individual is able to create meaning from the trauma, which indicates that meaning-making and social support possibly complement each other to facilitate increase in PTG (Zeligman et al., 2018). Besides the association between perceived social support and global PTG, researchers have found that perceived social support is most strongly associated with the Relating to Others subscale in PTGI (Danhauser et al., 2013; Tallman et al., 2010).

Current Study

The current study included participants who were mostly non-Hispanic Black, low-income mothers and who survived Hurricane

Katrina. Approximately 1 year prior to the hurricane (Time 1; T1), 4 years after the hurricane (Time 2; T2) and 12 years after the hurricane (Time 3; T3), they completed inventories of psychosocial resources corresponding to the five domains of PTG, including purpose in life, perceived social support, and two indicators of religiosity (religious importance and religious attendance). At T2, they also completed the PTGI. We assessed whether changes in resource inventories were significantly associated with corresponding domains of the PTGI. In particular, based on similarity of the constructs being measured, we hypothesized that (a) pre- to posttrauma changes in purpose in life would be positively associated with the PTGI full scale and all subscales; (b) changes in indicators of religiosity would be positively associated with the PTGI Spiritual Change subscale score; and (c) changes in perceived social support would be positively associated with the PTGI Relating to Others subscale score.

Method

Participants and Procedure

The current study included three waves of data from a large multiwave longitudinal study of low-income parents who survived Hurricane Katrina in New Orleans in August 2005. Participants were students in three community colleges across New Orleans. Prior to Hurricane Katrina, they had enrolled in a longitudinal study of an educational intervention designed to encourage community college retention and graduation (Richburg-Hayes et al., 2009). Institutional review boards from Harvard University, Princeton University, and University of Massachusetts Boston approved the study.

At baseline (i.e., upon enrollment in the study and prior to random assignment) participants provided primarily demographic information (e.g., age, race, number of children), as well as some basic physical and mental health data ($n = 1,019$). Nearly half of the participants ($n = 493$) had completed a more comprehensive 12-month follow-up survey (at T1), administered over the telephone by trained interviewers, approximately one year prior to Hurricanes Katrina and Rita, which made landfall in August and September 2005, respectively. Because this group completed more comprehensive predisaster surveys, with relevant variables, and were most closely followed in the aftermath of the disaster, they are the focus of this study. The T1 survey included measures of social support, religious importance, frequency of religious service attendance, and purpose in life. From April 2009 to March 2010, approximately 4 years post-Katrina, participants were located and surveyed, again over the telephone (Time 2; T2). From November 2016 to November 2018, approximately 12 years post-Katrina, participants were once again located and surveyed either by telephone or online (Time 3; T3). Both T2 and T3 surveys contained the same measures as the T1 survey, as well as a measure of PTG and Katrina-related trauma exposure.

Participants provided written consent to study participation. The current study sample includes only those participants who completed all three waves ($N = 328$, 66.5% of the T1 sample). As data from male participants were not collected at T3, the sample consists of female participants only. This is important to note, as

gender is known to affect postdisaster psychological outcomes (Norris et al., 2002) and PTG (Xu & Liao, 2011).

At T1, the mean age of the final sample of women was 25.57 ($SD = 4.39$) and their average number of children at T1 was 1.81 ($SD = .99$). The majority of participants (85.2%) self-identified as Black, whereas 10.1% identified as White, and 3.1% as Hispanic. All the participants were exposed to Hurricane Katrina, and nearly half (46.6%) to Hurricane Rita, which hit New Orleans about 3 weeks after Katrina.

Measures

Posttraumatic Growth

PTG was measured at T2 and T3 using the 21-item PTGI (Tedeschi & Calhoun, 1996). Participants rated the extent to which they experienced psychological changes as a result of Hurricane Katrina on a 5-point scale, ranging from 0 (*not at all*) to 4 (*extremely*). The PTGI has five subscales: Relating to Others (seven items; e.g., "I have a greater sense of closeness with others"), Personal Strength (four items; e.g., "I have a greater feeling of self-reliance"), New Possibilities (five items; e.g., "I am able to do better things with my life"), Appreciation of Life (three items; e.g., "I can better appreciate each day"), and Spiritual Change (two items; e.g., "I have a stronger religious faith"). Cronbach's α reliability for the PTGI total scale in this study was .92 at T2 and .95 at T3. Furthermore, Cronbach's α reliability for PTGI subscales ranged from .72 to .83 at T2 and ranged from .73 to .89 at T3.

Psychosocial Resources

Inventories of constructs corresponding to the subscales of the PTGI were included at T1, T2, and T3. First, a measure of *purpose in life* was included as relevant to PTGI full scale and all PTGI subscales. The MacArthur Network on Transitions to Adulthood developed a 13-item Sense of Self measure for the evaluation of the Opening Doors program (Brock & Richburg-Hayes, 2006) of which purpose in life was one of two subscales, consisting of seven items (e.g., "You feel your life is filled with meaning, a sense of purpose," "You can envision the type of person you'd like to become"), rated on a 4-point Likert-type scale from 0 (*strongly disagree*) to 3 (*strongly agree*). The full scale has been shown to be reliable and associated with educational achievement (Scrivener et al., 2008). Cronbach's α of the purpose in life subscale for the current study was .79, .86, and .87 at T1, T2, and T3, respectively.

Second, *religiosity* was included as corresponding to the PTGI Spiritual Change subscale. Religiosity was measured using two single-item questions asking about the frequency of attending religious services and the importance of religion to the participant. Report of religious services attendance was based on a 5-point scale ranging from 0 (*never*) to 4 (*several times per week*). Responses to the religious importance item ranged from 0 (*not at all important*) to 4 (*very important*).

Third, a measure of *perceived social support* was included as corresponding to the PTGI Relating to Others subscale. Perceived social support was assessed using nine items from the Social Provisions Scale (Cutrona & Russell, 1987), previously shown to have good validity and reliability (Cutrona et al., 1986). Items

were rated using a 4-point Likert-type scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). Sample items are “There are people I know will help me if I really need it” and “If something went wrong, no one would help me.” Cronbach’s α was .82, .80, and .86 at T1, T2, and T3, respectively.

Covariates

Demographic characteristics including age, race, and number of children were collected from participants at baseline. Participants were also asked to indicate (Yes/No) whether they were exposed to seven items of Katrina-related trauma exposure at T2 and T3. These items included lack of fresh water, lack of food, lack of necessary medicine, lack of access to medical care for self, lack of medical care for family, and missing family members in the week after Hurricane Katrina, as well as Katrina-related bereavement. Participants who indicated exposure of an individual item at either timepoint were counted as being exposed for that exposure item. The number of trauma exposures were totaled up to indicate a final trauma exposure score with a maximum of seven Katrina-related trauma exposures.

Data Analysis

Data analysis consisted of five steps. First, we conducted missing data analyses using chi-tests and analysis of variance (ANOVA) to assess for sociodemographic differences between the analytic sample and full sample. Second, we calculated change scores of related constructs by subtracting each T1 score from the scores in the respective subsequent waves. Third, using these change scores, we calculated the percentage of participants who reported reliable change for each related measure, defined as change beyond that explainable by measurement error (Jacobson & Truax, 1991). Two exceptions were the single-item variables of religious importance and frequency of religious service attendance. As it is difficult to calculate reliable change accurately for single item variables, we simply noted the percent of participants who experienced an increase or decrease in these variables. Fourth, we examined bivariate correlations between the PTGI total and subscale scores and the raw change scores of parallel measures at T2 and at T3. Finally, we conducted multivariable linear analyses to examine whether T2 and T3 psychosocial resources significantly predicted PTG at their respective timepoints while

controlling for psychosocial resources at T1. All multivariable regression equations also controlled for age, Hispanic ethnicity, Black race, number of children, and Katrina-related trauma exposure.

Results

Preliminary Analyses

Means and standard deviations of study variables are presented in Table 1. Missing data analyses revealed no significant differences between the analytic sample and the full sample in age, $F(1, 1018) = 2.69, p = .10$, Hispanic ethnicity ($\chi^2 = .24, p = .63$), Black race ($\chi^2 = .02, p = .89$), and number of children, $F(1, 1016) = .01, p = .99$.

Changes in Psychosocial Resources

The reliable decreases and increases in psychosocial resources between T1 and subsequent timepoints are reported in Table 1. We found reliable increases in from 6 to 33% of participants from pre- to posttrauma at T2, and reliable increases in from 10 to 26% of participants from pre- to posttrauma at T3. For both timepoints, the greatest pre- to post-Katrina increases were seen in religious attendance, followed by perceived social support. We also found reliable decreases in from 22 to 80% of the participants from pre- to posttrauma at T2, and reliable decreases in from 24 to 43% from pre- to posttrauma at T3. Religious importance had the largest decrease at T2 and religious attendance had the largest decrease at T3.

Bivariate Analysis

The bivariate associations between PTGI and the respective changes in psychosocial resources for T2 and T3 are reported in Table 2. At T2, changes in purpose in life were positively associated with all PTGI subscales except for Appreciation for Life and Spiritual Change. Changes in perceived social support were positively associated with Relating to Others, and changes in religious importance were negatively associated with Personal Strength. At T3, changes in purpose in life were positively associated with all PTGI subscales except for Spiritual Change. Meanwhile, changes in perceived social support were positively associated with PTGI subscale Relating to Others, and changes in religious importance

Table 1
Means, Standard Deviations, and Reliable Change of Included Variables (N = 328)

Variable	T1 <i>M (SD)</i>	T2 <i>M (SD)</i>	T3 <i>M (SD)</i>	T2-T1 reliable increase	T2-T1 reliable decrease	T3-T1 reliable increase	T3-T1 reliable decrease
PTGI-Full scale	—	61.11 (17.12)	59.18 (20.14)	—	—	—	—
PTGI-Relating to others	—	18.45 (6.87)	18.39 (7.39)	—	—	—	—
PTGI-Personal strength	—	12.46 (3.62)	12.20 (4.08)	—	—	—	—
PTGI-New possibilities	—	14.00 (4.78)	13.90 (5.54)	—	—	—	—
PTGI-Spiritual change	—	6.14 (2.45)	5.51 (2.74)	—	—	—	—
PTGI-Appreciation for life	—	9.86 (2.71)	9.23 (3.05)	—	—	—	—
Perceived social support	3.30 (0.48)	3.21 (0.45)	3.21 (0.55)	13.98%	22.05%	18.99%	26.90%
Religious importance ^a	3.56 (0.87)	2.74 (0.62)	3.16 (1.19)	6.42%	79.51%	10.25%	31.37%
Religious attendance ^a	2.35 (1.30)	2.80 (0.92)	1.93 (1.41)	33.07%	25.50%	26.09%	43.48%
Purpose in life	18.91 (2.49)	18.12 (3.21)	18.26 (3.43)	12.58%	23.62%	18.32%	24.22%

Note. PTGI = Posttraumatic Growth Inventory.

^aPercentage of participants showing increase/decrease rather than reliable change.

Table 2
Correlation Matrix of Change Scores and PTGI Full Score and Subscales at Times 2 and 3

Change score	PTGI domain					
	Full scale	Relating to others	Personal strength	New possibilities	Appreciation for life	Spiritual change
Time 2						
Perceived social support	0.07	0.14*	0.02	0.02	0.03	0.03
Religious importance	-0.1	-0.07	-0.11*	-0.11	-0.08	-0.04
Religious attendance	-0.07	-0.1	-0.04	-0.06	-0.07	0.05
Purpose in life	0.17**	0.18**	0.15**	0.17**	0.08	0.09
Time 3						
Perceived social support	0.14*	0.22***	0.1	0.11	0.02	0.05
Religious importance	0.09	0.08	0.05	0.06	0.06	0.29***
Religious attendance	<0.01	0.02	-0.04	0.01	-0.09	0.10
Purpose in life	0.25***	0.17**	0.25***	0.33***	0.18**	0.11

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

were positively associated with Spiritual Change. Changes in religious attendance were not significantly associated with any PTGI indicators at either T2 or T3.

Multivariable Analysis

The results of multivariable linear regressions are reported in Table 3. The results demonstrated similar patterns of associations at both T2 and T3. At T2, after controlling for sociodemographic information, Katrina-related trauma exposure, and baseline indicators, higher purpose in life was found to be associated with higher Full Scale PTG and all PTGI subscales except for Appreciation for Life, higher perceived social support with higher Full Scale PTG and Relating to Others, religious importance with higher Spiritual Change, and religious attendance with lower Personal Strength.

At T3, after controlling for sociodemographic information, Katrina-related trauma exposure, and baseline indicators, higher purpose in life was found to be associated with higher Full Scale PTG and all PTGI subscales, higher perceived social support with higher Relating to Others, and higher religious importance with higher Relating to Others and Spiritual Change.

Discussion

The purpose of this study was to examine how the PTGI may be associated with pre- to posttrauma changes in related constructs of PTG at four years and 12 years after the trauma. We found small but significant correlations between pre- to post-trauma changes in specified measures and the PTGI subscales hypothesized to parallel them at both timepoints. Specifically, both our bivariate and multivariable analyses showed that changes in purpose in life were positively associated with PTGI Full Scale, changes in perceived social support were positively associated with PTGI subscale Relating to Others, and changes in religious importance were positively associated with PTGI subscale Spiritual Change.

Our findings parallel some of the findings from the two prior studies that have examined associations between changes in pre- to post-trauma psychological resources and PTGI subscales. As with Frazier et al. (2009), we found that changes in religious importance were significantly related to the PTGI Spiritual Change subscale in bivariate correlations at T3, as well as in multivariable regressions at T2 and

Table 3
Results of Multivariable Regression Analyses Predicting Times 2 and 3 PTGI Subscales

Change score	PTGI domain											
	Full scale		Relating to others		Personal strength		New possibilities		Appreciation for life		Spiritual change	
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
Time 2												
Perceived social support	6.32*	2.79	3.97***	1.10	0.65	0.63	0.43	0.80	0.69	0.48	0.47	0.37
Religious importance	-0.98	4.65	-0.83	1.83	-0.65	1.05	-0.89	1.34	0.10	0.81	1.31*	0.62
Religious attendance	-1.64	1.29	-0.66	0.51	-0.63*	0.29	-0.53	0.37	-0.18	0.22	0.00	0.17
Purpose in life	1.21***	0.36	0.41**	0.14	0.27***	0.08	0.32**	0.10	0.12	0.06	0.09*	0.05
Time 3												
Perceived social support	1.80	2.28	2.37**	0.86	-0.15	0.45	0.10	0.63	-0.29	0.35	-0.32	0.30
Religious importance	2.34	1.24	1.00*	0.47	0.10	0.25	0.35	0.34	0.26	0.19	0.81***	0.17
Religious attendance	0.14	1.00	-0.01	0.38	0.06	0.20	-0.18	0.28	-0.17	0.15	0.22	0.13
Purpose in life	1.78***	0.37	0.43**	0.14	0.46***	0.07	0.53***	0.10	0.23***	0.06	0.13*	0.05

Note. All equations controlled for age, Hispanic ethnicity, Black race, number of children, trauma exposure, and psychosocial resources at time 1.
* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

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T3. Thus, we provide additional evidence that the PTGI appears to correspond to pre- to posttrauma change in religiosity. Interestingly, changes in religious attendance were not found to be significantly associated with the PTGI Spiritual Change subscale at both timepoints, suggesting that this subscale captures an individual's religious values, rather than external expressions of one's religiosity.

In addition, Frazier et al. (2009) found that pre- to posttrauma changes in a "current standing" version of the PTGI were significantly but moderately associated with corresponding PTGI subscales. We likewise found that changes in constructs of social support and purpose in life were associated with related PTGI subscales. Unlike in our study, Frazier et al. (2009) did not find associations between PTGI subscales and pre- to posttrauma changes in measures of positive relationships and meaning in life. And, unlike Yanez et al. (2011), the only other study to compare pre- to posttrauma changes in similar constructs with the PTGI, we found significant associations.

We also noted the strongest relationships between pre- to posttrauma changes in purpose in life and PTGI full scale as well as multiple PTG subscales (Relating to Others, Personal Strength, and New Possibilities) in both bivariate and multivariable analyses. This suggests that creating meaning and building a sense of purpose posttrauma may be a general driver of PTG, not specific to any single PTG domain. Indeed, meaning-making has long been considered central to the cognitive processing of trauma that has been found to lead to PTG (Park, 2010); and measures of meaning in life have previously been positively associated with PTG (Triplett et al., 2012). Future research should further examine the relationship between building a sense of purpose posttrauma and PTG.

It is also noteworthy that, whereas perceived social support and Relating to Others were consistently associated over the course of the study, perceived social support and PTGI full scale were not. Specifically, in the bivariate analyses, changes in perceived social support were associated with PTG Full-scale at T3, but not at T2. In contrast, in the multivariable analyses, perceived social support was associated with PTG Full Scale at T2, but not at T3. It may be the case that the associations between the two constructs were heavily influenced the covariates in the multivariable analyses. For instance, a number of Katrina-related trauma exposures indicated relational stressors and losses, which could impact both perceived social support and PTG Full Scale, and perhaps the relationship between them as well. Indeed, research has shown that experiencing bereavement through sudden deaths are more likely to have barriers in accessing support from their social networks and perceived less social support overall (Dyregrov et al., 2018; Frost et al., 2017). It is also possible that the associations between changes in perceived social support is not a strong driver of PTG Full Scale, particularly when social networks continue to change within the postdisaster period. Finally, it is worth noting that the bivariate analysis includes a perceived social support pre- to postdisaster change score, whereas the multivariable analysis included postdisaster perceived social support and controlled for predisaster perceived social support. It is possible that the different analytic approaches could underlie the different pattern of results. These inconsistent findings suggest that further research on the association between changes in perceived social support and PTG Full Scale is warranted.

Although further research in this area is needed, the current study adds to the prior research in several ways. First, we were able to examine and measure pre- to posttrauma changes that occurred over several years' time, as opposed to the several weeks' duration of prior studies. This is important as PTG appears to develop and shift over time (Gangstad et al., 2009; Powell et al., 2007). Moreover, we presented results from two timepoints after the trauma (i.e., 4 years and 12 years), providing evidence for the stability of the associations over time. Second, participants in prior studies reported a range of stressful experiences, some of which may have not created the level of stress that would prompt the development of PTG. This may have weakened associations between PTG and some of the related constructs examined by those studies, potentially because these events were not sufficiently impactful to trigger PTG. Unlike prior studies, we were able to use an index trauma (exposure to Hurricane Katrina) that was the same for all participants, and that is defined as traumatic across commonly used inventories of traumatic events (Breslau et al., 1998; Mills et al., 2011). Third, whereas both prior studies were limited to undergraduate student samples, our study extended the research by examining a sample of a typically understudied population—young, low-income, Black mothers. Fourth, we examined our research question through two statistical methodologies, providing stronger evidence about the associations between PTGI and related psychosocial resources.

Implications

Taken together, these results provide support for the proposition that retrospectively self-reported PTG corresponds to actual measured changes over time in related constructs—including social support, purpose in life, and religiosity. Our results indicate that increases in perceived social support, purpose in life, and religiosity—all of which have been independently linked to lower distress and greater psychological well-being (Lowe et al., 2010; Zebrack & Chesler, 2002) – are predictive of PTG, even 12 years after occurrence of the trauma. This pattern of results suggests that PTG may be an indicator of positive development among trauma survivors. Helping survivors rebuild a social support structure and sense of purpose through posttrauma clinical interventions could therefore not only reduce symptoms, but also lead to PTG. Particularly in Black American communities, religiosity has also been found to be protective against maladaptive psychological outcomes such as substance use (e.g., Meyers, 2017). Thus, clinicians may wish to attend to survivors' spirituality in their therapeutic work. As our results suggested that PTG is significantly associated with religiosity but not religious attendance, clinicians should adopt a person-centered approach to the multifaceted ways survivors may want to express their spirituality and religiosity.

Limitations

This study has several limitations, in part because it was not originally designed to test the convergence between change in related measures and the PTGI. First, the measures of related constructs differed from the PTGI in terms of assessment instructions, content, and item wording to varying degrees. Thus, we may have underestimated associations between change in related psychosocial constructs and PTG.

Further, all measures used in this study were self-report questionnaires. To mitigate shared method variance issues, future research should collect data from multiple reporters, especially in relation to the hypothesized dimensions of PTG, and across behavioral indicators. Future longitudinal studies should also compare PTG as assessed retrospectively to temporal changes in measures that more closely track the PTGI, as well as to other indices such as behavioral changes over time.

Finally, the sample in this study consisted predominantly of low-income young mothers who identified as non-Hispanic Black, and who were all community college students in the New Orleans area upon enrollment in the original study. Examining the validity of the PTGI in such an understudied population is important; however, because these women are likely not representative of Hurricane Katrina survivors on the whole, nor of low-income Black women who experienced the storm, the generalizability of these findings is limited. Furthermore, it is important to note that survivors of different traumas may experience PTG in different ways (Lowe et al., 2020). Hence, the results of this study also may not generalize to survivors of other disasters or traumatic events.

Conclusion

Despite these limitations, this study demonstrated multiple links between the PTGI subscales and pre- to posttrauma changes in parallel constructs. The results contribute to the nascent literature on whether reports of PTG correspond to actual pre- to posttrauma psychological changes. Further research on this topic is needed to parse out the conditions under which PTG is associated with actual adaptive change, and when such changes might translate into mental health benefits.

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