

Children's Adjustment Following Hurricane Katrina: The Role of Primary Caregivers

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Hurricane Katrina severely disrupted the lives of many children and families in the central Gulf Coast of the United States. Face-to-face interviews with child-caregiver dyads were conducted at approximately 1 year posthurricane (T1) and 6–10 months later (T2). The contribution of several factors—caregiver's self-reported symptomatology and coping advice and child perceptions of caregiver distress, unavailability, warmth, and caregiver-child conflict—to child-reported posttraumatic stress symptoms (PTSS) and depressive symptoms was examined. Findings provide partial support for the importance of the caregiving context to children's adjustment. Specifically, higher levels of caregiver-child conflict at T1 were associated with more PTSS at T2, controlling for baseline symptoms. In contrast, higher levels of caregiver education were negatively related to child PTSS at T2. After adjusting for objective hurricane exposure and symptoms at T1, none of the caregiving variables was related to child-reported depressive symptoms at T2. The implications of these findings for efforts to promote children's adjustment after disaster are discussed.

Hurricane Katrina caused extensive devastation, loss of life, and the forced relocation of over one million people in the central Gulf Coast (Hunter, 2006). In Katrina's aftermath, children and families experienced substantial adversity in the form of further trauma exposure (Gil-Rivas, Kilmer, Hypes, & Roof, 2010; Weems et al., 2007) and difficulties meeting basic needs (Kilmer & Gil-Rivas, 2010a) that persisted for months and years (Osofsky, Osofsky, Kronenberg, Brennan, & Hansel, 2009; Save the Children, 2006).

Exposure to such a far-reaching disaster can contribute to posttraumatic stress symptoms (PTSS; Davis & Siegel, 2000; Dyregrov & Yule, 2006; Norris et al., 2002; Pfefferbaum, 1997), anxiety, depressive symptoms (Goenjian et al., 1995; Pine & Cohen, 2002), and behavioral and academic difficulties (La Greca, Silverman, & Wasserstein, 1998; Scheeringa & Zeanah, 2008) among children. In the case of Katrina, youth in areas heavily impacted by the hurricane continued to have elevated trauma symptoms 30 months following the disaster (Weems et al., 2010). Similarly, findings from a school-based study indicated that 41% of youths exposed to the hurricane were in need of mental health services nearly 2 years later (Osofsky et al., 2009).

Disasters and other major stressful events, however, do not always lead to symptoms of clinical significance or to long-lasting social and behavioral difficulties in children. Rather, the impact of these events is contingent on event-related factors (e.g., degree of exposure, harm and perceived threat, and secondary adversity), child characteristics (e.g., age, sex, ethnic

background, and predisaster functioning), and the characteristics and functioning of youths' postevent social context (Şahin, Batigün, & Yilmaz, 2007; Scheeringa & Zeanah, 2001; Silverman & La Greca, 2002). The caregiver-child relationship is a core proximal influence and a central element of children's social context and thus is of particular importance postdisaster (Kilmer & Gil-Rivas, 2010b; Laor, Wolmer, & Cohen, 2001; Scheeringa & Zeanah, 2001).

The Role of Caregivers in Children's Postadversity Adjustment

Interactions within the caregiver-child dyad, reflecting the overall quality of the relationship (i.e., perceived warmth and conflict), specific caregiving behaviors, and caregivers' responses to their children's emotional needs and distress, are meaningful contributors to children's stress-related appraisals, coping behaviors, and adjustment (e.g., Eisenberg & Valiente, 2004; Masten, Best, & Garnezy, 1990). For example, warm and supportive parenting has been shown to foster positive adaptation in the face of stress (Klingman, 2001; Masten & Coatsworth, 1998) and trauma (Valentino, Berkowitz, & Stover, 2010). In contrast, caregiver-child relationships characterized by high levels of conflict (Gil-Rivas, Holman, & Silver, 2004) and hostile or coercive interactions (Kelley et al., 2010) may contribute to elevated PTSS and, more broadly, internalizing symptomatology (Valentino et al., 2010).

Unfortunately, the disruptions in families' social contexts associated with large-scale disasters may limit caregivers' ability to create or maintain a supportive and responsive family environment and to model and guide children's stress appraisals and coping (Kilmer & Gil-Rivas, 2010a; Margolin, Ramos, & Guran, 2010). Furthermore, caregivers struggling with poverty and limited financial resources may have greater difficulties

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maintaining a predictable and structured home environment (Evans, Gonnella, Marcynyszyn, Gentile, & Salpekar, 2005), including developing or reestablishing routines and expectations in the home, which may place their children at a greater risk of poor adjustment.

Changes in family routines, as well as social and tangible resources in the aftermath of disaster, may increase caregivers' stress and interfere with their ability to parent and maintain an environment in which children can process these experiences (Bosquet, 2004; Korol, Green, & Gleser, 1999; Laor et al., 2001). Under these circumstances, caregivers may experience difficulties engaging in responsive parenting practices, that is, being aware of their child's needs and acting on those needs (Alisic, Boeije, Jongmans, & Kleber, 2012). For example, in the aftermath of disaster, caregivers may have difficulties creating an environment in which they can have open and supportive conversations with their children about the event, their emotions and concerns, and ways to cope. These challenges have implications for children's adaptation in the postdisaster context.

A significant body of research has documented linkages between caregiver functioning and mental health and child adjustment (e.g., Cicchetti & Toth, 1998; Downey & Coyne, 1990). For example, caregiver distress has been shown to be negatively associated with children's coping (Cappa, Begle, Conger, Dumas, & Conger, 2011) and competence in emotion regulation (Valiente, Fabes, Eisenberg, & Spinrad, 2004). On the other hand, positive caregiver mental health has been associated with child resilience among profoundly stressed children, a finding attributed, at least in part, to the influence of caregiver well-being on the establishment of an emotionally responsive caregiving environment (e.g., Kilmer, Cowen, & Wyman, 2001; Luthar, 2010; Wyman et al., 1999).

Findings regarding the contribution of caregivers' symptoms to their children's adjustment following disaster exposure are mixed. Some studies have found that caregivers' PTSS, distress, and depressive symptoms are associated with higher levels of PTS and depressive symptoms among youth exposed to disaster (Gil-Rivas, Silver, Holman, McIntosh, & Poulin, 2007; Kilic, Özgüven, & Sayil, 2003; Meiser-Steadman, Yule, Dalgleish, Smith, & Glucksman, 2006; Scheeringa & Zeanah, 2008). In contrast, other studies have found that, after accounting for trauma exposure (Koplewicz et al., 2002) and child characteristics (Laor et al., 2001), caregivers' self-reported symptoms were not significantly associated with children's PTSS over time (Kelley et al., 2010; Koplewicz et al., 2002).

In addition to caregiver self-reported symptoms, children's perceptions of their caregivers' distress may contribute to greater trauma-related symptomatology (Cunningham, Kliever, & Garner, 2009; Dyregrov & Yule, 2006). Some evidence suggests that children's perception that their caregiver is too upset to talk about what happened may contribute to greater symptomatology among children (Gil-Rivas et al., 2007). In other words, children's perceptions that their caregiver is unavailable at a time when they may have a greater need for parental support and guidance may be a particularly salient influence on children's adjustment.

The type of coping advice provided by caregivers may be another mechanism by which caregivers influence children's adjustment (e.g., Kliever, Sandler, & Wolchik, 1994). For instance, engagement coping strategies such as problem solving

and support seeking have been shown to be associated with lower levels of internalizing and externalizing symptoms (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001). Unfortunately, relatively few studies have examined the role of caregiver advice in the context of mass traumas. The current evidence suggests that positive reframing, emotional expression, and acceptance are associated with lower levels of youth-reported distress (see, e.g., Gil-Rivas et al., 2007) following trauma exposure.

Given mixed findings in the literature, this study examined the contribution of aspects of the caregiver-child relationship (i.e., perceived caregiver warmth, child-caregiver conflict, and perceived parental unavailability to discuss feelings and concerns) and caregiver-reported symptoms to child-reported PTSS and depressive symptoms nearly 2 years following Hurricane Katrina. Specifically, we expected that:

- After adjusting for baseline (T1) symptoms, higher levels of perceived parental warmth and acceptance and caregiver coping advice involving positive reappraisal and active coping at T1 would be associated with lower levels of PTSS and fewer depressive symptoms nearly 2 years following the hurricane (T2).
- Children's perceptions of caregivers' distress, their concerns about upsetting their caregivers by talking about their feelings, and perceived caregiver-child conflict at T1 would contribute to greater child symptom severity at T2.
- Caregiver-reported PTSS, distress, and coping advice involving avoidance and denial at T1 would be associated with more severe symptoms at T2.

Method

Participant Recruitment and Study Design

Children and their primary caregivers participated in face-to-face interviews at two time points, roughly 1 year (T1; $M = 12.62$ months, $SD = 4.08$) and approximately 2 years following the hurricane (T2; $M = 22.36$ months, $SD = 3.25$). Participants were recruited in the Baton Rouge and New Orleans, LA metropolitan areas and along the Mississippi Gulf Coast. Interviews were conducted by psychology faculty members and trained graduate research assistants at participants' homes or at locations convenient to caregivers, including within Federal Emergency Management Agency (FEMA)-operated trailer parks, public libraries, and other locations. At T1, participants included 68 caregiver-child dyads; of these, 53 completed the T2 interview (76% retention). Caregivers were compensated with gift cards at each time point for their participation and that of their child. The study was approved by the University of North Carolina at Charlotte and the Louisiana State University Institutional Review Boards.

Measures

Children completed the following measures at T1, unless otherwise noted.

Children's hurricane exposure. Trauma exposure, as defined by the *DSM-IV* PTSD criteria (American Psychiatric

Association [APA], 1994), was assessed with part I of the child version of the UCLA-Posttraumatic Stress Reaction Index Revision 1 (UCLA-PTSD RI-1; Pynoos, Rodriguez, Steinberg, Stuber, & Frederick, 1998). Specifically, children responded to seven items assessing objective exposure (criterion A1, "the person experienced, witnessed, or was confronted with an event or events that involve actual or threatened death or serious injury; or threat to the physical integrity of himself or herself or others"; APA, 1994, p. 427) and five items assessing subjective exposure (criterion A2, a response to the event that involves "intense fear, helplessness, or horror"; APA, p. 428). Summary scores of items endorsed for objective and subjective exposure were created.

Children's posttraumatic stress symptoms. The UCLA-PTSD RI-1 (Pynoos et al., 1998) was also used at both T1 and T2 to assess children's hurricane-related *DSM-IV* (APA, 1994) PTSD symptoms: reexperiencing (i.e., intrusive memories, nightmares; five items), arousal (i.e., irritability, sleep difficulties, concentration problems; five items), and avoidance (i.e., avoiding people, activities, feelings, detachment; eight items). Children reported how much of the time they had experienced these symptoms during the past month using a scale ranging from 0 (*none*) to 4 (*most of the time*). A total score was computed. The index has demonstrated good internal consistency and test-retest reliability (Roussos et al., 2005); Cronbach's $\alpha_{T1} = .88$; $\alpha_{T2} = .83$.

Children's depressive symptoms. Children's self-reported symptoms were assessed at T1 and T2 using the 10-item Children's Depression Inventory-Short Version (CDI-S; Kovacs, 1992). Possible scores range from 0 to 20; a total score was computed ($\alpha_{T1} = .71$; $\alpha_{T2} = .58$). The drop in internal reliability of the measure may be explained by the small sample size and the fact that 35.8% of the children did not report depressive symptoms at T2. Although the alpha dropped below optimal levels, the T1 alpha was acceptable, and this measure has been widely used and researched, with its psychometric properties well documented (Kovacs, 1992). For these reasons, it was retained as one of the study's central indicators of outcome.

Perceived caregiver warmth and acceptance. Children completed a 10-item scale assessing perceptions of caregiver warmth and acceptance (e.g., "My caregiver really understands me;" "My caregiver enjoys spending time with me"; Greenberger & Chen, 1996). Respondents used a 1 (*not all true*) to 4 (*very true*) scale, and a mean score was created ($\alpha_{T1} = .68$).

Caregiver-child conflict. A nine-item scale was used to assess the frequency of caregiver-child conflict during the past month (Greenberger & Chen, 1996). The scale was modified to assess age-appropriate disagreements regarding schoolwork, friends, family relationships, chores, routines, physical appearance, and obedience. Children responded regarding the frequency of conflict using a scale ranging from 1 (*never*) to 4 (*almost every day*); the scale demonstrated adequate reliability ($\alpha_{T1} = .71$). A mean score was created.

Perceived caregiver distress. Children responded to a question assessing their perception of caregiver distress (i.e., "How upset was your caregiver about the hurricane?") during the past month, using a scale ranging from 0 (*not at all*) to 3 (*a great deal*). This item has been used in previous research (Gil-Rivas et al., 2007).

Perceived caregiver unavailability and distress. Children responded to the following questions: "How often did you feel your caregiver did not want to talk about Hurricane Katrina?" (i.e., perceived unavailability) and "How often was your caregiver too upset to talk about Hurricane Katrina?" (i.e., too upset) during the past month, using a scale ranging from 0 (*not at all*) to 3 (*a great deal*). These items were used in previous research (Gil-Rivas et al., 2007).

Caregivers completed the following measures at T1.

Demographic characteristics. Caregivers' age, gender, ethnic background, marital status, employment, annual income, and housing status were obtained. Caregivers also provided information regarding their child's age, grade, and ethnicity.

Caregiver posttraumatic stress symptoms. Caregivers completed the 17-item PTSD Checklist-Civilian (PCL; Weathers, Litz, Herman, Huska, & Keane, 1993) indicating how bothered they were by reexperiencing, avoidance, and arousal symptoms related to Hurricane Katrina during the previous 7 days. Participants responded about their experience using a scale ranging from 1 (*not at all*) to 5 (*extremely*); a mean score was computed ($\alpha = .93$).

Caregiver psychological distress. The frequency of depression, anxiety, and somatization symptoms over the past week was assessed with the Hopkins Symptom Checklist-25 (HSCL-25; Derogatis, Lipman, Rickels, Uhlenhuth, & Covi, 1974). Caregivers responded using a scale from 0 (*not at all*) to 3 (*extremely*); a mean score was computed ($\alpha = .96$).

Coping advice. Caregivers completed a 20-item scale assessing how frequently they encouraged their children to use the following strategies to cope with Hurricane Katrina and its aftermath: self-distraction, denial, active coping, avoidance, emotional support, positive reframing, planning, religious coping, and emotional expression (Gil-Rivas et al., 2007). The response scale ranged from 0 (*not at all*) to 4 (*most of the time*); total scale $\alpha = .89$.

Analytic Approach

Preliminary analyses were conducted to ensure that the data met normality assumptions. Correlational analyses examined the associations between caregiver self-reported symptoms and indicators of the caregiving context at T1 to children's PTSS and depressive symptoms at T2. Analyses were conducted with children who had complete data across both time points ($n = 47$). Variables that were found to be significantly associated with the outcomes at the bivariate level were tested for inclusion in the final hierarchical regression models. The following variables were tested for inclusion: child-reported hurricane

exposure (i.e., objective and subjective); caregiver characteristics (i.e., sex, employment status, age, education); children's perceptions of their caregiver's distress and unavailability; and caregiver self-reported PTSS, distress symptoms, and coping advice (i.e., self-distraction, denial, active coping, and avoidance). To develop the most parsimonious model, variables not significantly associated with the outcomes ($p > .05$) were excluded from the final model (Kleinbaum, Kupper, Muller, & Nizam, 1998). Multicollinearity diagnostics were examined, and no problems were identified.

Attrition Analyses

Analyses were conducted to determine whether children who did not participate at T2 ($n = 15$) were significantly different from those who completed the follow-up ($n = 53$). No significant differences were identified in demographic characteristics, PTSS and depressive symptoms at baseline, hurricane exposure, and other variables of interest.

Results

Nearly all children (97.0%) were directly exposed to Hurricane Katrina, and they reported exposure to an average of three hurricane-related events (see Table 1). Children, on average, were 8.5 years of age ($SD = 1.1$), and 56.1% were female. A majority of children were African American (77.3%), 15.2% were White, and 7.5% were from other backgrounds. Caregivers were predominantly female (87.9%), and, on average, they were 38.1 years old ($SD = 9.6$); 80.9% of them were the child's biological parent. Over half (63.6%) of caregivers had a GED or high school diploma or less; about one third (34.9%) were married or living as married, 31.8% were divorced or separated, and 33.3% were single. At T1, approximately two thirds (68.2%) of caregivers were unemployed; 56.1% reported an

annual household income of less than \$9,999, and an additional 16.7% had an income of less than \$20,000. Nearly all (95.7%) of the families had to evacuate their communities, and 90.0% lost their homes. Families moved an average of 3.1 times ($SD = 2.1$; range 0–11) in the year following the hurricane. At T1, 36.4% of participants were living in FEMA trailers, 16.7% in their own house or apartment, 37.9% in a rented apartment or house, 6.1% lived with relatives, and 2.9% reported other arrangements. At T2, 51.2% of caregivers were employed; 27.9% of the families were living in FEMA trailers, 16.3% in their own house or apartment, 41.9% in a rented apartment or house, 9.3% with relatives, and 4.6% had other arrangements.

Descriptive statistics for variables of interest are presented in Table 1. Children reported mild to moderate levels of PTSS and few symptoms of depression at T1 and T2. Overall, children perceived their parents as warm and accepting and reported moderate levels of caregiver-child conflict. Children reported that their caregiver was moderately distressed about the hurricane and that some of the time he or she was not available to talk and was too distressed to talk. Caregivers reported mild to moderate levels of PTSS at T1 and relatively low levels of distress.

The most frequent types of coping advice caregivers provided to their children in an effort to help them cope with Hurricane Katrina and its aftermath were as follows: seeking social support ($M = 3.52$, $SD = 0.75$), positive reframing ($M = 3.39$, $SD = 0.73$), religious coping ($M = 3.15$, $SD = 1.11$), avoidance ($M = 3.13$, $SD = 0.88$), self-distraction ($M = 3.11$, $SD = 1.09$), and planning ($M = 3.07$, $SD = 0.97$).

Correlates of Child-Reported PTSS

As expected, hurricane exposure (objective and subjective), caregiver PTSS and depressive symptoms, perceived caregiver distress, caregiver unavailability to talk, and children's perceptions that their caregiver was too upset to talk were positively associated with concurrent child-reported PTSS at T1 (see Table 2). In addition, caregiver education was negatively related to symptoms at T1 ($r = -.28$, $p < .05$), whereas caregiver coping advice involving self-distraction ($r = .40$, $p < .01$), active coping ($r = .36$, $p < .01$), avoidance ($r = .41$, $p < .01$), and denial ($r = .31$, $p < .01$) was associated with greater child-reported PTSS at T1. At T2, T1 PTSS, objective hurricane exposure, caregiver-child conflict, children's perceptions that their caregiver was too upset to talk, and caregiver coping advice involving avoidance ($r = .44$, $p < .01$) and support seeking ($r = .27$, $p < .05$) were related to the higher levels of child-reported PTSS. In contrast, caregiver education was associated with lower symptomatology ($r = -.46$, $p < .01$) at T2.

The final hierarchical regression analyses indicated that, after accounting for PTSS at T1, higher levels of caregiver education were associated with lower child-reported symptoms at T2 (see Table 3). As expected, greater caregiver-child conflict was also associated with higher levels of child-reported PTSS at T2. Contrary to expectations, none of the other caregiver-related variables made a unique contribution to child self-reported PTSS at follow-up.

Table 1. Descriptive Statistics for Key Variables of Interest

	<i>M</i> (<i>SD</i>)	Scale range
Hurricane exposure (PTSD criterion A1)	3.13 (1.86)	0–7
Subjective hurricane exposure (PTSD criterion A2)	2.54 (1.55)	0–5
Posttraumatic stress symptoms (child reported)		
Baseline (T1)	27.81 (16.02)	0–72
Follow-up (T2)	23.79 (12.53)	
Depressive symptoms (child reported)		
Baseline (T1)	2.72 (2.68)	0–20
Follow-up (T2)	1.94 (2.21)	
Perceived caregiver warmth and acceptance T1	3.27 (0.50)	0–4
Caregiver-child conflict T1	1.95 (0.62)	0–3
Perceived caregiver distress T1	1.82 (1.16)	0–3
Caregiver unavailable to talk T1	0.89 (1.16)	0–3
Caregiver too upset to talk T1	0.94 (1.19)	0–3
Caregiver PTSS T1 (self-report)	2.62 (1.06)	1–5
Caregiver distress T1 (self-report)	1.08 (0.78)	0–3

Note. PTSS = posttraumatic stress symptoms.

Table 2. Correlations Among Variables of Interest

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. PTSS T1	—	.49***	.42***	.36**	.60***	.60***	.31*	.26*	.01	.32*	.37**	.37**	.54***
2. PTSS T2		—	.33*	.27†	.38**	.27†	.32*	.25†	-.16	.48**	.17	.14	.41**
3. Depressive symptoms T1			—	.54***	.38**	.44***	.12	.07	-.36**	.32*	.08	.17	.12
4. Depressive symptoms T2				—	.48***	.19	.17	.07	-.42**	.39**	.30*	.26†	.28†
5. Hurricane exposure—objective					—	.51***	.06	.06	-.18	.32*	.37***	.21	.29*
6. Hurricane exposure—subjective						—	.19	.16	.15	.09	.22†	.27*	.27*
7. Caregiver PTSS T1							—	.89***	-.07	.29*	.14	.04	.18
8. Caregiver distress T1								—	-.08	.22†	.14	-.02	.14
9. Perceived caregiver warmth T1									—	-.24†	-.04	-.05	.04
10. Caregiver-child conflict T1										—	.22†	.03	.12
11. Perceived caregiver distress T1											—	.33*	.44***
12. Caregiver unavailable to talk T1												—	.33**
13. Caregiver too upset to talk T1													—

Note. Sample size T1 = 68; T2 = 47.

† $p = .06$. $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 3. Summary of Regression Analyses Predicting Children's Posttraumatic Stress Symptoms at T2

	Step 1			Step 2		
	<i>B</i>	β	95% CI	<i>B</i>	β	95% CI
Posttraumatic stress symptoms T1 ^a	0.29	.37**	0.09, 0.50	0.13	.16	-0.84, 0.34
Caregiver education	-2.32	-.35**	-4.03, -0.61	-1.96	-.30*	-3.54, 0.37
Caregiver-child conflict T1 ^b	—	—	—	7.19	.34**	2.20, 12.17
Parental coping advice—avoidance T1 ^c	—	—	—	3.13	.23†	-0.30, 6.60

Note. $N = 47$. ^aChild reported; ^bScale ranged from 1 (*never*) to 4 (*almost every day*); ^cScale ranged from 0 (*not at all*) to 4 (*most of the time*). The following variables were tested for inclusion in this model: child demographic characteristics (i.e., gender and ethnic background), child hurricane exposure, caregiver characteristics (i.e., employment status), caregivers' distress and PTSS, perceived caregiver distress (i.e., too upset to talk, unavailability), perceived parental warmth, and coping advice (i.e., self-distraction, active coping, and denial). Nonsignificant variables ($p > .05$) were not included in the final model. Model 1 Adjusted $R^2 = .32$, $p < .001$; Model 2 Adjusted $R^2 = .48$, $p < .01$.

^aChild reported. ^bScale ranged from 1 (*never*) to 4 (*almost every day*).

^cScale ranged from 0 (*not at all*) to 4 (*most of the time*).

† $p = .06$. * $p < .05$. ** $p < .01$.

Correlates of Depressive Symptoms

Hurricane exposure and PTSS were associated with greater child-reported symptoms at T1 (see Table 2). In contrast to the findings for PTSS, caregiver symptomatology and child perceptions of parental distress and unavailability to talk about the events at T1 were not significantly related to concurrent depressive symptoms. Children's perceptions of caregiver warmth ($r = -.36$, $p < .01$) and higher levels of caregiver education ($r = -.27$, $p < .05$) were negatively associated with T1 depres-

Table 4. Summary of Regression Analyses Predicting Children's Depressive Symptoms at T2

	Step 1			Step 2		
	<i>B</i>	β	95% CI	<i>B</i>	β	95% CI
Depressive symptoms T1 ^a	0.37	.48**	0.16, 0.57	0.29	.36**	0.08, 0.50
Objective hurricane exposure	0.39	.35**	0.11, 0.67	0.35	.31*	0.07, 0.63
Perceived caregiver warmth T1 ^b	—	—	—	-0.99	-.23†	-2.04, 0.05
Caregiver-child conflict T1 ^c	—	—	—	0.23	.07	-0.62, 1.08

Note. $N = 47$. ^aChild reported. ^bScale ranged from 1 (*never*) to 4 (*almost every day*); ^cScale ranged from 0 to 20. The following variables were tested for inclusion in this model: child demographic characteristics (i.e., gender and ethnic background), child hurricane exposure, caregiver characteristics (i.e., employment status), caregivers' distress and posttraumatic stress symptoms, and caregiver coping advice (i.e., self-distraction, avoidance, denial, active coping). Nonsignificant variables ($p > .05$) were excluded. Model 1 Adjusted $R^2 = .43$, $p < .001$; Model 2 Adjusted $R^2 = .46$, $p < .001$.

^aChild reported. ^bScale ranged from 1 (*never*) to 4 (*almost every day*).

^cScale ranged from 0 to 20.

† $p = .06$. * $p < .05$. ** $p < .01$.

sive symptoms. Of the coping advice offered by caregivers at T1, only denial ($r = .26$, $p < .05$) was significantly associated with symptoms at T1. At T2, objective hurricane exposure, perceived caregiver warmth, caregiver-child conflict, and caregiver self-reported distress at T1 were correlated significantly with children's self-reported depressive symptoms at follow-up (Table 2). Caregiver-reported coping advice and caregiver education were associated with children's depressive symptoms at T2.

The hierarchical regression model indicated that, after adjusting for depressive symptoms at T1 and objective hurricane exposure, none of the variables reflecting the caregiving context was significantly associated with child-reported depressive symptoms at T2 (see Table 4). Caregiver warmth at T1 was the

only “active” caregiver variable—it approached significance at $p = .06$.

Discussion

Although a significant body of research indicates that the caregiving context is of importance for children’s coping with stress (e.g., Luthar, 2003; Masten & Coatsworth, 1998; Wyman et al., 1999), relatively few studies have examined the contribution of key aspects of this context to children’s posttraumatic stress symptoms and psychological distress in the aftermath of disaster, particularly over a substantial time period. Both children and caregivers in this sample were exposed to high levels of adversity related to the hurricane and its aftermath. This study aimed to examine the contribution of several aspects of the caregiving context to child-reported PTSS and depressive symptoms 2 years following Hurricane Katrina. In turn, although several factors were correlated with concurrent PTSS and depressive symptoms roughly 1 year after the hurricane, the analyses investigating the contribution of study variables to T2 child symptoms were of particular relevance.

The study findings provided partial support for the importance of the caregiving context in the aftermath of disaster. Caregiver education was significantly associated with lower levels of child-reported PTSS at T2 after adjusting for symptoms at T1. It is possible that better educated parents had greater access to financial, personal, and social resources that allowed them to restore some normalcy to their children’s lives and to create a more responsive, stable, and predictable family environment. As expected, higher levels of caregiver–child conflict at T1 were associated with higher levels of PTSS at T2. A post-disaster caregiving context characterized by negative caregiver–child interactions may hinder children’s ability to process their experiences and effectively manage their emotions. Contrary to expectations, perceived caregiver warmth, parental PTSS and distress symptoms, and children’s perceptions of parental distress and unavailability were not related to child-reported symptoms at T2. This is surprising, as these factors can be viewed as indicators of the caregivers’ ability to create a supportive and positive environment for their children, which has been shown to be associated with better adjustment in the face of adversity. It is possible that these young children may not have been fully aware of their caregivers’ distress and reactions to the hurricane (a possibility supported by the lack of meaningful correlation between children’s perceptions of their caregivers’ distress, unavailability, and upset and caregivers’ reports of their own distress). Thus, they may not have been affected by their caregiver’s negative affect. Moreover, the fact that these children generally viewed their caregivers as warm and accepting lends some support to this idea. Contrary to expectations, parental coping advice was not significantly associated with child PTSS after controlling for baseline symptoms.

A different pattern of results emerged for depressive symptomatology. As expected, hurricane exposure (objective) was associated with higher levels of symptoms at T2, after accounting for baseline symptom levels. Contrary to expectations, none of the caregiver variables was significantly associated with depressive symptoms over time.

Study Limitations, Contributions, and Future Directions

This study has noteworthy strengths and limitations. Among its assets, few disaster studies have focused on the caregiver–child dyad and included reports from both children and their caregivers. Indeed, the inclusion of self-reported child symptomatology and caregiver-reported symptoms reduces concerns about reliance on caregiver reports of child symptoms. Also, the examination of both caregiver self-reported PTSS and distress symptoms as well as child-reported perceptions of caregiver distress and unavailability allowed exploration of the extent to which children’s perceptions of their caregiving environment contribute to adjustment in the aftermath of trauma. The significant follow-up period (i.e., nearly 2 years following Hurricane Katrina) is also an asset.

That said, the study also has several limitations that should be considered. First, the use of a small sample of convenience and the sample’s characteristics (i.e., evacuees, residents of FEMA-provided housing) also limit our ability to generalize these findings. In addition, given that 20% of the children in the sample did not live with their biological parent and that many of the children came from impoverished backgrounds, they may have experienced significant adversity prior to Hurricane Katrina (e.g., Osofsky et al., 2009). Such experiences may have influenced their appraisal of the event, their capacity to cope, and their access to services and supports in the aftermath of the hurricane. Further, the correlational nature of the data does not allow us to make causal attributions regarding the effects of caregiving variables on children’s adjustment postdisaster.

Nevertheless, this study contributes to this growing literature, as it is one of the few studies to include (a) data from caregiver–child dyads to assess the impact of the caregiving context on children’s adjustment postdisaster and (b) more than one indicator of functional outcome (i.e., PTSS and depressive symptoms). Further, in light of research suggesting that the onset of caregiver psychiatric symptoms (such as PTSD and depression) after trauma exposure relates strongly to the onset of new symptoms among their children (Scheeringa & Zeanah, 2008), this study also points to the value of attending to the needs of caregivers and their children months and even years after a large-scale disaster, particularly because they may still be facing challenges in their mental health functioning, their relationships, and other critical elements of their day-to-day worlds (see also Kilmer & Gil-Rivas, 2010a, 2010b).

Notably, academic researchers, agencies and organizations, and even those in the media regularly highlight the need to “talk to your children” after disaster. Although this is a valid recommendation, it is inadequate in many ways. That is, such a recommendation, without further tangible guidance, can leave some caregivers feeling uncertain regarding how to recognize that their child needs help, how to create an environment in which their children feel free to talk, how to talk with their children, including what to say (or not), how they might question or prompt their children to share about their experiences or emotions, or what kinds of approaches they can use to support their children’s attempts to understand and cope with what has happened. For many caregivers, the postdisaster context falls well

outside their experience base and, in turn, their comfort level for discussions with their children. Online resources now abound, including materials from the National Child Traumatic Stress Network (n.d.), the Substance Abuse and Mental Health Services Administration (2007), the U.S. Department of Education (2005), and others. Professionals and advocacy groups can work to ensure that the specific, concrete recommendations in such resources reach caregivers via psychoeducational approaches and outreach efforts.

Beyond such strategies for supporting children, recommended questions, or suggestions about how to talk with children, our communities, professionals and nonprofessionals alike, need to better support caregivers and families. This notion can certainly be advocated more generally (see, e.g., Cook & Kilmer, 2010; Melton, 2010) but is particularly of relevance during times of pronounced adversity, such as after large-scale disaster. For instance, stand-alone recommendations to talk with one's children are also inadequate because they do not acknowledge or take into account the potential challenges being faced by a given caregiver. Disasters are typically shared traumas, and he or she (and his or her spouse or partner) may be struggling to reclaim a semblance of normalcy for the family, meet the family's basic needs, or cope with PTSS or other psychological or emotional sequelae of the disaster. Thus, following disaster, child-serving settings (e.g., schools, social services), agencies, or groups must not rely solely on an individual-level focus in their work. Rather, they should seek to assess, address, and support the needs of the whole family (e.g., Kilmer & Gil-Rivas, 2010b). This may include helping connect the caregiver with needed resources and supports, whether formal mental health services or informal, community-based supports. Faith-based communities and organizations, nonprofits, and other volunteer efforts or nonprofessional "informal" support services can make an essential contribution here (see, e.g., Phillips & Jenkins, 2010), particularly as families' needs extend beyond the immediate postdisaster context (e.g., Kilmer & Gil-Rivas, 2010a).

Even though the present study's findings were mixed, it is necessary to emphasize the need to attend to the caregiver's well-being as well (and, in turn, the caregiver-child dyad). When caregivers' resources for coping are overly taxed, they may not engage in optimal parenting, decision making, planning, and the like. This in turn may result not only in less effective emotional support or nurturant caregiving of one's children but in heightened levels of conflict and discord with one's children (a factor that contributed to child PTSS at T2 in this study) as well.

Future studies would benefit from including more than one caregiver (i.e., mother and father), as the influence of caregiver response, behaviors, and coping suggestions on children's emotional response and adjustment may depend on the response of other caregivers in the family (McElwain, Booth-LaForce, Lansford, Wu, & Dyer, 2008). In addition, it is possible that the overall emotional family climate (i.e., overall expression of positive and negative emotions; see, e.g., Valiente et al., 2004) or the family's level of cohesion, rather than specific event-related perceptions of caregiver distress or availability, may influence children's coping efforts and emotion regulation in the aftermath of major stressful events.

It is clear that disaster-focused research, interventions, and supports need to expand their focus beyond a "target" individual (e.g., an adult or a child) within a specific setting to include the whole family and attend to and address the family's specific needs (e.g., Kilmer & Gil-Rivas, 2010b). It is also crucial to develop and enhance social connections in communities, to foster social capital and resources that can mobilize both before and after disaster; doing so is one means of increasing critical community capacity and increasing the likelihood of community resilience postdisaster (see Norris, Stevens, Pfefferbaum, Wyche, & Pfefferbaum, 2008).

Keywords: children; caregivers; posttraumatic stress; trauma; depressive symptoms; caregiver-child conflict; caregiver distress; caregiver warmth; disaster; Hurricane Katrina

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