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Caregiver distress, shared traumatic exposure, and child adjustment among area youth following the 2013 Boston Marathon bombing

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Abstract

Background—Disasters are associated with myriad negative outcomes in youth, including posttraumatic stress disorder and related psychopathology. Prior work suggests links between caregiver distress and child mental health outcomes following community traumas, but the extent to which caregiver distress is directly linked to post-disaster child functioning, or whether such associations may simply be due to shared traumatic exposure, remains unclear.

Methods—The current study examined relationships among caregiver distress, caregiver-child shared traumatic exposure, and child outcomes in Boston-area families (N=460) during the six months following the 2013 Boston Marathon bombing. Parents completed surveys about their and their child's potentially traumatic experiences during the bombing and subsequent manhunt. Post-attack caregiver distress and child psychological functioning were also assessed.

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Jonathan S. Comer, Ph.D. Dr. Comer helped conceptualize and design the study, supervised participant recruitment and data collection, helped develop the data analytic plan, reviewed the initial draft of the manuscript and provided suggestions for revision, and approved the final manuscript as submitted.

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Results—After accounting for caregiver-child shared traumatic exposure, significant associations were retained between caregiver distress and child functioning across several domains. Furthermore, after accounting for caregiver traumatic exposure, caregiver distress moderated relationships between child traumatic exposure and child posttraumatic stress and conduct problems, such that associations between child traumatic exposure and child posttraumatic stress and conduct problems were particularly strong among children of highly distressed caregivers.

Limitations—The cross-sectional design did not permit evaluations across time, and population-based methods were not applied.

Conclusions—Findings clarify links between caregiver distress and child psychopathology in the aftermath of disaster and can inform optimal allocation of clinical resources targeting disaster-affected youth and their families.

Keywords

disasters; child mental health; PTSD; parental distress

Introduction

Destructive occurrences that disrupt and overwhelm entire communities, such as natural and manmade disasters, affect tens of millions worldwide each year and are associated with myriad negative outcomes in exposed youth, including posttraumatic stress symptoms, broader internalizing and externalizing psychopathology, and overall reduced functioning (Furr, Comer, Edmunds, & Kendall, 2010; La Greca et al., 2013; McLaughlin, Fairbank, Gruber, Jones, Osofsky et al., 2010; Hoven et al., 2005). At the same time, outcomes among exposed youth are heterogeneous, and many children exposed to potentially traumatic events show pathways of resilience and endure remarkably well (Kilmer & Gil Rivas, 2010; La Greca, Lai, Joormann, Auslander, & Short, 2013; Lai, Kelley, Harrison, Thompson, & Self-Brown 2014; Masten & Narayan, 2012). Clarifying key factors associated with the heterogeneity of outcomes across exposed youth is critical.

Research suggests that several factors contribute to child and adolescent vulnerability to developing posttraumatic stress symptoms and emotional and behavioral problems in the aftermath of potentially traumatic events. These factors include, but are not limited to, level/dose of trauma, exposure to multiple traumas, pre-existing anxiety problems, coping resources, social support, neurobiological processes, genetic factors, and socio-environmental adversity (e.g., poverty, poor access to quality education) (see Cloitre, Stolbach, Herman, van der Kolk, Pynoos, et al., 2009; De Bellis, 2001; Furr et al., 2010; La Greca et al., 2013; Pynoos, Steinberg, & Piacentini, 1999).

Increasingly, parental distress and/or psychopathology is also understood to play a role in the development of child stress reactions following exposure to potentially traumatic events (e.g., Nugent, Ostrowski, Christopher, & Delahanty, 2007; Salmon & Bryant, 2002; Stoddard et al., 2006). Parents serve critical roles as models of coping and distress for children in the aftermath of disasters and help children process that to which they have been

exposed. Moreover, parenting practices and behaviors, which can be largely impacted by parental distress, greatly influence the primary ecology within which child post-event adjustment unfolds. Research on basic processes in families unaffected by disasters shows parental distress impacts parenting behaviors (Gondoli & Silverberg, 1997; Papp, Cummings, & Goeke-Morey, 2005), which in turn can impact child adjustment. Indeed, meta-analytic work quantitatively synthesizing the research on youth exposed to trauma has established links of moderate magnitude between parental depression, parental posttraumatic stress disorder (PTSD), and child posttraumatic stress symptoms (Morris, Gabert-Quillen, & Delahanty, 2012).

The relevance and impact of parental distress on children's development of posttraumatic stress and emotional and behavioral problems may vary across different types of potentially traumatic events, and events that directly affect *both* parents and children—such as large-scale community events and disasters—may be associated with particularly strong links between parental distress and child post-event functioning. When parents endure the same traumatic event as their children, they themselves are at heightened risk for posttraumatic stress and general distress, which in turn is associated with greater child psychopathology (e.g., Bryant, Mayou, Wiggs, Ehlers, & Stores, 2004). In fact, one study found mothers' reactions to a devastating wildfire was an even stronger predictor of children's PTSD symptoms than children's own exposure to the wildfire itself (McFarlane, Policansky, & Irwin, 1987).

Importantly, given that children and caregivers are more likely to endure similar forms and doses of exposure following disasters relative to the aftermath of other smaller-scale potentially traumatic child experiences (e.g. car accidents), it is not always clear to what extent caregiver distress is directly linked to post-disaster child functioning or whether such associations may simply be due to shared caregiver-child disaster exposure. For example, if a parent and child both lose their house in a wildfire, they may both be distressed, but it is difficult to disentangle the effects of losing one's house on both parent and child adjustment from direct links between parent and child adjustment that truly speak to the intergenerational transmission of post-disaster distress.

Research examining intergenerational distress and maladjustment associations in traumatized populations has been limited, and the unique contributions of caregiver distress in predicting child posttraumatic responses following community-wide disasters in which caregivers and children may share traumatic experiences remains poorly understood. Previous work examining links between parent and child distress following community-wide disasters has been constrained by factors such as small sample sizes and failure to control for caregiver-child shared exposure to potentially traumatic events (e.g. Birmes et al., 2009; Jones et al., 2002; Kilic, Ozguven, & Sayil, 2003; Koplewicz et al., 2002). Understanding unique relationships between caregiver and child adjustment following disasters, over and above the influences of shared traumatic exposure, is critical to better identify youth at elevated risk for poor adjustment following potentially traumatic exposure.

The 2013 Boston Marathon bombing and subsequent manhunt offers a unique opportunity to study intergenerational distress and maladjustment on a large scale after accounting for

shared traumatic exposure, given the enormous number of families that were directly affected (e.g., more than half a million families attended the Marathon and 1 million families were under the subsequent shelter-in-place warning during the manhunt). Unlike most researched terrorist attacks that have targeted office buildings of high symbolic value, the Marathon attack specifically targeted a family event in which large numbers of parents and children jointly attended and experienced the events together.

2013 Boston Marathon bombing and subsequent manhunt

On Monday April 15th, 2013, the finish line at the Boston Marathon became a site of terror when two coordinated bombs were detonated among the crowds cheering on runners. Three were killed and 264 others were injured, as a sense of fear and shock overcame the region. In the days following the attack, speculation about suspects at-large built until surveillance photographs of two men were released Thursday evening, setting off a chain of dramatic and violent events. After the murder of a uniformed officer and an armed carjacking in which a hostage was taken, police chased the two suspects to the quiet residential suburb of Watertown, where further explosions and gunfire ensued during a shootout. One suspect was killed during the shootout, while the second escaped. An emergency “shelter-in-place” warning was declared for nearly 1,000,000 area residents. Uniformed officers armed with heavy artillery roamed the streets of Watertown and Boston, entering and searching homes for the remaining suspect, as many families in the area of greatest manhunt activity hid in their basements. Roughly eighteen hours later, following a second wave of heavy gunfire and explosions on residential property while thermal-imaging helicopters circled overhead, the second suspect was apprehended.

These events collectively presented a series of potentially traumatic events over several days for Boston-area families. Media coverage was ubiquitous, and those not present at the actual events were repeatedly exposed to the carnage and violence through media-broadcast pictures and videos. One study of the impact of these events on area youth found that 11.3% of Marathon-attending youth exhibited clinically elevated posttraumatic symptoms, with seeing dead bodies or injured people or knowing someone injured or killed associated with the largest increases in PTSD symptoms (Comer et al., in press). In addition, Comer and colleagues found that exposures to potentially traumatic events during the manhunt were even more robustly associated than attack-related exposures with a range of children’s post-event outcomes, including emotional symptoms, conduct problems, hyperactivity/inattention, and peer problems.

The present study

Because of the nature and scope of the 2013 Boston Marathon bombing and subsequent manhunt, this large-scale event provides an opportunity to overcome limitations of previous work examining intergenerational distress and maladjustment associations following children’s disaster exposure. Specifically, we examined relationships between caregiver distress, caregiver-child shared traumatic exposure, and a range of child psychiatric outcomes among 460 Boston-area families following the 2013 Boston Marathon bombing. It was hypothesized that: (a) higher levels of caregiver distress would be associated with poorer child psychiatric functioning across clinical domains following the events, and (b)

that these relationships would remain significant even after accounting for shared exposure to potentially traumatic experiences during the week of the bombing and manhunt. Further analyses examined the extent to which caregiver distress moderated relationships between child exposure to potentially traumatic events and child psychiatric functioning after accounting for caregiver traumatic exposure.

Methods

Design and Participants

The Boston University Charles River Campus IRB approved all study procedures. Parents and caregivers of children between the ages of 4–19 years living within 25 miles of the Marathon attack site or Watertown, Massachusetts were recruited to participate in a survey assessing their own and their child's experiences related to the Marathon bombing and subsequent manhunt. Caregivers were also surveyed about their psychiatric distress and their child's functioning across a range of clinical domains since these events. Caregivers were recruited through schools, pediatricians' offices, community events, and local media/publications (e.g., superintendents, including the Watertown Public Schools Superintendent, sent recruitment letters home to parents encouraging participation; study staff attended "Boston Strong" rallies to distribute recruitment flyers). Participation occurred from June 15, 2014 to October 15, 2014 (2–6 months post-attack).

Caregivers interested in participating were directed to contact study staff or visit a study website to obtain further information. A total of 460 caregivers completed the survey out of 1,105 who initially communicated with study staff or visited the study website (41.6% response rate). Informed consent was obtained and then caregivers completed surveys via Qualtrics—a secure web-based survey program that uses data encryption and server authentication. Caregivers with more than one child between the ages of 4–19 years were asked to complete survey questions about their oldest child in the study age range. Participants took ~45 minutes to complete the survey and were compensated with a $30 Amazon gift card, or were offered the option of donating their $30 compensation to The One Fund Boston. Demographic characteristics of the sample are presented in Table 1.

Measures

Child posttraumatic stress symptoms were measured using the *UCLA Reaction Index* (UCLA-RI; Steinberg et al., 2004), Parent-Report Symptoms Scale, a 20-item scale assessing PTSD symptoms in youth. The UCLA-RI has demonstrated strong internal consistency and convergent validity (Steinberg et al., 2013). Further child functioning domains were assessed using the parent-report *Strengths and Difficulties Questionnaire* (SDQ; Goodman, 2001), a well-supported measure with several subscales: (a) emotion symptoms, (b) conduct problems, (c) hyperactivity/inattention, (d) peer problems, and (e) prosocial behavior. A total difficulties score is computed by summing SDQ subscales a–d.

Caregiver distress was assessed using the 21-item *Depression Anxiety and Stress Scales* (DASS; Lovibond & Lovibond, 1995). Total DASS score is a cumulative measure of adult depression, anxiety, and stress over the past week and indexes broad adult negative

emotional symptoms (Psychological Foundation of Australia, 2012). The DASS has demonstrated excellent internal consistency and validity (Antony et al., 1998).

Child and caregiver exposure to potentially traumatic events during the bombing and manhunt were assessed using a checklist asking respondents whether they and their child: (a) attended the Marathon, (b) were injured in the attack, (c) directly witnessed injured people, (d) directly witnessed dead bodies, (e) were evacuated during the attack, (f) knew a person injured in the bombing, (g) knew a person killed in the bombing, (h) were under the shelter-in-place warning, (i) saw a heavier police presence in their neighborhood during the manhunt, (j) saw uniformed service persons in their neighborhood not typically seen in civilian areas (e.g., National Guard, Homeland Security), (k) saw officers with guns drawn related to the manhunt, (l) heard manhunt-related gunshots or explosions, (m) saw manhunt-related gunshots or explosions, (n) saw manhunt-related blood, (o) had an officer knock on their door related to the manhunt, (p) had an officer enter/search their home as part of the manhunt, (q) knew the slain officer, and/or (r) knew the injured transit officer. Caregiver and child experiences were tallied separately to obtain a cumulative *Traumatic Exposure Score* for each. A *Shared Traumatic Exposure Score* was tallied by summing the number of experiences endorsed for both caregiver *and* child.

Results

Means and standard deviations for measures of caregiver distress and child outcomes are presented in Table 2. As reported elsewhere (Comer et al., in press), children's clinical scores, on average, fell within normative ranges, although parents of Marathon-attending children reported greater posttraumatic stress, conduct problems, peer problems, and total difficulties, and the proportion of youth with likely PTSD was roughly 6 times higher among Marathon-attending, than non-attending, youth.

Table 3 presents the number and proportions of each potentially traumatic event endorsed for children, caregivers, and children *and* caregivers. Children's most common potentially traumatic experiences were being under the shelter-in-place warning and seeing heavier police presence in their neighborhoods, whereas children's least likely experiences were being injured in the attack or knowing one of the injured or slain officers. Caregivers' most common experiences were identical to those for children, and they were least likely to have been injured in the attack or to have seen blood related to the manhunt. The most common experience shared by both children *and* caregivers was being under the shelter-in-place warning. Additionally, in roughly one-third of families, both children and caregivers saw a heavier police presence and uniformed service persons not typically seen in civilian regions (e.g., National Guard, Homeland Security) in their neighborhood. Shared traumatic exposure was high; among exposures endorsed for children, the percentage of caregivers also reporting those same exposures was high (i.e., average %=82.6). Shared exposure demonstrated a moderate-to-large association with child PTSD, and small-to-moderate associations with the remainder of child outcomes, even after accounting for demographic covariates.

Higher caregiver distress following the bombing and manhunt predicted greater child posttraumatic stress, as well as SDQ total difficulties, emotional problems, hyperactivity/inattention, peer problems, and lower prosocial behavior. All associations remained significant after controlling for age, race/ethnicity, household income, and respondent education, as well as caregiver-child shared exposure to potentially traumatic events (see Table 4). After accounting for demographic covariates and caregiver-child shared traumatic exposure, caregiver distress demonstrated a large association with child PTSD symptoms, a moderate-to-large association with child overall difficulties and emotional symptoms, a moderate association with conduct problems, hyperactivity/inattention, and peer problems, and a small but still significant association with prosocial behavior.

Further analyses examined whether caregiver distress moderated relationships between child traumatic exposure and child clinical outcomes. Separate regression models were run in the prediction of each child outcome, simultaneously entering the following predictors: a) demographic covariates: age, race/ethnicity, household income, respondent education, b) main effects of child traumatic exposure and caregiver distress, and c) the interaction (product) term of child traumatic exposure and caregiver distress. Post-event caregiver distress significantly moderated the relationship between child exposure and posttraumatic stress symptoms [b=.021, SE_b=.009, β=.139, *p*=.016] as well as the relationship between child exposure and conduct problems [b=.003, SE_b=.002, β=.143, *p*=.044]. After controlling for caregiver traumatic exposure, caregiver distress continued to moderate the relationship between child exposure and posttraumatic stress symptoms [b=.020, SE_b=.009, β=.134, *p*=.020] and the relationship between child exposure and conduct problems [b=.003, SE_b=.002, β=.142, *p*=.047].

To probe the nature of these significant moderation findings, the sample was split into two groups: “distressed caregivers” had DASS scores above the sample mean, while “non-distressed caregivers” had DASS scores below the sample mean. The association between child exposure and posttraumatic stress was significantly stronger among children with distressed caregivers [b=2.28, SE_b=.24, β=.59, *p*<.0001] than non-distressed caregivers [b=.63, SE_b=.19, β=.20, *p*=.001]. Likewise, the link between child exposure and conduct problems was stronger for children with distressed caregivers [b=.19, SE_b=.04, β=.39, p=.000] than non-distressed caregivers [b=.04, SE_b=.04, β=.06, *p*=.381].

Discussion

The present findings extend a small but growing literature documenting a link between caregiver distress and children’s responses to traumatic events (e.g., Morris et al., 2012; Nugent et al., 2007), by clarifying that such associations are not simply due to caregiver-child shared traumatic exposure. Indeed, the present study found caregiver distress significantly predicted greater child posttraumatic stress, overall difficulties, emotional problems, hyperactivity/inattention, peer problems, and lower prosocial behavior even after accounting for the extent to which children and caregivers were exposed to similar potentially traumatic events. These findings also help clarify evidence that children’s responses to disasters are heterogeneous (e.g., Comer et al., in press; Furr et al., 2010; Hoven et al., 2005; La Greca et al., 2013; Shahar, Cohen, Grogan, Barile, & Henrich, 2009).

Family factors, such as caregiver distress, appear to explain some of the heterogeneity observed across children's responses. The effects of traumatic exposure on youth were not uniform across different levels of caregiver distress. Among Boston-area youth, the effects of exposure to potentially traumatic events on child mental health outcomes were disproportionately strong for children with a distressed caregiver. The observed interaction was not due to demographic differences or differences in the extent to which parents themselves were exposed to potentially traumatic events. The present findings support increasing evidence that children's risk for developing mental health problems following traumatic exposure can be partially determined by their parent's own reactions (Morris et al., 2012; Nugent et al., 2007). Importantly, many prevention programs for youth exposed to a potentially traumatic event take a family-based approach (e.g., Berkowitz, Stover, & Marans, 2011). To optimally inform targeted intervention efforts for youth most at risk following disasters, future research is needed to uncover specific mediating pathways through which parental distress may impact disaster-affected children.

Research on non-disaster exposed families reveals how parental distress and psychopathology can powerfully and adversely impact parenting behaviors, and consequently children's functioning (Goodman et al., 2011; Hoffman, Crnic, & Baker, 2006; Lovejoy, Graczyk, O'Hare, & Neuman, 2000). A distressed parent can model maladaptive cognitions, affect, and behaviors for children, and parental distress can contribute to an overall stressful home environment (Goodman & Gotlib, 1999). Future work would do well to utilize multimodal methods including observational assessments of parent-child interactions and family discussions of potentially traumatic experiences.

While PTSD is the most commonly assessed outcome following disasters, the present findings add to an emerging body of empirical work suggesting that child conduct can also be adversely affected following exposure to community disasters (e.g., Comer et al., in press; Hoven et al., 2005). Our findings suggest negative outcomes beyond PTSD symptoms are of particular concern among youth with highly distressed caregivers. Future research examining specific parenting behaviors is needed to elucidate mediating factors that link parental distress and child conduct problems. Parental distress can impact parents' ability to interact with children in a positive, consistent, and predictable manner, which can lead to negative coercive interaction cycles between parents and children, which in turn are associated with child externalizing problems (Patterson, 1982). Furthermore, Valentino and colleagues (2010) found that hostile, coercive parenting puts kids at risk for PTSD. Understanding complex relationships between parental distress, negative/coercive parenting, child conduct problems, and PTSD following trauma is critical to inform targeted intervention efforts with disaster-exposed families.

Following disasters, there are often efforts to promote interventions directly targeting child PTSD and associated mental health problems. The present findings suggest that we should not consider children's post-disaster psychiatric functioning in a vacuum. Indeed, a broadened contextual approach, in which parent distress and parent-child interactions are considered, might yield improved child outcomes. In fact, research on families not exposed to disasters suggests that treating parental distress and psychopathology can indirectly improve children's mental health considerably (Gunlicks & Weissman, 2008). Given the

present findings, interventions targeting children individually may not be sufficient. Further, given difficulties intervening directly with children in the aftermath of disasters, treating parental distress without explicitly targeting children's symptoms may nonetheless yield meaningful child improvements. Future work is needed to elucidate differential advantages of child-focused, parent-focused, and/or family-based interventions in the wake of disasters and identify moderators of differential treatment response.

Limitations

A number of limiting factors should be considered. First, all data were from caregiver-reports. Given research showing discrepancies between parent and child reports of PTSD symptoms (e.g. Shemesh et al., 2005), future studies would do well to incorporate multi-informant assessment methods. Second, the present cross-sectional design did not permit analyses examining how child and caregiver responses might change over time. Similarly, the present design cannot address matters of temporal precedence among study variables, nor clarify the dynamic and transactional interplay between caregiver distress and child problems across time. Koplewicz and colleagues (2002) found that initial child distress following the 1993 World Trade Center bombing predicted increased levels of distress in their parents nine months later. Understanding how caregivers and children might reciprocally impact one another's responses following traumatic events will be critical for designing effective interventions for disaster-exposed families. Third, as population-based methods were not applied, the present findings may not reflect experiences and outcomes in the general population of Boston-area families. Fourth, data on gender were not collected in the present de-identified survey, and thus the impact of gender on study variables cannot be presently evaluated. Given previous research suggesting girls are more likely to develop posttraumatic stress symptoms, and boys are more likely to develop conduct problems, future work evaluating parental distress and child outcomes in the context of gender is needed. Finally, the demographic makeup of the sample was predominately college-educated non-Hispanic Caucasians and roughly 50% of the sample reported an annual household income of $100,000 or greater. Further, as the survey required access to a computer and the Internet, interested participants without technological literacy may not have been able to participate. Concerns about the representativeness of the sample, however, may be somewhat tempered by the fact that 84.9% of Watertown residents are White, 74.5% of residents of Back Bay (where the bombing occurred), are White, and roughly half of families in Watertown and Back Bay earn more than $100,000 annually (US Census Bureau, 2010a; 2010b).

Conclusions

Despite these limitations, the present study provides key insight into and clarity regarding the relationship between caregiver distress and child adjustment following broad community traumas in which parents and children share many potentially traumatic experiences. Our results support the notion that parental and child distress following community-based trauma are not simply linked due to shared experiences, but that there may be a dynamic interplay between caregiver distress and child posttraumatic responses regardless of shared exposure. While it is deeply unfortunate that disasters themselves are largely unpredictable and rarely preventable, continued empirical work examining how disaster responses unfold within the

family, and the complex relationships between caregiver distress and child functioning, is critical to meaningfully inform effective prevention and intervention efforts targeting disaster-exposed youth at greatest risk of negative outcomes.

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Table 1

Demographic characteristics among sampled Boston-area families (*N*=460) in the 6 months following the 2013 Boston Marathon bombing and subsequent manhunt[1]

Demographic Characteristics	M	SD	N	%
Child age, years	11.8	3.8		
Child race/ethnicity				
Non-Hispanic Caucasian			374	81.3
Racial/ethnic minority			86	18.7
Caregiver				
Biological mother			351	76.4
Biological father			78	16.9
Adoptive mother			18	3.9
Relative/guardian			7	1.5
Adoptive father			4	0.9
Foster mother			2	0.4
Caregiver age, years	43.8	7.8		
Caregiver education				
Completed college			374	81.3
Did not complete college			86	18.7
Household income, USD				
< $50,000			71	15.4
$50,000–74,999			45	9.8
$75,000–99,999			99	21.5
$100,000–$199,999			184	40.0
>200,000			61	13.3

[1] Reported previously in Comer et al., in press

Table 2

Means and standard deviations for caregiver distress and child psychological adjustment among Boston-area families (*N*=460) in the first 6 months post Marathon bombing and subsequent manhunt

Measure	Range	M	SD
Caregiver Distress[1]	21–79	30.92	10.05
Child Posttraumatic Stress Symptoms[2]	0–67	8.18[5]	10.65
Child Total Difficulties[3]	0–30	7.75[5]	5.86
Child Emotional Symptoms[3]	0–10	1.95[5]	2.05
Child Conduct Problems[3]	0–9	1.28[5]	1.54
Child Hyperactivity/Inattention[3]	0–10	3.09[5]	2.44
Child Peer Problems[3]	0–10	1.45[5]	1.73
Child Prosocial Behavior[3]	1–10	8.00[5]	2.15

[1] Measured via Total Score on the Depression Anxiety Stress Scales (DASS)

[2] Measured via the UCLA Reaction Index (UCLA-RI-PTSD)

[3] Measured via the Strengths and Difficulties Questionnaire (SDQ)

[4] Higher scores indicate more prosocial behavior

[5] Reported previously in Comer et al., in press

Table 3

Number and proportion of children and caregivers exposed to each of eighteen potentially traumatic experiences related to the Marathon attack and subsequent manhunt

	Child		Caregiver		Caregiver *and* Child		
Potentially Traumatic Experience	**N**	**% of total sample (*N*=460)**	**N**	**% of total sample (*N*=460)**	**N**	**% of total sample (*N*=460)**	**% of children exposed whose caregiver shared exposure**
Attended marathon	71	15.4	87	18.9	57	12.4	80.3
Injured in attack	7	1.5	6	1.3	6	1.3	85.7
Saw injured people	19	4.1	35	7.6	17	3.7	89.5
Saw dead bodies	11	2.4	17	3.7	8	1.7	72.7
Evacuated during attack	28	6.1	37	8.0	22	4.8	78.6
Knew person injured	26	5.7	81	17.6	23	5.0	88.5
Knew person killed	12	2.6	23	5.0	11	2.4	91.7
Under shelter-in-place warning	238	51.7	238	51.7	238	100.0	100.0
Saw heavier police presence in neighborhood	161	35	215	46.6	152	33.0	94.4
Saw uniformed service persons not typically found in civilian neighborhoods	148	32.2	214	46.4	140	30.4	94.6
Saw officers with guns drawn related to manhunt	53	11.5	83	18.0	46	10.0	86.8
Heard gunshots/explosions related to manhunt	45	9.8	58	12.6	33	7.2	73.3
Saw gunshots/explosions related to manhunt	25	5.4	28	6.1	19	4.1	76.0
Saw blood related to the manhunt	16	3.5	15	3.3	9	2.0	56.3
Had officer knock on door related to manhunt	27	5.9	32	7.0	24	5.2	88.9
Had officer enter and search home related to manhunt	24	5.2	33	4.8	19	4.1	79.2
Knew slain MIT officer	10	2.2	27	5.9	8	1.7	80.0
Knew injured transit officer	10	2.2	18	3.9	7	1.5	70.0

Table 4

Zero-order and unique associations between caregiver distress and child psychological adjustment

	Associations with Child Psychological Adjustment						
	PTSD Symptoms	**Total Difficulties**	**Emotional symptoms**	**Conduct problems**	**Hyperactivity/inattention**	**Peer problems**	**Prosocial behavior**
Caregiver distress[a]	.56***	.53***	.48***	.41***	.34***	.37***	−.20***
Caregiver distress[b]	.56***	.53***	.47***	.40***	.34***	.37***	−.18***
Caregiver distress[c]	.51***	.48***	.44***	.35***	.31***	.33***	−.15*

[a] Row provides unadjusted (i.e., zero-order) correlations

[b] Row provides partial correlations controlling for household income, child age, race/ethnicity, and respondent education

[c] Row provides partial correlations controlling for household income, child age, race/ethnicity, respondent education, and shared caregiver-child exposure

* p<.05;

** p<.01;

*** p<.001