

# Posttraumatic Distress and Attributions in Children Exposed to a Natural Disaster

Caleb W. Lack & Maureen A. Sullivan  
Oklahoma State University, Department of Psychology

## Introduction

The vast majority of children who survive a natural disaster will suffer some negative effects (Russoniello et al., 2002). For some children, these effects persist well beyond the immediate post-disaster period, causing significant distress and impairment in functioning. Posttraumatic stress symptoms (PTSS) such as reexperiencing the disaster in some manner, persistent avoidance of stimuli related to the disaster, and increased arousal levels can lead to impairments in social relationships and academic functioning that can have serious long-term consequences. There are several gaps in the current literature that the current study addresses. There are very few long-term follow-up studies that examine the reaction of children to disasters, but those which do exist indicate that a significant number of children experience long-term persistent distress (e.g., McFarlane, Policansky, & Irwin, 1987; Lack & Sullivan, 2003). More information of this nature will help to understand the development and presence of symptoms over time. Also, little information is available about the type of attributions children make for natural disasters and if those attributions change as time progresses. These few studies, however, have shown that attributions are highly related to amount of distress experienced following a disaster (Greening, Stoppelbein, & Docter, 2002; Lack & Sullivan, 2004), but little work has examined how those attributions may change over time. The current study has examined how both PTSS and attributions for a disaster manifest over time, as well as the relationship between the two.

## Method

### Procedure

At the time of the first data collection roughly six months had passed since a major storm system that spawned multiple tornadoes swept through multiple areas of Oklahoma in late May and early June. Data were gathered from two elementary schools in central Oklahoma, with children in grades 3-6 were solicited as participants. The second data collection was undertaken in early May of the following year, making it one year from the original tornadoes.

### Measures

Parents completed a Demographic Questionnaire and a Tornado Exposure Questionnaire (TEQ) used in previous Oklahoma disaster research. For the first assessment, children completed a parallel TEQ with age-appropriate language; Frederick's Reaction Index (RI; Frederick, Pynoos, & Nader, 1992), a measure of the level of post-traumatic stress symptoms; and the Trauma Attribution Checklist (TAC; Knight, 2001), a measure designed to assess attributions made by children following a traumatic experience. The RI and the TAC were also completed during the 12-month follow-up.

### Participants

Ninety-six children ages 8-13 enrolled at two public elementary schools in central Oklahoma towns participated in the current study. Participants received small prizes and were entered into a drawing for \$50. The children were predominantly Caucasian (80.2%), with 10.9% identified as American Indian, and had a mean age of 9.85 years ( $SD = 1.35$ ). Children were split fairly evenly across sex (45.5% male, 54.5% female) and grade (28.3% in 3rd grade, 23.8% in 4th grade, 31.7% in 5th grade, 14.9% in 6th grade).

## Results

### Tornado Exposure Questionnaire (TEQ)

Although the majority of participants reported no damage to their homes (72.8%), 10 of the families in the sample experienced a total loss. Parent-report of child fear during the tornado ranged from not at all scared (20%), somewhat scared (30%), scared (22.2%), very scared (17.8%), to terrified (10%). Only 28.6% of the parents reported that their child did not currently worry about tornadoes happening, while 16.5% described their child as currently very scared or terrified about tornadoes. On children's self-report of fear, 34.5% reported being not at all scared, 35.4% reported being somewhat scared, 13.1% reported being scared, and 17.9% reported being very scared or terrified.

### Frederick's Reaction Index (RI)

The RI has a range of scores from 0 to 80. The average RI total score at the first assessment was 25.90 ( $SD = 13.75$ ), which is in the moderate range, with scores ranging from 2 to 62. The average RI total score for the second assessment was 25.10 ( $SD = 16.05$ ). Table 1 shows the distribution of RI scores across the degree of distress for both assessments.

**Table 1**

**Degree of PTSD Symptoms as measured by the Reaction Index**

Degree of Symptoms	Time 1	Time 2
	%	%
No PTSD Symptoms	12.8	19.5
(Range 0-11)	( <i>n</i> = 12)	( <i>n</i> = 8)
Mild PTSD Symptoms	40.4	41.5
(Range 12-24)	( <i>n</i> = 38)	( <i>n</i> = 17)
Moderate PTSD Symptoms	25.5	21.2
(Range 25-39)	( <i>n</i> = 24)	( <i>n</i> = 9)
Severe PTSD Symptoms	18.1	15.4
(Range 40-59)	( <i>n</i> = 17)	( <i>n</i> = 6)
Very Severe PTSD Symptoms	3.3	2.4
(Range 60-80)	( <i>n</i> = 3)	( <i>n</i> = 1)
Total RI Score		
Mean	26.66	24.76
<i>SD</i>	(14.64)	(15.73)

### Trauma Attribution Checklist (TAC)

The TAC has a range of 0 to 48. Each scale of the TAC has its own range. For the Attribution of Responsibility scale the range is 0 to 18, while the subscales that compose it range from 0 to 8 (Self-blame), 0 to 4 (Other-blame and God-blame), and 0 to 2 (No-blame). The Importance of Attributing Responsibility scale ranges from 0 to 6; both the Expectations/Hypervigilance and Search for Meaning scales range from 0 to 10. The Expectations subscale ranges from 0 to 6, with the Hypervigilance subscale ranging from 0 to 4. Finally, the Omen Formation scale has a range of 0 to 4.

## Results (cont.)

The average TAC score at the first assessment was 12.77 ( $SD = 8.27$ ), with a range from 0 to 34. The Attribution of Responsibility scale had a mean of 4.15 ( $SD = 3.17$ ). It was divided into the subscales of Self-blame ( $M = 1.88$ ,  $SD = 1.84$ ), Other-blame ( $M = 0.46$ ,  $SD = 0.86$ ), God-blame ( $M = .82$ ,  $SD = 0.92$ ), and No-blame ( $M = 1.06$ ,  $SD = 0.94$ ). The Importance of Attributing Responsibility scale had a mean of 0.93 ( $SD = 1.25$ ). The Expectations/Hypervigilance scale mean score was 3.85 ( $SD = 2.67$ ). The Search for Meaning scale had a mean of 2.91 ( $SD = 2.37$ ), and the Omen Formation scale had a mean of 1.42 ( $SD = 1.19$ ).

The average TAC score at the second assessment was 13.36 ( $SD = 9.00$ ), with a range from 0 to 31. The Attribution of Responsibility scale had a mean of 4.02 ( $SD = 2.78$ ). It was divided into the subscales of Self-blame ( $M = 1.70$ ,  $SD = 1.97$ ), Other-blame ( $M = 0.42$ ,  $SD = 0.64$ ), God-blame ( $M = 0.95$ ,  $SD = 1.04$ ), and No-blame ( $M = 1.07$ ,  $SD = 0.96$ ). The Importance of Attributing Responsibility scale had a mean of 0.87 ( $SD = 1.17$ ). The Expectations/Hypervigilance scale mean score was 4.23 ( $SD = 3.38$ ). The Search for Meaning scale had a mean of 2.75 ( $SD = 2.68$ ), and the Omen Formation scale had a mean of 1.32 ( $SD = 1.07$ ).

### Changes in Distress and Attributions

As hypothesized, there was not a significant change in RI scores between the assessment periods ( $t = -.011$ ,  $p = .991$ ). Paired-samples *t*-tests revealed no significant differences between total TAC scores ( $t = .090$ ,  $p = .929$ ) or scale scores between assessments.

### Regression Analyses

Stepwise multiple regression analyses were used to examine the relationship between parent reported exposure, child reported exposure and attributions, and degree of posttraumatic distress as measured by the total score on the RI (see Table 2). Analyses were conducted at each assessment period. At Time 1, the TAC total score entered on the first step and accounted for a total of 36.4% of the variance in the total RI score. Neither parent nor child reported exposure entered the regression analysis. For Time 2, however, a different pattern emerged. Again, parent and child reported exposure, as well as TAC total score at Time 2, were entered into a stepwise multiple regression to predict RI total score at Time 2. The TAC total score still entered on the first step, but this time accounted for 70.6% of the variance in RI total score. Parent reported exposure entered on the second step and attributed an additional 3.2% to the model's predictive power, bringing the total predicted variance to 73.8% for the model.

**Table 2**

**Regression Analyses for Predicting Posttraumatic Distress**

Time 1	Multiple R	R <sup>2</sup>	Adjusted R <sup>2</sup>	F change	Signif. of F
Step 1	.603	.364	.357	50.34	< .001
TAC Total Score					
(Note: Parent and child reported exposure did not enter into the equation)					
Time 2	Multiple R	R <sup>2</sup>	Adjusted R <sup>2</sup>	F change	Signif. of F
Step 1	.845	.714	.706	87.30	< .001
TAC Total Score					
Step 2	.868	.753	.738	5.33	.027
+ Parent reported exposure					
(Note: Child reported exposure did not enter into from the equation)					

## Results (cont.)

To further examine the use of the TAC to predict total RI scores, the five scales of the TAC and the child's self-reported fear during the tornado were entered into a stepwise multiple regression analysis for each assessment period (see Table 3). At Time 1, the TAC Self-Blame scale alone accounted for 38.9% of the variance in total RI score. No other TAC scale scores were found to contribute significantly to the model. At Time 2, the TAC Search for Meaning scale entered on the first step, accounting for 67.4% of the variance in RI score. The TAC Expectations/Hypervigilance scale entered on the second step, adding 6.4%, followed by parent reported exposure with an additional 5.8%. This resulted in a total  $R^2 = .797$  for the Time 2 model.

**Table 3**

**Regression Analyses for Exposure and Specific Attribution Types Predicting Posttraumatic Distress at Times 1 and 2**

Time 1	Multiple R	R <sup>2</sup>	Adjusted R <sup>2</sup>	F change	Signif. of F
Step 1	.629	.396	.389	53.789	< .001
TAC Self-Blame					
(Note: All other TAC scales did not enter into the equation)					
Time 2	Multiple R	R <sup>2</sup>	Adjusted R <sup>2</sup>	F change	Signif. of F
Step 1	.826	.683	.674	73.198	< .001
TAC Search for Meaning					
Step 2	.868	.754	.739	9.521	.004
+ TAC Hypervigilance/ Expectations					
Step 3	.903	.815	.797	10.518	.003
+ Parent reported exposure					
(Note: All other TAC scales did not enter into the equation)					

## Discussion

The results of the current study support the idea that the attributions one makes for a disaster, even in children as young as 8 years old, explain a substantial amount of the variance in long-term distress. This holds true both in the short term (less than six months) and long term (one year post disaster). This supports previous research that found this relationship in another disaster-exposed child population (Lack & Sullivan, 2004) and in adult samples that were sexually traumatized as children (Steel et al., 2004), have chronic illnesses (Chaney et al., 2004), and experienced a natural disaster (Böðvarsdóttir & Elklit, 2004). Given the high degree of stability in the children's level of distress found in this and other studies (Lack & Sullivan, 2003), the highly predictive nature of attributions would indicate more research examining the relationship between the development of distress and attributions should be undertaken. If one were able to intervene following a disaster and change the types of attributions made (e.g., away from blaming one's self), it may be possible to decrease the long-term level of distress.

Please address correspondence regarding this poster to: Caleb W. Lack, Department of Psychology, 215 N. Murray Hall, Stillwater, OK 74078 or to caleb@caleblack.com

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