



Research report

Posttraumatic stress disorder symptom trajectories in Hurricane Katrina affected youth

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ABSTRACT

Objective: This study examined trajectories of posttraumatic stress disorder symptoms in Hurricane Katrina affected youth. **Method:** A total of 426 youth (51% female; 8–16 years old; mean age = 11 years; 75% minorities) completed assessments at 4 time points post-disaster. Measures included Hurricane impact variables (initial loss/disruption and perceived life threat); history of family and community violence exposure, parent and peer social support, and post-disaster posttraumatic stress symptoms. **Results:** Latent class growth analysis demonstrated that there were three distinct trajectories of posttraumatic stress disorder symptoms identified for this sample of youth (resilient, recovering, and chronic, respectively). Youth trajectories were associated with Hurricane-related initial loss/disruption, community violence, and peer social support. **Conclusions:** The results suggest that youth exposed to Hurricane Katrina have variable posttraumatic stress disorder symptom trajectories. Significant risk and protective factors were identified. Specifically, youth Hurricane and community violence exposure increased risk for a more problematic posttraumatic stress disorder symptom trajectory, while peer social support served as a protective factor for these youth. Identification of these factors suggests directions for future research as well as potential target areas for screening and intervention with disaster exposed youth. **Limitations:** The convenience sample limits the external validity of the findings to other disaster exposed youth, and the self-report data is susceptible to response bias.

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0. Introduction

An estimated 14% of American youth experience a disaster during their childhood (Becker-Blease et al., 2010). Disaster-exposed youth are at risk for developing symptoms of posttraumatic stress disorder (PTSD), (Norris et al., 2002; Osofsky et al., 2009; Yelland et al., 2010). Research on the longitudinal course of youth PTSD following disasters indicate that the majority of symptoms remit in the months and years following the event (Kronenberg et al., 2010); however, persistence or worsening of symptoms also has been documented (e.g., Bokszczanin, 2007; Goenjian et al., 2005; John et al., 2007; Lai et al., in press).

Hurricane Katrina was one of the worst natural disasters in U.S. history in terms of death, destruction, and delayed recovery (Knabb et al., 2006). Researchers studying youth who experienced Katrina have found variability in post-trauma symptoms. For instance, Marsee (2008) found that 63% of youth reported symptoms of PTSD 15–18 months post-Katrina, while 27% reported no symptoms. In comparison, Kronenberg et al. (2010)

found that 45% of youth did not meet the clinical cutoff for symptoms at either a two or three year post-Katrina assessment time point, and 27% who initially met the clinical cutoff at year two, were recovered one year later. However, there were some youth who exhibited more chronic pattern trajectories, with 23% of youth demonstrating no reductions in symptoms over time, and 4% had an increase in symptoms. These findings are commensurate with how (Bonanno and Mancini, 2008) conceptualize post-disaster adult recovery patterns, in terms of resilience (absence of elevated PTSD symptoms), recovery (initially elevated PTSD symptoms that decline to adaptive functioning levels), chronic dysfunction (elevated PTSD symptoms that do not abate with time), and delayed trauma (PTSD symptoms increase over time to elevated levels).

To date, published research examining post-disaster outcomes in youth over time has relied on analytic strategies that permit assessment of mean-level changes in PTSD symptoms. This approach does not allow characterization of differing trajectories of more chronic and less symptomatic children. Growth mixture modeling is an analytic approach that allows for explication of differing trajectories (Curran and Hussong, 2003; Muthén and Asparouhov, 2008), as well as factors associated with each trajectory. This approach has been increasingly utilized in the

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adult trauma and PTSD symptom literature (e.g., Dickstein et al., 2010; Elliott et al., 2005; Galatzer-Levy et al., 2011; Orcutt et al., 2004), with results indicating significant heterogeneity in trajectories of PTSD symptoms over time.

Although growth mixture modeling has not yet been applied to studying youth after natural disasters, a few emerging studies have used these techniques with youth exposed to other types of trauma (e.g., Amstadter et al., 2009; Le Brocque et al., 2010; Nugent et al., 2009). For example, Nugent and colleagues (2009) examined latent class trajectories of PTSD symptoms in youth ages 7 to 18 years who had been exposed to family violence. Results indicated a resilient trajectory group and a persistent symptom trajectory group. Similarly, Le Brocque et al., 2010 used this approach to examine the course of PTSD symptoms for youth following an accidental injury. Three trajectories emerged, including youth who were resilient following the accident, those who initially experienced high levels of stress but recovered quickly, and, lastly, those with chronic stress patterns. Collectively, these studies support the notion that youth response to trauma is not homogenous, and that the distinct PTSD trajectory paths emerge.

Patterns of post-disaster recovery in youth are impacted by multiple factors that can serve to enhance the risk of negative trajectories or promote resilience (Weems and Overstreet, 2008), and such factors can be important in distinguishing PTSD trajectories. Similar to prior research examining youth outcomes post-disaster (e.g., La Greca et al., 1998; La Greca et al., 2010; Vernberg et al., 1996; Russoniello et al., 2002; Neuner et al., 2006), emerging research evaluating Katrina-affected youth indicate differential outcomes based on individual-level and microsystem-level (i.e., family and other systems in the child's immediate environment, Brofenbrenner, 1979) risk and protective factors. For instance, several studies have indicated that individual-level factors, such as Hurricane loss and life disruption following Katrina, are associated with youth-reported posttraumatic stress symptoms (Kelley et al., 2010; Rowe et al., 2010). Furthermore, Weems et al. (2007) found that youth pre-disaster anxiety and negative affect significantly influenced Katrina-related posttraumatic stress symptoms. In regard to microsystem-level factors, (Kronenberg et al., 2010) found that life stressors, including school and family problems, increased risk for poor long-term outcomes post-Katrina, while Kelley and colleagues (2010) found that violence exposure and parent behavior significantly impacted youth PTSD symptoms.

The aim of the current study was to identify trajectories of youth's PTSD symptoms following Hurricane Katrina, as well as risk and protective factors associated with each trajectory. In terms of risk, youth-reported disaster loss and disruption, as well as youth exposure to other traumatic events, specifically, home and community violence, were examined. Parental and peer social support, which researchers have found to be associated with positive youth post-disaster outcomes (Khoury et al., 1997; La Greca et al., 1996), were examined as potential protective factors. Latent Class Growth Analysis, a subset of growth mixture modeling, was employed to identify youth's varying PTSD symptom trajectories. Based on prior research, we hypothesized that distinct PTSD symptom trajectories would emerge among Hurricane Katrina-exposed youth, and that youth who reported higher levels of Hurricane loss/disruption and violence exposure, as well as lower levels of social support, would be at greatest risk for a chronic and persistent PTSD symptom trajectory.

1. Method

1.1. Participants

Participants were 426 children living in New Orleans and the surrounding area when Hurricane Katrina made landfall.

The majority were displaced from their home as a result of the Hurricane (75%). Children (51% female) ranged in age from 8 to 16 years old ($M=11.63$ years; $SD=2.26$) and were in grades 4–8 at Time 1. Children were primarily African American (68%), with 25% identifying as Caucasian, and 7% as other ethnicities. Median income prior to Hurricane Katrina was below \$25,000; 56% of children came from single-parent households. Children in special education were excluded.

1.2. Procedures

After obtaining approval from Louisiana State University's Institutional Review Board, principals from six schools were contacted regarding recruitment of participants for the study. Children and their parents were recruited as part of a multi-wave, longitudinal study on the psychological impact of Hurricane Katrina. Interested parent participants received a packet containing information about the study, the consent forms (for parent and child), and self-report questionnaires. Parents completed and returned consent forms and self-report questionnaires to their child's school in a sealed envelope. Children completed questionnaires in small groups at school. Data collection was conducted by graduate students and research assistants trained in data collection procedures including explaining informed consent, assent, and the limits of confidentiality and administering questionnaires. In addition, research assistants were available to assist children with reading difficulties.

Questionnaires were administered at four time points: Time 1 was conducted at 3 months post-Katrina; Time 2 was conducted at 13 months post-Katrina; Time 3 was conducted 19 months post-Katrina; and Time 4 was conducted at 25 months post-Katrina. Subsequent to Time 1, parents were contacted regarding their continued participation and to obtain updated contact information.

Compensation was provided in several ways. At Time 1, children were provided compensation at the discretion of school personnel. This included entry into one of several \$5.00 drawings or a class pizza party. During subsequent waves of the study, parents were compensated \$25.00–\$50.00 for participation, and children were provided with small items such as stickers or pencils.

Of the families contacted regarding their interest in the study, approximately 35% consented and completed questionnaires. At Time 1, 388 children participated in the study. An additional 38 children began participating at Time 2, but no additional participants were added during Times 3 or 4. Of the total 426 participants, (including those who first participated at Time 2) nine participants did not provide responses about their PTSD symptoms. Given that PTSD symptom severity was the primary outcome measure of this study, these nine participants were not included in the analyses. Thus, 417 participants were analyzed in this study. The number of participants who completed the UCLA PTSD Reaction Index—Revision 1 at each wave are as follows: Time 1 = 346 (83%); Time 2 = 356 (85%); Time 3 = 345 (83%); Time 4 = 331 (79%). The majority of participants completed measures at either 3 or 4 time points: 238 (57%) completed four time points; 105 (25%) completed three time points; 37 (9%) completed two time points; and 37 (9%) completed only one time point.

Demographic characteristics (gender, income, race, age) were examined to determine whether differences emerged for number of time points participants completed according to any of these variables. No significant differences were found for gender, income or race. A one-way ANOVA examining age and number of time points completed revealed a significant difference $F(3, 412)=3.548, p=.02$; however, post-hoc comparisons (Tukey HSD) showed only a trend such that children completing one time

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