

The Psychological Impact of Natural Disasters on Children

A Bibliography



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Introduction

Natural disasters are nothing new, nor are the traumatic effects experienced by those affected. Tornadoes, earthquakes, floods, devastating storms, volcanic eruptions, tsunamis and hurricanes are a part of the world we inhabit. Children have always suffered physically and psychologically, not only as a direct consequence of the disaster itself, but also from grief and displacement. And although warning systems to alert the public have steadily improved, the scale of loss from hurricane Katrina in 2005 in the U.S., the earthquakes and wildfires in the western U.S., and the recurring tornadoes that blanket areas of the midwestern and southern U.S. each year are evidence of the susceptibility of any populace to the forces of nature. The common stress reactions of both adults and children can include anxiety, fear, anger, re-experiencing, and avoidance of reminders. The sense of loss in children whose experience of displacement, feelings of helplessness, grief or depression may be intensified. But further, children may become the victims of violence from adults who are having difficulty coping with their stress and posttraumatic anger.

Scope

This annotated bibliography pertains to the psychological impact of natural disaster on children. It is a selected bibliography, not comprehensive. With only a very few exceptions, it does not address issues related to physical injuries or the practicalities of disaster relief; it does not include the effects of war, terrorism, or other violence inflicted upon children; it does not include the effects of disease epidemics or individual illnesses; and it does not include resources pertaining to natural disasters beyond the North American continent.

Organization

The items listed here are books, chapters, journal articles, and selected other publications published in English 1987-2006. The bibliography does not include theses and dissertations, conference papers, audiovisual materials, or ephemera. This bibliography is organized chronologically, from the most recent to the oldest publication date.

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The Psychological Impact of Natural Disasters on Children

A Bibliography of Selected Resources on Diagnosis and Treatment

Legerski, J., Greenhoot, A. F., Vernberg, E. M., M. La Greca, A., & Silverman, W. K. (2015). Longitudinal analysis of children's internal states language and posttraumatic stress symptoms following a natural disaster. *Applied Cognitive Psychology, 29*(1), 91-103.

Disclosure of internal states terms (e.g., emotions, cognitions, and perceptions) in traumatic event descriptions is thought to be associated with physical and mental health in adults, but studies with children have been mixed, and the interpretation of many findings is complicated by the lack of longitudinal data. Using data collected from 568 students (ages 7–12 years) attending schools in Miami-Dade County, Florida, this study examined the internal states language in participant's written descriptions of the 'worst things that happened during the hurricane' collected 3 and 7 months after Hurricane Andrew. Associations between these internal states and their posttraumatic stress symptoms (PTSS) 3, 7, and 10 months post-hurricane were evaluated using structural equation modeling. Patterns of association suggest that PTSS were not affected by internal states disclosure; rather, internal states language seemed to be a manifestation of PTSS. Implications for risk assessment, theory building, and treatment of PTSS in children are discussed. Copyright © 2014 John Wiley & Sons, Ltd.

Scott, B. G., Lapré, G. E., Marsee, M. A., & Weems, C. F. (2014). Aggressive behavior and its associations with posttraumatic stress and academic achievement following a natural disaster. *Journal of Clinical Child & Adolescent Psychology, 43*(1), 43-50.

Despite an abundance of evidence linking maltreatment and violence-related trauma exposure to externalizing problems in youth, there is surprisingly little evidence to support a direct link between disaster exposure and youth aggressive behavior. This study tested the theory that there is primarily an indirect association between disaster exposure and aggression via posttraumatic stress disorder (PTSD) symptoms. The current study also examined the association between aggression and academic achievement. A sample of 191 4th- to 8th-grade minority youth who experienced Hurricane Katrina were assessed for aggressive behavior using the Peer Conflict Scale (PCS), disaster exposure, PTSD symptoms, and academic achievement. Structural equation

modeling of the set of associations was consistent with the theory suggesting that there is an indirect link between disaster exposure and aggression through PTSD symptoms. Aggression was negatively associated with academic achievement, and modeling indicated that the set of associations was age and gender invariant. Findings advance the theoretical understanding of the linkage between aggression and disaster exposure. Findings also support the utility of the PCS in disaster research and the link between PCS scores and academic achievement.

Jones, S. L., & Schmidt, C. K. (2013). Psychosocial effects of disaster in children and adolescents. significance and management. *Nursing Clinics of North America*, 48(Pediatrics), 229-239.

This article provides a synthesis of the literature addressing the psychological and social effects on children and adolescents after disasters, and the factors that contribute to protecting this population from experiencing related symptoms. Clinical implications are presented for health care providers to reduce the possibility of long-term psychopathologies based on the *National Commission on Children and Disasters 2010 Report*.

Powell, T., & Holleran Steiker, L. K. (2012). Working with children and families who have survived natural disasters: Exploring substance abuse and other risk factors. *Journal of Social Work Practice in The Addictions*, 12(2), 209.

Overstreet, S., Salloum, A., Burch, B., & West, J. (2011). Challenges associated with childhood exposure to severe natural disasters: Research review and clinical implications. *Journal of Child & Adolescent Trauma*, 4(1), 52-68.

Natural disasters cause widespread destruction, economic loss, and death, leaving children to cope with the devastating aftermath. The research literature has demonstrated that children are at risk postdisaster for negative mental health outcomes, such as posttraumatic stress disorder and depression. The purpose of this review is to highlight the challenges associated with childhood exposure to severe natural disasters and to summarize the current research on clinical interventions for children postdisaster. Specific challenges reviewed include disaster-related deaths, secondary stressors typical in postdisaster environments, disruption in social networks, and the threat of

recurrent disasters. A public health framework for school-based mental health services is discussed and the need for research on effective intervention models for youth in postdisaster environments is highlighted. [ABSTRACT FROM AUTHOR]

Furr, J. M., Comer, J. S., Edmunds, J. M., & Kendall, P. C. (2010). [Disasters and youth: a meta-analytic examination of posttraumatic stress](#). *Journal of consulting and clinical psychology, 78*(6), 765.

Meta-analyze the literature on posttraumatic stress (PTS) symptoms in youths post-disaster. Meta-analytic synthesis of the literature (k 96 studies; Ntotal 74,154) summarizing the magnitude of associations between disasters and youth PTS, and key factors associated with variations in the magnitude of these associations. We included peer-reviewed studies published prior to 1/1/2009 that quantitatively examined youth PTS (18 years at event) after a distinct and identifiable disaster. Studies conducted within 1 year post-disaster, studies that used established measures, and studies that relied on child-report data identified a significant effect. Conclusion: Youths are vulnerable to appreciable PTS after disaster, with preexisting child characteristics, aspects of the disaster experience, and study methodology each associated with variations in the effect magnitude. Findings underscore the importance of measurement considerations in post-disaster research. Areas in need of research include the long-term impact of disasters, disaster-related media exposure, prior trauma and psychopathology, social support, ethnicity/race, prejudice, parental psychopathology, and the effects of disasters in developing regions of the world. Policy and clinical implications are discussed.

Sprung, M., & Harris, P. L. (2010). Intrusive thoughts and young children's knowledge about thinking following a natural disaster. *Journal of Child Psychology & Psychiatry, 51*(10), 1115-1124.

Hurricane Katrina devastated the Mississippi Gulf Coast in August 2005. Intrusive re-experiencing is a common posttraumatic stress symptom. However, young children with limited introspection skills might have difficulties identifying their intrusive thoughts. Method: A sample of 165 5- to 9-year-old children were surveyed about their unwanted intrusive thoughts and their knowledge about thinking, 10 months following the hurricane. Results: Results replicate and extend the

findings from a previous study (Sprung, 2008). Although there was no difference in the overall occurrence of intrusive thoughts, there was a striking difference between hurricane-exposed and control children in their contents. Children's knowledge about thinking was linked to their ability to report on their negative intrusive thoughts, even taking language ability into account. Conclusion: There is a shift toward negative content following hurricane exposure compared with non-hurricane-exposed children and knowledge about thinking is linked to the reporting of such intrusive thoughts. Implications for current research on autobiographical memory and for interventions following potentially traumatic events are discussed.

McFarlane, A. C., & Van Hooff, M. (2009). [Impact of childhood exposure to a natural disaster on adult mental health: 20-year longitudinal follow-up study.](#) *The British Journal of Psychiatry*, 195(2), 142-148.

Studies examining the impact of childhood disaster exposure on the development of adult psychopathology report increased rates of post-traumatic stress disorder (PTSD) and other psychopathology. To examine the rates of PTSD and other lifetime DSM-IV disorders in adults exposed to an Australian bushfire disaster as children in 1983 using a matched control sample recruited at the time of the original study. A total of 1011 adults recruited from an original sample of 1531 were assessed 20 years following the fires using the Composite International Diagnostic Interview (CIDI-2.1). Results showed only a small direct impact of the fires on adult psychiatric morbidity. A higher proportion of bushfire survivors met criteria for 'any DSM-IV disorder' and 'any anxiety'. Findings suggest that the long-term impact of a prominent trauma in childhood should be assessed in the context of other lifetime trauma in order to provide a more accurate account of PTSD prevalence rates.

Terranova, A. M., Boxer, P., & Morris, A. S. (2009). Factors influencing the course of posttraumatic stress following a natural disaster: Children's reactions to Hurricane Katrina. *Journal of Applied Developmental Psychology*, 30, 344-355

This investigation examined psychosocial and behavioral factors involved in the course of post-traumatic stress disorder (PTSD) symptoms in youth affected by Hurricane Katrina. Participants ($N = 152$; 54% female; 61% Caucasian; mean age = 11.5 years) self-reported on hurricane

exposure, PTSD symptoms, fear reactivity, regulatory abilities, social experiences, and coping 1.5 months following the storm, and on their PTSD symptoms again 8 months following the storm. Fear reactivity predicted more severe initial PTSD symptoms. Peer victimization added to the prediction of subsequent PTSD symptoms. Whereas regulatory abilities protected against PTSD symptoms both initially and across time, a negative coping style enhanced vulnerability to PTSD symptoms. Thus, mental health service providers should work to minimize peer victimization experiences, improve regulatory abilities, and promote alternatives to negative coping in youth following disasters.

Baggerly, J., & Exum, H. A. (2008). Counseling children after natural disasters: Guidance for family therapists. *American Journal of Family Therapy*, 36(1), 79-93.

After natural disasters, most children exhibit typical symptoms, which can be mitigated when parents and teachers provide emotional support and facilitate adaptive coping strategies. However, some children may experience clinical symptoms, which require professional counseling. This article guides family therapists in (a) identifying children's typical and clinical symptoms after a natural disaster, (b) training parents and teachers in basic interventions, and (c) implementing developmentally appropriate clinical interventions that integrate play. A multimodal, three-phase approach of Cognitive Behavior Therapy, Play Therapy, and Family Play Therapy is described.

Peek, L. (2008). Children and disasters: Understanding vulnerability, developing capacities, and promoting resilience—An introduction. *Children Youth and Environments*, 18(1), 1-29.

This comprehensive overview of the literature on children and disasters argues that scholars and practitioners should more carefully consider the experiences of children themselves. As the frequency and intensity of disaster events increase around the globe, children are among those most at risk for the negative effects of disaster. Children are psychologically vulnerable and may develop post-traumatic stress disorder or related symptoms; are physically vulnerable to death, injury, illness, and abuse; and often experience disruptions or delays in their educational progress as a result of disasters. Children have special needs and may require different forms of physical, social, mental, and emotional support than adults. However, children also have the capacity to

contribute to disaster preparedness, response, and recovery activities. In order to promote children's resilience to disasters, we must improve their access to resources, empower them by encouraging their participation, offer support, and ensure equitable treatment.

Salloum, A., & Overstreet, S. (2008). Evaluation of individual and group grief and trauma interventions for children post disaster. *Journal of Clinical Child & Adolescent Psychology*, 37(3), 495-507.

This study evaluated a community-based grief and trauma intervention for children conducted post-disaster. Fifty-six children (7 to 12 years old) who reported moderate to severe levels of symptoms of posttraumatic stress were randomly assigned to group or individual treatment. Treatment consisted of a manualized 10-session grief- and trauma-focused intervention and a parent meeting. Measures of disaster-related exposure, posttraumatic stress symptoms, depression, traumatic grief, and distress were administered at preintervention, postintervention, and 3 weeks postintervention. There was a significant decrease in all outcome measures over time, and there were no differences in outcomes between children who participated in group intervention and those who participated in individual intervention. Results suggest that this intervention using either treatment modality may be effective for addressing childhood grief and trauma post-disaster.

Cryder, C. H., Kilmer, R. P., Tedeschi, R. G., & Calhoun, L. G. (2006). [An exploratory study of posttraumatic growth in children following a natural disaster.](#) *American Journal of Orthopsychiatry*, 76(1), 65-69.

This study extends L. G. Calhoun and R. G. Tedeschi's (1998) model of posttraumatic growth (PTG), positive change resulting from the struggle with trauma, to children by exploring the construct among youngsters who experienced Hurricane Floyd and the subsequent flooding. Despite burgeoning interest in PTG, few studies have examined the phenomenon among non-adults. This first systematic study of PTG in children explores hypothesized linkages among PTG and social support, competency beliefs, and ruminative thinking. Results suggest that competency beliefs relate to PTG and that a supportive social environment and ruminative thinking are associated with positive competency beliefs. Contrary to expectations, social support did not relate

to rumination. Findings testify to the merit of studying the PTG process in children. Clinical implications and future directions are considered.

Evans, L., & Oehler-Stinnett, J. (2006). Children and natural disasters: A primer for school psychologists. *School Psychology International*, 27(1), 33-55.

Worldwide children are impacted by natural disasters, including hurricanes, floods, tornadoes, earthquakes, wildfires, landslides and sandstorms, winter and severe storms, heat waves, volcanoes and tsunamis. School psychologists should understand natural disaster effects, such as economic loss, relocation and health concerns and mental health issues. While most children are able to cope, a significant minority develops severe symptoms and Post Traumatic Stress Disorder (PTSD). School psychologists should gain trauma mental health training through the American Psychological Association, the National Association of School Psychologists, and the International School Psychology Association. They can also be involved in school and community prevention, mitigation and educational programming. This article presents an overview for school psychologists of the literature on children in natural disasters.

Evans, L. G., & Oehler-Stinnett, J. (2006). Structure and prevalence of PTSD symptomology in children who have experienced a severe tornado. *Psychology in the Schools*, 43(3), 283-295.

Children served by school psychologists are frequently impacted by natural disasters. In the United States, tornadoes are a particular threat but have been studied very little. The current investigation developed a scale for assessing posttraumatic stress disorder (PTSD) in children in Kindergarten to Grade 6 impacted by a severe tornado. Six factors were found: Avoidance, Re-experiencing, Interpersonal Alienation, Interference with Daily Functioning, Physical Symptoms/Anxiety, and Foreshortened Future. Prevalence rates for PTSD symptomology ranged from 34 to 44% for factor scores and 41% for meeting all three Diagnostic and Statistical Manual of Mental Disorder, fourth edition-text revision (DSM-IV-TR; American Psychiatric Association, 2000) criteria; 40% indicated no symptoms. Children's fear during the tornado and damage to their school were related to many factor scores.

McDermott, B. M., Lee, E. M., Judd, M., & Gibbon, P. (2005). Posttraumatic Stress Disorder and general psychopathology in children and adolescents following a wildfire disaster. *Canadian Journal of Psychiatry, 50*(3), 137-143.

Objective: To report on the use of the Post Traumatic Stress Disorder Reaction Index (PTSD-RI) and the Strengths and Difficulties Questionnaire (SDQ) in identifying children and adolescents who may require psychological interventions following exposure to a wildfire disaster. *Method:* Six months after a wildfire disaster, we conducted a school-based program to screen for wildfire-related events, such as exposure to and perception of threat, posttraumatic stress disorder (PTSD), and general psychopathology. *Results:* The screening battery was completed by 222 children (mean age 12.5 years, SD 2.48; range 8 to 18 years). Severe or very severe PTSD was reported by 9.0% of students, while 22.6% scored in the abnormal range on the Emotional Symptoms subscale of the SDQ. Younger children and individuals with greater exposure to and perception of threat experienced higher levels of PTSD and general psychopathology. Female students reported a greater perception of threat but did not report higher levels of PTSD or other symptoms. *Conclusions:* Screening was well received by students, parents, and staff and proved feasible in the post-disaster environment. The PTSD-RI and SDQ demonstrated different individual risk associations and functioned as complementary measures within the screening battery. The identification of children at greatest risk of mental health morbidity enabled service providers to selectively target limited mental health resources.

National Child Traumatic Stress Network and National Center for PTSD. (2005). *Psychological first aid field operations guide*. [Los Angeles: The Center].

Psychological First Aid (PFA) is an evidence-informed modular approach for assisting children, adolescents, adults, and families in the immediate aftermath of disaster and terrorism. PFA is designed to reduce the initial distress caused by traumatic events, and to foster short- and longterm adaptive functioning. Principles and techniques of PFA meet four basic standards. They are: (1) consistent with research evidence on risk and resilience following trauma; (2) applicable and practical in field settings; (3) appropriate to developmental level across the lifespan; and (4) culturally informed and adaptable. PFA is designed for delivery by mental health specialists who provide acute assistance to affected children and families as part of an organized disaster response

effort. These specialists may be imbedded in a variety of response units, including first responder teams, incident command systems, primary and emergency health care providers, school crisis response teams, faith-based organizations, Community Emergency Response Teams (CERT), Medical Reserve Corps, the Citizens Corps, and disaster relief organizations.

Gurwitch, R. H., Kees, M., Becker, S. M., Schreiber, M., Pfefferbaum, B., & Diamond, D. (2004). When disaster strikes: Responding to the needs of children. *Prehospital Disaster Medicine, 19*(1), 21-28.

When a disaster strikes, parents are quick to seek out the medical advice and reassurance of their primary care physician, pediatrician, or in the case of an emergency, an emergency department physician. As physicians often are the first line of responders following a disaster, it is important that they have a thorough understanding of children's responses to trauma and disaster and of recommended practices for screening and intervention. In collaboration with mental health professionals, the needs of children and families can be addressed. Policy-makers and systems of care hold great responsibility for resource allocation, and also are well-placed to understand the impact of trauma and disaster on children and children's unique needs in such situations.

Keenan, H. T., Stephen, W. Marshall, S. W., Nocera, M. A., & Runyan, D. K. (2004). Increased incidence of inflicted traumatic brain injury in children after a natural disaster. *American Journal of Preventive Medicine, 26*(3), 189-193.

Background The incidence of child abuse following natural disasters has not been studied thoroughly. However, parental stress and decreased social support have been linked to increased reports of child maltreatment. We hypothesized that a large-scale natural disaster (North Carolina's Hurricane Floyd) would increase the incidence of inflicted traumatic brain injury (TBI) in young children. *Methods* An ecologic study design was used to compare regions affected to those regions unaffected by the disaster. Cases of inflicted TBI resulting in admission to an intensive care unit or death from September 1998 through December 2001 in North Carolina were ascertained. Poisson regression modeling was employed to calculate rate ratios of injury for each geographic area by time period. *Results* Inflicted TBI in the most affected counties increased in the 6 months post-disaster in comparison to the same region pre-disaster (rate ratio 5.1, 95% confidence interval

[CI]=1.3–20.4), as did non-inflicted TBI (rate ratio 10.7, 95% CI=2.0–59.4). No corresponding increased incidence was observed in counties less affected or unaffected by the disaster. The rate of inflicted injuries returned to baseline in the severely affected counties 6 months post-hurricane; however, the rate of non-inflicted injuries appeared to remain elevated for the entire post-hurricane study period. *Conclusions* Families are vulnerable to an elevated risk of inflicted and non-inflicted child TBI following a disaster. This information may be useful in future disaster planning.

Lieberman, A. F., & van Horn, P. (2004). Assessment and treatment of young children exposed to traumatic events. In: Osofsky, J. D., ed. *Young children and trauma: Intervention and treatment* (pp. 111-138). New York: Guilford Press.

The impact of traumatic events on infants, toddlers, and preschoolers is only beginning to be systematically documented and understood. Children respond to trauma in ways that reflect the particular developmental tasks and challenges they are attempting to master. This chapter describes assessment strategies designed to identify traumatic responses in a developmental and contextual framework, and presents forms of intervention aimed at alleviating traumatic responses in the present and at preventing the consolidation of these responses into chronic patterns of emotional, social, and cognitive dysfunction.

Hamada, R. S., Kameoka, V., Yanagida, E., & Chemtob, C. M. (2003). Assessment of elementary school children for disaster-related posttraumatic stress disorder symptoms: The Kauai recovery index. *Journal of Nervous & Mental Disease, 191*(4), 268-272.

Reports the first and second stage results of a project to establish the psychometric properties of a PTSD symptom scale for children designed to be used communitywide after disasters. This analysis confirms the psychometric soundness of the Kauai Recovery Index (KRI). The KRI can be readily used as a brief instrument to screen disaster-exposed children in schools to identify those in need of psychological intervention and to plan and monitor effects of those interventions. It can also be used to monitor over time the psychological recovery of children after a disaster.

Kreuger, L., & Stretch, J. (2003). Identifying and helping long term child and adolescent disaster victims: Model and method. *Journal of Social Service Research, 30*(2), 93-108.

This paper reports on secondary analysis of data collected as part of an effort by social work providers and a major parochial school system to assess longer term impact and possible Post Traumatic Stress Disorder (PTSD) among children and adolescents in 17 schools heavily affected by flooding. The assessment protocol, implemented by classroom teachers, measured self-reported amount of damage from a major flood along with two standardized measures of PTSD. Discussed are findings regarding factors that predict PTSD including amount of harm and ability of family to recover, whether loss of residence was related to recovery and PTSD and other variables from this field screening of 3876 children and adolescents in the Midwest who lived in areas impacted by an extensive flooding.

Laor, N., Wolmer, L., Spirman S, & Wiener Z. (2003). Facing war, terrorism, and disaster: Toward a child-oriented comprehensive emergency care system. *Child & Adolescent Psychiatric Clinics of North America, 12*(2), 343-361.

The combination of the overwhelming nature of disasters and the massive losses they engender gives rise to a complex clinical and social picture with long-term physical, psychological, and social effects on children, families, and communities. The authors suggest that to assess the damage properly, implement interventions on a large scale, keep tabs on rising needs, and restore societal function, mental health professionals must adopt an ecologic systems approach. This approach entails working within and together with related institutions (education, health, local government) and assisting other committed professionals within these institutions to mediate care. This is of utmost importance in the area of children's care because of their particular vulnerability and their special importance for families and society. For this reason, the authors suggest that emergency mental health systems be better designed and implemented while keeping children at the center of their focus. An essential component of the ecologic systems approach is improved education for mental health professionals, providing them the appropriate tools to cope with widespread disaster and the expertise to apply these tools. This approach, how-ever, is not enough. A good outcome cannot be achieved without preparedness on the part of the other relevant institutions and the community as a whole. Greater awareness is needed among local and national authorities of the importance of metaadaptive systems and of local, national, and international

networking. In the current global village that is threatened by pervasive terrorism, no community must face it alone. The challenge of a disaster to one community is a challenge to all. By working together we can lessen the devastating impact of these events, save countless lives, prevent untold suffering, and maintain hope for a better world for children.

Reijneveld, S.A., Crone, M.R., Verhulst, F.C., & Verloove-Vanhorick, S.P. (2003). The effect of a severe disaster on the mental health of adolescents: A controlled study. *Lancet*, 362(9385), 691-696.

Background: Disasters greatly affect the mental health of children and adolescents, but quantification of such effects is difficult. Using prospective predisaster and postdisaster data for affected and control populations, we aimed to assess the effects of a severe disaster on the mental health and substance use of adolescents. *Methods:* In January, 2001, a fire in a cafe in Volendam, Netherlands, wounded 250 adolescents and killed 14. In the 15 months before the disaster, all grade 2 students (aged 12-15 years) from a school in Volendam (of whom 31 were in the cafe during the fire), and from two other schools, had been selected as controls for a study. 124 Volendam students and 830 from the other two schools had provided data for substance use, and completed the youth self-report (YSR) questionnaire about behavioural and emotional problems. 5 months after the disaster, we obtained follow-up data from 91 (re-sponse rate 73.4%) Volendam adolescents and 643 (77.5%) controls from the other two schools. The primary outcome measures were changes in score in YSR categories of total problems, alcohol misuse, smoking, and substance use. We compared changes in scores between groups using logistic regression. *Findings:* Volendam adolescents had larger increases in clinical scores than controls for total problems (odds ratio 1.82, 95% CI 1.01-3.29, $p=0.045$) and excessive use of alcohol (4.57, 2.73-7.64, $p<0.0001$), but not for smoking or use of marijuana, MDMA (ecstasy), and sedatives. Increases in YSR scores were largest for being anxious or depressed (2.85, 1.23-6.61), incoherent thinking (2.16, 1.09-4.30), and aggressive behaviour (3.30, 1.30-8.36). Intention-to-treat analyses showed significantly larger for increases in rates of excessive drinking and YSR symptom subscales in Volendam adolescents than controls. Effects were mostly similar in victims and their classmates. *Interpretation:* Mental health interventions after disasters should address anxiety, depression, thought problems, aggression, and alcohol abuse of directly affected adolescents and their peer group.

Wolmer, L., Laor, N., & Yazgan, Y. (2003). School reactivation programs after disaster: Could teachers serve as clinical mediators? *Child & Adolescent Psychiatric Clinics of North America*, 12(2), 363-381.

Mental health interventions are known to prevent the progressive worsening of symptoms in young victims of disaster and, subsequently, to prevent a decline in their academic performance and self-esteem. The tremendous needs that emerge after a disaster and the reluctance shown by most victims to seek professional help require mental health leaders to adopt a proactive stance and implement relief programs in the child's most natural setting. The school as institution and the teachers as empowered mediators offer the appropriate conditions for implementing an effective large-scale intervention program. Well-intentioned child professionals who deal with school administrators and teachers must take into account that, as stated by Pfefferbaum et al, "avoidance is at the core of the posttraumatic response, and it sometimes involves avoidance of treatment." For child mental health professionals, routine collaboration across systemic boundaries may prove critical for the rapid mobilization of resources during mass traumatic emergencies. Further studies are needed to identify the protective and risk factors that predict resilience and pathology, respectively, and factors that facilitate or aggravate factors that predict improvement, resistance, and deterioration in response to treatment.

Gurwitch, R. H., Silovsky, J. F., Schultz, S., Kees, M., & Burlingame, S. (2002). Reactions and guidelines for children following trauma/disaster. *Communication Disorders Quarterly*, 23(2), 93-99.

What to expect following trauma among elementary school students, middle school students, high school students, and teachers, and guidelines for response.

Jones, R. T., Ribbe, D. P., Cunningham, P. B., Weddle, J. D., & Langley, A. K.. (2002). Psychological impact of fire disaster on children and their parents. *Behavior Modification*, 26(2), 163-186.

Six weeks following a major wildfire, children's psychosocial functioning was examined. Employing a multi-method assessment approach, the short-term mental health consequences of the fire were evaluated. Individual adjustment was compared between families who reported high

levels of loss as a result of the fire (high-loss group) and families who reported relatively low levels of loss resulting from the fire (low-loss group) . Standardized assessment procedures were employed for children and adolescents as well as their parents. In general, high-loss participants reported slightly higher levels of post-traumatic stress disorder (PTSD) symptoms and significantly higher scores on the Impact of Events Scale. PTSD symptoms reported by parents were generally significantly correlated with (but not concordant with) PTSD symptoms reported by their children. The high-loss group scored significantly higher on the Resource Loss Index than did the low-loss group. Preexisting and comorbid disorders and previous stressors are described. A methodological framework for future studies in this area is discussed.

Shannon, M. P., Lonigan, C. J., Finch, A. K.. (2002). Children exposed to disaster: I. Epidemiology of post-traumatic symptoms and symptom profiles. *Journal of the American Academy of Child & Adolescent Psychiatry*, 33(1), 80-93.

5,687 school-aged children (aged 9-19 yrs) were surveyed about their experiences and reactions related to Hurricane Hugo. Significant variation in the prevalence of posttraumatic stress disorder (PTSD) symptoms was found across race, gender, and age groups. Self-reported symptoms were used to derive a post-traumatic stress syndrome classification according to Diagnostic and Statistical Manual of Mental Disorders-III-Revised (DSM-III-R) guidelines for the diagnosis of PTSD. More than 5% of the sample reported sufficient symptoms to be classified as exhibiting this post-traumatic stress syndrome. Females and younger children were more likely to receive this classification. At the symptom level, females reported more symptoms associated with emotional processing and emotional reaction to the trauma. Males were more likely to report symptoms related to cognitive and behavioral factors. Younger children were more likely to report symptoms overall.

Lonigan, C. J., Shannon, M. P., Taylor, C. M., Finch, A. J., et al. (2002). Children exposed to disaster: II. Risk factors for the development of post-traumatic symptomatology. *Journal of the American Academy of Child & Adolescent Psychiatry*, 33(1), 94-105.

Three months after Hurricane Hugo, 5,687 school-aged children were surveyed about their experiences and reactions to the hurricane. The children were divided into 3 age groups: preadolescents (aged 9-12 yrs), early adolescents (aged 13-15 yrs), and late adolescents (aged 16+ yrs). Self-reports of posttraumatic stress disorder (PTSD) symptoms were obtained by use of a PTSD Reaction Index. The presence of PTSD symptoms was strongly related to children's reported severity of the hurricane, degree of home damage sustained, and continued displacement; however, children's level of trait anxiety and their reported emotional reactivity during the hurricane were more strongly related to the presence of PTSD symptoms than were the exposure factors. Different sets of risk factors appeared to differentially influence the development of the 3 Diagnostic and Statistical Manual of Mental Disorders-III-Revised (DSM-III-R) PTSD symptom clusters.

Shen, Y. J., & Sink, C.A. (2002). Helping elementary-age children cope with disasters. *Professional School Counseling*, 5(5), 322-330.

Focuses on the need for school counselors to incorporate disaster prevention and intervention in counseling elementary-age children. Effects of disasters on elementary-age children; Suggestions for possible school-based intervention; Use of child-centered play therapy in school setting.

Stubenbort, K., Donnelly, G. R., & Cohen, J. A. (2001). Cognitive-behavioral group therapy for bereaved adults and children following an air disaster. *Group Dynamics*, 5(4), 261-276.

On September 8, 1994, USAir Flight 427 from Chicago crashed on its descent to the Pittsburgh International Airport. All 132 passengers and crew were killed. This crash was unique in that more than 80% of the victims were residents of the greater Pittsburgh area. In this regard, the need for professional intervention became vital. Group intervention allowed the professionals to promptly serve a large number of affected families. It was hypothesized that the group experience would

lead to bonding and support that would persist beyond the time limits of the group. A group-based intervention program for adult and child survivors is described, including its administrative structure, therapeutic objectives and interventions, and group process. A direct outcome of this group was the establishment of The USAir Flight 427 Disaster Support League and, subsequently, the development of the National Air Disaster Alliance.

Ball, J., & Allen, K. (2000). Consensus recommendations for responding to children's emergencies in disasters. *National Academies of Practice Forum: Issues in Interdisciplinary Care*, 2(4), 253-257.

Discusses consensus recommendations for responding to children's emergencies in disasters that emerged from the 1998 Children's Emergencies in Disasters: A National Emergency Medical Service for Children Workshop in Orlando, Florida. Emergency physicians, pediatricians, nurses, emergency medical service and disaster planners, school representatives, and mental health professionals developed the pediatric disaster recommendations. The consensus recommendations include information on medical capabilities, managed care, mental health, community planning, data collection, volunteer services, school and child care, public awareness, and family empowerment.

Bolton, D., O'Ryan, D., Udwin, O., Boyle, S., & Yule, W. (2000). The long-term psychological effects of a disaster experienced in adolescence: II: General psychopathology. *Journal of Child Psychology & Psychiatry*, 41(4), 513-523.

Children and adolescents exposed to trauma can suffer major adverse psychological effects including not only post-traumatic stress but also other psycho-logical disorders. This study investigates the long-term course of general psychopathology following trauma in adolescence using a standardized diagnostic interview and comparisons with a matched control group. Young people ($N= 216$) who as teenagers had survived a shipping disaster—the sinking of the “Jupiter” in Greek waters—between 5 and 8 years previously and 87 young people as matched controls were interviewed. The survivors showed raised rates of diagnosis in a range of anxiety and affective disorders during the follow-up period. The highest rates were among the survivors who had

developed Post-Traumatic Stress Disorder (PTSD), and those survivors who had not were generally similar to the controls. Onset of anxiety and affective disorders varied between being indefinitely close to the disaster to years later. Differences in rates of disorder between the survivor and control groups had lessened by the time of follow-up but were still apparent, due to continuing distress among the survivors still suffering from PTSD, and to a lesser extent among those who had recovered from PTSD. Generalisability of the findings are discussed.

Bulut, S., & Yule, W. (2000). The long-term psychological effects of a disaster experienced in adolescence: II: General psychopathology. *Journal of Psychology in the Orient*, 47(3), 158-168.

Because Oklahoma has more tornadoes per square mile than any region in the world, children in Oklahoma and other disaster prone areas are at risk for developing posttraumatic stress disorder (PTSD) due to exposure to and threat of tornadoes. Given the gaps in the literature and the risk to children living in Oklahoma, the present study was undertaken to factor analyze items representing underlying dimensions of PTSD. This factor analysis of the responses of children who experienced a tornado indicates that it may be more useful to re-align the DSM-IV symptoms into five underlying dimensions. These dimensions appear to be: (1) blocking/vigilance, (2) affective/adjustment difficulties, (3) re-experiencing/ intrusion, (4) somatic/attachment and (5) sense of foreshortened future. Items of avoidance stimuli, loaded across factors, with avoiding places associated with vigilance, avoiding people associated with adjustment problems, and television stimuli associated with re-experiencing. Psychologists should consider these results when developing interventions.

Curtis, T., Miller, B., & Berry, E. (2000). Changes in reports and incidence of child abuse following natural disasters. *Child Abuse & Neglect*, 24, 1151–62.

Objective The aim of this research was to investigate if there is a higher incidence of child abuse following major natural disasters. *Methodology* Child abuse reports and substantiations were analyzed, by county, for 1 year before and after Hurricane Hugo, the Loma Prieta Earthquake, and Hurricane Andrew. Counties were included if damage was widespread, the county was part of a

presidential disaster declaration, and if there was a stable data collection system in place. *Results* Based on analyses of numbers, rates, and proportions, child abuse reports were disproportionately higher in the quarter and half year following two of the three disaster events (Hurricane Hugo and Loma Prieta Earthquake). *Conclusions* Most, but not all, of the evidence presented indicates that child abuse escalates after major disasters. Conceptual and methodological issues need to be resolved to more conclusively answer the question about whether or not child abuse increases in the wake of natural disasters. Replications of this re-search are needed based on more recent disaster events.

Udwin, O., Boyle, S., Yule, W., Bolton, D., & O'Ryan, D. (2000). Risk factors for long-term psychological effects of a disaster experienced in adolescence: Predictors of Post Traumatic Stress Disorder. *Journal of Child Psychology & Psychiatry*, 41(8), 969-979.

This paper examines risk factors for the development of Post Traumatic Stress Disorder (PTSD), and its severity and chronicity, in a group of 217 young adults who survived a shipping disaster in adolescence. The survivors were followed up 5 to 8 years after the disaster. Risk factors examined fell into three main categories: pre-disaster child and family vulnerability factors, including childhood psychopathology; objective and subjective disaster-related experiences; and post-disaster factors, including results from screening questionnaires administered 5 months post-disaster, coping mechanisms adopted subsequently, life events, and availability of social supports. Developing PTSD following the disaster was significantly associated with being female, with pre-disaster factors of learning and psychological difficulties in the child and violence in the home, with severity of exposure to the disaster, survivors' subjective appraisal of the experience, adjustment in the early post-disaster period, and life events and social supports subsequently. When all these factors were considered together, measures of the degree of exposure to the disaster and of subjective appraisal of life threat, and ratings of anxiety obtained 5 months post-disaster, best predicted whether survivors developed PTSD. For those survivors who developed PTSD, its duration and severity were best predicted not by objective and subjective disaster-related factors, but by pre-disaster vulnerability factors of social, physical, and psychological difficulties in childhood together with ratings of depression obtained 5 months post-disaster, and whether survivors received post-disaster support at school. The implications of these findings are

considered for targeting assessment and intervention efforts at survivors most at risk of developing difficulties in adjustment following similar traumatic experiences.

Yule, W., Bolton, D., Udwin, O., Boyle, S., O'Ryan, D., & Nurrish, J. (2000). The long-term psychological effects of a disaster experienced in adolescence: I: The incidence and course of PTSD. *Journal of Child Psychology & Psychiatry*, 41(4), 503-511.

Previous studies have shown that children and adolescents exposed to traumatic experience in a disaster can suffer from high levels of post-traumatic stress. The present paper is the first a series reporting on the long-term follow-up of a group of young adults who as teenagers had survived a shipping disaster-the sinking of the "Jupiter" in Greek waters-between 5 and 8 years previously. The general methodology of the follow-up study as a whole is described, and the incidence and long-term course of Post-Traumatic Stress Disorder (PTSD). It is the first study of its kind on a relatively large, representative sample of survivors, using a standardised diagnostic interview, and comparing survivors with a community control group. Survivors of the Jupiter disaster (N = 217), and 87 young people as controls, were inter-viewed using the Clinician Administered PTSD Scale (CAPS). Of the 217 survivors, 111 (51.7%) had developed PTSD at some time during the follow-up period, compared with an incidence in the control group of 3.4 % (N = 87). In the large majority of cases of PTSD in the survivors for whom time of onset was recorded, 90 % (N = 110), onset was not delayed, being within 6 months of the disaster. About a third of those survivors who developed PTSD (30%, N = 111) recovered within a year of onset, through another third (34 %, N = 111) were still suffering from the disorder at the time of follow-up, between 5 and 8 years after the disaster. Issues relating to the generalisability of these findings are discussed.

Lee, O. (1999). Science knowledge, world views, and information sources in social and cultural contexts: Making sense after a natural disaster. *American Educational Research Journal*, 36(2), 187-219.

This study examined children's views of the world after they personally experienced a natural disaster--specifically, Hurricane Andrew in South Florida during the summer of 1992. The study addressed three issues: (a) children's knowledge of the hurricane; (b) children's views of the world, especially the causality of the hurricane; and (c) children's sources of information in social and

cultural contexts. The study was conducted in the early spring of 1994. It involved 127 fourth and fifth grade students in two elementary schools located in areas that were particularly hard hit by the hurricane. The student sample was representative of various ethnic, socioeconomic, and gender backgrounds. Both quantitative and qualitative research methods were used for data collection and analysis. Results indicate significant differences as well as similarities in children's knowledge, world views, and information sources by ethnicity, socio-economic status, and gender. Implications for promoting scientific literacy for all students, including socially and culturally diverse students, are discussed.

McDermott, B. M. C., & Palmer, L. J. (1999). Post-disaster service provision following proactive identification of children with emotional distress and depression. *Australian & New Zealand Journal of Psychiatry*, 33(6), 855-863.

Objective: Proactive, school-based psychological testing for emotional distress and depression was employed 6 months after a bushfire disaster. The service provision aim was to provide children with the greatest emotional distress the relatively limited therapeutic resources available in the post-disaster environment. Specific hypotheses were tested: that the prevalence of emotional distress and depression would be elevated 6 months post disaster; that emotional distress would be correlated with traumatic events; and that depression would be related to experiences of loss.

Method: Six months after a bushfire disaster grade 4, 5, and 6 students (n = 601) participated in screening using a test battery measuring emotional distress, depressive symptoms and trait anxiety.

Results: Twelve percent (n = 72) of children experienced severe emotional distress 6 months after the bushfire. Rates of depression were similar to rates in non-traumatized child community samples. Multivariate analysis suggested that emotional distress was significantly associated with trait anxiety, evacuation experience, the perception that parents may have died during the bushfire, and depressive symptoms. Depressive symptoms were associated with total distress score, trait anxiety and perception of threat to the parents.

Conclusions: Substantial mental health morbidity was identified 6 months after a bushfire disaster. The usefulness of post-disaster service provision influenced by proactive screening is discussed and reasons for further research highlighted.

Bahrnick, L. E., J. F. Parker, et al. (1998). The effects of stress on young children's memory for a natural disaster. *Journal of Experimental Psychology: Applied*, 4(4), 308-331.

The effects of stress on children's long-term memory for a major hurricane were studied. Stress was objectively defined as low, moderate, or high according to the severity of damage to the child's home. One hundred 3 and 4-year-old children received a structured interview 2-6 months following the hurricane. Older children recalled and elaborated more than younger children. Prompted recall was greater than spontaneous recall. There was a quadratic function, consistent with an inverted U-shaped curve, relating storm severity with overall as well as spontaneous recall. These findings can be applied to the effects of stress on the amount recalled by children giving retrospective accounts of temporally extended, naturalistic events.

Flynn, B. W., & Nelson, M. E. (1998). Understanding the needs of children following large-scale disasters and the role of government. *Child & Adolescent Psychiatric Clinics of North America*, 7(1), 211-227.

No one who experiences a disaster is untouched by it. Children and their families are often among the most affected. This article explains how mental health and medical professionals can assist families and communities in dealing with common disaster-related stress reactions in children. An overview of disaster research and examples of special concerns about children are given. In addition, an overview of the role of local, state, and federal governments, as well as other organizations, is provided.

Gurwitsch, R. H., Sullivan, M. A., & Long, P. J. (1998). The impact of trauma and disaster on young children. *Child & Adolescent Psychiatric Clinics of North America*, 7(1), 19-32.

In the past few decades, the study of the impact of trauma and disaster on children has grown; however, information about the effects on very young children is still scarce in the literature. In some regards, the characteristics of stress in young children are similar to those of older children and adults; in other ways, their reactions are unique. These characteristics, as well as mediating factors and interventions with young children, are discussed. Suggestions for future research are offered.

Johnson, K. (1998). *Trauma in the lives of children: Crisis and stress management techniques for counselors, teachers, and other professionals*. 2nd ed. Alameda, CA: Hunter House.

This book discusses the impact of traumatic events upon children and strategies for addressing the problems they experience. Chapters include: what we know about crisis, children's reactions to trauma, what schools can do, and what therapists can do. It also addresses the impact of disaster mental health impact on workers and methods for managing professional stress.

Lonigan, C. J., Anthony, J. L., & Shannon, M. P. (1998). Diagnostic efficacy of posttraumatic symptoms in children exposed to disaster. *Journal of Clinical Child Psychology*, 27(3), 255-267.

Examined 5 conditional probability indices to determine the diagnostic efficacy of 48 symptoms associated with posttraumatic stress disorder (PTSD) in 5,687 children exposed to Hurricane Hugo, of whom 5.5% had a diagnosis of posttraumatic stress syndrome (PTSS). Moderate levels of sensitivity and high levels of specificity were obtained for most symptoms. Odds ratios more precisely demonstrated that some Diagnostic and Statistical Manual of Mental Disorders (DSM) symptoms of PTSD, especially when combined, were useful for identifying children with PTSS but that anxiety symptoms and some DSM symptoms of PTSD had poor diagnostic utility. Satisfying criteria for the DSM-III-R numbing/avoidance cluster and symptoms from the numbing/avoidance cluster had the highest diagnostic efficacy, suggesting that avoidance may be the hallmark of severe posttraumatic reactions. These results suggest which symptoms should be conceptualized as central versus peripheral to the disorder and which symptoms and symptom combinations clinicians should attend to most when diagnosing or screening PTSD in children.

Pfefferbaum, B. (1998). Caring for children affected by disaster. *Child & Adolescent Psychiatric Clinics of North America*, 7(3), 579-597.

The child and adolescent psychiatrist must play an essential role in the wake of disaster. The focus of the community and the world understandably turns to the physical devastation wrought, and emergency and medical efforts take center stage. Physical evidence of the past may be lost, but the child psychiatrist is able to maintain focus on what cannot be seen. He or she may be the only one to advocate the child's emotional needs. It may be too difficult for others who lack the specialized

expertise of mental health training to attend to both the child's physical and emotional needs, and it may be impossible for those without medical training to impress on medical personnel the importance of emotional issues. The child and adolescent psychiatrist, with his or her understanding of medical, mental health, and developmental concerns, is well positioned to support the child, the child's community, and the helpers whose own responses may complicate recovery.

Khoury, E. L., Warheit, G. J., Hargrove, M. C., Zimmerman, R. S., Vega, W. A., & Gil, A. G. (1997). The impact of hurricane Andrew on deviant behavior among a multiracial/ethnic sample of adolescents in Dade County, Florida: A longitudinal analysis. *Journal of Traumatic Stress, 10*(1), 71-91.

Findings from a longitudinal study are presented on the relationships between the problems and stresses resulting from Hurricane Andrew and post-hurricane minor deviant behavior. The sample (N = 4,978) included Hispanic, African-American, and White non-Hispanic middle school students enrolled in Dade County, Florida public schools. Two waves of data were collected prior to the hurricane; a third was obtained approximately 6 months following the storm. Results indicated that females were likely to report higher levels of hurricane-related stress symptoms than males. After controlling for prehurricane levels of minor deviance, family support, and race/ethnicity, hurricane stress symptom level remained a significant predictor of posthurricane minor deviant behavior. The findings lend support to stress theories of social deviance.

Prinstein, M. J., & La Greca, A. M. (1996). Children's coping styles and friends help children cope after a natural disaster. *Journal of Clinical Child Psychology, 25*(4), 463-475.

Investigates types of coping assistance offered by parents, friends and teachers to children after a natural disaster. Assessment of post-traumatic stress disorder; Frequency of ten types of coping strategies; Children's perception of social support from significant others.

Swenson, C. C., Saylor, C. F., Powell, M. P., Stokes, S. J., Foster, K. Y., & Belter, R. W. (1996). of a natural disaster on preschool children: Adjustment 14 months after a hurricane. *American Journal of Orthopsychiatry*, 66(1), 122-130.

Fourteen months after a hurricane, young children who had experienced the storm showed significantly higher anxiety and withdrawal and more behavior problems than did children who had not. Behavioral problems decreased steadily over the six months following the storm. Mothers' distress in the hurricane's aftermath was associated with the longevity of their children's emotional and behavioral difficulties.

Warheit, G. J., Zimmerman, R. S., Khoury, E. L., Vega, W. A., & Gil, A. G. (1996). Disaster-related stresses, depressive signs and symptoms, and suicidal ideation among a multi-racial/ethnic sample of adolescents: a longitudinal analysis. *Journal of Child Psychology & Psychiatry*, 37, 435-44.

Longitudinal findings are presented on the relationships between disaster related stresses, depression scores, and suicidal ideation among a multi-racial/ethnic sample of adolescents (N = 4,978) all of whom have been exposed to Hurricane Andrew. Regression analysis showed that being female, hurricane generated stresses, low levels of family support, pre-hurricane suicidal ideation, and post-hurricane depression scores were significant predictors of post-hurricane suicidal ideation. Path analysis revealed that being female, low socioeconomic status, pre- and post-hurricane depression, high stress scores, low family support, and pre-hurricane suicidal ideation had significant direct/indirect effects on post-hurricane suicidal ideation.

U.S. Department of Health and Human Services. Children's Bureau. (1995). *Coping with disasters: A guide for child welfare agencies*. Washington, DC: The Bureau. 11 p.

Lonigan, C. J. D., Grace, M. P., Taylor, C. M., Finch, A. J., Jr., & Sallee, F. R. (1994). Children exposed to disaster: II. Risk factors for the development of post-traumatic symptomatology. *Journal of the American Academy of Child & Adolescent Psychiatry*, 33(1), 94-105.

Objective To examine the influence of subject and exposure variables on the development of post-traumatic stress disorder (PTSD) symptoms and syndrome in children exposed to disaster. *Method* Three months after Hurricane Hugo, 5,687 school-aged children were surveyed about their experiences and reactions to the hurricane. Self-reports of PTSD symptoms were obtained by use of a PTSD Reaction Index. *Results* The presence of PTSD symptoms was strongly related to children's reported severity of the hurricane, degree of home damage sustained, and continued displacement; however, children's level of trait anxiety and their reported emotional reactivity during the hurricane were more strongly related to the presence of PTSD symptoms than were the exposure factors. Different sets of risk factors appeared to differentially influence the development of the three DSM-III-R PTSD symptom clusters. Little evidence for a differential effect of the risk factors between females and males and younger and older children was found. *Conclusions* Level of trait anxiety appears to be the single strongest risk for the development of severe post-traumatic reactions. The higher rate of post-traumatic symptoms in females and younger children in combination with the absence of differential reaction to the risk factors suggests that females and younger children are more likely to develop posttraumatic reactions following a disaster.

Durkin, M. S., Khan, N., Davidson, L. L., Zaman, S. S., & Stein, Z. A. (1993). The effects of a natural disaster on child behavior: Evidence for posttraumatic stress. *American Journal of Public Health*, 83(11), 1549-1553.

Objectives. A prospective study of children examined both before and after a flood disaster in Bangladesh is used to test the hypothesis that stressful events play a causal role in the development of behavioral disorders in children. *Methods.* Six months before the disaster, structured measures of selected behavioral problems were made during an epidemiological study of disability among 2- to 9-year-old children. Five months after the disaster, a representative sample of 162 surviving children was reevaluated. *Results.* Between the pre- and postflood assessments, the prevalence of aggressive behavior increased from zero to nearly 10%, and 45 of the 134 children who had bladder control before the flood (34%) developed enuresis. *Conclusions.* These results help define what

may be considered symptoms of posttraumatic distress in childhood; they also contribute to mounting evidence of the need to develop and evaluate interventions aimed at ameliorating the behavioral and psychological consequences of children's exposure to extreme and traumatic situations.

Jeney-Gammon, P., Daugherty, T. K., Finch, A. J., Jr., Belter, R. W., & Foster, K. Y. (1993). Children's coping styles and report of depressive symptoms following a natural disaster. *Journal of Genetic Psychology, 154*(2), 259-267.

The present study examined the relationship between children's coping styles (Spirito, Stark, & Williams, 1988) and self-reported levels of depressive symptoms (Kovacs, 1983) following a major stressor. 257 third- to fifth-grade children consented to participate in the study, 5 months following a hurricane. The number of coping strategies employed was positively related to depression scores, whereas coping efficacy was negatively related to depression scores. Social withdrawal, self-blaming, and emotional regulation were associated with more severe depressive symptoms. Lower levels of symptomatology were found among children who sought social support and engaged in cognitive restructuring. The overall symptom level in the sample did not exceed that of normative samples. Results are discussed in terms of competing theories of childhood depression.

Smith, E.M., North, C.S. (1993). Posttraumatic stress disorder in natural disasters and technological accidents. In: Wilson, J. P., & Raphael, B., eds. *International Handbook of Traumatic Stress Syndromes*. (pp. 405-419). NY: Plenum Press.

Vernberg, E.M., & Vogel, J.M. (1993). Psychological response of children to natural and human-made disasters: II. Interventions with children after disasters. *Journal of Clinical Child Psychology, 22*(4), 485-498.

Provides a summary and evaluation of disaster-related psychological interventions with children and adolescents. Intervention models are grouped in temporal sequence in relation to the disaster event (predisaster phase, impact phase, short-term adaptation phase, and long-term adaptation phase). It is noted that most interventions are based on plausible conceptual assumptions, and

convergence often can be seen in the content of interventions derived from diverse theoretical perspectives. Relatively little evaluation of disaster-related interventions with children has been published, and recommendations for research are presented.

Vogel, J. M., & Vernberg, E. M. (1993). Psychological response of children to natural and human-made disasters: I. Children's psychological responses to disasters. *Journal of Clinical Child Psychology*, 22(4), 464-484.

Provides a summary and evaluation of disaster-related psychological interventions with children and adolescents. Intervention models are grouped in temporal sequence in relation to the disaster event (predisaster phase, impact phase, short-term adaptation phase, and long-term adaptation phase). It is noted that most interventions are based on plausible conceptual assumptions, and convergence often can be seen in the content of interventions derived from diverse theoretical perspectives. Relatively little evaluation of disaster-related interventions with children has been published, and recommendations for research are presented.

Chemtob, C. M., J. D., Grace, M. C., & Leonard, A. C. (1992). Brief treatment for elementary school children with disaster-related posttraumatic stress disorder: A field study. *Journal of Clinical Psychology*, 58(1), 99-112.

With a randomized group design, a 12-session anger treatment was evaluated with severely angry Vietnam War veterans suffering combat-related posttraumatic stress disorder (PTSD). Eight participants in anger treatment and 7 in a routine clinical care control condition completed multiple measures of anger control, anger reaction, and anger disposition, as well as measures of anxiety, depression, and PTSD at pre- and posttreatment. Controlling for pretreatment scores, significant effects were found on anger reaction and anger control measures but not on anger disposition or physiological measures. Eighteen-month follow-up (for both completers and drop-outs) supported the posttreatment anger control findings. The challenges of treatment research with this refractory population are discussed.

Green, B. L., Lindy, J. D., Grace, M. C., Leonard, A. C. (1992). Chronic posttraumatic stress disorder and diagnostic comorbidity in a disaster sample. *Journal of Nervous and Mental Disorders*, 180(12), 760-766.

Research has indicated significant comorbid psychopathology with chronic posttraumatic stress disorder (PTSD) in samples of war veterans. The present paper examined the issue of comorbidity in a disaster sample to learn whether findings from veterans generalized to this event. 193 Ss exposed to the Buffalo Creek dam collapse of 1972 were examined 14 yrs later using diagnoses derived from the Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders-III (DSM-III). Past and present PTSD was found in a significant portion of the sample. Major depression was the next most common diagnosis and was highly related to PTSD. Anxiety disorders were also common. The overlap with other diagnoses was similar to that found in a sample of Vietnam veterans studied earlier, except that the disaster sample had fewer dysthymic disorders, substance abusers, and antisocial personality disorders.

Saylor, C.F., Swenson, C.C., & Powell, P. (1992). Hurricane Hugo blows down the broccoli: Preschoolers' post-disaster play and adjustment. *Child Psychiatry & Human Development*, 22(3), 139-149.

This article reports highlights from over 200 parents' observations of their preschoolers' play and verbalizations in the year following Hurricane Hugo. Commonly reported activities included reenactment and discussion of the event in multiple mediums, personification of "Hugo," and expression of fears related to storms. Precocious concern for others, insight, and vocabulary were also noted. In these intact, relatively high functioning families, parents seemed able to facilitate their youngsters' adjustment without outside intervention.

Bradburn, I. S. (1991). After the earth shook: Children's stress symptoms 6-8 months after a disaster. *Advances in Behaviour Research & Therapy*, 13(3), 173-179.

Studied 22 children's (aged 10-12 yrs) response to an earthquake 6-8 mo after the event, particularly subjects' traumatic stress-related symptoms and factors mediating individual response. Principal variables examined were (1) experience of and proximity to loss of life and severe property damage, (2) family reactions, and (3) psychological vulnerability to having an adverse

response, based on previous experience of psychological trauma. Measures administered during interview included a posttraumatic stress reaction index for children. Subjects reported experiencing traumatic stress-related symptoms that appeared associated with the seismic event. Subjects who lived closer to a heavily dam-aged area were more likely to experience a greater degree of stress than subjects who lived farther away.

Green, B. L., Korol, M., Grace, M. C., Vary, M. G., Leonard, A. C., Gleser, G. C., & Smitson-Cohen, S. (1991). Children and disaster: Age, gender, and parental effects on PTSD symptoms. *Journal of the American Academy of Child & Adolescent Psychiatry, 30*(6), 945-951.

Psychiatric reports of 179 children aged 2 to 15 who were exposed to the Buffalo Creek dam collapse in 1972 were rated for post-traumatic stress disorder (PTSD) symptoms 2 years after the disaster. Age and gender effects and the impact of the level of exposure and parental functioning were examined according to a conceptual model addressing factors contributing to adaptation to a traumatic event. Results showed fewer PTSD symptoms in the youngest age group and higher symptom levels for girls than boys. Approximately 37% of the children were given a "probable" diagnosis of PTSD. Multiple regression analysis showed that life threat, gender, parental psychopathology, and an irritable and/or depressed family atmosphere all contributed to the prediction of PTSD symptomatology in the children.

Lonigan, C. J., Shannon, M. P., Finch, A. J., Daugherty, T. K., et al. (1991). Children's reactions to a natural disaster: Symptom severity and degree of exposure. *Advances in Behaviour Research & Therapy, 13*(3), 135-154.

Self-report data for 5,687 children (aged 9-19 yrs) were collected approximately 3 months after a hurricane devastated the children's community. Information about the children's perceptions of hurricane severity, degree of home damage suffered as a result of the hurricane, and hurricane-related parental job loss was used to categorize children into 4 levels of hurricane exposure. Anxiety was measured via the Revised Children's Manifest Anxiety Scale, and reports of posttraumatic stress disorder (PTSD) symptoms were obtained via the Reaction Index. Significantly higher anxiety scores and significantly more PTSD symptomatology were found for

children experiencing more or more severe exposure to the hurricane. Girls reported more anxiety and PTSD symptoms than boys, and Black children were more likely than White children to report PTSD symptomatology.

Aptekar, L., & Boore, J. A. (1990). The emotional effects of disaster on children: A review of the literature. *International Journal of Mental Health, 19*(2), 77-90.

Examines the issues surrounding the mental health of children who are disaster victims.

The review focuses on findings and problems associated with the nature and extent of the disaster trauma; influence of family and community; resilience or vulnerability of the child; and symptoms, their onset and duration. Predisaster level of functioning, cross-cultural differences, therapeutic approaches, and methodological considerations are discussed.

Ball, J., Woodbury, M. A., & Ribera, J. C. (1990). The psychological sequelae of disaster stress prospectively and retrospectively evaluated. *American Journal of Community Psychology, 18*(5), 661–80.

Aimed to document the psychological sequelae of a disaster in the adult (17-68 years) population of the Caribbean island of Puerto Rico, by surveying 912 persons (including 375 previously interviewed) with a Spanish version of the Diagnostic Interview Schedule. A rigorous methodology, which included both retrospective and prospective designs, was used, enabled by the occurrence of a catastrophic disaster only a year after a comprehensive survey was completed. Framed in a stress theoretical perspective, disaster effects for new depressive, somatic, and posttraumatic stress symptoms were identified, even after adjusting for demographic and methodologic factors. All the effects, however, were relatively small, suggesting that most disaster victims were rather resilient to the development of new psychological symptoms. Comparison of results with previous findings and its implications for both disaster and stress research are discussed, as well as the role of community psychologists in disaster action.

Bravo, M., J., Woodbury, M.A., & Ribera, J.C. (1990). The psychological sequelae of disaster stress prospectively and retrospectively evaluated. *American Journal of Clinical Psychology*, 58(1), 99-112.

Evaluated the effectiveness of a brief intervention for disaster-related posttraumatic stress disorder (PTSD). At 1-yr follow-up of a prior intervention for disaster-related symptoms, some previously treated children were still suffering significant trauma symptoms. Using a randomized lagged-groups design, 3 sessions of Eye Movement Desensitization and Reprocessing (EMDR) treatment were provided to 32 of these children (ages 6-12 yrs) who met clinical criteria for PTSD. The Children's Reaction Inventory (CRI) was the primary measure of the treatment's effect on PTSD symptoms. Associated symptoms were measured using the Revised Children's Manifest Anxiety Scale (RCMAS) and the Children's Depression Inventory (CDI). Treatment resulted in substantial reductions in both groups' CRI scores and in significant reductions in RCMAS and CDI scores. Gains were maintained at 6-mo follow-up. Health visits to the school nurse were significantly reduced following treatment. Psychosocial intervention appears useful for children suffering disaster-related PTSD. Conducting controlled studies of children's treatment in the postdisaster environment appears feasible.

Briere, J., & Cramer, P. (1990). Children's defensive responses and emotional upset following a disaster: A projective assessment. *Journal of Personality Assessment*, 54(1-2), 116-127.

Tested the validity of P. Cramer's Defense Mechanism Manual (1982, unpublished manuscript) by using it to evaluate children's reactions to a life-threatening traumatic event (lightning strike). The defense mechanisms of 27 boys (aged 10-13 yrs) who were victims of a lightning strike were assessed. Subjects were interviewed 1-2 mo following the incident (in which one boy died), rated on degree of emotional upset based on behavior in the interview, and constructed projective stories from pictures of lightning bolts. Denial, projection, and identification, in combination, were inversely related to clinical upset, as was the age and sex-appropriate individual defense of projection. Results provide evidence for the validity of the Defense Mechanism Manual and support the hypothesis that defense mechanisms protect children from emotional upset.

Sugar, M. (1989). Children in a disaster: An overview. *Child Psychiatry & Human Development*, 19(3), 163-179.

Most children have psychopathological reactions to disasters, which are individually-based and vary according to age, developmental level, proximity to family members, specifics of their situation, losses during and after the disaster, and the responses of the family and community. Treatment should be individualized since children's improvement is not determined by parental response.

Sugar, M. (1988). A preschooler in a disaster. *American Journal of Psychotherapy*, 42(4), 619-629.

A search of the literature of children in disasters showed no case of individual therapy with such a child. The absence may be related to a specific countertransference. In the case of the preschooler presented here, the child's particular situation and developmental stage were significant aspects of his reaction and therapy.

McFarlane, A. C. (1987). Family functioning and overprotection following a natural disaster: The longitudinal effects of post-traumatic morbidity. *Australian & New Zealand Journal of Psychiatry*, 21(2), 210-218.

The longitudinal impact of a natural disaster on the patterns of interaction in families with latency-aged children is examined. An 11-item questionnaire was developed and two factors were isolated: irritable distress and involvement. A group of 183 disaster-affected families were contrasted with 497 families who had not been exposed to the disaster. Eight months after the disaster, the interaction in the disaster-affected families was characterised by increased levels of conflict, irritability and withdrawal. Maternal overprotection was also a common feature of the pattern of care in these families. Post-traumatic morbidity in parents was the major determinant of the observed changes in family functioning and the overprotection.

McFarlane, A.C. (1987). Posttraumatic phenomena in a longitudinal study of children following a natural disaster. *Journal of the American Academy of Child & Adolescent Psychiatry*, 26(5), 764-769.

The prevalence of posttraumatic phenomena (PTP) and how they relate to symptomatic and behavioral disorders were examined in 808 school-children (mean age 8.2 yrs) at 2, 8, and 26 mo after being exposed to an Australian bushfire. The prevalence of PTP did not change over an 18-mo period, suggesting that they were markers of significant developmental trauma. Mothers' responses to the disaster were better predictors of the presence of PTP than the subjects' direct exposure to the disaster. Both the experience of intrusive memories by the mothers and a changed pattern of parenting seemed to account for this relationship.

McFarlane, A. C., Policansky, S. K., & Irwin, C. (1987). A longitudinal study of the psychological morbidity in children due to a natural disaster. *Psychological Medicine*, 17(3), 727-738.

This longitudinal study examined the psychological impact of a bushfire disaster on a group of 808 children aged from 5 to 12. Contrary to prediction, the prevalence of behaviour and emotional problems 2 months after the fire was less than the prevalence in a carefully selected comparison group. Rather than decrease with time, the prevalence of psychological morbidity increased significantly, being as great 26 months after the disaster as at 8 months.

Burke, J. D., Jr., Moccia, P., Borus, J. F., & Burns, B. J. (1986). Emotional distress in fifth-grade children after a natural disaster. *Annual Progress in Child Psychiatry & Child Development*, pp. 349-364.

The authors surveyed 300 4th-6th grade earth-quake victims in 6 Italian villages. In one village, a treatment program was introduced as a series of steps that led to a replaying of the earthquake. The hypothesis that the number of subjects shown to be at risk for developing neurotic or antisocial problems would be positively correlated with the amount of destruction in a village was not supported. The hypothesis that treatment would reduce earthquake fears and the number of children at risk was verified. The village where treatment was carried out for 1 academic year showed a significant drop in the at-risk scores. It is concluded that treatment alleviated symptoms

but that the number of children at risk seemed to be related to the length of time needed for the community to reorganize after the disaster.

Burke, J. D., Jr., Moccia, P., Borus, J. F., & Burns, B. J. (1986). Emotional distress in fifth-grade children ten months after a natural disaster. *Journal of the American Academy of Child Psychiatry*, 25(4), 536-541.

Ten months after a blizzard and flood disaster struck their town, 19 5th-grade children in a church wrote stories about the coming winter. Stories were also written by 28 5th graders from a nearby but unflooded town. These were assessed blindly by 6 mental health clinicians for signs of distress, including fear, depression, and anxiety. Children from the flooded area demonstrated more distress than those from the nonflooded area. Only girls showed this effect; for boys, there was no difference between flooded and nonflooded groups. These results, which suggest that distress can persist as long as 10 months after a natural disaster, corroborate and extend the findings of an earlier study of younger children in this community conducted by J. D. Burke et al.

Frederick, C. J. (1985) Children traumatized by catastrophic situations. In: Eth, S., & Pynoos, R.S., eds. *Post-Traumatic Stress Disorder in children* (p. 73-99). Washington, DC: American Psychiatric Press.

This book chapter discusses post-traumatic stress disorder in a variety of traumatic and catastrophic situations, with particular emphasis upon problems occurring in children. The experiences discussed are based upon a wide spectrum of calamitous events including natural disasters.

Burke, J. D., Jr., Borus, J. F., Burns, B.J., Millstein, K. H., & Beasley, M. C. (1982). Changes in children's behavior after a natural disaster. *American Journal of Psychiatry*, 139(8), 1010-1014.

Five months after a severe winter storm, a survey of children whose behavior had been assessed by means of a parent rating scale during a Head Start program 6 months before the disaster showed that some problem-behavior scores had increased significantly. The subgroups of children at higher risk were boys, whose Anxiety scale scores increased, and children accepted for Head Start

only because their parents said they had special needs, whose Aggressive Conduct scale scores increased. For the entire group of children, school behavior improved. The findings support previous impressions that parents deny their children's problems after a natural disaster.