THEORETICAL CONSTRUCTS OF POST TRAUMATIC STRESS DISORDER AS ASSESSED IN CHILDREN IN A NATURAL DISASTER INVOLVING TORNADOES IN THEIR COMMUNITIES

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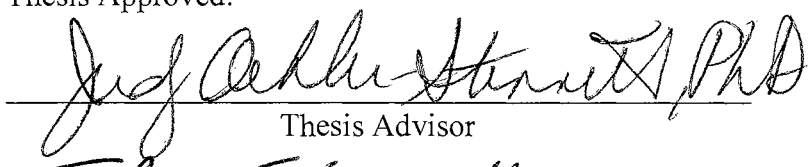

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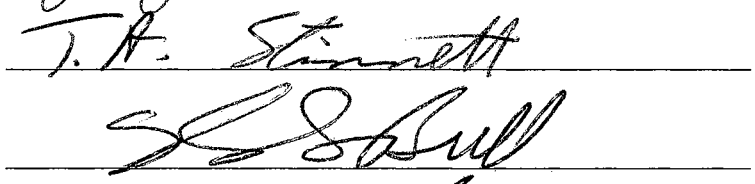

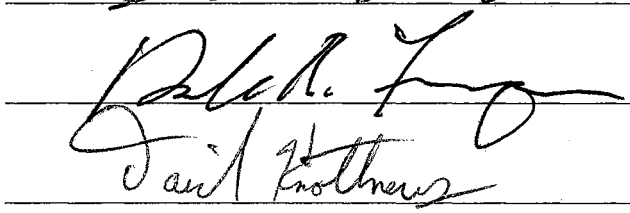

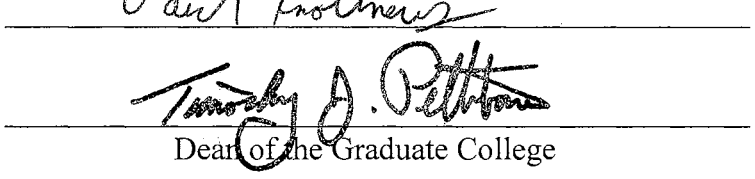

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CHAPTER I

Introduction

Limited research exists on the effects of significant trauma on children (Kendall-Tackett, Williams, & Finkelhor, 1993). Indeed, most of the work on the effects of trauma has focused on adult war veterans (McNally, 1991). It was assumed that children would follow the same course as adults who had been traumatized (Anthony, Lonigan, & Hecht, 1999). Epidemiological studies of posttraumatic stress disorder in children vary in their estimates of the number of children affected by this disorder. In a study of Hurricane Hugo, 5,687 children were evaluated for posttraumatic stress disorder (PTSD) three months after the disaster. Of these children, 5.4% met the criteria for diagnosis (Lonigan, Shannon, Taylor, Finch, & Sallee, 1994; Shannon, Lonigan, Finch, & Taylor, 1994). Other studies have examined various types of trauma on children, including (a) natural disasters, (Bradburn, 1991; Earls, Smith, Reich, & Jung, 1988; Pynoos, et al., 1993); (b) war (Nader, Pynoos, Fairbanks, Al-ajeel, & Al-Asfour, 1993); (c) sexual abuse (DeBellis, Lefter, Trickett, & Putname, 1994; Wolfe, Gentile, & Wolfe, 1989); witnessing violent behavior on another person (Pynoos & Nader, 1988); (e) serious life-threatening illness (Stuber, Nader, Yasuda, Pynoos, & Cohen, 1991); and (f) community violence (Nader, Pynoos, Fairbanks, & Frederick, 1990; Pynoos, et al., 1987).

Reports of the prevalence of PTSD in these children have varied tremendously. Due to changing diagnostic criteria and differing sampling techniques, prevalence rates range from 16% (Stuber, Nader, Yasuda, Pynoos, & Cohen, 1991) to 94% (Pynoos, et al., 1987) in children who have experienced trauma. However, there are not true epidemiological data concerning PTSD in children (Perry, 1994; Terr, 1991). Studies on prevalence rates appear to be a critical area for research in the immediate future.

Posttraumatic Stress Disorder

There are multiple theories regarding the etiology of PTSD. In general, there are four broad categories of theories: biological, cognitive, affective and behavioral. No integrated theory of posttraumatic stress disorder currently exists. This is especially true of PTSD in children.

The presence of the disorder and its severity appear to be dependent upon numerous variables. Investigators (March & Amaya-Jackson, 1993; Pynoos & colleagues, 1987) report that the risk of PTSD and the severity of the disorder have a strong correlation with the degree of exposure. Fitzpatrick and Boldizar (1993) posit that risk for victimization has been found to be disproportionately distributed across demographic categories including gender, socioeconomic status, race, level of community urbanization and age. Other authors (Pynoos & Nader, 1988) hypothesize that multiple traumas become additive in their effects and that recurring traumas seriously impact the child's continuing efforts to cope with PTSD itself. Therefore, multiple minor traumas can be as serious as a single major trauma.

Gender differences in response to posttraumatic stress are the most commonly cited in the literature on PTSD. Steinglass and Gerrity (1991) found women suffered from PTSD at a ratio of 2:1 to men in both flood-ravaged and tornado-damaged communities. Helzer, et al. (1987) and Shore and colleagues (1986) also report an increased prevalence rate for women versus men in victims of disaster. Madakshira and O'Brien (1987), in their study of a rural community struck by a tornado, found no gender differences.

Other studies emphasize racial differences in response to the disorder. Shannon, Lonigan, Finch and Taylor (1994) found that African American children were more at risk for PTSD than white children or other minority children. This is an area of controversy in the literature. Other researchers (Garrison, Weinrich, Hartin, Weinrich, & Wang, 1993) have not found this to be the case and report lower rates of PTSD among black males than among females of both races and white males.

Differences in the types of disaster may also affect individuals and communities differently. Rubonis and Bickmann (1991) report significant heterogeneity in types of disasters and resulting PTSD in their review of the literature. Other authors (Steinglass & Gerrity, 1990) have found differences in both short term and long term PTSD effects in communities having differing types of disaster (tornado vs. flood). The tornado victims were more severely affected than were the flood victims.

PTSD, Tornadoes and Children

The literature on the reaction of children to tornadoes is quite scant. Few studies on the subject exist, and yet still fewer were conducted within the last 12 years when posttraumatic stress disorder has become a discrete and acknowledged disorder. Given the prevalence of tornadoes in the United States, this is a surprising finding and a significant gap in the literature on PTSD. Additionally, most of the older studies suffer from methodological difficulties. These include limited sample size and the fact that most were conducted in an anecdotal manner without adequate control. Furthermore, none of the assessment instruments were standardized.

What few studies do exist underscore the devastating psychological effects that being in a tornado has upon children in the community. In the Worcester tornado of 1953, two rural schoolhouses were struck by tornadoes, killing both teachers and numerous students (Perry & Perry, 1955). The Vicksburg Tornado of 1953 hit a movie theater filled with children on a busy Saturday afternoon, killing many of the children and injuring dozens of other children (Block, Wilber, & Perry, 1955). Both of these studies were conducted prior to the establishment of a Diagnostic and Statistical Manual. However, the authors found adults seeking to normalize the activities of the children in an effort to assist in recovery. Many of the children showed intense psychological distress and refused to go into a theater of any kind. In 1974, a tornado struck Monticello, Indiana in the "great outbreak" of that year (Zarle, Hartsought, & Ottinger, 1974). That study was primarily qualitative in nature and anecdotal. However, there was significant impact upon the mental health of the people in the community. Penick, Powell and Sieck (1976)

examined the emotional responses of people in Joplin, Missouri following a devastating tornado in that community. Researchers again found significant emotional trauma in the townspeople. Madakasira and O'Brien (1987) studied survivors of a 1984 storm in North Carolina. This is the first study conducted following the establishment of a Diagnostic and Statistical Manual. The diagnostic criteria have changed considerably since this study was conducted. The significance of this study is that it highlighted the fact that PTSD symptoms may vary considerably depending upon the type of disaster experienced. Steinglass and Gerrity (1990) conducted one of the few modern studies of posttraumatic stress disorder in a community struck by a tornado and in a community damaged by a flood. Their study focused only on adults but found that people in a tornado were more severely emotionally affected than people surviving a flood in their community. Greening and Dollinger (1992) did examine adolescents in a community where there had been lightning deaths at a school soccer game and a tornado had struck the high school without killing anyone. They found that the children were more concerned about the chance of being killed by a tornado than they were being killed by lightning.

Considering the frequency of tornadoes and the number of people affected in the United States alone each year, the scarcity of research in this area is surprising.

Purpose of the Study

It would appear that a comprehensive examination of post traumatic stress disorder in children following a tornado would be a valuable contribution to the scientific literature of disaster. Tornadoes are somewhat unique among natural disasters in that

there is frequently extremely limited or no warning before the disaster strikes. Hurricanes and floods, by their nature, make it possible for potential victims to have several hours or even several days warning. However, for people living in tornado prone areas of the United States, the warning may consist of seconds or minutes if it comes at all. The purpose of this study is to examine the variables that predict the development of posttraumatic stress disorder in children who experience a tornado in their community, and to further delineate the nature of PTSD in this population. The following questions were addressed:

1. What are the underlying dimensions of posttraumatic stress disorder experienced by children?
2. How correlated are the instruments used in this study to examine PTSD in children: the instrument examining posttraumatic stress disorder using DSM-IV criteria, the Oklahoma State University Posttraumatic Stress Disorder scale and the Oklahoma State University PTSD Screener?
3. Are there significant mean differences between males and females in the average amount of PTSD in children?
4. Are there significant mean differences across ethnic groups in the average amount of PTSD in children?
5. Is there a significant relationship between age and the amount of PTSD in children?
6. Is there a statistically significant relationship between the degree of exposure to the tornado and the level of PTSD in children?

7. Does the level of social support predict the expression of symptoms in children experiencing PTSD?
8. What is the relationship of the DSM-IV Children's Questionnaire, the Oklahoma State University PTSD Screener, and the Oklahoma State University Posttraumatic Stress Disorder Scale to the Behavior Assessment System for Children, a standardized measure of behavior?

Statement of the Problem

Tornadoes pose a significant threat to millions of children living in the United States. Oklahoma has more tornadoes per square miles than does any other area in the world (National Severe Storms Laboratory, 1999). This makes tornadoes and the threat of tornadoes a threat to the personal safety, property and mental health of children who live in our state. On the May 3, 1999 outbreak, 2,314 homes in Oklahoma were destroyed, 7,428 homes were damaged, 473 apartments were destroyed, 568 apartments were damaged, 139 businesses were destroyed, 96 businesses were damaged, 11 public buildings were damaged or destroyed, five churches were destroyed and two public schools were obliterated (The Daily Oklahoman, 5/14/99). Within the states of Oklahoma and Kansas, 678 confirmed reports of tornadoes occurred on this single evening (National Oceanic and Atmospheric Administration, 1999). In addition to the one billion dollars in damage in Oklahoma, the Kansas tornadoes caused another estimated 142 million dollars in damage, killed another six people and injured 150 more (National Oceanic and Atmospheric Administration, 1999).

Despite the intense media attention given this severe tornado outbreak, the National Severe Storms laboratory in Norman, Oklahoma (1999) reports, "the magnitude of the current outbreak of tornadoes is not unusual. In fact, outbreaks of this magnitude occur about every five years". The National Severe Storms Laboratory also reports that there are approximately 1,000 tornadoes every year with approximately 2% of them rated as F4 or F5. According to the Fujita Scale, this means that the winds range from 207 miles per hour in the F4 to 318 miles per hour in the F5 tornado. The F6 tornado that hit Oklahoma City, the first ever to be recorded, had winds that ranged from 319 to 379 miles per hour.

Despite the frequency of occurrence of tornadoes, the damage that they incur, the significant loss of life and hundreds of injuries inflicted, tornadoes and their effects upon people have seldom been studied. A review of the literature reveals few studies examining the effects of tornadoes upon the mental health of the people involved (Block, Silber & Perry, 1956; Chinnici, 1985; Crawford, 1957; Hurst, 1981; Liu, et al., 1999; Madakaria & O'Brien, 1987; Moore, 1958; Penick, Powell & Sieck, 1976; Perry & Perry, 1959; Sullivan, Romero & Hutchison, 1993; Weinreb, 1954; Zarle, Hartsough, & Ottinger, 1974). Of these studies, only four focused specifically on children and adolescents (Block, Silber, & Perry, 1956; Liu, et al., 1999; Perry & Perry, 1959; Sullivan, Romero & Hutchison, 1993). The Block, Silber & Perry (1956) article and the Perry & Perry (1959) article were published prior to the establishment of posttraumatic stress disorder as a discrete and identifiable disorder. Both studies have methodological difficulties as a result. The Liu, et al. (1999) article is in Chinese and unavailable. This

leaves only the unpublished Sullivan, Romero, and Hutchison (1993) study specifically examining the effects of tornadoes upon children.

It would appear, therefore, that the examination of posttraumatic stress disorder in children following a tornado would be a valuable contribution to the literature.

Limitations of the Study

The present investigation and analysis is limited to the collection and analysis of data related to the specific research questions addressed. It is recognized that there are multiple factors which can affect the process of the development of posttraumatic stress disorder in children. However, it is beyond the scope of this study to address these additional variables or to apply the results of this study to settings other than the communities that are to be studied. Additionally, further research is necessary before the findings of this study are applied to children suffering from different types of trauma.

Significance of the Study

The intent of the study was threefold: (1) to determine if the demographic variables such as age, ethnicity, and gender; severity of exposure to the tornado; social support; and premorbid functioning of the child, predicts the expression of posttraumatic stress disorder; (2) to examine the underlying constructs of PTSD in the population being studied; (3) to examine what factors contribute to resiliency as measured by parental questionnaires, self-reports and a standardized global measure of functioning. The study

was significant for a number of reasons. First, the literature reflects the need for empirical research that focuses on posttraumatic stress disorder in children who have experienced a tornado. There is considerable data focusing on children who have experienced earthquakes and war. However, in the field of PTSD, there is no systematic study of children who have survived a tornado disaster. Secondly, numerous questions have been raised by the research on children surviving other types of natural disasters. In particular, there is considerable controversy within the literature regarding differences in prevalence of PTSD by age, ethnicity and gender (Garrison, Weinrich, Hartin, Weinrich, & Wang, 1993; Helzer, 1987; Madakshira & O'Brien, 1987; Marsella, Friedman & Spain, 1992; Shannon, Lonigan, Finch & Taylor, 1994; Shore, 1986; Steinglass & Gerrity, 1991). There are also notable gaps in the literature regarding facets of the disorder itself that have been studied. For example, only one study in the vast literature on posttraumatic stress disorder has looked at premorbid functioning as a measurable construct (Earls, Smith, Reich & Jung, 1988) or at resiliency (Steinglass & Gerrity, 1991).

Finally, the Diagnostic and Statistical Manual-IV (DSM-IV; American Psychiatric Association, 1994) is used extensively by psychologists in practice as the basis for diagnosis and treatment. However, many of the constructs of disorders within the DSM-IV have not been empirically validated. This study will serve to address this deficiency in regards to posttraumatic stress disorder. In particular, this study will examine and help define PTSD as it specifically relates to children who have survived a tornado in their communities.

Based upon a review of the literature, it is hypothesized that children surviving a tornado will experience significant trauma and that the expression of symptoms

surrounding the trauma will show appreciable deviation from the current criteria of DSM-IV. Additionally, demographic variables such as gender, age and ethnicity will affect the expression of those symptoms. Finally, the expression of symptoms will vary depending on the severity of exposure to the tornado.

CHAPTER II

Review of the Literature

It would appear that the exposure to catastrophic events is not all that unusual. Children comprise a significant percentage of the victims. In a national sample of 2,000 youth ten to 16 years of age, over one third reported having been the victim of an assault (Boney-McCoy & Finklehor, 1995). The Children's Defense Fund (1994) reported that 63% of all children in the nation have been a victim, know someone who has been a victim, or have witnessed a violent crime. Groves, Zuckerman, and Marans (1993) report that 3.3 million children a year are at risk of observing parental abuse. In 1985, there were 19,000 homicides; children witnessed 10% to 20% of them (Pynoos & Nader, 1990). Other recent literature documented 217,700 annually reported and verified cases of child sexual abuse and 381,700 reports of physical abuse (Sedlak & Broadhurst, 1996). Natural disasters involve millions of children annually. In 1992, Hurricane Andrew left over 175,000 residents homeless, and thousands of children were traumatized as they lost homes, pets, toys and friends (Vernberg, LaGreca, Silverman, & Prinstein, 1996).

One of the pioneering breakthroughs specifically examining the effects of trauma on children occurred with the Chowchilla kidnapping (Terr, 1979). Dr. Lenore Terr was one of the first to analyze how children respond to traumatic events separately from adults. She followed 26 of the 29 children in the Chowchilla School Bus Kidnapping.

Terr found many symptoms in these children that differed significantly from those of adults. They did not appear to hallucinate or experience classic "flashbacks" such as those reported by war veterans. Rather, the children tended to re-enact the traumatic event or to engage in trauma related play. The children also missequenced events during recall, had a sense of a foreshortened future and demonstrated omen formation (claimed to identify omens regarding the occurrence of the event when looking at it retrospectively.) Additionally, the children did not "bounce back" as had been generally assumed, but continued to exhibit problems over the years and to generalize their fears (Terr, 1979).

Posttraumatic stress disorder did not appear as a diagnostic category until the DSM-III was published (Sauter & Franklin, 1998). Prior to that time, PTSD had various names such as "shell shock" or "nervous exhaustion". Since the focus was on adults and their reaction to traumatic events, it was not until the publication of the DSM-III-R (American Psychiatric Association, 1987) that specific clinical guidelines were established for children (McNally, 1991) following publication of Terr's Chowchilla research (Terr, 1979, 1981a, 1983a).

Difficulties in establishing diagnostic criteria for PTSD have affected prevalence rates. Sauter and Franklin (1998) cite the more liberal diagnostic criteria of the DSM-III as being the probable causal agent. A study by Schwarz and Kowalski (1991), examining the prevalence of PTSD after a school shooting, found that children meeting the criteria for PTSD changed from 91% to 50% when using the DSM-III and the DSM-III-R criteria respectively.

The DSM-III criteria have been empirically demonstrated to have appropriate specificity for diagnosing PTSD in children (Nader, et al., 1990; Pynoos, et al., 1987; Saigh, 1989) but are considered by many to be too general and lacking in detail (Webb, 1991). The DSM-III-R provides clusters of symptoms specific to children with PTSD such as (a) reliving the traumatic event through repetitive play on the theme of the trauma; (b) losing interest in activities may be expressed in the loss of recently learned developmental skills; (c) acquiring a belief that future life goals will not be attainable; (d) developing "omen formation", and (e) exhibiting psychological and physical symptoms, such as separation anxiety and stomachaches (American Psychiatric Association, 1987).

The DSM-IV has few major changes from the DSM-III-R. The primary and most significant change was to acknowledge that children might react to a traumatic event with disorganized or agitated behavior (American Psychiatric Association, 1994). Previously, the definition of the reaction to the stress was that of "intense fear, helplessness, or horror" (American Psychiatric Association, 1987). The DSM-IV also did away with the criterion of "loss of newly learned skills". An additional nosological system was developed by the National Center for Clinical Infant Programs in 1994 to address symptoms believed specific to children from birth to age three. This system has not currently been evaluated through empirical studies (Sauter & Franklin, 1998) but may prove helpful to clinicians in the assessment of very young children.

Theories of Posttraumatic Stress Disorder

Theoretical underpinnings regarding the etiology of PTSD are varied. At the present time, there are four broad theories: affective, behavioral, cognitive and biological. This study will examine these theories and how they differ in their understanding of what PTSD is and how it is expressed as a disorder. These theoretical differences are significant in their impact upon intervention strategies.

Type I and Type II PTSD. Terr's work with the Chowchilla children began the re-evaluation of posttraumatic stress disorder. Terr has proposed that PTSD resulting from a single traumatic event might differ from PTSD resulting from repeated trauma (Terr, 1979). Type I PTSD was hypothesized to result from a single-impact traumatic event, whereas Type II results from a series of traumatic events or from exposure to a prolonged traumatic stressor. Classic reexperiencing phenomena are typical of Type I PTSD, and denial, disassociation, and numbing are especially characteristic of Type II PTSD (McNally, 1991). Terr hypothesized that adaptations to a Type II stressor could produce symptoms of borderline and multiple personality disorders. Corwin (1989) theorized that Type II stressors produced a multitude of psychiatric disturbances rather than a coherent syndrome.

Cognitive Theories

A cognitive theory of posttraumatic stress disorder has also been proposed. Brewin, Dalgleish, and Joseph (1996) posited that trauma experienced after early childhood gives rise to 2 kinds of memory. The first type is verbally accessible, and the second type is automatically accessible through situational cues. They base their hypothesis on previous work done on cognitive theories of PTSD.

All cognitive theories of PTSD are formulated around a set of beliefs central to shared theoretical assumptions (Brewin, Dalgleish, & Joseph, 1996). The primary belief is that individuals who are traumatized did not exist in a void before their experience. Rather, they brought with them to their experience, a set of preexisting beliefs and models of the way the world functions. The trauma provides experiences that are incompatible to this core belief system. Posttraumatic stress disorder is a result of the unsuccessful attempt to assimilate this new experience and new information into the preexisting model.

It is at this juncture that cognitive theories of PTSD separate. There are two primary theories. The social-cognitive theory stresses the struggle of individuals to readjust their world to integrate the traumatic event into the person's existing schema about the way the world functions (Horowitz, 1986; Horowitz, Weiss, & Marmar, 1987; Janoff-Bulman, 1985). The second theory, proposed by Foa, Steketee, and Rothbaum (1989) focuses more on information processing regarding the trauma-related threat, how trauma-related information is represented in the cognitive system, and how it is finally processed (Brewin, Dalgleish, & Joseph, 1996).

Horowitz is chiefly concerned with cognitive processing of traumatic information, arguing that the main impetus for such processing comes from a completion tendency. This is the psychological need for new information to be integrated with existing cognitive world models or schemata (Horowitz, 1986). The completion tendency causes the unwanted memories to break through defenses and intrude into consciousness. The tension between the completion tendency on one side and defenses on the other, causes the swings between intrusive thoughts, memories and feelings and numbing-denial as the person processes the new information into long-term schema.

According to Horowitz (1986), failures of information processing cause the partially assimilated memory to remain in active or "working memory" without full integration. This leads to chronic posttraumatic stress symptomatology.

Janoff-Bulman extends Horowitz's work to describe the ways trauma-related information interferes with the individual's assumptions and schema about the way the world operates. Three primary beliefs are shattered: the assumption of personal invulnerability, the perception of the world as meaningful or comprehensible, and the view of the self in a position light (Janoff-Bulman, 1985).

Foa stresses that PTSD centers on the formation of a fear network in memory. This fear network is composed of stimulus information about the traumatic event, information about cognitive, behavioral and physiological reactions to the trauma, and information that links these stimulus/response elements (Foa & Kozak, 1986; Foa & Riggs, 1993; Foa, et al., 1989, 1992). Activation of the fear network by stimuli causes the information to enter conscious memory. Successful resolution of the trauma occurs only

when the new information regarding the trauma is integrated with existing memory structure--a difficult proposition.

Creamer and colleagues (1992) attempted to synthesize Foa and Horowitz's theories. Creamer proposes that the fear network must be stimulated for recovery to occur. This is congruent with Foa's position but is reminiscent of Horowitz's completion tendency as well. Interestingly, Creamer felt that high levels of initial intrusion of trauma-related memories are predictors for a successful recovery; low levels of initial intrusion are hypothesized to be predictive of a poorer outcome. Creamer's (1992) longitudinal follow-up of the victims of an office block shooting supported this hypothesis.

Brewin, Dalgleish, and Joseph (1996), building on this earlier work, proposed a dual representation model for posttraumatic stress disorder. Brewin hypothesizes that traumatic events are likely to have more than one representation. One representation is verbally accessible knowledge. Though readily accessible, these memories are selective due to the effects of anxiety on attention and short-term memory capacity. The second representation is more extensive and involves non-conscious processing of the trauma. These memories are accessed automatically when situational cues remind the person of the event. Brewin's theory explains many difficult constructs of PTSD including why some individuals do not initially show a response to the trauma but later develop severe emotional problems. Brewin believes that this is due to inhibited processing, i.e., the individual prematurely inhibits the integration of the traumatic event into their personal schema. This explains why some individuals are stimulated into re-experiencing the trauma by environmental variables even if they were not part of the person's initial verbal

descriptions of the trauma. Even more importantly, Brewin hypothesized that as a result of inhibited processing, there is a substantial subgroup of clients who appear to be currently asymptomatic for PTSD who will (a) show a preattentional bias to attend to trauma-related stimuli; (b) show strong priming effects in response to such stimuli; (c) avoid processing of trauma-related stimuli, resulting in impaired memory for this material; (d) show phobic avoidance of trauma-related stimuli; (e) show enhanced sensitivity to life events; (f) report more dissociation at the time of the trauma; (g) have unrealistically positive assumptions and beliefs; and (h) show evidence of impaired health status.

Empirical Theories. Empirically based theory has recently been utilized as an attempt to conceptualize PTSD into symptom categories. Anthony, Lonigan, and Hecht (1999) factor analyzed self-reported symptoms of 5,664 children and adolescent victims of Hurricane Andrew. Using ten different models of PTSD dimensionality, Anthony, et al. (1994) found that the disorder was best represented by a 2nd order PTSD factor involving the three symptom clusters of intrusion/active avoidance, numbing/passive avoidance, and arousal. This dimensionality was sustained across cross validation studies in differing age groups.

This study is important because it is one of the first attempts to empirically validate symptom clusters generally assumed to be indicative of the disorder and to test existing theories of PTSD. Support for this model has also come from explanatory factor analysis of posttraumatic symptoms of adult war veterans (Watson, Kucala, Juba, Manifold, & Anderson, 1991), elderly war veterans (Hovens, et al., 1993), and adolescent

and adult Cambodian refugees (Sack, Seely, & Clarke, 1997). The four factor, three cluster model is significant because it emphasizes the hierarchical nature of PTSD. Anthony, et al. (1999) characterize PTSD as consisting of "intrusive phenomena coupled with active avoidance of the negative experiences, emotional numbing along with passive avoidance of emotionally unrewarding activities, and arousal". An important implication of the study is that PTSD dimensionality was found to be consistent across several important symptoms: age at the time of trauma, type of trauma, means of measuring PTSD symptomatology, and time elapsed since the trauma. Many earlier studies had indicated that the age of the victim, type of trauma and time elapsed, all diminished symptoms (Anthony, et al., 1999). Anthony's confirmatory factor analysis of the Hurricane Andrew children casts serious doubt upon these previously generally accepted findings. Severity of the symptoms across age groups might vary but the dimensions of the disorder remained consistent. This difference between logical and empirical models has created much confusion.

Anthony's model diverges from DSM-IV in two important ways. Placement of the avoidance symptoms is primary. DSM-IV places avoidance as part of the Numbing/Avoidance cluster of symptoms. Anthony and colleagues' model (1994) and CFA differentiates these symptoms into two separate subgroups of active avoidance and passive avoidance. Active avoidance symptoms appear to belong on the factor reflective of Intrusion/Active Avoidance. The passive avoidance symptoms belong to the factor that reflects Numbing/Passive Avoidance. Anthony's group hypothesizes that the two separate avoidance mechanisms may reflect separate motivational systems that respond to different types of distress. Stated differently, Anthony, et al. believe that trauma victims

may actively avoid trauma-related thoughts and actions by consciously engaging in different thoughts, feelings and behaviors. However, they may also refrain from other activities "as a passive means of avoiding the frustration that results after trauma when these activities are no longer emotionally rewarding" (Anthony, et al., 1999).

Anthony and his colleagues (1994) also found that placement of fear of reoccurrence/hypervigilance was different from DSM-IV in his analysis. They found these symptoms belonged on the Intrusion/Active Avoidance factor and did not fall into the Arousal factor cluster. This makes a tremendous theoretical difference in that this would conceptualize fear of reoccurrence and hypervigilance as differing from being results of increased arousal. Rather, they may be the direct result of trauma-related thoughts. This has implications for treatment. Equally significant, learning/memory problems, anhedonia, and attentional problems were found to be normal reactions to trauma and not pathological, i.e. they are associated rather than diagnostic features of PTSD. These features were among the most common reported by victims but were least predictive of a diagnosis of PTSD.

Certainly there appear to be numerous questions presenting for research. Confirmatory factor analysis may be a promising technique to examine this disorder and to provide explanations for disparities noted in the research. No single theory seems to adequately explain the full range of symptoms.

Biological Theories. There is evidence to suggest that the physiologic arousal often observed during recollection of traumatic events and the startle response sometimes exhibited by PTSD victims are related to alterations in the neuroendocrine functions

associated with changes in the sympathetic adrenocortical axes of the human stress response system (Kolb, 1993; van der Kolk & Saporta, 1993). In the case of PTSD, it has been proposed that these neuroendocrine alterations may reflect the consequences of an extreme state of physiopsychological conditioning often observed in animal models after severe stress exposures (van der Kolk, Greenberg, Boyd, & Krystal, 1985). In addition, other evidence suggests that the general stress response is probably a critical mammalian mechanism for environmental adaptation and survival (Chrousos & Gold, 1992; Hofer, 1987). For example, research with human infants indicates that neuroendocrine systems are responsive to environmental stress from birth (Gunnar, 1992), and research with nonhuman infants suggests that stress reactions are basic for learning in all mammals (Hofer, 1987).

Interrelated neurochemical processes, along with glandular and organ systems responses, appear to be organized into a systemic response that is activated during exposure to stress. Two of the major axes, the adreonomedullary and hypothalamic systems, have been identified as being components of this response system (Boyce & Jemerin, 1990). The stress response is initiated in the central nervous system (CNS), but it is subsequently carried out by multiple endocrine mechanisms. These mechanisms have wide-ranging effects on the body and nervous system (Boyce & Jermerin, 1990; Greenspan & Baxter, 1994).

Research has shown that when stimuli are perceived as threatening, the sympathetic-adrenomedullary system becomes activated (Boyce & Jemerin, 1990; Chrousos & Gold, 1992). Higher brain centers, such as the cortex and limbic structures, then activate the sympathetic arm of the autonomic nervous system. Sympathetic

activation of the adrenal medulla occurs during the second phase, resulting in the secretion of epinephrine and norepinephrine into the blood stream. The effects of these secretions prepares a response to danger, including increases in heart rate, oxygen supply, blood glucose, blood clotting, mental alertness, and anxiety (Boyce & Jemerin, 1990; Chrousos & Gold, 1992).

Continuous exposure to internal or external noxious stimuli causes activation of the hypothalamic-pituitary-adrenocortical axis (Boyce & Jemerin, 1990). When this occurs, systemic responses include release of corticotropic-releasing hormones (CRH) from the median eminence of the hypothalamus, which stimulates secretion of the adrenocorticotropic hormone (ACTH) in the anterior lobe of the pituitary. ACTH then activates the adrenal cortex, which in turn results in the secretion of glucocorticoids (Boyce & Jemerin, 1990). It has been suggested that stress-induced changes in cortisol regulate the body's response to severe stress to order in order to protect against the negative effects that could result if these neurochemical mechanisms were overstimulated (Boyce & Jermerin, 1990).

Boscarino (1996) found long-term biological alterations related to the stress response among a large national sample of Vietnam veterans. He found that some men exposed to heavy combat appear to have altered neuroendocrine system functions 20 years after this exposure. Boscarino's study is important in that it is one of the first to demonstrate that individuals exposed to extreme life-threatening situations can experience permanent biological changes.

Orr, et al., (1990) emphasize the importance of psychophysiological research. In general, Orr and his colleagues stress that this research is confirmatory of current

psychological practice and psychometric scales in use. Orr, et al. also propose that psychobiology may provide many of the answers currently being sought by researchers in defining this complex disorder.

Theories of Stress and Anxiety

Hobfoll and Spielberg (1992) define stress as "a state in which individuals' resources are challenged by the environment in a way that overtaxes their coping ability and endangers their well-being". Kazak (1992) hypothesizes that change is an implicit part of the process associated with stress. Change in and of itself is not necessarily harmful. Some changes are positive and are an integral part of the growth process. Others are catastrophic in their consequences for individuals, families or communities. Kazak notes that a critical mediating factor in change is the extent to which the individual controls the change and the amount of choice involved. However, whether or not the change is positive or negative, stress and anxiety are frequently involved in the process (Kazak, 1992). For this reason, it is important to examine theories of stress and anxiety as part of any comprehension investigation of PTSD. Depression must also be studied with anxiety as there is considerable evidence that these two disorders are so frequently comorbid that it is rare to find one in existence without the other (Brown, Chorpita, & Barlow, 1998).

In a review of the literature, Clark, and Watson (1991) note that anxiety and depression share a significant nonspecific component encompassing general affective distress and other symptoms that they share in common. Yet, the two constructs can be

distinguished by certain features that are unique. Therefore, Clark and Watson propose a tripartite structure of anxiety and depression that consists of general distress or negative affect (shared by anxiety and depression), physiological hyperarousal (specific to anxiety), and an absence of positive affect, which is specific to depression.

Factor analytic work on the tripartite models is supportive that the three-factor structure is valid with adult populations. Individuals who experience anxiety and depression may exhibit similar, elevated scores on measures of negative affect (NA). However, the significant and distinguishing characteristic is that depressed individuals score low on measures of positive affect (PA).

Therefore, while depression and anxiety are frequently comorbid, it may be possible to distinguish the two disorders. Depression is characterized by anhedonia (low positive affect) whereas anxiety appears to be characterized by physiological hyperarousal (Clark & Watson, 1991). General negative affect (NA) is nonspecific and related to both depression and anxiety. In persons with a primary diagnosis of depression, anxiety is always present. However, in persons with a primary diagnosis of anxiety, depression is not always present. These distinctions are critical in the understanding of mood and anxiety disorders.

In application of the tripartite theory to children, Lonigan, et al. (1994) found results consistent with this view among children and adolescents who were inpatients. Other authors (Chorpita, Albano, & Barlow, 1998; Joiner, Cantanzaro, & Laurent, 1996) have found in a study of clinically anxious children that the tripartite theory does appear to explain observed symptomatology. The authors found that the latent constructs of fear, anxiety and depression were distinct yet correlated. In the study by Chorpita and

colleagues, anxiety corresponded to Clark and Watson's negative affect (NA); depression corresponded to low positive affect (PA); and fear corresponded to physiological hyperarousal.

In an investigation of British and American children, Ollendick and Yule (1990) also found that depression and anxiety were highly related. However, they found evidence that anxiety and fear were distinct constructs. In their study, results indicated that children who report high levels of depression also tend to report high levels of manifest anxiety and social evaluative fear. However, these depressed children did not report heightened levels of fear to specific stimuli such as animals, bodily injury or natural disasters. Gray (1987) found separate neurological systems related to anxiety, depression and fear in animals. Gray suggests that it may be possible for fear to involve brain structures distinct from those related to anxiety and depression.

Chorpita and Barlow (1998) extensively reviewed the literature on anxiety and depression. They state that within the model of negative emotions, a clear picture is emerging that highlights the role of uncontrollability and unpredictability that is emphasizing the role of early experience in the development and expression of pre-existing genetic vulnerabilities. Uncontrollability and unpredictability may come from numerous sources: attachment, parenting, family structure and life events. There appears to be a significant interplay between the factors that contributes to the development of anxiety and depression.

The role of control in the development of anxiety is particularly salient to anxiety and the eventual development of posttraumatic stress disorder. There is a considerable body of literature supporting the concept that an immediate sense of diminished control is

commonly associated with the immediate expression of anxiety (Barlow, 1988,1991; Beck & Emery, 1985; Lazarus, 1966, 1968; Lazarus, Averill, & Opton, 1970; Mandler, 1972; Sanderson, Rapee, & Barlow, 1989). Lowered control is hypothesized to increase the expectation of danger. A history of lack of control may put individuals at eventual risk to experience chronic anxiety or the related negative affect through diminished psychological well being. Sufficient early experience with uncontrollable events may eventually lead to an increased generalized tendency to perceive or process events as not within one's control. Therefore, early experience with uncontrollable events may be thought of as a primary pathway to the development of anxiety due to an increased tendency to perceive events as outside one's control (Chorpita & Barlow, 1998).

In animal studies involving lack of control and aversive stimuli, researchers have found that there appear to be profound emotional consequences resulting from this perception. Barlow (1988) and Mineka (1985) suggest that the results bear a striking similarity to the body of knowledge concerning chronic anxiety. Drugan, Ryan, Minor, and Maier (1984) found that the administration of anti-anxiety drugs to animals prior to exposure to uncontrollable stimuli prevented the development of learned helplessness.

In children, an interesting synergistic effect has been demonstrated between attributional styles and negative affect. Abramson, Seligman, and Teasdale (1978) assert that negative events are not necessarily a risk factor for pervasive learned helplessness. This occurs only when the individual makes global, stable and internal attributions for these events. This is consistent with Kazak's (1992) position regarding the mediating effects of the perception of choice during a period of change. However, Nolen-Hoekseman, Girgus, and Seligman (1986) found that increases in depression in children

were predictive of change in attributional style. Extending their earlier work, Nolen-Hoekseman, Girgus, and Seligman (1992) included negative life events in their model. They found that data collected at nine intervals over a five-year period supported an interplay between depression, attributional style and negative life events, i.e. early experiences with depression or negative events may contribute to the development of a negative cognitive style (Chorpita & Barlow, 1998).

Furthermore, there appear to be developmental considerations regarding anxiety. Examining the extent to which negative experience increases negative cognitions, Cole and Turner (1993) comparatively evaluated moderational and mediational attributional models of depression in a non-clinical sample. They found that in children, negative events do increase negative cognitions, which in turn increase negative affect. In adults, a moderational model best describes the interaction of negative affect (i.e. anxiety or depression) with negative experiences. In a second examination, Turner and Cole (1994) confirmed their earlier study. In this second study, the investigators found evidence for Age by Event by Cognition interactions. For the oldest children in their sample (eighth graders), the moderational effects of cognition began to have an observable effect not present in the younger children. The results supported their previous investigation and those of other researchers that suggested moderational effects of cognition with life events appears only at later developmental levels (Fincham & Cain, 1986; Rholes, Blackwell, Jordan, & Walters, 1980).

While extensive research is needed to replicate, confirm and refine issues being studied in the areas of anxiety, depression and fear, the applications of this research to the study of posttraumatic stress disorder is readily apparent. The theories regarding

mediational versus moderational effects of cognition with life events, for example, could account for perceived differences in posttraumatic stress disorder at differing developmental levels. Differences in parenting style, family reactions to change, perceptions of loss of control in one's environment all have direct implications for the development and maintenance of posttraumatic stress disorder. The distinctions between anxiety and fear are also significant given a chronic versus acute onset of a stressor. Additionally, a child suffering from anxiety or depression may be more at risk for developing PTSD than a child who is developing normally.

Comorbidity

There is substantial evidence to suggest that the occurrence of childhood psychiatric disorders such as depression and anxiety exist concurrently with PTSD. McFarlane (1992) found that around 80% of those diagnosed with PTSD received an additional psychiatric diagnosis. Work with combat veterans has suggested that comorbidity over the lifespan may be as much as 99% (Kulka, et al., 1990). Epidemiological surveys have reported that somatization disorder, anxiety disorder, depression and psychosis have markedly increased rates in PTSD sufferers (Helzer, Robins & McEvoy, 1987; Shore, Vollmer, & Tatum, 1989).

Other researchers point to a significant symptom overlap (Farmer, Tranah, O'Donnell & Catalan, 1992; McNally, 1992). Brewin, Dalgleish, and Joseph (1996), however, admonish that symptom overlap does not adequately explain comorbidity. McNally (1992) concludes that depression and PTSD are similar with the distinctive and

defining features of PTSD being the exaggerated startle, the re-experiencing symptoms (nightmares and intrusive memories), and physiological reactivity to trauma-related cues. He also reviewed a number of differences in biological variables and drew attention to various ways in which PTSD differed from panic disorder and phobia (i.e., in the latter, psychic numbing and re-experiencing phenomena are unusual).

Famularo and colleagues (1996) interviewed 117 children presented before a juvenile/family court for severe maltreatment. Of these 117 children, 41 (35%) met criteria for PTSD. His findings revealed that the PTSD diagnosis was significantly correlated with attention deficit hyperactivity (ADHD), other anxiety disorders, brief psychotic disorder of Psychotic Disorder NOS, the presence of suicidal ideation and a trend toward mood disorders.

Other research indicates that children who are sexually abused are at an increased risk for PTSD and other psychiatric problems (Kendall-Tackett, Williams & Finkelhor, 1993). Victims of child sexual abuse also have been reported to exhibit increased depression (Browne & Finkelhor, 1986), anxiety (Brierer & Runitz, 1988), and anger (Friedrich, Beilke, & Urquiza, 1987). The degree to which this occurs appears clouded and confounded by trauma type.

Other Diagnostic Considerations

Etiology and comorbid disorders are but two of the areas requiring further research with posttraumatic stress disorder. The presence of the disorder and its severity appear to be dependent upon numerous variables. Investigators (March & Amaya-

Jackson, 1993; Pynoos & colleagues, 1987) report that the risk of PTSD and the severity of the disorder have a strong correlation with the degree of exposure. Pynoos and Nader (1988) suggest that the effects of repeated traumas can be additive and seriously impact the child's ability to cope with PTSD itself. Fitzpatrick & Boldizar (1993) found numerous variables to affect the prevalence rate of posttraumatic stress disorder. The degree of community urbanization, socioeconomic status, gender, ethnicity and age are among the reported variables that significantly impacted prevalence rates. There is considerable controversy in the literature regarding the effects of gender on the prevalence rate for posttraumatic stress disorder. Steinglass and Gerrity (1991) found women suffered from PTSD at a ratio of 2:1 to men in both flood ravaged and tornado damaged communities. Helzer, et al. (1987) and Shore and colleagues (1986) also report an increased prevalence rate for women versus men in victims of disaster. Madakshira and O'Brien (1987), in their study of a rural community struck by a tornado, found no gender differences.

Marsella, Friedman, and Spain (1992) cite the varying quality of published studies of PTSD as being causative for conflicting reports regarding ethnocultural effects of the disorder. Shannon, Lonigan, Finch, and Taylor (1994) do report racial differences with response specificity on the Frederick Reaction Index (RI) and the Revised Children's Manifest Anxiety Scale (RCMAS). They found that African American children were more at risk for PTSD than white children or other minority children. Other authors have not found this to be the case, however, and even report lower rates of PTSD among black males than among females of both races and white males (Garrison, Weinrich, Hartin, Weinrich, & Wang, 1993).

Differences in the types of disaster may also affect individuals and communities differently. Rubonis and Bickmann (1991) report significant heterogeneity in types of disasters and resulting PTSD in their review of the literature. Other authors (Steinglass & Gerrity, 1990) have found differences in both short term and long term PTSD effects in communities having differing types of disaster (tornado vs. flood). The tornado victims were more severely affected than the flood victims were.

Saigh (1991) studied 230 children identified with posttraumatic stress disorder. In this important study, Saigh confirmed earlier work by several researchers which demonstrated that PTSD might occur after direct exposure (Fairbanks & Keane, 1981; Keane & Kaloupek, 1982; Kolb, 1984; Saigh, 1987a) or observation (Pynoos & Eth, 1985; Saigh, 1987b). His study supports the hypothesis that PTSD may occur via verbal mediation and that these children did not differ appreciably from the groups directly exposed to the trauma in the level of psychopathology produced.

In a study of psychological impairment in the wake of disaster, Rubonis and Bickman (1991) found that death rate had the strongest relationship to effect size relative to other independent variables and that death rate appeared to be a significant moderator of the relationship between disasters and subsequent psychological problems. Shore, Tatum, and Vommer (1986) examined PTSD as a function of property loss and bereavement. As is to be expected, property loss and bereavement were positively correlated with increased distress following the disaster. Another critical factor in multiple studies (Rubonis & Bickman, 1991) has been elapsed time since the disaster and the time of the study.

A somewhat surprising finding focuses on the responsibility for the disaster, i.e. man-made versus natural disasters. Rubonis and Bickman (1991), in their examination of the literature regarding psychopathology in the wake of disaster, found that there were significantly higher impairment estimates following natural disasters. Clinical lore had assumed that the opposite proposition held, i.e. that man-made disasters would produce stronger symptoms of PTSD than natural disasters. Rubonis and Bickman hypothesize that this effect may be due to uncertainty and concern regarding reoccurrence. Assignment of blame towards humans makes the cause of the disaster readily identifiable as opposed to ambiguous (e.g., nature, act of God, etc.). The latter is completely outside the victim's control and contributes to feelings of helplessness.

Assessment of Posttraumatic Stress Disorder

In the 12 years since the appearance of PTSD in the diagnostic nomenclature for psychiatry, there has been considerable progress in the area of assessment (Keane, Weathers, & Kaloupek, 1992). In 1991 a special section in the journal Psychological Assessment highlighted advances in the assessment of PTSD in children (McNally, 1991), the effects of disasters and PTSD (Green, 1991), the assessment of rape-related PTSD (Resnick, et al., 1991), the use of neuropsychological assessment in PTSD research and clinical care (Wolfe & Charney, 1991), and the measurement of PTSD among refugees (Mollica & Caspi-Yavin, 1991). Each of the specific assessment areas of PTSD stressed the need for multiple measures of the PTSD construct due to the imperfection of any single measure of the disorder (Keane, Weather, & Kaloupek, 1992).

The initial work on the assessment of PTSD was done with in-depth, unstructured interviews with the Chowchilla children (Terr, 1979, 1981a, 1983a). Subsequent research has been based on structured interviews with traumatized children and their parents, administration of questionnaires, and psychophysiological evaluation. However, research on children's responses still lags behind research on adult responses (Fletcher, 1996). McNally (1991) examined the various methods used to evaluate PTSD and common instruments utilized in their application in his overview of the assessment of childhood PTSD. Both Fletcher (1996) and McNally (1991) note that many of the measures used with childhood PTSD are derived from adult measures that were not written with children or adolescents in mind. Additionally, they likely do not cover the full range of symptoms in the DSM-IV (American Psychiatric Association, 1994). Another problem is that the measures are frequently directed at the child, or the parent, but not both (Fletcher, unpublished paper). Despite these criticisms, assessment of PTSD typically follows one of these established patterns: structured interviews, questionnaires, or psychobiological measures.

Structured Interviews. The Diagnostic Interview for Children and Adolescents (DICA; Welner, Reich, Herjanic, Jung, & Amado, 1987) is a structured interview to which PTSD items from the Diagnostic Interview Schedule (DIS; Robins & Smith, 1984) have been added. Research with the DICA for PTSD has been somewhat limited and the sample sizes have been small (Earls, Smith, Reich, & Jung, 1988; Stoddard, et al., 1989).

Kulka, et al. (1988) have criticized the DIS for its poor sensitivity in diagnosing combat related PTSD. This makes the DICA vulnerable to the same criticisms due to its adaptation from the DIS (McNally, 1991).

McLeer and associates developed an instrument designed to assess PTSD in sexually abused children (McLeer, Deblinger, Atkins, Foa, & Ralphe, 1988). Even though the children were experiencing PTSD symptoms, the instrument diagnosed PTSD in only 48% of the sample (McNally, 1991).

Saigh (1989a, 1989b) has developed the Children's Posttraumatic Stress Inventory (CPTSDI) designed to assess DSM-III PTSD. Sauter & Franklin (1998) report that this instrument has very crude psychometric properties. They recommend much more research with the CPTSDI in assessing its reliability and validity before it is used outside of research settings.

The most widely used structured interview used for diagnosing childhood PTSD is the Posttraumatic Stress Disorder Reaction Index (PTSD-RI; Frederick, 1985, 1986; Pynoos, et al., 1987a). The 20-item PTSD-RI has been widely used with a variety of traumas. With adults, it can be used as a self-report measure; with children it can be administered as a structured interview. For confirmed cases of childhood PTSD, the correlation between caseness and PTSD-RI scores is .91 (McNally, 1991).

The Children's Impact of Traumatic Events Scale-Revised (CITES) has been utilized to evaluate PTSD in sexually abused children (Wolfe, Gentile, & Wolfe, 1989). However, the CITES cannot provide a PTSD diagnosis because it fails to cover the full range of symptoms (McNally, 1991).

Numerous authors stress the importance of talking directly to the children during any assessment of posttraumatic stress disorder. Earls and colleagues (1988) and Sack, Angell, Kinzie, and Rath (1986) found that parents and teachers generally underestimate the suffering of children. This may be attributable to many variables such as parents being unfamiliar with PTSD symptomatology or to a psychological unwillingness to examine symptoms in those they feel they should have protected. Earls (1988) administered the DICA-P to parents of children exposed to a natural disaster. The parents reported no PTSD symptoms. The children's reports did not agree. Nader and Pynoos (1989) also found that children interviewed after a sniper attack reported more internalizing symptoms than did their parents. However, the parents reported more externalizing symptoms than did the children. Therefore, parents may provide another dimension to the diagnostic process but parental report should not be the sole basis for an assessment of PTSD.

Questionnaires

Most questionnaires used to assess trauma in children measure anxiety or depression, general psychopathology, or low self-esteem. McNally (1991) reports that these measures are not directly designed to assess PTSD but to assess common associated features.

Some investigators in the field have added symptomatology of PTSD in an effort to address this deficit. McFarlane (1987) modified Rutter's behavior scales (Rutter & Graham, 1967) in an assessment of PTSD following an Australian bush fire. Other

investigators take items from well-known assessment instruments such as the Child Behavior Check List and attempt to construct their own PTSD scales (Wolfe, et al., 1989). These instruments are not necessarily psychometrically robust nor do they always assess the full range of PTSD symptoms (McNally, 1991). Some of the most commonly used questionnaires are the Child Depression Inventory (CDI; Kovacs, 1985), the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1985) and a global measure, the Child Behavior CheckList (CBCL; Lambert, Knight, Taylor, & Achenbach, 1994).

The Child Depression Inventory (CDI; Kovacs, 1985) is perhaps the most widely utilized self-report measure of depression among children and adolescents (Craighead, Smucker, Craighead, & Hardi, 1998). The CDI has been shown to be a good indicator of self-reported distress in children (Lonigan, Carey, & Finch, 1994). However, there are concerns that it does not have adequate sensitivity to diagnose depression (Fristad, Weller, Weller, Teare, & Preskorn, 1988, 1991; Nelson, Politano, Finch, Wendel & Mayhall, 1987; Weiss, et al., 1991). Fristad, Emery, and Beck (1997) stress that the CDI is not to be used in isolation but as part of a multiple gating procedure. Asarnow and Carlson (1985) suggest that the diagnostic utility of the CDI may be limited.

The Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1978) is commonly used to assess anxiety in children. Saigh (1989) has demonstrated that the RCMAS could discriminate children diagnosed as having PTSD from nonclinical control children. Lonigan, Carey & Finch (1994) demonstrated that the RCMAS and the CDI measure distinct syndromes of depression and anxiety despite some overlap. Depressed children reported significantly more dissatisfaction with themselves

than those diagnosed with an anxiety disorder. Conversely, children with an anxiety disorder reported more concern about the future, their well being, and the reaction of others. In an investigation of self-report questionnaires, Hodges (1990) found no differences in scores on the RCMAS for anxiety disordered and non-anxiety disordered children. Furthermore, her analysis found a significant relationship between the RCMAS and the CDI. Hodges urged caution in using self-report questionnaires for diagnosis.

Global measures utilized in assessing childhood PTSD include the Child Behavior Checklist (CBCL; Lambert, Knight, Taylor, & Achenbach, 1994). This questionnaire is considered to be the "gold standard" of global assessment instruments with excellent reliability and validity (Achenbach & Edelbrock, 1979). Some studies have suggested that the CBCL may be an appropriate supplement when assessing PTSD in children (Sullivan, Saylor, & Foster, 1991; Wolfe, et al., 1989). Sauter and Franklin (1998) report that the CBCL is popular with clinicians and easy to use. They endorse its use in clinical practice along as part of a multi-trait, multimethod assessment of PTSD.

There are a few rating scales that do directly assess posttraumatic stress disorder. The Impact of Events Scale (IES; Horowitz, Wilner, & Alvarez, 1979) is a questionnaire that has been validated as a measure of childhood PTSD (Malmquist, 1986; Pynoos, Nader, Frederick, Gonda, & Stuber, 1987b; Yule & Williams, 1990). However, Pynoos and his colleagues found that the IES did not differentiate well between grief and PTSD. Sauter and Franklin (1998) criticize the IES for its psychometric properties and note that it has not had any psychometric studies conducted regarding its use with children, despite the fact that the IES is commonly used with children. Additionally, Sauter and Franklin

report that the IES has only limited norms with no published reports of its use with low-income or ethnically diverse populations.

Roger Hamada (in press) has devised a questionnaire, The Kauai Recovery Index (KRI), to assess posttraumatic stress disorder in elementary school aged children. The KRI is a new rating scale for which normative data is being gathered. Hamada, Kameoka and Yanagida (in press) recently administered the KRI to 3,732 children in a system-wide public school screening 26 months after Hurricane Iniki. The first generation instrument was patterned on Frederick's (1985) Reaction Index. Wording was simplified and additional items were added using rational deduction. The initial instrument was refined and a number of items were reduced prior to administration in the Iniki study.

The KRI is a 24-item self-report instrument designed to measure the presence of posttraumatic stress disorder. The KRI items represent three primary clusters of PTSD symptoms including Re-experiencing (six items), Avoidance (seven items) and Arousal (six items). Additionally, two age specific items and three items designed to measure associated features were added that did not pertain to these symptom clusters. Items were answered on a three point rating scale: "no" = 0, "sometimes" = 1, "almost all the time" = 2. KRI total scale scores range from a minimum of zero to a maximum of 48. Researchers also had three demographic questions and six hurricane exposure questions. The hurricane exposure questions asked: (a) whether the child lived in Hawaii during Hurricane Iniki, (b) where the child was located when the hurricane struck Kauai, (c) whether the child thought that he or she would die, (e) how much the hurricane hurt the family's home, and (f) how scared the child was during the hurricane. Demographic

questions concerned the child's grade, gender and ethnicity (Hamada, Kameoka, & Yanagida, in press).

Results from the KRI indicated high internal consistency across all items (Chronbach's alpha = .84). Alpha coefficients were .75 for Re-experiencing, .52 for Avoidance, and .64 for Arousal. The KRI was re-administered to a subsample of 43 children four weeks after the initial assessment. The test-retest reliability estimate was .77 for this subsample.

Consistent with theory, the KRI scores increased as exposure to the hurricane increased. There were significantly higher KRI scores for children who thought they would "die or get hurt", who feared for the lives of friends or family, whose homes had greater damage and who reported greater fear during the hurricane.

Exploratory factor analysis of the KRI using a Promax rotation indicated a four-factor solution accounted for 38.9% of the variance. Three of the factors were defined by items corresponding to the three rationally derived subscales. The factors were: Re-experiencing (factor 1), Arousal (factor 2), and Avoidance (factor 3). The fourth factor was uninterpretable.

Consistent with research on the Reaction Index (Shannon, et al., 1994; Vernberg, et al., 1996), there were age and gender differences present in the KRI scores. There were no attempts to develop age or gender norms for the KRI.

The authors report limitations on the KRI that are in line with limitations of other self-report scales. The authors recommend further research with the KRI using structured clinical interviews to analyze the KRI's sensitivity and specificity.

Fletcher (unpublished paper) examined the psychometric properties of his four measures of PTSD in children. They will be examined here as a group.

Two of the scales are rating scales, the "Parent Report of the Child's Reaction to Stress" and "When Bad Things Happen", a self-report scale for children. Fletcher has also devised a semi-structured interview for children and one for their parents.

The Childhood PTSD Interview includes a rating scale built into it. The interview is organized to ask questions about various criteria that satisfy DSM III-R and DSM-IV diagnostic items. Each of the symptoms requires a simple yes or no answer. The Childhood PTSD Interview-Parent Form closely parallels the child form.

The Dimensions of Stressful Events (DOSE) helps collect and compare information regarding traumatic situations. Fletcher (unpublished paper) notes that the DOSE can be used with single or multiple exposures to trauma.

The final instrument is entitled "When Bad Things Happen" (WBTH). The WBTH has 90 questions that are answered "Never", "Some", and "Lots". The reading level for this rating scale is approximately third grade. Again, the wording closely follows the wording of the self-report.

Fletcher has tested these scales on both clinic and non-clinic children. Internal consistency was "very good" for the scales, ranging from .89 in the parent paper-and-pencil report to .94 in the parent interview (Fletcher, unpublished paper). Correlations between the child PTSD reports with each other were higher than correlations with the parent reports. The parent PTSD scales were more highly correlated with themselves as well. Parent scales were also highly correlated with the Achenbach Child Behavior Checklist internalizing disorder scales.

Both children's and parents' PTSD scores were closely associated with CBCL ratings of thought problems (which included obsessional thinking, concentration problems, repetitive acts and blankly staring), anxiety, withdrawal, attention problems, or somatic problems. Thought problems were most closely associated with children's PTSD reports. The parent reports were most strongly associated with CBCL somatic problems and internalizing problems. Both parents and children, in their PTSD reports, were strongly associated with the CBCL anxiety/depression scale and the social problems scale.

Although these are only preliminary reports, Fletcher reports that they provide a good indication that the measures are valid and reliable measures of childhood PTSD. Fletcher reports good to excellent internal consistency for total PTSD severity scores as well as for all of the DSM-IV criteria except criterion A (exposure to and distress over traumatic events). Interestingly enough, none of the PTSD scales were significantly associated with children's reports of the number of lifetime stressors they have experienced. The reasons for this lack of association are unclear. Results also support that both the child and parents should be interviewed whenever possible and that the child's responses should be given greater weight than those of the parent.

Fletcher limits his results with his acknowledgment that the scales need considerably more research, including factor analysis.

Psychobiological Assessment. This particular assessment method is somewhat difficult to perform in large-scale studies of PTSD. However, it has value in that it is purely subjective and therefore lends itself to forensic examinations of the disorder in

particular settings such as the legal system. Ornitz and Pynoos (1989) investigated an exaggerated startle reflex in children exposed to sniper fire in Los Angeles. Exaggerated startle has subsequently been found to be specific to PTSD and is consistent with chronic brainstem dysfunction (McNally, 1991). Lowered plasma cortisol levels as measured in saliva have also been found to be indicative of stress in children as young as nine months (Gunnar, Larson, Hertsgaard, Harris, & Broderson, 1992). Other investigators have found memory deficits in victims of trauma (McNally, Kaspi, Riemann, & Zietlin, 1990) through use of the Modified Stroop test. Indeed, neuropsychological assessment of PTSD appears to be a particularly promising area of research.

Wolfe and Charney (1991) question an acquired learning dysfunction as a result of exposure to severe and uncontrollable stress. Basing their hypothesis on animal stress studies, Wolfe and Charney propose that involvement of the locus coeruleus and amygdala may implicate learning and memory disorders in adults. They cite other researchers (Krystal, et al., 1989; Mellman & Davis, 1985; Rainey, et al., 1987) as implicating the amygdala in aversive learning paradigms and in the integration of information across multiple channels. Conjoint functioning of these brain systems suggests a distinct role for cognitive, perceptual, and memory processes in the genesis of certain PTSD symptoms. Therefore, Wolfe and Charney propose that cognitive and neuropsychological assessment of PTSD victims can prove valuable. Certainly, studies on the performance of PTSD victims on the Stroop test have been supportive of their arguments. Neuropsychological assessment is assisting physicians in discriminating PTSD from other psychiatric disorders with known or suspected memory disturbance

(Butters, Wolfe, Marton Granholm, & Cermak, 1988; Wolfe, Granholm, Butters, Saunders, & Janowsky, 1987).

In summary, posttraumatic stress disorder is an important but often baffling disorder. Currently, there is a tremendous amount of research being conducted to assess the various theories underlying PTSD. Additionally, studies examining the effects of age, gender, ethnicity, specific types of trauma and socioeconomic status on the severity and course of this disorder are providing psychologists with valuable information. These findings may serve as a springboard for developing clinical interventions.

While epidemiological considerations are important, equally crucial are attempts to understand the expression of symptoms among victims. This understanding will come only through an increased comprehension of the disorder itself, i.e. what posttraumatic stress disorder is as a specific disorder. This process is considerably impeded by comorbid disorders that are by no means unique to PTSD. However, at the current time, attention is focused on the possibility that PTSD is not a discrete category but may have at least two subcategories, PTSD I and PTSD II, being dimensional for chronic versus acute stressors. Additionally, there is a strong possibility that differing types of disasters affect victims differently both in terms of severity and duration of the disorder.

Posttraumatic Stress Disorder and Disasters

The American Psychological Association commissioned a task force to study the psychological reactions of children to disaster. Their report was published in 1993 (Vogel & Vernberg, 1993). The formation of this task force was in response to the limited

information available to psychologists who were treating children following a disaster. Disaster research has progressed from qualitative studies to studies that are methodologically more complex and sophisticated. Standardardized and research instruments are being utilized to collect data on diverse types of disasters. The Vogel and Vernberg study is perhaps the more comprehensive of any investigation regarding disaster research and children over the years. Examination of this report yields important information about the current state of the art in regards to this continuing endeavor.

Earthquakes

Several articles have examined the effects of earthquakes upon children (Durkin, 1993; Galante & Foa, 1986; Guerin, Junn & Rushbrook, 1991; Goenjian, 1993; Goenjian, et al, 1995; Nolen-Hoeksema & Morrow, 1991; Pynoos, et al., 1993). Third World countries appear to be reporting rates of psychiatric morbidity in children far in excess of that found in communities in the United States (Goenjian, et al., 1994; Lima, et al., 1989; Pynoos, et al., 1993). Durkin (1993) found higher rates of PTSD after the 1985 earthquake in Chile compared with rates following the Coalinga earthquake. Rates of depression were quite similar, however.

Goenjian and colleagues (1995) examined children in Armenia following the 1988 earthquake. They utilized children from three cities at varying distances from the epicenter of the quake. As has been theorized in other disasters, the degree of posttraumatic stress closely following exposure, i.e. the number of family members lost in the earthquake and the extent of damage to their home. The study was conducted 18

months following the disaster. Yet, an astonishing number of children reported wanting to die. Again, the percentage of children in each of the three communities wanting to die closely followed the degree of exposure, i.e. the children in the community most affected had the highest percentage of children wanting to die. The frequency of PTSD, depressive disorder and mixed PTSD/depressive disorder was associated with proximity to the epicenter.

Rates of PTSD in Spitak and Gumri, two of the three communities studied in Armenia, were far in excess of that reported in children after other natural disasters such as Hurricane Hugo (Belter, et al., 1991; Shannon, et al., 1994), the Missouri flood (Earls, et al., 1988) and manmade disasters such as the Buffalo Creek dam collapse (Green, et al., 1991) and the sinking of the Jupiter (Yule, 1992). Goenjian and colleagues hypothesize that this high PTSD occurrence rate likely reflects the degree of disruption to the community and the nature and intensity of the earthquake experience. Many children witnessed the life-threat not only to themselves but friends and family members; witnessed destruction, mutilation and death; and reported hearing the screams of people trapped within the rubble. Often these people died a slow, agonizing death, as rescue workers were unable to reach them in time. Rescue efforts were much more coordinated and swift in the United States during the Loma Pieta earthquake, possibly reducing the impact of the quake upon survivors.

Goenjian, et al., (1995) also point to high PTSD occurrence in Yerevan, where there was mild damage and no significant loss of life. The authors hypothesize that this is a result of vicarious victimization via television and other media coverage as well as the

participation of people within the community assisting in the relief efforts of communities that were more severely impacted.

What is somewhat unusual in the Armenia earthquake studies is the degree of guilt suffered by survivors. Pynoos, et al. (1995) noted that children involved in a school shooting may be developmentally vulnerable to unrealistic and excessive self-blame in regards to their inability to prevent others from experiencing death and/or injury. Goenjian, et al., (1994, 1995) also found that guilt appears to be closely associated with increased severity of the PTSD syndrome. The children in Armenia reported much higher rates of guilt than their adult counterparts.

Floods

The most extensive examination of the consequences of a flood in psychological literature is the collapse of the Buffalo Creek dam and the ensuing inundation of surrounding communities with water and mud. Green and various colleagues (Gleser, Green, & Winget, 1981; Newman, 1976) studied the effects of the flood upon survivors. This was prior to the emergence of posttraumatic stress disorder as a disorder. Therefore, findings do not focus on the absence or presence of posttraumatic stress disorder. However, the authors did find significant psychological distress in the survivors.

In 1991 (Green, et al.) received a grant from the National Institute of Mental Health to do a 17 year follow up of the Buffalo Creek children. At this time, the researchers reviewed psychiatric notes gathered during the ensuing lawsuit and were able

to study posttraumatic stress symptoms using the new diagnostic criteria. The interviews were conducted approximately 18 months after the disaster.

The researchers found that 37% of the children examined reported posttraumatic stress symptoms, retrospectively being diagnosed with "probable PTSD". Green (1991) found that the prevalence of symptoms was related to the child's individual disaster experience, age, gender, parental functioning and general atmosphere in the home.

Earls, Smith, Reich, and Jung (1988) examined the effects of floods on two housing subdivisions in Missouri. The floods occurred in December, 1982 and again in the spring of 1983. Twenty families with 39 children participated in the study. Earls and colleagues found that parents underreported the distress their children might be experiencing. This is consistent with the research of Handford, et al., (1986). Earls found that children with pre-existing psychiatric problems, or whose parents had pre-existing psychiatric problems, had their difficulties exacerbated by the additional stressor of having experienced the flood. The investigators did not examine age or gender differences. However, they found that, in general, few of the children met the diagnostic criteria for posttraumatic stress disorder.

Steinglass and Gerrity (1990) compared two communities with differing types of disasters, flood and tornado. All of the participants in the study were adults. In the tornado-afflicted community of 1,800 people, 12 people were killed and 200 others injured. Over 100 families were left homeless. The community had approximately a 15-minute warning period. The flood affected community had three days of heavy rain that preceded the actual disaster. The community is approximately the same size as the tornado-damaged community with 1,900 people. Over 400 families were displaced and

90% of the business district was destroyed. Forty-seven people were killed in the surrounding area.

The researchers collected data on participants four months after the disasters and again at sixteen months. In both communities, over half of the people examined had posttraumatic stress disorder at the four month period. Symptoms were primarily intrusive with victims re-experiencing the disasters through images and emotions. At 16 months, there was considerable improvement in both types of survivors. However, whereas the communities had initially been comparable in their rates of PTSD, the tornado-damaged community had significantly higher rates at the 16-month period. There were also clear-cut gender differences in incidence rates with females being afflicted at higher levels than men. The prevalence differences existed despite the fact that the tornado-afflicted community had recovered more completely than the town damaged by the flood. Additionally, the tornado-damaged community had been more effective at organizing relief efforts from the beginning. The authors hypothesize that the flood damaged community's response to the disaster was more cohesive and this feeling of community mediated the emotional consequences of the flood. The rate of PTSD was considerably lower in both communities than that reported in the Buffalo Creek disaster. Steinglass and Gerrity guess that this may have had to do with significant litigation that followed the Buffalo Creek disaster. Additionally, their study was confined to adults whereas the Buffalo Creek study examined the effects of the disaster upon children.

Hurricanes

The most scientifically rigorous studies using the DSM III-R and DSM-IV criteria are the studies on Hurricane Andrew and Hurricane Hugo (Belter, Foster, Imm & Finch, 1991; Cohler, 1991; Garrison, Bryan, Addy, Spurrier, Freedy, & Kilpatrick, 1995; Lonigan, Shannon, Finch, Daugherty, & Taylor, 1991; Saylor, Finch & Belter, 1990; Sullivan, Saylor, & Foster, 1991). Subsequent studies have examined the prevalence of PTSD in the community following these disasters (Garrison, et al., 1995), developmental and/or age effects of PTSD (Garrison, Weinrich, Hardin, Weinrich, & Want, 1993; Shannon, et al., 1994; Vernberg, et al., 1996), diagnostic efficacy of the PTSD symptoms (Lonigan & Anthony, 1998), ethnicity (Garrison, et al., 1993, 1995; LaGreca, 1996; Shannon, et al., 1994), coping behaviors (LaGreca, et al., 1996; Vernberg, et al., 1996), and social support (La Greca, et al., 1996).

Researchers found high rates of posttraumatic stress disorder among victims of the hurricane. Lonigan and Anthony (1998) also found that many victims, while not meeting the specific criteria for PTSD, exhibited combinations or symptoms that were highly predictive of PTSD and were present in many children with PTSD. They also found that children exhibited behavioral avoidance, emotional avoidance, had bad dreams, and repetitive thoughts about the hurricane not only immediately but several months following the disaster. Comparing 5,664 children in Hurricane Hugo to a study involving 2,400 Vietnam veterans, Anthony, Lonigan, and Hecht (1999) found that children in their study were not qualitatively different, based on their responses to the Frederick Reaction Index and the Revised Children's Manifest Anxiety Scale, in the

symptoms they exhibited from the veterans. However, they were quantitatively different, i.e. young children showed more severe symptoms than did older children and adolescents but PTSD symptoms had consistent dimensionality across age groups. In general, they found three symptoms clusters: Intrusion/Active Avoidance, Numbing/Passive Avoidance, and Arousal.

Garrison and colleagues (1995) studied children from a different storm, Hurricane Andrew, in their examination of the prevalence of specific PTSD following a natural disaster. Using structured telephone interviews, the researchers found that difficulty concentrating was the most prevalence symptoms (36%), followed by diminished intereste in significant activities (35%), irritability or outbursts (30%), recurrent and intrusive recollections (20%), and avoidance of thoughts (29%). Physiological reactivity (9.2%) to a reminder of the event, psychological distress to a reminder of the event (8.8%) and a sense of a foreshortened future (8.6%) were least experienced phenomenon. Most symptoms were reported more frequently in females than in males with the exception of sense of a foreshortened future and diminished interest in a significant activity. Patterns of symptomatology were not consistent across ethnic categories. However, black, non-Hispanic subjects tended to report most avoidance symptoms. General prevalence rates for PTSD were 7.3% in children and youth in the community.

As with the children surviving earthquakes, guilt was common in children surviving a hurricane (Lonigan & Anthony, 1998) but was not predictive of PTSD. Omens, guilt, anger and anxiety all appeared to be markers of exposure to trauma rather than diagnostic indicators of PTSD. Researchers also found that children were more

accurate reporters of their distress than parents and teachers (Vogel & Vernberg, 1993; Vernberg, et al., 1996).

In a related study, Bahrick, Parker, Fivush, and Levitt (1998) examined pre-school children following Hurricane Andrew. They assessed memory related to events surrounding the storm that had occurred two to six months prior. They found a quadratic relation between stress and memory. Children who experienced moderate stress recalled more information than children with high or low levels of exposure to stress did. Additionally, children were most likely to show this quadratic relationship when they answered open-ended, rather than specific questions. This curvilinear relationship of recall was maintained whether the children were recalling actions, descriptions or their internal states.

Garrison, Weinrich, Hardin, Weinrich, and Wang (1993) also investigated the frequency and correlates of PTSD in 1,264 adolescents in South Carolina following Hurricane Hugo. Data were gathered using a 174-item self-administered questionnaire. The base rate for PTSD in this sample was approximately 5%. Stating that it is quite likely that some natural disasters may be more likely than others to evoke symptoms of posttraumatic stress disorder, Garrison and colleagues still found that females were generally more affected than males. However, they found the prevalence rate to be lower among black males than among white males and black or white females. The researchers were uncertain regarding possible causative factors for this finding. Garrison also found increased PTSD with increased exposure to the hurricane or other traumatic events.

LaGreca, Silverman, and Wasserstein (1998) studied the predisaster functioning of children as a predictor of PTSD following Hurricane Andrew. The researchers were

participating in a study of anxiety in the South Dade, Florida school system before the storm. They were in a unique position to examine the effects of the hurricane upon their relatively small sample of children who had been participants in the earlier study. Using the Frederick Reaction Index (Frederick, Pynoos, & Nader, 1992), LaGreca and her colleagues found that children's preexisting levels of anxiety were predictive of significant PTSD reactions. Additionally, these anxious children were also less likely to recover from initial levels of PTSD when assessed at a more distant time period.

LaGreca, Silverman, and Vernberg (1996) also evaluated children on five conditions following Hurricane Andrew. The conditions were: (a) exposure to traumatic events during and after the disaster, (b) their preexisting demographic characteristics, (c) the occurrence of major life stressors, (d) the availability of social support, and (e) the type of coping strategies used to cope with disaster-related distress. They found all five factors to be predictive of children's PTSD symptoms at three, seven and ten months postdisaster. LaGreca once again used the Frederick Reaction Index (Frederick, 1985), the Hurricane-Related Traumatic Experiences questionnaire (HURTE; Vernberg, et al., 1996), the Social Support for Children (SSSC; Harter, 1985) and the Kidcope (Spirito, Stark, & Williams, 1988) designed to assess coping strategies.

Findings were generally supportive of previous studies of children and hurricanes. The most frequent coping strategy reported by the children was wishful thinking, followed by positive coping, social withdrawal, and blame/anger. In general, the trend was towards less symptom endorsement as time elapsed. Hispanic and African American children reported higher levels of PTSD than did White children. Children reported the greatest level of support from parents and friends and the least from classmates. Life

threat was the greatest predictor of children who continued to exhibit PTSD symptoms over time. Teacher support was also highly and uniquely predictive of the ability to resolve PTSD.

Lonigan, Anthony, and Shannon (1998) examined five conditional probability indices to determine the diagnostic efficacy of 48 symptoms associated with PTSD following Hurricane Hugo. These researchers examined positive predictive power (PPP.) and negative predictive power (NPP) of DSM III-R and DSM-IV posttraumatic stress criteria. Lonigan and colleagues also examined the odds ratio (OR) or base rate of a disorder given the presence or absence of a symptom. Using the Frederick Reaction Index (Frederick, 1985; Pynoos, et al., 1993), and the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1985), over 5,600 children were examined. They found that the diagnostic utility of a given symptom fluctuated. In general, combining PTSD symptoms resulted in incremental predictive power and increased the odds for a PTSD diagnosis. However, they found that symptom combinations involving problems with attention, memory and reckless behavior did not improve predictive power and often reduced the significance of symptoms that had good predictive power when considered in isolation. Lonigan also found that anxiety did not have high diagnostic utility for a PTSD diagnosis. In general, children who reported symptoms associated with behavioral and emotional avoidance were the most likely to have severe posttraumatic stress.

One of the most interesting findings regarding children and hurricanes is contained in the study of elementary school age children following Hurricane Andrew (Shaw, et al., 1995). Using the Frederick Reaction Index (Frederick, Pynoos, 1993), the

Hurricane-Related Traumatic Experiences Questionnaire (HURTE; Vernberg, et al., 1996) and the Teacher's Report Form (TRF; Achenbach, 1991), researchers examined PTSD symptoms in a sample of elementary school aged children in South Dade County, Florida. What makes this study significant is that children less impacted by the hurricane in their district had the same prevalence rate of mild and moderate PTSD symptoms as did children in the immediate path of the storm. This finding suggested vicarious traumatization of these children via the media, uncertainty regarding the path of the storm, and peripheral impact of living in a storm ravaged area. This is consistent with a study by Kiser (1993) regarding anticipatory anxiety in a group of children who were told an earthquake was imminent which did not materialize.

Other significant findings of this study include continuing high rates of PTSD at 32 weeks postdisaster. Shaw, et al. (1995) hypothesize that this observed rate may result from the process of trauma, i.e. the hurricane destroyed the infrastructure of the community, resulting in unemployment, loss of the family home, mass relocation and exodus from the area and the loss of many modern conveniences. This is consistent with the study of the children in the 1988 earthquake in Armenia where prolonged community disruption also resulted in continued high rates of PTSD (Goenjian, et al., 1995).

An additional finding that has generated much interest is the failure of the researchers to replicate previous findings that found gender, grade and ethnic differences in children with PTSD following a disaster. Shaw hypothesizes that this may reflect a tendency with the Frederick RI to be insensitive to gender differences.

However, the finding that fascinated Shaw and colleagues the most is that there was a documented reduction in emotional and behavioral problems in the school system

following the hurricane. This finding was confirmed with the TRF and the findings were compared in the school districts heavily impacted by the hurricane and the districts less heavily impacted. The findings were tested against all 39 schools within the district and found to be consistent. Shaw, et al. (1995) hypothesize that this reduction of reported acting out may be due to an overall numbing effect. Rates returned to normal the following year. In schools less heavily effected by the storm, there was a reported increase in disruptive behaviors as measured by the Teacher Report Form (TRF).

In general, being in a hurricane created a significant risk for children for the development of posttraumatic stress disorder. Researchers (Lonigan & Anthony, 1998; Shannon, et al., 1994) stress the need for continuing longitudinal study of these children in order to determine if PTSD contributes to the formation of adult psychopathology. Currently, no longitudinal studies exist in this area.

There appear to be many commonalties exhibited by the hurricane children with the earthquake children and the children surviving floods. What is unclear is whether the specific symptoms exhibited and the severity of these symptoms is the same or different in these different disaster populations.

Tornadoes

The effect of surviving a tornado has been a surprisingly little studied phenomenon. The first known study of the effects of tornadoes was by Joseph Weinreb in 1953. Weinreb studied reactions to the Worcester tornado of 1953. In 1959 Perry and Perry examined the effects of the "Schoolhouse Disaster". In February of 1955 tornadoes

struck two rural schoolhouses in Mississippi, killing both teachers and many of the students. This was a very limited case study and was prior to the designation of PTSD as an identifiable syndrome.

Bloch, Wilber, and Perry (1955) researched the Vicksburg Tornado of 1953. This disaster concerned a tornado that struck a movie theater filled with children on a Saturday afternoon. Survivors were interviewed four days after the disaster. The children, their parents, community leaders, pediatricians, school officials and teachers all took part in the study. The researchers reported that a common defense was to suppress memories of the disaster. In general, the adults concerned with the care of these children sought to get them back into activities that were "normal" without acknowledging anything had happened to them. Additionally, the adults themselves demonstrated tremendous difficulty discussing the tornado without becoming extremely anxious. Bloch and his colleagues found that the interview process itself helped many parents discover the psychological relief that came with talking about the tragedy, thus freeing the children to talk about it and enhancing communication within the family.

Another strategy noted by the researchers was the need to deal with the parents' fears before talking with the children. This was done through the use of parent groups that appeared especially helpful to large numbers of parents. The investigators also found that adjustment was facilitated among adolescents in the community through rehabilitation work or working in relief canteens, i.e. helping others adjust to the disaster. The article is interesting in that it is a good example of work done at an early time in the field of mental health. It is limited by its rambling, qualitative nature, however.

In 1974 a tornado hit the town of Monticello, Indiana in one of the largest outbreaks of tornadoes nationwide that the United States had ever experienced (Zarle, Hartsough, & Ottinger, 1974). This article focuses on the efforts to build a disaster response to tornadoes. Major assumptions were made regarding the responses of disaster victims to a tornado. The paper examines the stages of marshalling relief efforts, citing "predictable" responses of tornado victims with no identifiable research to bolster its claims. The article has little usefulness in assisting researchers attempting to examine posttraumatic reactions in tornado victims. One of the first articles that empirically examines the emotional responses of tornado victims was published in 1976. Penick, Powell, and Sieck (1976) interviewed 26 tornado victims to determine the mental health consequences of a natural disaster. The victims lived in Joplin, Missouri, a small town in southwest Missouri that was struck by a tornado in 1973. In a town of approximately 40,000 people, there were two deaths. Approximately 24,000 people suffered property damage of some kind. Interviews with the victims took place five months after the disaster. They were interviewed by a structured interview format.

The researchers found that the victims were still experiencing significant number of mental health problems. Additionally, one-fourth of the respondents reported greater interpersonal tensions in their families. Almost three-fourths of the respondents said that they had experienced emotional changes in themselves that worried and concerned them. Most of these changes were described as being nervous, tense, or irritable. Most of the victims felt that it was only natural to feel this way and that they would get better with the passage of time. Most stated that they would not seek help other than talking to their minister or a family member.

This study is limited by its small sample size and methodology. Terms within the study were not quantified nor consistently measured. However, though its methodology may be rudimentary, the study does confirm that survivors of tornadoes do have observable mental health issues following the disaster.

A tornado struck eastern North Carolina on March 28, 1984. In a five-hour period, these storms caused more than 1,000 casualties and caused property damage in excess of $100 million. Madakasira and O'Brien (1987) interviewed survivors of these storms, which are rare in the Carolinas. Warnings came too late for many to take shelter. Even in communities where there was some warning, residents did not take them seriously and many did not bother to take shelter. This contributed to the number of killed and injured.

Using the Hopkins Symptom Checklist (HSCL) utilizing DSM-III criteria, 279 victims were interviewed. However, only 116 victims filled out the HSCL. Intrusive thoughts were the most frequent symptom (82%), followed by increased tension on exposure to disaster scenes or mentions (68%), concentration difficulty (66%), memory impairment (61%), estrangement (57%), and insomnia (55%). The authors concluded that the symptoms exhibited by their survivors did not necessarily follow the findings in other studies. They suggested there might be variations in the nature and frequency of PTSD symptoms exhibited in various types of natural and human initiated disasters.

Steinglass and Gerrity (1990) conducted one of the few studies that compared responses of victims in two different kinds of disasters. They compared flood victims and tornado victims in regards to the types of symptoms exhibited by each, and their respective resiliencies. In the tornado-damaged community, 12 people were killed, 200

injured and 100 families were left homeless. The flood community was in a region where 29 counties were declared disaster areas and 47 people were killed.

The communities were assessed twice. The first time was four months post disaster; the second time was 16 months post disaster. The Horowitz Impact of Event Scale (HIES) and the Diagnostic Interview Schedule (DIS) were utilized in the study. Seventy-six adults from 40 families were assessed. Results indicate that short-term PTSD symptom rates were very high in both communities. At 16 months, these levels had decreased remarkably. However, the tornado damaged community had a significantly higher incident of posttraumatic stress (21%) than the flood ravaged community (14.5%). The symptoms were not only at a higher prevalence rate, the symptoms were more severe and longer lasting. This is in spite of the fact that the community experiencing the tornado had more effective and speedy relief services and that this community, in general, recovered more quickly in material terms.

Once again, this study is hampered by a small sample size. However, it is the first to use an assessment instrument still in use today and to compare types of disasters.

Greening and Dollinger (1992) examined 455 adolescents to assess their perceptions regarding the risk of tornadoes and/or lightning. The sample was somewhat specialized in that the first group was a control group from communities with no known disasters in the previous eight years. The second group included 123 students whose town had experienced two lightning strike incidents. The first incident occurred when lightning struck a group of children playing a soccer game, killing one and injuring several others. The second incident occurred when lightning injured a high school student following a baseball game. The third group included students whose high school had been hit by a

tornado. This group was also the visiting soccer team when lightning struck the children's soccer match. The final group was a group of adolescents whose community had had both flooding and a tornado in 1986.

Students were assessed through the use of questionnaires distributed during their regular class periods at school. Students in all groups perceived tornadoes to have a higher fatality risk than lightning. This was across all groups, even the groups that had witnessed a lightning death. Among the 421 students assessed, only 43 (10%) thought that the risk of being killed by lightning was greater than their chances of being killed by a tornado. The authors hypothesize that this finding likely reflects the more sensational aspects of tornadoes over lightning in the media.

The final study compared the survivors of a tornado in Madison, Florida to survivors of two other disasters. The two disasters examined were both of human origin, i.e. a plane crash and a mass killing in Killeen, Texas. This study examines the effects of perceived benefit upon recovery from these disasters. Plane crash survivors had the lowest rates of perceived benefit (55% one month post-crash and 35% three years post crash). Survivors of the tornado had the highest rates of perceived benefit (90% one month posttornado and 95% three years posttornado). Explanations proposed by the researchers include the fact that tangible aid (housing, food) was needed and available for tornado victims and that people responding felt more comfortable in offering this type of aid. However, the exact mechanism of recovery was not clearly identified.

The lack of research examining the effects of tornadoes upon survivors is underscored by this review of the literature. Hurricanes are the most like tornadoes in their impact upon people and property. However, there are significant differences.

Hurricanes may have a warning period of several hours to several days. Tornadoes tend to strike suddenly with little or no warning. Hurricanes are prolonged and tornadoes are usually over in moments. Additionally, tornadoes are the most frequently occurring natural disaster in the United States. It is difficult to rationally justify the lack of research in this critical area.

With a foundation based on the review of the literature and possible implications for professional practice when considering the impact on the emotional functioning of children who have experienced a tornado in their communities, the methods for this study were established.

Purpose of the Study

The study was conducted in two rural school districts in Oklahoma. The districts, Stroud and Mulhall, were both damaged in the May 3, 1999 tornado outbreak in Oklahoma. Stroud suffered extensive damage to its economic base by having the primary business in the town, the Tanger Outlet Mall, completely destroyed. The Mall offered employment to many of the people living in and around the community of Stroud and contributed heavily to the overall economic functioning of the community through sales taxes and visitors it drew into the town for shopping. The Mall will not be rebuilt. The hospital in Stroud was also completely destroyed and the citizens of Stroud now seek medical care in surrounding communities. The hospital also has not been rebuilt but there are plans to do so. Numerous homes were also damaged or destroyed. There were no deaths reported from the storm in the Stroud area. The tornado has resulted in relocation

for many people due to job loss and loss of their homes, a layoff in municipal employees due to tax moneys lost, and reduced medical care for the entire community. Stroud has approximately 850 students in grades K-12.

Mulhall was also extensively damaged. Visible signs of the tornado damage were still readily apparent one year after the tornado. The school was totally destroyed and children have had to attend school in the neighboring rural community of Orlando for the 1999-2001school years. The school is being rebuilt by a grant from the Federal Emergency Management Agency (FEMA). A large percentage of homes in the community have been destroyed and are in the process of being rebuilt. There are no industries in Mulhall. It is an agricultural community. Mulhall has approximately 230 students in grades K-12. It is significantly smaller than Stroud. The school is the center of community cohesiveness.

The study was undertaken due to requests for assistance from the elementary school principal of Mulhall. Oklahoma State University is quite close to Mulhall and has a long relationship with the school and its faculty. Children from Mulhall were continuing to demonstrate behavioral problems that are outside the usual range of behaviors that school personnel had previously noted. School officials were becoming increasingly concerned with behavior that they felt swung between marked apathy and increased aggressiveness in children who had previously demonstrated appropriate behavior. Discussions with school officials following the tornado indicated that the federal government was working extensively with community officials. However, follow up calls to the school approximately three months later indicated that the children were

continuing to exhibit behavior problems and immediate disaster relief had been withdrawn.

Permission for the study was undertaken with the assurance that an intervention for the distressed children would be part of the research effort. The participation of the Stroud superintendent of schools was requested due to Stroud being the next smallest community to also receive extensive tornado damage. Permission from the Institutional Review Board was granted after a full board review of the research design and methodology. In keeping with the mandates for protection of human subjects, follow up therapy sessions were conducted at Mulhall by members of the Oklahoma State University research team and senior graduate students from the Principles of Child Psychotherapy class.

This study specifically examined (1) the underlying constructs of PTSD, (2) the relationship of the instruments used to assess PTSD in the population being studied, (3) the relationship of demographic variables of gender, (4) ethnicity, and (5) age upon the expression of symptoms, (6) the effects of severity of exposure to the tornado and the expression of PTSD symptoms, and (7) resiliency factors within the child's social support network that contribute to recovery from posttraumatic stress disorder. Finally, the study examined (8) the relationship of the research instruments to the Behavior Assessment System for Children-Self Report. The following research questions were generated.

Research Questions

1. What are the underlying dimensions of posttraumatic stress disorder experienced by children?
2. How correlated are the instruments used in this study to examine PTSD in children: the instrument examining posttraumatic stress disorder using DSM-IV criteria, the Oklahoma State University Posttraumatic Stress Disorder scale and the Oklahoma State University PTSD Screener?
3. Are there significant mean differences between males and females in the average amount of PTSD in children?
4. Are there significant mean differences across ethnic groups in the average amount of PTSD in children?
5. Is there a significant relationship between age and the amount of PTSD in children?
6. Is there a statistically significant relationship between the degree of exposure to the tornado and the level of PTSD in children?
7. Does the level of social support predict the expression of symptoms in children experiencing PTSD?
8. What is the relationship of the DSM-IV Children's Questionnaire and the Oklahoma State University Posttraumatic Stress Disorder Scale to the Behavior Assessment System for Children, a standardized measure of behavior?

Hypotheses

From the research questions, the following hypotheses were generated, were stated in the null form and are as follows:

Hypothesis 1. There will be no difference in the underlying dimensions of posttraumatic stress disorder identified in this study and current DSM-IV criteria.

Hypothesis 2. There will be no difference in the numbers of children identified with posttraumatic stress disorder using the DSM-IV criteria, the Oklahoma State University PTSD Screener, or the Oklahoma State University Posttraumatic Stress Disorder Inventory for Children.

Hypothesis 3. For children experiencing posttraumatic stress disorder, there will be no differences in prevalence based on gender, ethnicity or age.

Hypothesis 4. For students experiencing posttraumatic stress disorder, there will be no difference in prevalence based on the degree of severity of exposure to the tornado, social support or premorbid functioning of the child.

Hypothesis 5. There will be no relationship among the instruments used to assess PTSD in this study and the Behavior Assessment System for Children-Self Report.

Statistical Analysis

A six-stage analysis procedure will be constructed for the data. First, descriptive statistics will be completed. Factor analysis will be performed on the DSM-IV criteria and the OSU PTSD Scales using the children's responses to these instruments as the database. Next, correlational analysis of the DSM-IV questionnaire and the OSU PTSD Scale will be conducted in order to examine their relationship. Third, correlational analysis will be conducted to assess the relationship between gender, ethnicity and age in the expression of PTSD symptoms using the DSM-IV criteria. Finding no significant difference among the groups will indicate that the demographic variables of age, ethnicity and gender do not seriously affect the scores obtained. Regression studies will also be utilized to examine whether the degree of exposure, and perceived levels of social support following the tornado predict the amount of PTSD present in the children. Finally, the relationship of the Oklahoma State University Posttraumatic Stress Disorder Inventory, the DSM-IV criteria and the OSU Screener to the Behavior Assessment System for Children- Self-Report of Personality will be examined using correlational analysis.

Stage I

Demographic variables will be compiled and descriptive statistics reported in Table 1 (p. 82).

Stage II

The underlying dimensions of posttraumatic stress disorder will be factor analyzed using the reports of the children on the DSM-IV criteria questionnaire and the OSU PTSD Scale. The intention is to examine the constructs of PTSD as defined in the DSM-IV and to empirically validate or reject these criteria as they relate to children who have experienced a tornado in their communities. The OSU PTSD Scale utilizes the BASIC ID model to examine posttraumatic stress disorder. This scale attempts to define the constructs of PTSD through Behavior, Affective states, Social behaviors, Imagery used by the individual and Cognitions.

Stage III

The DSM-IV criteria and the OSU PTSD Scale use different criteria for examining the underlying dimensions of this disorder. The OSU scale differs from the DSM-IV criteria in that it utilizes the BASIC ID model versus the better-known DSM-IV diagnostic criteria in looking at PTSD. The purpose of this stage of statistical analysis is

to examine how correlated the two instruments are and to examine any critical differences which emerge in the instruments.

Stage IV

To determine if there were any differences in the DSM-IV score obtained by the participants, the effects of gender, ethnicity and age on this score will be examined. Finding no significant differences among the groups will indicate that the demographic variables of age, ethnicity and gender do not seriously affect the scores obtained. The same demographic variables will be examined using scores from child responses to the BASIC ID criteria on the OSU PTSD Inventory.

Independent t-tests were used to examine the effects of gender. The intent of this component of the hypothesis was to determine if there were any significant mean differences between males and females in the average amount of PTSD symptoms acknowledged by the participants.

The second effect tested was ethnicity. The intent of this component was to determine if there were any significant mean differences in the scores on the DSM-IV criteria based on the ethnicity of the student.

The third effect tested was age. The intent of this component of the hypothesis was to determine if there were any significant differences in the scores on the DSM-IV criteria based on the age of the student.

Stage V

A correlational analysis will be conducted on the child reports of severity of exposure and their perceptions of social support using the DSM-IV factor scores, the OSU PTSD Inventory composite scores and the OSU PTSD Screener composite scores. The purpose of this correlational study is to determine if there is a relationship between the amount of PTSD symptoms being reported by the participants and the degree of severity of exposure to the tornado or the perception of available social support following the storm.

Stage VI

Correlational coefficients measure the strength of association between two variables. Since no instrument currently utilized in the measurement of PTSD has been standardized, it would appear to be important to correlate these instruments with an instrument that has undergone rigorous psychometric testing. During this stage of statistical analysis, the Oklahoma State University PTSD Inventory for Children will be correlated with the Behavior Assessment System for Children-Self Report of Personality. The intent of this part of the hypothesis is to establish validity for the OSU inventory and/or the DSM-IV diagnostic criteria.

CHAPTER III

Method

The purpose of this chapter is to describe the participants, the procedure of the study, the instruments used and the statistical analysis implemented.

Participants

Participants were 152 children in grades K-12 in Stroud, Oklahoma and Mulhall, Oklahoma.

Procedure

Prior to the study, conferences were held with the superintendents of the Stroud and Mulhall Public Schools. They were invited to participate in the study in order to screen the children in their schools for adverse psychological sequelae resulting from the May 3, 1999 tornado that struck their communities. The superintendents then presented the study to their respective Board of Education for approval. The researcher outlined the rationale for the study, assessment strategies, and provided copies of all research

instruments for the superintendents' perusal. They, in turn, provided the copies of the research instruments to their respective Boards of Education.

Upon approval from the two school districts, letters were sent home with the children to their parents. These letters summarized the purpose of the research, the methods to be utilized, and sample questions for the parents to examine. With the letters were included the parent questionnaires and a requested date of completion. Parents were advised that they could contact the researcher, supervising faculty or the Oklahoma State University Institutional Review Board if they so desired. Contact numbers were provided.

Dates for the administration of the questionnaires to students was established with the principals of each elementary school and high school participating in the study. In the schools, the questionnaires were administered only to children whose parents had returned a completed parent permission form and a complete set of parent questionnaires. The elementary school children were administered the forms in the cafeteria. The high school students were administered the questionnaires in their English classes.

Instruments

This section discusses the questionnaires that were utilized in collecting data on the children and their families. Questionnaires sent to the parents included a demographic and informational questionnaire, and a DSM-IV criteria questionnaire. Questionnaires used with the children included: Child Form DSM-IV Criteria, the Oklahoma State University PTSD Inventory for Children, the Oklahoma State University PTSD Screening Inventory, and the Behavior Assessment System for Children-Self Report.

Oklahoma State University Scales

All questionnaires were modified by the researcher from previously existing scales being utilized for research on posttraumatic stress disorder. These scales were The UCLA Posttraumatic Stress Inventory for Children, the Hamada Index, When Bad Things Happen and the Posttraumatic Stress Inventory for Children (See Appendix B). They were modified for use in this study and in Oklahoma with the permission of the authors. None of these instruments are currently standardized or normed. For this reason, the Behavior Assessment System for Children-Self Report (BASC-SRP) was also administered to the children. The BASC-SRP is a nationally normed and standardized global assessment instrument of child behavior.

The Behavior Assessment System for Children-Self-Report

The Behavior Assessment System for Children-Self Report of Personality (BASC-SRP) is designed to facilitate the differential diagnosis and educational classification of a variety of emotional and behavioral disorders of children and to aid in the design of treatment plans (Reynolds & Kamphaus, 1992). The BASC-SRP combines the child's own statements regarding emotional well-being and self-perceptions. There are two age levels for BASC-SRP: child (8-11) and adolescent (12-18). These levels overlap to a considerable degree in scales, structure and individual items. The BASC-SRP yields composite scores in: School Maladjustment, Clinical Maladjustment, Personal Adjustment, and an overall score, the Emotional Symptoms Index (ESI). The child level

of the BASC has 12 scales and the adolescent level (SRP-A) has 14 scales. The ESI has both negative scales (clinical) and positive scales (adaptive). The scales can be interpreted with reference to national age norms (General, Male, and Female) or to clinical norms. There are also special indexes designed to assess the validity of the child's responses. These indexes are: The F index, the L ("fake good") index for the SRP-A only, and the V index which is designed to detect invalid responses that may be due to poor reading comprehension, failure to follow directions or poor contact with reality (Reynolds & Kamphaus, 1992).

The BASC-SRP was normed on 5,413 children ages 8-11, on 2,944 children aged 12-14 and on 1,540 adolescents ages 15-18 (BASC, 1992). It has been correlated with other standardized instruments such as the Minnesota Multiphasic Personality Inventory for Adolescents (MMPI-A; Hathaway & McKinley, 1942, 1943, 1970), the Youth Self-Report (YSR; Achenbach, 1985), and the Children's Personality Questionnaire, Form A (CPQ; Porter & Cattell, 1975) with good results, providing support for the construct validity of the SRP.

The BASC-SRP was used in the present study in order to demonstrate the validity of the author's research instruments through correlational analysis.

Personal Data Information

The Personal Data Information form was designed by the investigator and asks questions concerning demographics about the student and his/her family.

Research Design and Statistical Analysis

Factor Analysis

Exploratory principal components analysis is used to determine from a data set how many factors are present, and whether the factors are correlated or not (Stevens, 1996). The factors, or underlying constructs, determine the amount of variance accounted for by this linear combination of variables. The criteria for deciding on how many components to retain are somewhat complex. However, Stevens (1996) identifies four methods that can be used in deciding how many components to retain.

1. The most widely utilized criterion is that of Kaiser (1960). He recommended retaining only those components whose eigenvalues are greater than one.
2. Cattell (1966) proposed a graphical method called the scree test to determine the number of factors. The magnitudes of the eigen values (vertical axis) are plotted against their ordinal numbers. Typically, there is a sharp descent that levels off. The point at which the plot levels is determined to approximate the number of factors underlying the construct.
3. Lawley (1940) developed a statistical significance test for the number of factors to retain. However, his test is heavily influenced by sample size and large sample size may lead to the retention of too many factors (Stevens, 1996).

4. Stevens recommends retaining as many factors as will account for a specified amount of total variance. Generally, this amount should approximate 70% of the variance.

A principal components factor analysis summarizes most of the variance present in a large set of variables. The components, however, are designed to maximize the amount of variance accounted for and may not be readily interpretable (Stevens 1996). There are two major classes of rotations available:

1. Orthogonal (rigid) rotations-the new factors are uncorrelated
2. Oblique–the new factors are correlated

The orthogonal rotations also have different types. They include quartimax rotations used to "clean up" the variables. Each variable loads mainly on one factor and is a relatively pure measure. A fault with this method is that most variables tend to load on a single factor that makes meaningful interpretation difficult.

Varimax rotation takes a different path to analysis of the variables. Kaiser (1966) designed the Varimax rotation so that each factor tends to load high on a smaller number of variables and low or very low on others (Stevens, 1996). This facilitates interpretation of the factors. The Varimax rotation destroys the maximum variance property of the original components. Therefore, the first rotated factor does not necessarily account for the maximum amount of variance. Varimax rotation is the default option for SPSSX.

Oblique rotations have numerous proposed solutions such as oblimax, quartimin, maxplane, orthoblique, promax, and oblimin. Pedhazur and Schmelkin (1991) state:

> ...the decision whether to rotate factors orthogonally or obliquely reflects one's conception regarding the structure of the construct under consideration. It boils down to the question: Are aspects of a postulated multidimensional construct intercorrelated? The answer to this question is

relegated to the status of an assumption when an orthogonal rotation is employed.

The next question that comes to mind is to decide which loadings should be used for interpretation. Cliff and Hamburger (1967) demonstrated that the standard errors of factor loadings for orthogonally rotated solutions in all cases were considerably greater than the standard error for an ordinary correlation. Given these results, Stevens (1996) recommends testing each loading for significance at a=.01 (two-tailed test). Stevens also recommended using loadings of only .40 or greater for interpretation purposes.

Guadagnoli and Velicer (1988), through their Monte Carlo study, indicated that component saturation (the absolute magnitude of the loadings) and absolute sample size are the most important factors to consider when determining the adequacy of a sample for reliable factors. Other authors recommend two subjects per variable to 20 subjects per variable. Using Guadagnoli and Velicer's recommendations, the applied researcher would follow these guidelines:

1. Components with four or more loadings above .60 in absolute value are reliable, regardless of sample size.
2. Components with about ten or more low (.40) loadings are reliable as long as sample size is greater than about 150.
3. Components with only a few low loadings should not be interpreted unless sample size is at least 300.

In this investigation a principal components exploratory analysis was conducted on the three instruments used in this study using a Varimax rotation. Factor loadings of less than .40 were suppressed using the SPSS Statistical Package for analysis.

Additionally, cross loadings on factors were eliminated if (1) one factor was significantly higher ($\geq$.10) and (2) elimination of the cross loading made sound theoretical sense.

Correlation Coefficients

Correlation studies focus on the way in which scores on one measures are associated with scores on a second measure. The first step in examining the relationship between scores on two measures is to arrange them in the form of a joint distribution. A joint distribution is a distribution in which a pair of scores for each subject is represented. A next step is to summarize the relationship represented by a joint distribution with a single number—a correlation coefficient. The correlation coefficient is a descriptive statistic that represents both the magnitude of the relation between two variables (ranging from zero to [1]) and the direction of the relationship (positive or negative).

There are many different types of correlation coefficients. Most coefficients have been developed to measure the strength of relationship between two variables that show a linear relationship in a scatter plot (Shavelson, 1996). The most widely used measure of the strength of relationship between two linearly related variables is the Pearson product-moment correlation coefficient. The Pearson product-moment correlation coefficient provides a measure of the strength of association between two variables. It can take on values from –1.00 to +1.00 where the absolute magnitude provides an index of the strength of the relationship between the two variables and the sign indicates the direction of the relationship.

In the present study, correlations between the factor scores and composite scores on the three instruments measuring posttraumatic stress disorder were examined with various indicators including gender, age, ethnicity, severity of exposure, and reported social supports. Additionally, the factor and composite scores on the three PTSD instruments were correlated with the individual scales on the Behavior Assessment System for Children-Self Report as a measure of validity.

Multiple Regression Analysis

Multiple regression analysis employs a correlational design in which one group of subjects is measured on three or more continuous, individual-difference variables. Multiple regression analysis has four assumptions:

1. Independence: The scores for any particular subjects are independent of the scores of all other subjects.
2. Normality: In the population, the scores on the dependent variable are normally distributed for each of the possible combinations of the levels of the X variables.
3. Homoscedasticity: In the population, the variances of the dependent variable for each of the possible combinations of the levels of the X variables are equal.
4. Linearity: In the population, the relation between the dependent variable and an independent variable is linear when all other independent variables are held constant.

The square of the multiple correlation coefficient, R^2 provides an index of the proportion (or percent) of variation in the dependent variable that can be accounted for by the linear composite of (regression-weighted) independent variables. That is, it is an index showing the percentage of variation in Y accounted for by the set of X's. Sample size greatly affects R^2. Therefore, sample size should exceed 50 cases and there should be about ten times more cases than independent variables (Shavelson, 1996).

In the present study, multiple regression analysis was employed to determine whether the child's perception of social support predicted the expression of symptoms in children experiencing PTSD. The expression of symptoms was defined as the factor scores on the Children's DSM-IV Questionnaire and the composite scores on the OSU Posttraumatic Stress Inventory and the OSU PTSD Screener.

Research Design

The children were administered four questionnaires. These questionnaires included the Children's DSM-IV Questionnaire, the Oklahoma State University Posttraumatic Stress Disorder Inventory, the PTSD Screener, and the Behavior Assessment System for Children-Self Report. Scores were entered into the SPSS Statistical Package for analysis. Children were given prepared packets in which the instruments had been pre-assembled in a random order to counterbalance. This was not an experimental design because subjects were not randomly assigned to groups.

Directions to the children included the following statement:

> Today you are a scientist. You are helping other scientists understand how children feel when a really bad thing happens in their community. Your answers will be used so that we can better understand how to help children who have had a bad thing happen to them. There are no right or wrong answers to the questions we are going to give you. Instead, you are to answer and tell us exactly how you felt right after the storm and how you feel now. Please answer all the questions carefully. If you have any questions or need help with a word, please raise your hand. When you are finished, you can go back to your classroom.

Parents were also given the DSM-IV Questionnaire and a personal information page containing demographic information. These questionnaires were returned to the school and matched with their child's responses following completion of the child administrations.

CHAPTER IV

Results

The purpose of this chapter is to report the findings of data analysis of 152 students who took part in this study. The investigator received parental permission for student participation from approximately 14% of the impacted group of children.

The participants in the study were approximately equally divided between male and female. However, participants were almost exclusively confined to the elementary grades. The breakdown of the demographic information regarding the participants is presented in Table 1. The breakdown is presented first by gender, age, reported ethnicity, and finally the current grade placement of the child.

Table 1

Description of Participants

	Frequency	Percent
Gender		
Male	71	46.7
Female	81	53.3
Community		
Site		
Stroud	84	55.3
Mulhall	68	44.7
Age		
6	10	6.6
7	8	5.3
8	15	9.9
9	30	19.7
10	45	29.6
11	29	19.1
12	9	5.9
14	1	.7
16	3	2.6
18	1	.7
Missing	1	.7

Table 1 (continued)

	Frequency	Percent
Race/Ethnicity		
Race		
White	101	66.4
Native American	14	9.2
Asian	1	.7
Hispanic	2	1.3
Other	2	1.3
Not specified	32	21.1
School Placement		
Grade in School		
Kindergarten	6	3.9
First	12	7.9
Second	8	5.3
Third	34	22.4
Fourth	44	28.9
Fifth	36	23.7
Sixth	5	3.3
Eighth	1	.7
Tenth	3	2.0
Junior	1	.7
Unspecified	2	1.3

The first research question was addressed through a principal components analysis of the Child's DSM-IV Questionnaire, the OSU PTSD Screener, and the OSU PTSD Inventory. This analysis addressed the first research question.

1. What are the underlying dimensions of posttraumatic stress disorder experienced by children?

Factor Analysis

Examination of the underlying dimensions of PTSD was undertaken with a principal components analysis. A Varimax rotation with Kaiser Normalization was utilized. The factor structure of PTSD as represented by the participant responses to the DSM-IV questionnaire and the Oklahoma State University PTSD Inventory are presented separately.

The DSM-IV Questionnaire was analyzed to assess the goodness of fit with DSM-IV PTSD criteria. The rotation converged in 13 iterations and yielded six factors. Various factor models were attempted using a variety of factor analytic techniques. Multiple rotations were also attempted including oblimin and quartimax. The final decision to use principal components analysis with varimax rotation was based upon comparison of eigenvalues and the scree plots (see Figure 1).

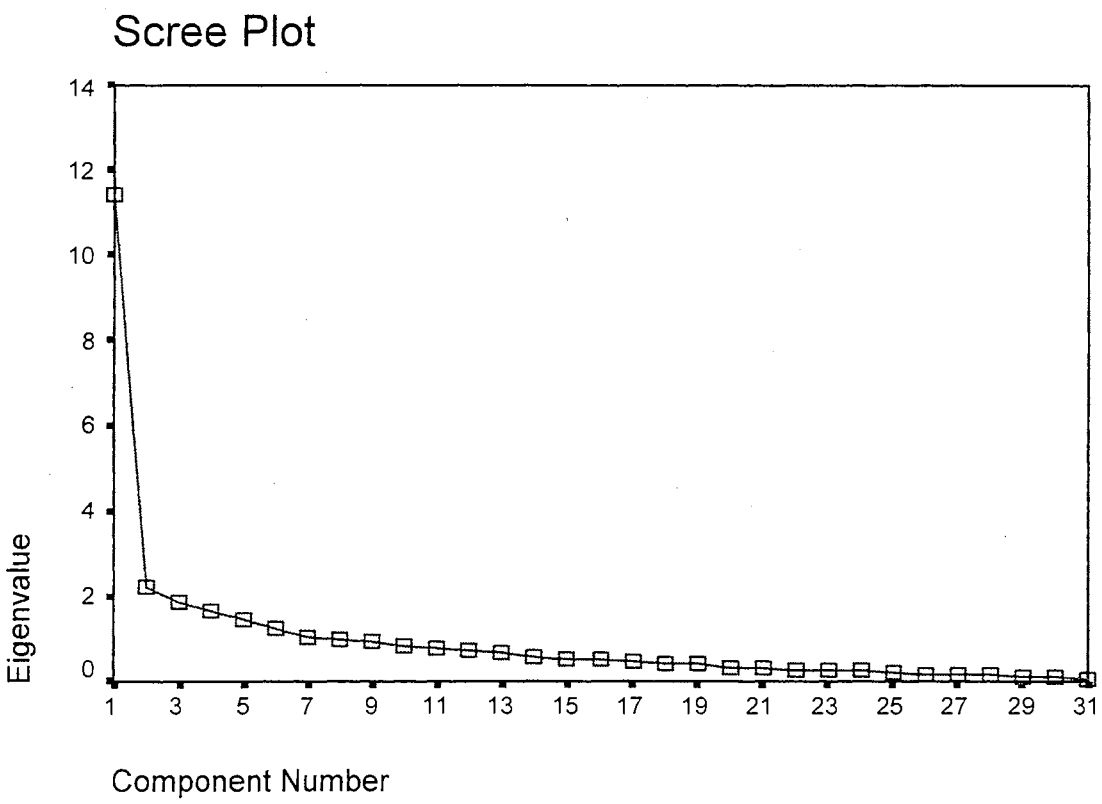

Figure 1. Scree Plot

The resulting six components solution (see Tables 2 & 3) is consistent with the survey of the literature that suggested five or six-factor solution best describes the disorder. The resulting factor explained approximately 63.8% of the variance. The Kaiser-Meyer-Olkin test of sampling adequacy was .84, indicating that there was enough common variance to make the factor analysis of the data useful. Reliability analysis of the Child's DSM-IV Questionnaire was .93 for the instrument as a whole with alpha set at .05.

Table 2

Child's DSM - IV Questionnaire Rotated Component Matrix

	Component					
Child's DSM	1	2	3	4	5	6
1 now						.666
2 now		.649				
3 now	.460					
5 now		.698				
4 now		.658				
6 now		.612				
7 now	.430	.610				
9 now						
10 now		.433			.589	
11 now		.652				
15 now	.777					
30 now	.692					
16 now	.678		.434			
18 now	.635					
14 now	.598	.411				
19 now	.541			.435		
29 now	.513		.506			
22 now			.699			
27 now			.674			

Table 2 (continued)

	Component					
Child's DSM	1	2	3	4	5	6
24 now			.559			.426
17 now			.562			
36 now			.551		.540	
21 now	.447		.460			
28 now				.729		
32 now		.464		.663		
31 now				.579		
34 now				.532	.407	
35 now					.875	
33 now					.855	
25 now						.792
26 now				.409		.676

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a Rotation converged in 13 iterations.

Table 3

Six Factor Solution

Factor 1 Avoidance	I do not like to hear people talk about the tornado. I am more jumpy (startle more easily) since the tornado. I try and not go places that make me think about the tornado. I cannot remember some important things about the tornado. I do not like to think about the tornado. I am not interested in things I used to like since the tornado. I watch out for bad things since the tornado. I am very alert. I felt like I could not help myself during the tornado.
Factor 2 Re-Experiencing	I dream about the tornado. I talk about the tornado a lot (several times a week.) I get upset when I see tornadoes on TV. I get really very scared thinking about the tornado. I feel like the tornado is happening again sometimes. I have more bad dreams now than before the tornado.
Factor 3 Interpersonal Alienation	I have more problems with my friends since the tornado. I get angry more since the tornado. I try and not see people that make me think about the tornado. I feel different from others since the tornado.
Factor 4 Interference with Daily Functioning	I have trouble thinking since the tornado. These feelings make me feel bad and cause trouble with my schoolwork. These feelings make me feel bad and cause trouble with my life.
Factor 5 Physical Symptoms/Anxiety	I feel guilty since the tornado, like maybe the tornado would not have happened if I had been a better child. I knew something bad was going to happen before the tornado. I have headaches, stomachaches or feel bad in other ways since the tornado came. I don't like to be away from my parents now. Sometimes I feel like I'm outside my body.
Factor 6 Foreshortened Future	I worry that I might die before I grow up. I don't feel like I will marry. I was in a tornado. I don't feel I will have children.

OSU PTSD Inventory

The OSU PTSD Inventory was analyzed using a varimax rotation with Kaiser normalization. Principal components analysis of this scale revealed that a single component appeared to comprise the scale. Attempts to force a factor solution yielded groupings of items that were not theoretically sound. Therefore, composite scores rather than factor scores were used in order to complete the remainder of the statistical analysis of the data. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy was .66 indicating that the amount of variance shared by the variables was moderately low. This made the results of a factor analysis of doubtful usefulness. The Reliability Analysis of the OSU PTSD Inventory was .87 with alpha set at .05. Approximately 51% of the variance was explained by the single component.

OSU PTSD Screener

The OSU PTSD Screener yielded a single factor solution. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy was .87, indicating that the amount of common variance of the items made examination of the underlying factors appropriate.
The single component solution accounted for 100% of the variance. Reliability analysis was .88 with alpha set at .05, indicating good reliability for the instrument.

2. How correlated are the instruments used in this study to examine PTSD in children: the instrument examining posttraumatic stress disorder using DSM-IV criteria, The Oklahoma State University Posttraumatic Stress Disorder Scale and the Oklahoma State University PTSD Screener?

In order to examine the strength of association among these scales, a Pearson product-moment correlation efficient was computed. Using the SPSS statistical package, the correlation was computed. Significance was set at the .05 level (see Table 4).

Table 4

Correlations

	DSM FACTOR 1	DSM FACTOR 2	DSM FACTOR 3	DSM FACTOR 4	DSM FACTOR 5	DSM FACTOR 6	OSU PTSD COMPOSITE	OSU PTSD SCREENER
DSM Factor 1							.317**	.295**
DSM Factor 2							.486**	.361**
DSM Factor 3							.476**	.360**
DSM Factor 4							.261*	.376**
DSM Factor 5							.256*	.218*
DSM Factor 6							.092	.233**
OSU PTSD Inventory	.317**	.486**	.476**	.261*	.256*	.092	1.000	.587**
OSU PTSD Screener	.295**	.361**	.360**	.376**	.218*	.233**	.587**	1.000

*Correlation is significant at the 0.05 level (two-tailed)
**Correlation is significant at the .01 level (two-tailed)

There was a significant correlation between Factor 1 (Avoidance), Factor 2 (Re-Experiencing) and Factor 3 (Interpersonal Alienation) with the OSU Posttraumatic Stress Disorder Inventory at the .01 level. Additionally, there were statistically significant correlations at the .05 level of significance between Factor 4 (Interference with Daily

Functioning), and Factor 5 (Physical symptoms/Anxiety) and the OSU PTSD Inventory. Only Factor 6 (Foreshortened Future) failed to significantly correlate with the OSU PTSD Inventory. As noted with the principal components analysis of the Children's DSM Questionnaire, Factor 6 appears to be a unique factor.

The OSU PTSD Screener had statistically significant correlations at the .01 level with the OSU PTSD Inventory, and Factors 1, 2, 3, 4, and 6. Factor 5 was correlated at the .05 level with the Screener.

While all three instruments do have statistically significant correlations with each other, they also appear to be measuring some distinct constructs of posttraumatic stress disorder. The children identified as having PTSD with one instrument might not necessarily be identified as having the disorder with the other instruments.

3. Are there significant mean differences between males and females in the average amount of PTSD exhibited?

The descriptive statistics for the factor scores, the OSU .....and OSU Screeners are reported in Table 5.

Table 5

Descriptive Statistics of Instruments

	N	Range	Mean	Standard Deviation	Skewness	Std Error
Factor Score	153	12.9	-1.27	2.44	1.22	.19
Composite	76	236.00	148.28	47.84	.10	.27
OSU PTSD	152	6.91	6.66	1.00	1.34	.19
Factor 1	152	6.40	-3.81	1.00	1.52	.19
Factor 2	152	6.53	1.27	1.00	1.12	.19
Factor 3	152	7.11	6.66	1.00	.71	.19
Factor 4	152	11.87	1.19	1.00	7.17	.19
Factor 5	152	5.76	3.93	1.00	1.23	.19
Factor 6						
Screener Composite	135	36	8.82	9.13	1.06	.20

*Correlation is significant at the 0.05 level (two-tailed)
**Correlation is significant at the .01 level (two-tailed)

An independent t-test was conducted to assess for significance in the mean difference of questionnaire scores between male and female participants in the study (see Table 6). Significance levels were set at .05, $p \leq .05$. Examination of results indicate that there were no significant differences observed in the average amount of PTSD reported by the children when gender was used as the grouping variable.

Table 6

Independent Samples Test t-test for Equality of Means

	t	df	Significance (2-tailed)
Factor 1 DSM	-.47	150	.63
Factor 2 DSM	-1.43	150	.15
Factor 3 DSM	-1.62	150	.10
Factor 4 DSM	1.10	150	.27
Factor 5 DSM	.87	150	.38
Factor 6 DSM	.28	150	.77
OSU composite	-1.80	74	.07
Screener composite	.23	150	.77

*Significant at the .05 level (two-tailed)
**Significant at the .01 level (two-tailed)

4. Are there significant mean differences across ethnic groups in the average amount of PTSD in children?

Of the 152 children who participated in this study, only 115 of their parents indicated their ethnicity on the demographic data page. Of the children with a designated ethnicity, 101 indicated they were white and 14 indicated they were Native American. There were not sufficient ethnic differences reported to make a meaningful comparison.

5. Is there a significant relationship between age and the amount of PTSD in children?

A correlational analysis was performed to examine the relationship between age and the amount of PTSD expressed via factor scores on the Children's DSM

Questionnaire and composite scores on the OSU PTSD Inventory (see Table 7). Based upon the analysis of the data, an omnibus measure of age does not appear to have a statistically significant relationship to PTSD as represented by responses on the OSU PTSD Inventory and the Children's DSM-IV Questionnaire. The OSU Screener had a statistically significant negative correlation between age and the children's responses on this instrument.

Table 7

Correlation of Age to PTSD Symptoms

	Factor 1 DSM	Factor 2 DSM	Factor 3 DSM	Factor 4 DSM	Factor 5 DSM	Factor 6 DSM	OSU PTSD Inventory	OSU Screener
Age	-.16	-.13	-.08	0-03	-.13	-.06	-.07	-.39**

*Significant at the .05 level (two-tailed)
**Significant at the .01 level (two-tailed)

6. Is there a statistically significant relationship between the degree of exposure to the tornado and the level of PTSD in children?

In order to examine the relationship between degree of exposure and the level of PTSD present in the children, a correlation was run between the indicators of severity of exposure to the tornado on the OSU Posttraumatic Stress Inventory and the factor scores on the Children's DSM-IV Questionnaire (see Table 8). Additionally, a correlation analysis was examined between the severity scores and the composite scores on the OSU PTSD Inventory and the PTSD Screener.

Table 8

Correlations - Severity with Factor Scores

	Factor 1 Avoidance	Factor 2 Re-Experiencing	Factor 3 Interpersonal Alienation	Factor 4 Daily Functioning	Factor 5 Physical Symp/ Anxiety	Factor 6 Foreshortened Future
How scared were you?	.30**	.36**	.29**	.09	.07	-.02
Damage home	.13	.15	.08	.12	-.09	-.03
Damage school	.30**	.05	.01	.00	.07	.29**
Hear tornado	.07	-.13	-.11	-.11	-.01	.19*
See tornado	.02	-.04	-.15	-.11	-.04	-.07
See it hit anything?	-.09	-.04	.05	-.16	-.07	.01
See it hurt someone?	-.08	-.05	.04	-.09	-.06	-.10
See injured people?	-.12	-.09	-.03	-.33**	-.08	-.12
See dead people?	.03	.00	-.01	-.05	.04	.00
Who were you with?	-.04	-.01	-.06	.03	-.00	.07
How close were you?	.17	-.02	-.06	.09	-.01	-.02
Have a storm shelter?	-.09	-.12	.25**	.11	.15	.12

*Significant at the .05 level (two-tailed)
**Significant at the .01 level (two-tailed)

It would appear that severity factors or the degree of exposure reported by the children is not an omnibus measure. Instead, the type of exposure appears to correlate with the type of symptoms experienced by the children. The tendency towards avoidance was more closely correlated to the degree of fear reported by the children, as was the tendency towards re-experiencing phenomena and feelings of interpersonal alienation. Children who had their school damaged reported significant feelings of avoidance as well as feelings of a foreshortened future. Hearing the tornado also was correlated with a sense

of foreshortened future. Seeing injured people was negatively correlated with interference in daily functioning. Additionally, having access to a storm shelter was correlated with feelings of interpersonal alienation. The OSU Posttraumatic Stress Disorder composite score was correlated only with the child's report of how frightened he/she had been. The OSU PTSD Inventory correlated .49 with the child's report of fear. This is significant at the .01 level. Finally, the OSU PTSD Screener proved to perhaps be the most significantly correlated of the three instruments (see Table 9).

Table 9

Severity Questions with Screener and OSU PTSD Inventory

	Screener	OSU PTSD Inventory
How scared were you during the tornado?	.40**	.49**
Did the tornado damage your home?	.26**	.10
Did the tornado damage your school?	.35**	.11
Did you hear the tornado?	NS	-.18
Did you see the tornado?	NS	-.15
Did you see the tornado hit anything?	-.18*	-.10
Did you see the tornado hurt someone?	-.20*	.03
Did you see any injured people after the tornado?	-.24*	-.21
Did you see any dead people after the tornado?	NS	-.01
Who were you with at the time of the tornado?	NS	.20
How close were you to the tornado?	NS	.02
Did you have a storm shelter to go to?	.20*	.03

*Significant at the .05 level
**Significant at the .01 level

7. Does the level of social support predict the expression of symptoms in children experiencing PTSD?

A stepwise multiple regression was performed using the composite scores for the OSU PTSD Inventory and the OSU PTSD Screener and the factor scores for the Children's DSM-IV Questionnaire. Additionally, a multiple regression was performed using the composite factor score. The composite or factor scores were the dependent variables and the social support questions on the OSU PTSD Inventory and the Children's DSM-IV Questionnaire were the independent variables. Analysis was performed using SPSS REGRESSION and SPSS FREQUENCIES for evaluation of assumptions. Descriptive statistics for the instruments and the social support questions are detailed in Table 10.

Table 10

Descriptive Statistics -OSU PTSD Screener, OSU PTSD Inventory, Child's DSM-IV Questionnaire and Social Support Predictors

	Mean	Standard Deviation	N
OSU PTSD Inventory	150.75	34.66	152
Screen T Composite	8.83	8.60	152
OSU social support 1	2.60	1.33	152
OSU social support 2	2.64	1.22	152
OSU social support 3	.73	.81	152
OSU social support 4	.74	.76	152
OSU after 1	1.02	1.18	152
OSU social support 6	2.16	1.35	152
OSU social support 7	2.30	1.32	152
OSU cognitive social support 1	.56	.91	152
OSU cognitive social support 2	.63	.98	152
OSU cognitive social support 3	1.14	1.11	152
OSU cognitive social support 4	.52	.86	152
Childs dsm 37 after	2.35	1.42	152
Childs dsm 38 after	2.45	1.44	152
Childs dsm 39 after	2.20	1.42	152
Childs dsm 40 after	2.23	1.48	152
Factor 1 DSM	3.51	1.00	152
Factor 2 DSM	-1.31	1.00	152

Table 10 (continued)

Factor 3 DSM	-4.67	1.00	152
Factor 4 DSM	5.26	1.00	152
Factor 5 DSM	5.84	1.00	152
Factor 6 DSM	3.93	1.00	152

OSU PTSD Screener

Results of evaluation of assumptions indicated normality. Casewise diagnostics eliminated six outliers from the regression. Elimination of outliers consisted of data that exceeded two standard deviations from the mean. This improved the normality, linearity, and homoscedasticity of residuals. No transformations of the data were indicated. The mean was substituted for any missing data, N=152.

Table 11 displays the expected R and R^2 for the three regression models and adjusted R^2.

Table 11 indicates the change statistics for the models. The ANOVA table (see Table 12) demonstrates that all three models are statistically significant. Model 3 is used to predict the Screener Composite score since it accounts for the greatest amount of variance (see Tables 13, 14, & 15). Collinearity diagnostics were performed and multicollinearity was not deemed to be problematic.

Table 11

Model Summary

Model	R	R^2	Adjusted R^2	St. Error of the Estimate	Change Statistics				
					R^2 Change	F Change	df1	df2	Sig. F Change
1	.41[a]	.17	.16	7.86	.17	30.74	1	150	.000
2	.44[b]	.20	.19	7.74	.03	5.86	1	149	.017
3	.48[c]	.23	.21	7.62	.03	5.84	1	148	.017

[a]Predictors: (Constant), OSU cognitive social support 1
[b]Predictors: (Constant), OSUcognitive social support 1, OSU cognitive social support 3
[c]Predictors: (Constant), OSU cognitive social support 1, OSU cognitive social support 3, OSU social support 7
[d]Dependent Variable: OSU Screener Composite Score

Table 12

ANOVA

Model		Sum of Squares	df	Mean Square	F	Significance
1	Regression	1903.81	1	1903.81	30.74	.0000[a]
	Residual	9287.27	150	61.91		
	Total	11191.08	151			
2	Regression	2255.72	2	1127.86	18.80	.0000[b]
	Residual	8935.36	149	59.96		
	Total	11191.08	151			
3	Regression	2595.03	3	865.01	14.89	.0000[c]
	Residual	8596.04	148	58.08		
	Total	11191.08	151			

[a]Predictors: (Constant), OSU cognitive social support 1
[b]Predictors: (Constant), OSU cognitive social support 2, OSU cognitive social support 3
[c]Predictors: (Constant), OSU cognitive social support 2, OSU cognitive social support 3, OSU social support 7

Table 13

Coefficients

Model		Standardized Coefficients Beta	t	Significance
1	(Constant)		8.87	.00
	OSU cognitive social support 1	.41	5.54	.00
2	(constant)		5.83	.00
	OSU cognitive social support 1	.34	4.39	.00
	OSU cognitive social support 3	.19	2.42	.02
3	(constant)		5.80	.00
	OSU cognitive social support 1	.37	4.81	.00
	OSU cognitive social support 3	.20	2.68	.01
	OSU social support 7	-.17	-2.41	.02

Table 14

OSU PTSD Screener-Stepwise Regression Model Summary

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate
1	.41[a]	.17	.17	7.87
2	.45[b]	.20	.19	7.74
3	.48[c]	.23	.22	7.62

Table 15

Model Summary[d]

		Change Statistics			
Model	R^2 Change	F Change	df 1	df2	Sig. F Change
1	.17	30.75	1	150	.00
2	.03	5.87	1	149	.02
3	.03	5.84	1	148	.02

[a]Predictors: (Constant), OSU cognitive social support 1
[b]Predictors: (Constant), OSU cognitive social support 1, OSU cognitive social support 3
[c]Predictors: (Constant), OSU cognitive social support 1, OSU cognitive social support 3, OSU social support 7
[d]Dependent variable: OSU Screener Composite Score

Model 3 was used for interpretation. Three of the individual variables contributed significantly to prediction of the composite score for the OSU PTSD Screener. The three variables in combination contributed 21.6% of the Screener composite score. Apparently the relationship between the Screener composite score and the degree of social support perceived by the child is mediated by how often the child's parents and friends say that they are afraid of tornadoes and how much the child feels their grandparents can be relied upon to help their family if in need.

OSU PTSD Inventory

A stepwise multiple regression was performed between the composite scores of the Oklahoma State University PTSD Inventory as the dependent variable and the social support questions on the PTSD Inventory and the Child's DSM-IV Questionnaire. Analysis was performed using SPSS REGRESSION for evaluation of assumptions.

Results of evaluation of assumptions indicate a normal distribution of the data. The mean was substituted for any missing data, N=152. No transformation of the data was deemed appropriate. Five outliers were found and eliminated from the data set. Outliers are defined as exceeding more than two standard deviations from the mean. Collinearity diagnostics indicated that multicollinarity was not problematic for this set of variables.

Table 16 displays the expected R and R^2 for the regression model and adjusted R^2. Table 16 also indicates the change statistics for the model. The ANOVA table (seeTable 17) demonstrates that the model is statistically significant. Model 1 is used to predict the Inventory. Model 1 accounts for 12% of the variance on the composite score for the OSU PTSD Inventory. The children indicated that the degree to which their parents currently indicate that they are afraid of storms accounts for approximately 12% of the composite score on the Inventory (see Table 18).

Table 16

Model Summary[b]

Model	R	R^2	Adjusted R^2	St. Error of the Estimate	Change Statistics				
					R^2 Change	F Change	df1	df2	Sig. F Change
1	.35	.13	.12	32.53	.13	21.41	1	150	.00

[a]Predictors: (Constant), OSU cognitive social support 1
[b]Dependent Variable: Oklahoma State University PTSD Inventory Composite Score

Table 17

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Significance
1	Regression	22654.29	1	22654.29	21.41	.00[a]
	Residual	158744.0	150	1058.29		
	Total	181398.2	151			

[a]Predictors: (Constant), OSU cognitive social support 2
[b]Dependent Variable: OSU PTSD Inventory Composite Score

Table 18

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	142.91	3.13		45.57	.00		
	OSU cognitive social support 2	12.37	2.67	.35	4.62	.00	1.00	1.00

[a]Dependent Variable: OSU PTSD Inventory Composite Score

Factor 1 Children's DSM-IV Questionnaire

A stepwise regression analysis was performed with Factor 1 (Avoidance) on the Children's DSM-IV Questionnaire as the dependent variable and the social support questions on the DSM-IV Questionnaire and the OSU PTSD Inventory as independent variables. Casewise diagnostics eliminated six outliers from the regression. This adjustment improved normality, linearity, and homoscedasticity of residuals. No transformation of the data was indicated. The mean was substituted for any missing data, N=152. The ANOVA table (seeTable 19) demonstrates that all six models are statistically

significant. Table 21 displays the expected R and R^2 for six models and adjusted R^2. Table 21 indicates the change statistics for the models. Model 6 is used to predict Factor 1 (Avoidance) since it accounts for the greatest amount of variance, adjusted R^2 =.23 or 23% of the variance. Collinearity diagnostics were performed and multicollinearity was not deemed to be problematic. Results indicate that 23% of the variance on Factor 1 (Avoidance) can be predicted by a combination of variables expressing how the child feeling that his family works together when there is a problem, how often the family did things together before the tornado, how often friends say that they are afraid of storms, how much their family talks about the tornado, whether the family has as much money now as before the tornado, and how often the child's teachers talk about the tornado.

Table 19

ANOVA[g]

Model		Sum of Squares	df	Mean Square	F	Significance
1	Regression	14.25	1	14.81	15.63	.00[a]
	Residual	136.75	150	.91		
	Total	151.00	151			
2	Regression	20.74	2	10.37	11.86	.00[b]
	Residual	130.26	149	.87		
	Total	151.00	151			
3	Regression	25.39	3	8.46	9.97	.00[c]
	Residual	125.61	148	.85		
	Total	151.00	151			
4	Regression	31.12	4	7.78	9.54	.00[d]
	Residual	119.88	147	.82		
	Total	151.00	151			
5	Regression	35.61	5	7.12	9.01	.00[e]
	Residual	115.39	146	.79		
	Total	151.00	151			
6	Regression	39.17	6	6.53	8.46	.00[f]
	Residual	111.83	145	.77		
	Total	151.00	151			

[a]Predictors: (Constant), OSU social support 1

[b]Predictors: (Constant), OSU social support 1, childs dsm 37now

[c]Predictors: (Constant), OSU social support 1, childs dsm 37now, OSU cognitive social support 3

Table 19 (continued

[d]Predictors: (Constant), OSU social support 1, childs dsm 37now, OSU cognitive social support 3, OSU social support 6

[e]Predictors: (Constant), OSU social support 1, childs dsm 37now, OSU cognitive social support 3, OSU social support 6, OSU social support 4

[f]Predictors: (Constant), OSU social support 1, childs dsm 37now, OSU cognitive social suport 3, OSU social support 6, OSU social support 4, OSU social support 3

[g]Dependent Variable: Factor 1 DSM

Table 20

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	-.60	.17		-3.52	.00		
	OSU social support 1	.23	.06	.31	3.95	.00	1.00	1.00
2	(Constant)	-.83	.19		-4.44	.00		
	OSU social support 1	.17	.06	.23	2.86	.01	.88	1.13
	childs dsm 37now	.16	.06	.22	2.72	.01	.88	1.13
3	(Constant)	-.94	.20		-4.94	.00		
	OSU social support 1	.16	.06	.22	2.70	.01	.87	1.14
	childs dsm 37now	.14	.06	.19	2.41	.02	.87	1.16
	OSU cognitive social support 3	.16	.07	.18	2.34	.02	.96	1.04
4	(Constant)	-.81	.19		-4.19	.00		
	OSU social support 1	.22	.06	.29	3.47	.00	.78	1.28
	childs dsm 37now	.16	.06	.22	2.78	.01	.85	1.18
	OSU cognitive social support 3	.18	.07	.20	2.66	.01	.95	1.05
	OSU social support 6	-.16	.06	-.22	-2.65	.01	.81	1.23

Table 20 (continued)

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
5	(Constant)	-.71	.19		-3.64	.00		
	OSU social support 1	.23	.06	.31	3.74	.00	.77	1.30
	childs dsm 37now	.15	.06	.21	2.73	.01	.85	1.18
	OSU cognitive social support 3	.21	.07	.24	3.11	.00	.91	1.09
	OSU social support 6	-.15	.06	-.21	-2.60	.01	.81	1.23
	OSU social support 4	-.23	.10	-.18	-2.38	.02	.94	1.06
6	(Constant)	-.70	.19		-3.64	.00		
	OSU social support 1	.25	.06	.33	3.99	.00	.76	1.31
	childs dsm 37now	.13	.06	.18	2.30	.02	.82	1.22
	OSU cognitive social support 3	.20	.07	.23	2.99	.00	.91	1.10
	OSU social support 6	-.18	.06	-.24	-2.99	.00	.78	1.28
	OSU social support 4	-.37	.11	-.28	-3.19	.00	.66	1.51
	OSU social support 3	.24	.11	.19	2.15	.03	.63	1.59

[a]Dependent Variable: Factor 1 DSM

Table 21

Model Summary[g]

Model	R	R^2	Adjusted R^2	St. Error of the Estimate	Change Statistics				
					R^2 Change	F Change	df1	df2	Sig. F Change
1	.31[a]	.09	.09	.95	.09	15.63	1	150	.00
2	.37[b]	.14	.13	.94	.04	7.42	1	149	.01
3	.41[c]	.17	.15	.92	.03	5.48	1	148	.02
4	.45[d]	.21	.18	.90	.04	7.03	1	147	.01
5	.49[e]	.24	.21	.89	.03	5.68	1	146	.02
6	.51[f]	.26	.23	.88	.02	4.62	1	145	.03

[a]Predictors: (Constant), OSU social support 1
[b]Predictors: (Constant), OSU social support 1, childs dsm 37now
[c]Predictors: (Constant), OSU social support 1, childs dsm 37now, OSU cognitive ss 3
[d]Predictors: (Constant), OSU social support 1, childs dsm 37now, OSU cognitive ss 3, OSU social support 6
[e]Predictors: (Constant), OSU social support 1, childs dsm 37now, OSU cognitive ss 3, OSU social support 6, OSU social support 4
[f]Predictors: (Constant), OSU social support 1, childs dsm 37now, OSU cognitive ss 3, OSU social support 6, OSU social support 4, OSU social support 3
[g]Dependent Variable: Factor 1 DSM

Factor 2 Children's DSM-IV Questionnaire

Results of evaluation of assumptions indicated normality. Casewise diagnostics eliminated 12 outliers from the data to improve normality, linearity, and homoscedasticity of residuals. No transformations of the data were indicated. The mean was substituted for any missing data and no suppressor variables were found, N=152.

Table 22 displays the expected R and R^2 for the four regression models and adjusted R^2. Table 22 indicates the change statistics for the models. The ANOVA table (see Table 23) demonstrates that all four models are statistically significant. Model 4 is used to predict Factor 2 since it accounts for the greatest amount of variance, $R^2 = 18.2\%$. Collinearity diagnostics were performed and multicollinearity was not deemed to be problematic. Model 4 was used for interpretation (see Table 24). The four variables in combination contributed 18.2% of the Factor 2 (Re-experiencing) score. The relationship between Factor 2 (Re-experiencing) and the degree of social support perceived by the child is mediated by how often the child's friends say they are afraid of storms, how often the child did things with his/her family before the storm, how often the family talks about the tornado, and how often the child's teachers say they are afraid of storms. It would appear that ongoing discussion of the trauma by significant individuals in the life of the child and the amount of time the child spent in activities with the family contributes significantly to ongoing trauma.

Table 22

Model Summary[e]

Model	R	R^2	Adjusted R^2	St. Error of the Estimate	Change Statistics				
					R^2 Change	F Change	df1	df2	Sig. F Change
1	.30[a]	.09	.09	.96	.09	15.32	1	150	.00
2	.35[b]	.13	.12	.94	.03	5.84	1	149	.02
3	.42[c]	.18	.16	.91	.05	9.56	1	148	.00
4	.45[d]	.20	.18	.90	.02	4.42	1	147	.04

[a]Predictors: (Constant), OSU cognitive ss 3
[b]Predictors: (Constant), OSU cognitive ss 3, OSU after 1
[c]Predictors: (Constant), OSU cognitive ss3, OSU after 1, OSU social support 3
[d]Predictors: (Constant), OSU cognitive ss 3, OSU after 1, OSU social support 3, OSU cognitive social support 4
[e]Dependent Variable: REGR factor score 2 for analysis 1

Table 23

AVOVA[e]

Model		Sum of Squares	df	Mean Square	F	Significance
1	Regression	13.99	1	13.99	15.32	.00[a]
	Residual	137.01	150	.91		
	Total	151.00	151			
2	Regression	19.16	2	9.58	10.83	.00[b]
	Residual	131.84	149	.89		
	Total	151.00	151			
3	Regression	27.15	3	9.05	10.82	.00[c]
	Residual	123.85	148	.84		
	Total	151.00	151			
4	Regression	30.77	4	7.69	9.41	.00[d]
	Residual	120.23	147	.82		
	Total	151.00	151			

[a]Predictors: (Constant), OSU cognitive ss3
[b]Predictors: (Constant), OSU cognitive ss3, OSU after 1
[c]Predictors: (Constant), OSU cognitive ss3, OSU after 1, OSU social support 3
[d]Predictors: (Constant), OSU cognitive ss3, OSU after 1, OSU social support 3, OSU cognitive social support 4
[e]Dependent Variable: REGR factor score 2 for analysis 1

Table 24

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
							1	
1	(Constant)	-.31	.11		-2.80	.01		
	OSU cognitive social support 3	.27	.07	.30	3.91	.00	1.00	1.00
2	(Constant)	-.22	.12		-1.86	.07		
	OSU cognitive social support 3	.34	.07	.38	4.60	.00	.85	1.17
	OSU after 1	-.17	.07	-.20	-2.42	.02	.85	1.17
3	(Constant)	-.34	.12		-2.86	.01		
	OSU cognitive social support 3	.33	.07	.36	4.49	.00	.85	1.18
	OSU after 1	-.25	.07	-.29	-3.41	.00	.75	1.34
	OSU social support 3	.31	.10	.25	3.09	.00	.84	1.20
4	(Constant)	-.36	.12		-3.01	.00		
	OSU cognitive social support 3	.27	.08	.30	3.50	.00	.74	1.35
	OSU after 1	-.25	.07	-.30	-3.52	.00	.75	1.34
	OSU social support 3	.28	.10	.23	2.86	.01	.82	1.21
	OSU cognitive social support 4	.20	.09	.17	2.10	.04	.82	1.23

[a]Dependent Variable: REGR factor score 2 for analysis 1

Factor 3 (Interpersonal Alienation) Children's DSM-IV Questionnaire

A stepwise regression analysis was performed with Factor 3 (Interpersonal Alienation) on the Children's DSM-IV Questionnaire as the dependent variable and the social support questions on the DSM-IV Questionnaire and the OSU PTSD Inventory as independent variables. Casewise diagnostics eliminated ten outliers from the regression. This adjustment improved normality, linearity, and homoscedasticity of residuals. No transformation of the data was indicated. The mean was substituted for any missing data, N=152.

Table 25 displays the expected R and R^2. Table 25 indicates the change statistics for the models. The ANOVA table (Table 26) demonstrates that all three models are statistically significant. Model 3 is used to predict Factor 3 (Interpersonal Alienation) since it accounts for the greatest amount of variance, adjusted R^2 =.10 or 10% of the variance (see Table 27). Collinearity diagnostics were performed and multicollinearity was not deemed to be a problem. Results indicated that 10% of the variance on Factor 3 (Interpersonal Alienation) can be predicted by a combination of the child's perceptions of how much the family does things together now, how much his friends say they are afraid of storms, and how much the child feels his/her grandparents help if they need it.

Table 25

Model Summary

Model	R	R^2	Adjusted R^2	St. Error of the Estimate	Change Statistics				
					R^2 Change	F Change	df1	df2	Sig. F Change
1	.27	.07	.07	.97	.07	11.99	1	150	.00
2	.39	.1	.14	.93	.08	13.39	1	149	.00
3	.42	.18	.16	.92	.03	4.79	1	148	.03

[a]Predictors: (Constant), severity 1
[b]Predictors: (Constant), severity 1, Severity 12
[c]Predictors: (Constant), severity 1, Severity 12, SEVERITY 5
[d]Dependent Variable: REGR factor score 3 for analysis 1

Table 26

ANOVA[d]

Model		Sum of Squares	df	Mean Square	F	Significance
1	Regression	7.29	1	7.29	7.61	.01[a]
	Residual	143.71	150	.958		
	Total	151.00	151			
2	Regression	13.00	2	6.50	7.02	.00[b]
	Residual	137.10	149	.93		
	Total	151.00	151			
3	Regression	17.15	3	5.72	6.32	.00[c]
	Residual	133.85	148	.90		
	Total	151.00	151			

[a]Predictors: (Constant), OSU social support 2
[b]Predictors: (Constant), OSU social support 2, childs dsm 39now
[c]Predictors: (Constant), OSU social support 2, childs dsm 39now, OSU cognitive social support 2
[d]Dependent Variable: REGR factor score 3 for analysis 1

Table 27

Coefficients[af]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	.48	.19		2.50	.01		
	OSU social support 2	-.18	.07	-.22	-2.76	.01	1.00	1.00
2	(Constant)	.26	.21		1.26	.21		
	OSU social support 2	-.22	.07	-.27	-3.31	.00	.95	1.06
	childs dsm 39now	.14	.06	.20	2.48	.01	.95	1.06
3	(Constant)	.17	.21		.80	.43		
	OSU social support 2	-.21	.07	-.25	-3.17	.00	.94	1.06
	childs dsm 39now	.12	.06	.17	2.16	.03	.92	1.08
	OSU cognitive social support 2	.17	.08	.17	2.14	.03	.98	1.03

[a]Dependent Variable: REGR factor score 3 for analysis 1

Factor 4 (Interference with Daily Functioning) Children's DSM-IV Questionnaire

A stepwise regression analysis was performed with Factor 4 (Interference with Daily Functioning) on the Children's DSM-IV Questionnaire as the dependent variable and the social support questions on the DSM-IV Questionnaire and the OSU PTSD Inventory as the independent variables. Casewise diagnostics eliminated 13 outliers from the regression. This adjustment improved normality, linearity, and homoscedasticity of residuals. No transformation of the data was indicated. The mean was substituted for any missing data, N=152.

Table 28 displays the expected R and R^2. Table 28 indicates the change statistics for the models. The ANOVA table (see Table 29) demonstrates that all 3 models are statistically significant. Model 3 is used to predict Factor 4 (Interference with Daily Functioning) since it accounts for the greatest amount of variance, adjusted $R^2 = 17\%$ of the variance. Collinearity diagnostics were performed and multicollinearity was not deemed to be a problem. Results indicated that 17% of the variance on Factor 4 (Interference with Daily Functioning) can be predicted by a combination of three variables. The child's perceptions of how much his family does things together now, how much the family talks about the tornado and how often the child's parents say they are afraid of storms predicts the degree to which a child is experiencing difficulty in their day to day functioning ability.

Table 28

Model Summary[d]

					Change Statistics				
Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	R^2 Change	F Change	df1	df2	Sig. F Change
1	.35[a]	.12	.11	.94	.12	20.40	1	150	.00
2	.38[b]	.14	.13	.93	.02	3.92	1	149	.05
3	.42[c]	.17	.16	.92	.03	5.77	1	148	.02

[a]Predictors: (Constant), OSU cognitive social support 2
[b]Predictors: (Constant), OSU cognitive social support 2, OSU social support 2
[c]Predictors: (Constant), OSU cognitive social support 2, OSU social support 2, OSU social support 3
[d]Dependent variable; REGR factor score 4 for analysis 1

Table 29

ANOVA[d]

Model		Sum of Squares	df	Mean Square	F	Significance
1	Regression	18.08	1	18.08	20.40	.00[a]
	Residual	132.92	150	.89		
	Total	151.00	151			
2	Regression	21.48	2	10.74	12.36	.00[b]
	Residual	129.52	149	.87		
	Total	151.00	151			
3	Regression	26.35	3	8.78	10.43	.00[c]
	Residual	124.66	148	.84		
	Total	151.00	151			

[a]Predictors: (Constant), OSU cognitive social support 2
[b]Predictors: (Constant), OSU cognitive social support 2, OSU social support 2
[c]Predictors: (Constant), OSU cognitive social support 2, OSU social support 2, OSU social support 3
[d]Dependent variable; REGR factor score 4 for analysis 1

Factor 5 (Physical Symptoms/Anxiety) Children's DSM-IV Questionnaire

A stepwise regression analysis was performed with Factor 5 (Physical Symptoms/Anxiety) on the Children's DSM-IV Questionnaire as the dependent variable and the social support questions on the DSM-IV Questionnaire and the OSU PTSD Inventory as independent variables. Casewise diagnostics eliminated four outliers from the regression. This adjustment improved normality, linearity, and homoscedasticity of

residuals. No transformation of the data was indicated. The means was substituted for any missing data, N=152.

Table 30 displays the expected R and R^2. Table 30 indicates the change statistics for the models. The ANOVA table (see Table 31) demonstrates that two models are statistically significant. Mode 2 is used to predict Factor 5 (Physical Symptoms/Anxiety) since it accounts for the greatest amount of variance, adjusted $R^2 = .12$ or 12% of the variance (see Table 32). Collinearity diagnostics were performed and multicollinearity was not deemed to be a problem. Results indicated that 12% of the variance on Factor 5 (Physical Symptoms/Anxiety) can be predicted by the child's perceptions of how much the family does things together at the present time and how often the child's parents indicate that they are afraid of storms.

Table 30

Model Summary[c]

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics				
					R^2 Change	F Change	df1	df2	Sig. F Change
1	.30[a]	.091	.09	.96	.09	14.94	1	150	.00
2	.37[b]	.134	.12	.94	.04	7.41	1	149	.01

[a]Predictors: (Constant), OSU cognitive social support 1
[b]Predictors: (Constant), OSU cognitive social support 1, OSU cognitive social support 2
[c]Dependent Variable: REGR factor score 5 for analyais 1

Table 31

ANOVA[c]

Model		Sum of Squares	df	Mean Square	F	Significance
1	Regression	13.68	1	13.68	14.94	.00[a]
	Residual	137.32	150	.92		
	Total	151.00	151			
2	Regression	20.19	2	10.09	11.50	.00[b]
	Residual	130.81	149	.88		
	Total	151.00	151			

[a]Predictors: (Constant), OSU cognitive social support 1
[b]Predictors: (Constant), OSU cognitive social support 1, OSU cognitive social support 2
[c]Dependent Variable: REGR factor score 5 for analysis 1

Table 32

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.19	.09		-2.02	.05		
	OSU cognitive social support 1	.33	.09	.30	3.87	.00	1.00	1.00
2	(Constant)	-.12	.09		-1.32	.19		
	OSU cognitive social support 1	.54	.11	.49	4.75	.00	.54	1.86
	OSU cognitive social support 2	-.29	.11	-.28	-2.72	.01	.54	1.86

[a]Dependent Variable: REGR factor score 5 for analysis 1

Factor 6 (Foreshortened Future) with Children's DSM-IV Questionnaire

A standard multiple regression was performed with Factor 6 (Shortened Future) on the Children's DSM-IV Questionnaire as the dependent variable and the social support questions on the DSM-IV Questionnaire and the OSU PTSD Inventory as independent variables. A stepwise multiple regression was attempted but failed to produce a workable model. Therefore, the standard multiple regression was performed. Casewise diagnostics eliminated nine cases. This adjustment improved normality, linearity, and homoscedasticity of residuals. No transformation of the data was indicated. The mean was substituted for any missing data, N=152.

Table 33 displays the expected R and R^2 for model produced. The ANOVA table (see Table 34) demonstrates that the model is not statistically significant. Social support cannot be used to predict the score on Factor 6 (Foreshortened Future). Collinearity diagnostics were performed and multicollinearity was not deemed to be problematic. Results indicate that 1% of the variance on Factor 6 is accounted for by the social support questions (see Table 35). Factor 6 continues to demonstrate its unique quality and may well serve as a severity factor for the disorder.

Table 33

Model Summary[b]

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics				
					R^2 Change	F Change	df1	df2	Sig. F Change
1	.30[a]	.09	-.01	.00	.09	.93	15	136	.54

[a]Predictors: (Constant), OSU cognitive social support 4, OSU social support 2, OSU social support 4, childs dsm 40now, childs dsm 39 now, OSU after 1, OSU social support 6, OSU social support 7, OSU cognitive ss 3, childs dsm 37now, OSU cognitive social support 1, OSU social support 3, childs dsm 38now, OSU social support 1, OSU cognitive social support 2

[b]Dependent Variable: REGR factor score 6 for analysis 1

Table 34

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Significance
1	Regression	14.00	15	.93	.93	.54[a]
	Residual	137.00	136	1.01		
	Total	151.00	151			

[a]Predictors: (Constant), OSU cognitive social support 4, OSU social support 2, OSU social support 4, childs dsm 40now, childs dsm 39now, OSU after 1, OSU social support 6, OSU social support 7, OSU cognitive ss 3, childs dsm 37now, OSU cognitive social support 1, OSU social support 3, childs dsm 38now, OSU social support1, OSU cognitive social support 2

[b]Dependent Variable: REGR factor score 6 for analysis 1

Table 35

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	4.78	.25		.19	.85		
	childs dsm 37now	9.75	.08	.14	-1.26	.21	.56	1.76
	childs dsm 38now	-.13	.09	-.18	-1.49	.14	.45	2.23
	childs dsm 39now	2.44	.08	.04	.32	.75	.57	1.77
	chids dsm 40now	-2.37	.03	-.08	-.87	.38	.86	1.16
	OSU social support 1	-2.96	.09	-.04	-.33	.75	.46	2.19
	OSU social support 2	-8.65	.10	-.11	-.88	.38	.46	2.18
	OSU social support 3	-.13	.14	-.11	-.95	.34	.53	1.90
	OSU social support 4	.16	.13	.12	1.19	.24	.64	1.56
	OSU after 1	9.99	.08	.12	1.22	.23	.71	1.41
	OSU social support 6	-2.17	.07	-.03	-.31	.76	.72	1.38
	OSU social support 7	.16	.07	.21	2.08	.04	.68	1.47
	OSU cognitive social support 1	.13	.14	.12	.97	.33	.44	2.29
	OSU cognitive social support 2	-.27	.13	-.27	-2.03	.04	.39	2.59
	OSU cognitive ss 3	-3.62	.09	-.04	-.40	.69	.66	1.53
	OSU cognitive social support 4	7.78	.12	.07	.63	.53	.57	1.75

[a]Dependent Variable: REGR factor score 6 for analysis 1

8. What is the relationship of the DSM-IV criteria, the Oklahoma State University Posttraumatic Stress Inventory and the OSU PTSD Screener to the Behavior Assessment System for Children, a standardized measure of behavior (see Table 36)?

Table 36

Correlation Matrix - Behavior Assessment for Children-Self Report with Children's DSM-IV Questionnaire, OSUPTSD Screener, OSU PTSD Inventory

	Factor 1 Avoidance	Factor2 Re-experiening	Factor3 Interpersonal Alienation	Factor 4 Interference w/daily functioning	Factor 5 Physical Symptoms/ Anxiety	Factor6 Foreshorttnd Future	OSU PTSD Inventory	OSU PTSD Screener
BASC Attitude to School	-.05	-.06	.17*	.35**	-.01	.07	.11	.26**
BASC Attitude to Teachers	.04	-.01	.22*	.32**	-.03	.08	.20	.32**
BASC Atypicality	.19*	-.04	.39**	.20*	.11	.12	.39*	.44**
BASC Locus of Control	.14	-.02	.26**	.20*	.04	.09	.33**	.40**
BASC Social Stress	.10	.10	.23**	.26**	.09	.11	.38**	.45**
BASC Anxiety	.28**	.24**	.28**	.17	.09	.22*	.45**	.58**
BASC Depression	.06	.09	.27**	.38**	.04	.11	.33**	.48**
BASC Sense of Inadequacy	.17	.06	.24*	.39**	.08	.12	.29*	.49**
BASC Relationship with Parents	.13	-.07	-.23**	-.37**	-.03	-.16	-.19	-.31**
BASC Interpersonal Relationships	-.11	-.04	-.14	-.30**	-.05	-.09	-.16	-.33**
BASC Self-Esteem	.01	-.11	-.13	-.33**	-.12	-.17	-.25*	-.39**
BASC Self-Reliance	.06	-.11	-.03	-.33**	-.05	-.05	-.12	-.25**
BASC School Adj. Composite	-.01	-.04	.21*	.37**	-.03	.08	.15	-.30**
Clinical Adjustment Composite	.08	.01	.02	-.01	.02	.12	.24*	.08
BASC Personal Adjustment Composite	.04	-.11	-.16	-.41**	-.08	-.14	-.22	-.39**

Table 36 (continued)

	Factor 1 Avoidance	Factor2 Re-experiening	Factor3 Interpersonal Alienation	Factor 4 Interference w/daily functioning	Factor 5 Physical Symptoms/ Anxiety	Factor6 Foreshorttnd Future	OSU PTSD Inventory	OSU PTSD Screener
BASC Emotional Symptoms Index	.17	.12	.27**	.36**	-.05	.14	.35**	.49**
BASC Sensation Seeking	.03	-.26	-.43	.44	.06	-.23	-.62	-.12
BASC Adolescent Somatization	.71*	.07	-.10	.14	-.03	.04	.21	.74*

*Significant at the .05 level
**Significant at the .01 level

The BASC and the PTSD instruments have statistically significant correlations in multiple areas that directly address the convergent validity of the instruments. They also appear to be measuring distinct factors, however, indicating divergent validity for the instruments.

Factor 1 (avoidance) has a statistically significant relationship to the BASC Atypicality scale and to the BASC Anxiety scale. Factor 2 (re-experiencing) has a statistically significant relationship with the anxiety scale on the BASC. Factor 3 (interpersonal alienation) correlates with numerous BASC scales. Primary among these scales are the BASC Attitude to school, Attitude to Teachers, BASC Atypicality, BASC Locus of Control, BASC Social Stress, BASC Anxiety, BASC Depression, and BASC Emotional Symptoms Index. There is a negative correlation between Factor 3 (Interpersonal Alienation) and the BASC Relationship with Parents scale. Factor 4 (Interference with Daily Functioning) demonstrates a statistically significant correlation with every BASC scale except BASC Anxiety, the Clinical Adjustment Composites, Sensation Seeking and Adolescent Somatization. Factor 5 (Physical Symptoms/Anxiety) does not correlate with the BASC Anxiety scales, indicating that these factors are likely

addressing different constructs. Indeed, Factor 5 did not correlate with ANY BASC subscales. Factor 6 (Foreshortened future), already noted to be a unique factor on the PTSD scales, did have a statistically significant correlation with Anxiety on the BASC. Additionally, most of the correlations with the BASC, while statistically significant, are still somewhat low, indicating once again the divergent validity of the Children's DSM-IV Questionnaire. Giving a BASC to a group of children following a disaster of some sort would not necessarily indicate the children who needed more in-depth assessment.

The OSU PTSD Inventory also demonstrated convergent and divergent validity from the BASC. The PTSD Inventory had statistically significant correlations with BASC Atypicality, BASC Locus of Control, BASC Social Stress, BASC Anxiety, BASC Depression, BASC Sense of Inadequacy, BASC Clinical Adjustment Composite and BASC Emotional Symptoms Index. The PTSD Inventory had a negative correlation to BASC Self-Esteem. The PTSD Inventory primarily failed to demonstrate statistically significant correlations with subscales on the BASC dealing with school, teachers and relationships with other people. Once again, the correlations were moderate, indicating that the PTSD Inventory is measuring similar but distinct constructs from the BASC.

The OSU PTSD Screener had the strongest statistical correlations with the BASC. The Screener correlated with every BASC subscale except the Clinical Adjustment Composite and BASC Sensation Seeking. The correlations were negative on BASC subscales measuring interpersonal relationships, self-esteem, self-reliance and school adjustment. The direction and strength of the correlations indicates that the Screener is an effective tool for screening children for more in-depth intervention following a disaster.

CHAPTER V

Discussion

Following a disaster, whether it is natural or manmade, important decisions must be made very quickly and can have long-term consequences for the survivors. Disaster relief agencies must relieve the immediate suffering of the victims through providing shelter, food and medical care. The long-term consequences of the disaster, however, are often ignored and have been seldom studied.

The purpose of this study was to examine the effects of a tornado upon children whose communities were heavily damaged by the largest and most costly tornado outbreak in the history of the United States. Factor analysis was utilized to determine the underlying constructs of posttraumatic stress disorder as were expressed in our participants. Research instruments were constructed by the Oklahoma State University research team based upon non-standardized instruments currently being used for research in other parts of the United States. Each instrument used in the study examined posttraumatic stress disorder from a slightly different viewpoint. The OSU PTSD Screener was a brief ten-question instrument based upon DSM-IV criteria. Its purpose was to fulfill a need for rapid screening of large numbers of children who had been traumatized by a disaster. The Children's DSM-IV Questionnaire was a more in-depth instrument based upon these same criteria. The OSU PTSD Inventory was based upon the

BASIC ID model of Lazarus. It, too, was designed to be more in-depth and to provide information for clinicians on how to appropriately intervene with an individual child who had been traumatized.

Correlation analysis examined the relationship of gender, age, and ethnicity to the intensity of symptoms endorsed by the participants in the study. Additional correlation studies examined the relationship of the research instruments to the widely utilized and standardized Behavior Assessment System for Children-Self Report and to each other. This part of the study has significance as it relates to the convergent and divergent validity of the instruments being used for the assessment of PTSD.

Finally, regression analysis looked at the predictive power of the child's perception of his/her social support network as it relates to the expression of posttraumatic symptoms endorsed by the children. This particular statistical analysis sought to examine factors that might contribute to resiliency and recovery. This would assist government agencies in planning long term response efforts following a disaster

The results of the study found support for a six-factor model of posttraumatic stress disorder. The study also find statistically significant but low correlations among the research instruments and the Behavior Assessment System for Children. This finding underscored the need for an instrument specifically related to trauma and trauma symptoms that could be used to identify children needing more in-depth assessment and treatment following a disaster. The study also identified critical items in the child's support system that foster recovery and resiliency. Following is a discussion of the implications for theory and intervention by school psychologists, limitations of the study, and directions for future research.

Factor Analysis

Factor analysis of the three research instruments used in this study yielded conflicting results. Two of the research instruments appear to be comprised of a single factor. This single factor may be similar to *g* defined in cognitive tests. It describes a global structure of trauma-induced symptomotology that does not easily separate into a clearly defined syndrome. This was not unexpected in a brief screening instrument comprised of ten questions. However, the results of the factor analysis of the OSU PTSD Screener were unanticipated.

The Children's DSM-IV Questionnaire did produce a six-factor solution. This is not consistent with the work of Anthony, Lonigan, and Hecht (1999) in their study of the Hurricane Hugo children. Their study found three symptom clusters. It does more closely confirm the work of Garrison and colleagues (1995) and their work with the Hurricane Andrew children. For example, difficulty concentrating, perhaps best expressed as difficulty with schoolwork, a diminished interest in daily activities (interference with daily functioning), and irritability were the most widely endorsed symptoms. The children of the May 3rd tornado also acknowledged, through their responses, a clustering of symptoms that bears striking similarity to the findings of the earlier study. Physiological reactivity and sense of foreshortened future, similar to factors 5 and 6, were the least endorsed in both studies. These two factors appear to be possible severity indicators.

What is also quite interesting is the clustering of acknowledged symptoms in their relation to DSM-IV criteria. For example, DSM-IV requires that the individual has

experienced or been exposed to a traumatic event that involved real or threatened death or serious injury, and caused feelings of intense horror or helplessness. Almost 25% of the children in this study indicated that they had not been "in a tornado". If the reports of the children were taken at face value, these children would be eliminated from further inquiry regarding the presence of PTSD. However, these children were survivors of the storm. Most of them had huddled in their storm shelters as the tornado passed overhead. They reported in group therapy sessions that they had felt the ground shake and felt as if the vacuum produced by the storm was suffocating them. They drew pictures of tornadoes and talked about how their friends had lost everything they owned. Many talked about seeing a severely injured man who had nearly died in the disaster. When asked why they had circled "no" on their questionnaires, they appeared surprised and stated, "It didn't hit our house."

DSM-IV also requires at least one of the following symptoms:

Intrusive, distressing recollections

Repeated, distressing dreams

Re-experiencing through flashbacks, hallucinations, or illusions

Marked mental distress to internal or external cues that symbolize or resemble some part of the event

Physiological reactions

The patient repeatedly avoids the trauma-related stimuli and has numbing of general responsiveness as shown by three or more of these:

Tries to avoid feelings, thought or conversations concerned with the event

Tries to avoid activities, people or places that recall the event

Cannot recall an important feature of the event

Experiences marked loss of interest or participation in activities important to the patient

Feels detached or isolated from other people

Experiences restriction in ability to love or feel other strong emotions

Feels life will be brief or unfulfilled (lack of marriage, job, children)

The patient has at least two of the following symptoms of hyperarousal that were not present before the traumatic event:

Insomnia

Angry outbursts or irritability

Poor concentration

Excessive vigilance

Increased startle response

The present study indicates that the children of the May 3rd tornado combined symptoms of re-experiencing as defined in the DSM-IV with intrusive recollections, dreams, and mental distress with flashback type experiences (Re-experiencing). This is a distinctly different construction of symptoms than the authors of DSM-IV indicated. Additionally, avoidance or people, places and thoughts that reminded them of the tornado formed a second cluster of symptoms (Avoidance), not the distinct symptoms noted in DSM-IV.

One of the most interesting factors (Interpersonal Alienation) that emerged from the present study is only alluded to in the literature. Clinical lore has referred to the isolation and alienation of war veterans for decades. There appears to be some confusion

as to the theoretical construct to which this symptom might be ascribed. Garrison and colleagues (1995) noted that irritability or bursts occurred in 30% of the children in the Hurricane Andrew study. The present study found this symptom occurring at a slightly higher prevalence rate and to form a discrete factor of its own. Approximately 35% reported having more problems with friends and to be experiencing more anger since the tornado. This is consistent with the initial and most urgent request for assistance from the Mulhall Elementary School principal, i.e. there was increased aggression or apathy evident among the students. Children who had never before had discipline referrals were now in trouble at school. The same 35% of the children reported feeling different from others since the tornado, even people in their same community who had survived the same experience.

Other differences with DSM-IV emerged with the factor analytic studies. Poor concentration (I have trouble thinking since the tornado) and loss of interest in daily activities clustered (Factor 4) instead of splitting to hyperarousal and numbing respectively as noted in the diagnostic criteria for PTSD as expressed in the DSM-IV. Physiological reactivity, separation anxiety and disassociative feelings also clustered in Factor 5 (Physical symptoms/anxiety).

A sense of a foreshortened future (Factor 6) proved to be the least reported symptom in the Garrison (1995) study. Their study found only 8.6% of the children reported feeling that they would not live to adulthood, marry or have children. The current study examined how many children said they could hear the tornado (58%) and how many reported seeing the tornado (36%). Fully 1/3 of the children in the May 3rd tornado acknowledge that they worry they might die before they grow up, that they don't

feel they will marry and that they don't feel they will have children. It is striking that the acknowledgement of having been in a tornado is clustered with these symptoms. Additionally, the child's perception of social support does not appear to ameliorate this symptom. For these reasons, it is quite likely that this particular group of symptoms identifies a severity factor and may indicate those children who are more seriously traumatized.

Gender, Ethnicity and Age

Numerous studies have examined the prevalence of PTSD symptoms as they related to gender, ethnicity and age. Results of the studies have been conflicting and the review of the literature yielded no clearly defined conclusions to these questions.

The current study found no differences in the expression of PTSD symptoms as they relate to gender. The effects of ethnicity upon the prevalence of PTSD could not be determined from the current study. Oklahoma is a state where the intermarriage between Caucasians and Native Americans is common. Many children were unclear about what race they were and this was one of the most frequent questions asked during the administration of the research instruments. Many children stated they were Indian but did not have a card from the Bureau of Indian Affairs. Others reported they were Indian but they didn't know how much and wanted to know if they should count themselves as Indian or Caucasian. There were no African American children who participated in the study. This is due to the fact that there was only one African American child who lived in

the two participating communities. Therefore, the issue ethnic differences as they relate to PTSD could not be determined.

Age did not appear to be a factor on two of the three research instruments. The Children's DSM-IV Questionnaire and the OSU PTSD Inventory did not appear to demonstrate any age differences in their resulting scores. However, the OSU PTSD Screener did negatively correlate with age. The younger the child, the more severe the symptoms acknowledged by the child on the Screener. This is consistent with earlier research (Anthony, Lonigan, & Hecht, 1999) on children surviving a hurricane.

Severity of Exposure and PTSD Prevalence

The severity of exposure was defined by 12 questions on the OSU PTSD Inventory. These questions addressed the child's evaluation of how severely he/she was frightened, whether or not he/she could see the tornado, whether they could hear the tornado, whether he/she had damage to his/her home, whether he/she had damage to his/her school, whether they saw injured people after the storm, if he/she saw the tornado damage anything, and injure or kill anyone. Additionally, the child was asked whether a storm shelter was available for them and whom they were with at the time of the tornado.

The Children's DSM-IV Questionnaire

The children's responses on this instrument yielded some interesting results. In interviews with the children during the testing sessions and the group therapy sessions, it

became readily apparent that the children did not distinguish between what they saw on television and what they witnessed personally. Many children who reported seeing and/or hearing the tornado later stated, when asked how they could see the tornado if it was at night and they were in the tornado shelter, stated they had seen it on television.

The child's report of how frightened he/she was appeared to correlate with Factor 1 (Avoidance), Factor 2 (Re-experiencing) and Factor 3 (Interpersonal Alienation). Damage to the child's home did not appear to be a particularly significant event. However, damage to the school was correlated with Factor 1 (Avoidance) and Factor 6 (Foreshortened Future). The school, in both of these small communities but especially in Mulhall, is the center of community cohesiveness. This was apparently a significant factor to the children in Mulhall and directly related to two facets of PTSD.

Hearing the tornado was correlated with Factor 6 (Foreshortened Future). Many of the children explained in group therapy that they felt at that time that they were going to die even though they were in a cellar. Seeing the tornado did not have the same effect. Again, this may relate to the fact that few children saw the actual tornado that damaged their community. Seeing the tornado hit someone and seeing it hurt someone proved not to be significant severity factors. This may be a function of the fact that no one was injured in Stroud and only one person was killed and one injured in Mulhall. If the prevalence rates of injured and killed were higher, this severity factor might gain more significance. In the present study, however, they were not significant factors.

Interestingly enough, who the child was with at the time of the storm did not predict the degree to which the child was traumatized. It was hypothesized that the children would be less traumatized if they were with their parents at the time of the

tornado. However, many children in this small community are related through large extended families and people they have known their entire lives. In a more urban area, being with strangers at the time of the trauma might prove to be a different experience.

Finally, having a storm shelter was correlated only with Factor 3 (Interpersonal Alienation). The reason for this is not readily apparent. In group sessions following the research project, many children spoke of being in public shelters in schools and churches or of going to neighbors' houses. The children also discussed having pets and even a horse in the shelters with them during the tornado.

The OSU PTSD Screener

The Screener had significant correlations with the severity questions of the OSU Inventory. The child's report of how frightened he/she was had the most significant correlations with the Screener (.402**). Seeing and hearing the tornado did not appear to be significant factors for the children. Seeing dead people and whom the child was with at the time of the tornado did not yield significant results. As stated in the previous section, this may be more reflective of the fact that there were no dead people in one community and only one person died in the second community than it is of the degree of trauma that might be a result of seeing dead or injured. How close the child reported being to the tornado also did not yield significant results.

The Oklahoma State University PTSD Inventory

The Oklahoma State University PTSD Inventory was significantly correlated only with the child's report of how frightened he/she was during the tornado. No other correlations yielded statistically significant results.

There are several possible explanations for the Inventory yielding a single factor solution. It is possible that the BASIC ID model simply did not hold up in practice. Additionally, the K-M-O test for sampling adequacy for this instrument was .66, indicating that there was not enough shared variance to yield a statistically meaningful solution. Finally, analysis of the wording of the instrument indicates that it may have confused the children since it was more general in nature and did not specifically address the trauma as being the result of a tornado. Since the instruments were administered in a random order, administration practices of the scale can be eliminated as a possible explanation for the results obtained.

Social Support and PTSD

It has been hypothesized that the degree of social support a child feels following a traumatic event can ameliorate the effects of the trauma. LaGreca, Silverman, and Vernberg (1996) found the availability of social support to be predictive of children's PTSD symptoms at three, seven and ten months post disaster following Hurricane Andrew.

Social support also appears to be a predictive factor in the present study. However, social support is a broad concept. Fifteen questions on the Children's DSM-IV Questionnaire, the Oklahoma State University PTSD Inventory and the OSU PTSD Screener sought to specify what kinds of social support would be predictive of children's PTSD symptoms. The research questions involved behavior constructs such as talking about the storm, doing things together as a family, and having as much money following the storm as before. Cognitive questions regarding family, friends and teachers saying they were afraid of storms were also asked. Finally, the degree to which parents, grandparents, extended family and social institutions such as the church could be counted on to help in a time of need was examined.

The most frequent predictor of PTSD symptoms was how much the child indicated his/her parents say they are afraid of storms at the present time. The next most frequent predictor of PTSD symptoms was how often friends say they are afraid of storms now and how much the family talks about the tornado. How often the family did things together before the storm, how often the family does things together now, how much teachers talk about the tornado, and how much parents said they were afraid of storms before the tornado were the next most frequent indicators. Finally, the degree to which grandparents can be counted on for help, how much money the family has now in relation to before the storm, and how much the family and extended family can be counted on for help were predictors of PTSD. How often teachers talk about their fear of storms and how much the church or other social institution be relied upon for help did not predict PTSD at all.

This analysis would indicate that the child takes his/her strongest cues regarding the degree to which it is appropriate to be frightened from his/her immediate family and closest associates. This is certainly consistent with social learning theory. Cognitive cues appear to more strongly influence than behavioral cues.

The Behavior Assessment System and the Children's DSM-IV Questionnaire, The Oklahoma State University PTSD Inventory, and The Oklahoma State University PTSD Screener

The Behavior Assessment System for Children is a widely utilized broadband assessment instrument that examines personality functioning of children across multiple behavioral domains. Its use in this study was primarily to serve as an indicator against which to measure the utility of the research instruments being used to examine the constructs of posttraumatic stress disorder. Correlation analysis between the BASC and the research instruments demonstrated that multiple correlations existed between the BASC and the PTSD instruments as expected. However, there were also some highly significant and somewhat unexpected results produced that bear closer examination.

As expected, there were multiple statistically significant correlations among the factor scores, the Inventory and the Screener with BASC scales for depression and anxiety. However, these correlations were only moderate, ranging from .27 to .48. The BASC Anxiety statistically significant subscale scores ranged from a low of .22 to .58. Therefore, it would appear that the PTSD research instruments are measuring psychological traits similar to those measured by the BASC but that are not identical. What was especially interesting was the observation that the reported symptoms of

anxiety and physiological reactivity on the Children's DSM-IV Questionnaire did not correlate at all with the BASC Anxiety subscale. Item analysis of the BASC Anxiety items reveals that more of the items are school focused than on the DSM-IV Questionnaire. However, many other items are strikingly similar such as acknowledging feeling guilty. Additionally, somatic complaints on the BASC are on the Adolescent Somatization Scale and are not listed under anxiety. These divergent item groupings likely explain the lack of a statistically significant correlation.

Additionally, the original concerns expressed by the school indicated that the children were demonstrating significantly more interpersonal and academic problems than had been noted in other years. The BASC subtest scores substantiated this concern. The factor scores on the DSM-IV Questionnaire correlated Factor 3 (Interpersonal Alienation) with the BASC Attitude to School (.17), BASC Attitudes to Teachers (.22), BASC Social Stress (.23), and BASC School Adjustment Composite (.21). The BASC Relationship with Parents had a statistically significant negative correlation with this factor. Additionally, Factor 4 (Interference with Daily Functioning) had statistically significant correlations with the BASC Attitude to School (.35), BASC Attitude to Teachers (.32), BASC Social Stress (.26), School Adjustment Composite (.37) and Emotional Symptoms Index (.36). This factor also had negative statistically significant correlations with Relationship with Parents, Interpersonal Relationships, Self-esteem and self-reliance. This argues strongly for both the convergent and divergent validity of the research instruments.

One of the most interesting correlations concerned the BASC Atypicality subscale. Reynolds and Kamphaus (1992) describe this scale in their manual as a scale

that "evaluates unusual perceptions, behaviors, and thoughts that are commonly associated with severe forms of psychopathology such as psychotic disorders." Several of the factor scores on the Children's DSM-IV Questionnaire and the composite scores on the PTSD Screener and the Oklahoma State University PTSD Scale correlated with this subscale.

On Factor 3 (Interpersonal Alienation) there was a correlation of .39 that was significant at the .01 level. Factor 4 (Interference with Daily Functioning) also loaded with this subscale (.20). The OSU PTSD Inventory and the OSU PTSD Screener also were moderately correlated with this subscale at .39* and .44** respectively. This scale often creates confusion among clinicians as to what exactly it is that is being measured by its items. Given the correlations noted, one possible hypothesis is that the Atypicality scale is measuring symptoms that may be related to having experienced a significant trauma.

Correlations that fell into the expected range were numerous. BASC Self-esteem scores tended to be negatively correlated with both factor and composite scores. Locus of Control, that subscale measuring the extent to which an individual feels in charge of his/her life, also had statistically significantly correlations with the research instruments. It is intuitively logical to expect trauma to be inversely related to self-esteem and feeling in charge of one's life. As noted on the social support questions, the child's relationship with his/her parents also appears to be one of the strongest planks in the platform of recovery. Relationship with Parents subscale on the BASC negatively correlated with every factor on the DSM-IV Questionnaire, the composite score on the OSU PTSD Inventory and the OSU PTSD Screener. The correlations reached statistical

significance on Factor 3 (Interpersonal Alienation), Factor 4 (Interference with Daily Functioning) and the OSU PTSD Screener composite score. This has important implications for prevention and intervention.

Implications for Theory

This investigation addressed: 1) the underlying constructs of PTSD as expressed in a group of children surviving a tornado in their communities; 2) the relationship of the three research instruments used in this study; 3) the effects of gender, ethnicity and age upon the expression of PTSD symptoms; 4) the relationship of degree of exposure to the tornado and the level of PTSD symptoms; 5) the ability of the level of social support perceived by the child to predict PTSD symptoms; and 6) the relationship of the three research instruments to the Behavior Assessment System for Children. A six factor solution most parsimoniously described posttraumatic stress disorder as it is experienced in children following a tornado. This is consistent with previous research on children experiencing other traumatic events. However, symptoms clusters appeared to significantly diverge from those described in the Diagnostic and Statistical Manual-IV. This has important implications for diagnosis and intervention with victims following a disaster.

The research instruments in this study appeared to be correlated but only to a moderate degree. The ten question Screener proved to be an effective tool for assessment of large numbers of children immediately following a disaster. However, the Screener did not completely describe the symptoms the children acknowledged experiencing. More in-

depth assessment is indicated if a child's responses on the Screener are significant. The Oklahoma State University PTSD Inventory proved to be the least useful of the three instruments. This is not to say, however, that Inventory does not have its place in comprehensive assessment of a child following a disaster. Further research with this instrument is indicated.

Gender did not prove to be a significant factor in PTSD. There has been conflicting research on this issue in previous studies. There was not a significant enough N in the present study to examine the effects of ethnicity. Age proved to not be a consideration on two of the instruments. However, age had a negative correlation with the Screener. Certainly further research on these issues is indicated.

Degree of exposure did not have as significant effect upon the PTSD symptoms of the children as the author had hypothesized. Certainly, degree of exposure did play a role in the level of trauma experienced by the children. What became readily apparent in interviews with the children was that the children had difficulty differentiating between what they had seen on television and what they had actually experienced. Additionally, the degree of exposure appears more qualitative than quantitative. Children reporting their level of fear during the tornado appeared to be the more significantly correlated as a severity indicator for PTSD than seeing or hearing the tornado. This cognitive interpretation is consistent with the examination of social support questions where the children's perceptions of social support via parental and friends' verbalizations were the best predictor of PTSD symptoms. It is interesting to note that the level of fear reported by the children was not dependent upon the proximity of the child to the funnel cloud. Indeed, several children interviewed in the group therapy sessions were in other

communities when the tornado struck their town. Their reports of levels of fear and traumatization did not differ significantly from those of their friends and classmates. The single exception to this finding was a family consisting of a mother and her children who huddled under an overpass while the tornado passed overhead. Those children had the highest levels of PTSD of any children interviewed. Indeed, one child has not spoken since this event.

Finally, the responses of children on the Behavior Assessment System for children would not help a school psychologist identify children with posttraumatic stress disorder. The BASC did appear to have moderate correlations with the research instruments on several scales. However, the BASC did not appear to indicate the severity of the trauma the children had experienced and trauma specific symptoms they endorsed experiencing.

Implications for School Psychologists

School psychologists are asked to observe behaviors and to intervene when a child exhibits inappropriate behaviors at school. However, the method of intervention is dictated by the nature of the disorder. A child may be exhibiting aggression, apathy or underachievement. Attempts to address those problems may not take into account that the behaviors are not indicative of primary depression, attention deficit disorder or other disorders commonly seen in the schools. Instead, these disorders may be symptomatic of a more comprehensive disorder such as posttraumatic stress disorder.

Assessment of the presenting problem may include classroom observations, teacher interviews and assessment of the child him/herself with standardized psychological instruments such as the Behavior Assessment System for Children. Again, the possibility that the child has experienced a serious traumatic event may not ever be directly addressed.

Based upon the clinical interviews and assessment of the children who survived a tornado, knowledge of exposure to a traumatic event can be missed unless directly assessed during the interview process. Additionally, instruments such as the Oklahoma State University PTSD Screener may prove to be an important part of any group of tests administered to a child experiencing emotional difficulties. More in-depth assessment could follow should the child's scores on the Screener prove significant.

A second important implication of the present study is that posttraumatic stress disorder is still a disorder as it is expressed in children is still not completely understood. The present study indicates that symptom clusters expressed in the children surviving a tornado do not correspond very well to PTSD as it is described in the DSM-IV. Further research is urgently needed.

Finally, the social support predictors of PTSD indicate that intervention following a disaster needs to be system wide. Children appear to be strongly influenced by how often their parents and friends indicate that they are afraid of storms. Intervention with the child him/herself would be relatively ineffective unless those significant individuals were included in the intervention. Additionally, the child's statements regarding how afraid of the tornado they were further reinforces the impact of cognitions upon trauma symptoms.

Limitations of the Study

The limitations of this study have affected the generalizability of this study. The sample size was smaller than was optimal. Students were self-referred or referred by parents. This may have resulted in a skewed sample, i.e. children whose parents felt they had been severely adversely affected, participating in the study. Additionally, the population was almost exclusively confined to the elementary grades. This may affect the appropriateness of the findings to older students.

Second, some parents and children were unwilling to participate due to the sensitive nature of the study. They felt that the children were being retraumatized by the research questions.

Third, the population was largely rural. This may affect the extrapolation of the research findings to children from urban areas.

Future Research

The results of this study suggest future research may be warranted in the following areas:

1. The expression of PTSD symptoms in children in middle school and high school following a tornado should provide additional information on the response of children following a community disaster.

2. A comparison of children from urban areas or larger municipal areas than the rural areas studied will likely provide significant information on PTSD as it relates to children following a tornado.
3. Age, gender and ethnicity should continue to be examined as factors relating to the expression of PTSD in children.

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Appendix A

Diagnostic Criteria for Posttraumatic Stress Disorder

A. The person has been exposed to a traumatic event in which both of the following were present:

   (1) the person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others
   (2) the person's response involved intense fear, helplessness, or horror. **Note:** In children, this may be expressed instead by disorganized or agitated behavior.

B. The traumatic event is persistently re-experienced in one (or more) of the following ways:

   (1) recurrent and intrusive distressing recollections of the event, including images, thoughts, or perceptions. **Note:** In young children, repetitive play may occur in which themes or aspects of the trauma are expressed.
   (2) recurrent distressing dreams of the event. **Note:** In children, there may be frightening dreams without recognizable content.
   (3) acting or feeling as if the traumatic event were recurring (includes a sense of reliving the experience, illusions, hallucinations, and disassociative flashback episodes, including those that occur on awakening or when intoxicated). **Note:** In young children, trauma-specific reenactment may occur.
   (4) intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.
   (5) physiological reactivity on exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.

C. Persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma), as indicated by three(or more) of the following:

   (1) efforts to avoid thoughts, feelings, or conversations associated with the trauma
   (2) efforts to avoid activities, places, or people that arouse recollections of the trauma
   (3) inability to recall an important aspect of the trauma
   (4) markedly diminished interest or participation in significant activities
   (5) feeling of detachment or estrangement from others
   (6) restricted range of affect (e.g., unable to have loving feelings)

(7) sense of a foreshortened future (e.g., does not expect to have a career, marriage, children, or a normal life span)

D. Persistent symptoms of increased arousal (not present before the trauma), as indicated by two (or more) or the following:

(1) difficulty falling or staying asleep
(2) irritability or outbursts of anger
(3) difficulty concentrating
(4) hypervigilance
(5) exaggerated startle response

E. Duration or the disturbance (symptoms in Criteria B, C and D) is more than one month.

F. The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.

Specify if:

Acute: if duration of symptoms is less than three months
Chronic: if duration of symptoms is three months or more

Specify if:

With Delayed Onset: if onset of symptoms is at least six months after the stressor

Appendix B

Severity Questions

1. How scared were you during the tornado? Not scared at all a little scared very scared panicked
2. Did the tornado damage your home? Not at all a little quite a bit it was destroyed
3. Did the tornado damage your school? Not at all a little quite a bit it was destroyed
4. Did you hear the tornado? Yes No
5. Did you see the tornado? Yes No
6. Did you see the tornado hit anything? Yes No
7. Did you see the tornado hurt someone? Yes No
8. Did you see any injured people after the tornado? Yes No
9. Did you see any dead people after the tornado? Yes No
10. Who were you with at the time of the tornado? Family Friends Day Care/School Alone
11. How close were you to the storm? Not close Close Very close In it
12. Did you have a storm shelter to go to? Yes No

Appendix C

Social Support Questions and Children's DSM-IV Questionnaire

Oklahoma State University PTSD Inventory

Please tell how often you do these things.

0 = never, 1 = sometimes 2 = often 3 =most of the time 4 = never

Behavioral

1SS	Before the tornado, did your family do things together?	0 1 2 3 4
2SS	Now does your family do things together?	0 1 2 3 4
3SS	How much does your family talk about the tornado?	0 1 2 3 4
4SS	How often do your teachers talk about the tornado?	0 1 2 3 4
5SS	How often do your friends talk about the tornado?	0 1 2 3 4
6SS	Does your family have as much money now as before the tornado?	0 1 2 3 4
7SS	How much do your grandparents help your family?	0 1 2 3 4

Cognitive

1SS	Before the tornado, how often did your parents say they were afraid of storms?	0 1 2 3 4
2SS	Now, how often do your parents say they are afraid of storms?	0 1 2 3 4
3SS	How often do your friends say they are afraid of storms?	0 1 2 3 4
4SS	How often do your teachers say they are afraid of storms?	0 1 2 3 4

Children's DSM-IV Questionnaire

37. My family works together when there are problems.	0 1 2 3 4
38. My grandparents help me if I need it.	0 1 2 3 4
39. My other family help me if I need it.	0 1 2 3 4
40. My church (or other group) helps if there are problems.	0 1 2 3 4

Appendix D

Child Assent

ID Number _____

Assessment of Reactions of Children to Tornadoes
Child Assent

I, _____, agree to take part in a study of how
(please print your name here)

children feel before, during, and after they have a tornado in their community. I know that my parents have given permission for me to take part in this study. However, I understand that I do not have to take part in this study if I don't want to. I also know that the results of this study may help officials better understand how to help people who have had a tornado in their community and that by taking part, I may be helping other people in the future. I know that my identity will be kept confidential. This means that nobody but the researchers will know who I am when they read my answers. I also know that Mrs. Palmer or members of the Oklahoma State University research team will talk to my parents if my answers show I am still very upset and might need someone to talk to about my problems.

I agree to do my best when answering the questions about how I felt during and after the tornado. I will answer honestly and carefully.

_____ _____

Please sign your name Date

Appendix E

Letter to Parents Soliciting Participants

Dear Parent,

Your school has agreed to participate in a study being conducted by Oklahoma State University. Today you are receiving several forms from OSU researchers. These researchers are investigating the effects of the May 3, 1999 tornado on families and children in the public school system of your community. The forms you will be receiving are for you to complete. Your child will receive additional forms for them to complete at their school should you decide to participate. It is hoped that the results of this study will assist those who work with families and children to better understand how people are affected when something bad happens to an entire community. It is also a school-wide screening to find any children who may need follow-up because of how they have been affected by the tornado. Additionally, the study may help local, state and national officials to better plan how to assist following a disaster. As a result, your cooperation is requested in this research project as well as the cooperation of your child.

In order to participate in this school-wide study, please take a few minutes to fill out the forms that are attached to this letter. Please return it to your child's school as quickly as possible. If at all possible, we would like to have the packet back to school by _____, as researchers will be coming to work with the children in your community on _____.

General results of the study will be posted on a webpage at http://OSUptsdstudy.homepage.com as results are studied and analyzed. Sample questions that demonstrate the type of questions your child will be answering are included in your packet. They are similar to the questions you will be answering. If you need further clarification or interpretation, please call the researchers at these numbers:

Dr. Judy Oehler-Stinnett (405) 744-9450
Dr. John Carlson (405) 744-9457
Linda Palmer (405) 744-8127

If necessary, we will make a personal appointment with you to go over all the questions that will be used in this assessment of your child. Thank you for your cooperation in this important study.

Sincerely,

Appendix F

Parental Consent Form

Assessment of Reactions of Children to Tornadoes

I, _____, agree to allow Linda Palmer, a Ph.D. graduate student at Oklahoma State University, or associates or assistants:

To administer questionnaires to my child _____ and myself regarding what effects having a tornado in our community had upon him/her. This study is examining the prevalence of posttraumatic stress disorder and the types of symptoms a child may have following a tornado. I am aware that the results of this project may assist state and local officials to better help children and families following a natural disaster in their community.

Mrs. Palmer is a doctoral graduate student at Oklahoma State University and this study is being conducted through Oklahoma State University under the supervision of faculty who are licensed psychologists in the State of Oklahoma. I understand and agree that the identity of my child is to be kept confidential. I know that researchers will notify me if my child's answers to the questionnaires indicate that my child may be in need of additional follow-up by mental health professionals and that I should call if I have any concerns regarding my child.

This study is part of Mrs. Palmer's doctoral dissertation. I understand that the results of this research study may be published but that the identity of all research subjects will remain confidential. I understand that participation is voluntary and that I will not be penalized if I choose not to participate. I also understand that I and/or my child are free to withdraw consent and end participation in this project at any time without penalty after either of us notify the project director.

Additional information such as the progress and general results of the research project, symptoms of posttraumatic stress disorder and mental health facilities in our area will be posted on a webpage maintained by the researchers. This webpage will be available for a year following completion of the project. I understand that the questions that I answer and the questions that are asked of my child will be similar in nature.

Any questions or concerns I have can be directed to the researcher or the supervising professors in this study. They may be reached at:

Dr. Judy Oehler-Stinnett (405) 744-9450
Dr. John Carlson (405) 744-9457
Linda Palmer (405) 744-8127

or the Institutional Review Board of Oklahoma State University: Sharon Bacher, IRB Executive Secretary, Oklahoma State University, 203 Whitehurst, Stillwater, OK 74078 or by phone at (405) 744-5700.

In signing this consent form, I am indicating that I understand the conditions of this study and agree to allow my child and myself to participate.

_____ _____

Parent's Name (Please print clearly) Date

Work Phone Number: (Mother)_____

Work Phone Number: (Father) _____

Home Phone: _____

Appendix G

Demographics Questionnaire

Please provide the following important information: Please print clearly.

Child's Gender: (Circle one) Male Female
Child's DOB: _____ Grade in School: _____
mm/dd/yy
Ethnicity: (Circle all that apply) White Native American Black Asian Hispanic Other

Educational Level of Parent: Circle highest grade completed
Father: Some high school h.s. graduate GED technical school College(1,2,3,4) Graduate School
Mother: Some high school h.s. graduate GED technical school College(1,2,3,4) Graduate School
Length of time lived in Oklahoma _____(Years) _____(Months)

In general, before the tornado, how did your child handle change, negative events, fears?
(circle all that apply)
cries frequently or easily withdraws or gets very quiet ignores it has tantrums
gets irritable or cranky has nightmares gets demanding has separation anxiety quarrels
has physical fights engages in wishful thinking (if only....) copes well/no big problems

In general, after the tornado, how does your child handle change, negative events, fears?
(circle all that apply)
cries frequently or easily withdraws or gets very quiet ignores it has tantrums
gets irritable or cranky has nightmares gets demanding has separation anxiety quarrels
has physical fights engages in wishful thinking (if only...) copes well/no big problems

Type of Dwelling at time of tornado (circle one) House Apartment Trailer

Circle the number that expresses the severity of your experience
0 = none, 1=some, 2=quite a bit, 3=a great deal, 4=extreme

How much damage was there to your home?	0	1	2	3	4
How much damage to immediate relative's home (parents, grandparents, siblings)?	0	1	2	3	4
How much damage to extended family's home (cousins, aunts, uncles)?	0	1	2	3	4
How much damage to a close friend's home?	0	1	2	3	4
How much financial loss did you have related to the tornado?	0	1	2	3	4
How much insurance did you have on your home or belongings?	0	1	2	3	4

Did you experience the loss of a pet due to the tornado? Yes No
Was anyone in your family killed or injured in the tornado? Yes No Killed Injured
_____(Relationship to Child of the injured person)

Where was your child when the tornado hit? _____
Did you have a shelter to go to? (Cellar, basement) Yes No
Was he/she with family at the time of the tornado? Yes No
Did the family remain together after the tornado? Yes No
How much warning did you have before the tornado hit? ___(Hrs)_____(Minutes)
Please mark how true each statement is. 0=never, 1=sometimes, 2=often, 3=usually, 4=always
We work together as a family when there is a problem. 0 1 2 3 4
Our extended family (grandparents, siblings) helps when there is a problem. 0 1 2 3 4
Our church (or other group like 4-H, neighborhood association) helps if there is a problem. 0 1 2 3 4
Name of group _____

Has your child experienced any other serious trauma? (Example: fire, car wreck, robbery, serious illness, other tornadoes) _____
_____
How significant was this trauma to the child?
(0=not important, 1=somewhat important, 2=important, 3=very important) 0 1 2 3
Did the tornado make it worse?
(0=no worse, 1=somewhat worse, 2=quite a bit worse, 3=lots worse) 0 1 2 3

Compared to how your child was before the tornado:
0=much worse, 1=a little worse, 2=the same, 3=a little better, 4=much better
In general, how are his/her grades in school? 0 1 2 3 4 than before the tornado
In general, how is your child emotionally? 0 1 2 3 4 than before the tornado
In general, how is the family emotionally? 0 1 2 3 4 than before the tornado

Has your child had counseling or other help since the tornado? Yes No

Appendix H

Sample Questions

This page is for you to keep.

Below are sample questions that are actual questions taken from one of your child's questionnaires. Should you have questions or want further explanation or interpretation, please contact the researchers at these contact numbers. They will make an appointment for you to go over all the questions if you desire prior to your child's participation.

Dr. Judy Oehler-Stinnett	(405) 744-9450
Dr. John Carlson	(405) 744-9457
Linda Palmer	(405) 744-8127

I felt like I couldn't help myself during the tornado

I dream about the tornado.

I have trouble thinking since the tornado.

I get angry more since the tornado.

I am more jumpy (startle more easily) since the tornado.

I feel guilty since the tornado, like maybe the tornado would not have happened if I had been a better child.

Appendix I

Parent DSM-IV Questionnaire

Please circle yes if you have noticed this symptom in your child since the tornado. Check the extent to which it was present immediately after the tornado (0-3 months) or if it is present now. 0=never, 1=sometimes, 2=often, 3=most of the time, 4=always

	Immediately after	Present Now
1. Has your child seen/been in a tornado? Y N		
2. Did they show great fear, helplessness, horror?	0 1 2 3 4	0 1 2 3 4
3. Do they talk about the tornado frequently (several times/wk)?	0 1 2 3 4	0 1 2 3 4
4. Do they play tornado or play with themes of the tornado?	0 1 2 3 4	0 1 2 3 4
5. Do they dream of the tornado? (If yes, how often do they dream about it?_____)	0 1 2 3 4	0 1 2 3 4
6. Does your child have more bad dreams now than before the tornado? (If yes, how often?_____)	0 1 2 3 4	0 1 2 3 4
7. Does your child seem to act or say they feel the tornado is happening again?	0 1 2 3 4	0 1 2 3 4
8. Does your child ever say they feel as if things were "not real" or that they are out of their body?	0 1 2 3 4	0 1 2 3 4
9. Does your child get upset when it storms or when they see pictures of tornadoes in magazines or on TV?	0 1 2 3 4	0 1 2 3 4
10. Does your child shake, tremble, get aggressive or very active, or have to sleep with you when they think about the storm, see pictures of storms or when there is a thunderstorm?	0 1 2 3 4	0 1 2 3 4
11. Does your child try to avoid thoughts, feelings or conversations about the tornado?	0 1 2 3 4	0 1 2 3 4
12. Does your child avoid activities, places or people that make him/her think about the tornado?	0 1 2 3 4	0 1 2 3 4
13. Does your child have trouble remembering important parts of what happened when the tornado came?	0 1 2 3 4	0 1 2 3 4
14. Has your child shown less interest in things they used to enjoy?	0 1 2 3 4	0 1 2 3 4
15. Does your child say they feel different from others or have more problems with friends than they used to before the tornado?	0 1 2 3 4	0 1 2 3 4
16. Does your child worry about the future, such as saying they don't think they'll ever grow up and have a job, or marry or have children or that they feel like they are going to die young?	0 1 2 3 4	0 1 2 3 4
17. Does your child have difficulty falling asleep since the tornado?	0 1 2 3 4	0 1 2 3 4
18. Is your child irritable or have outbursts of anger?	0 1 2 3 4	0 1 2 3 4
19. Does your child have difficulty concentrating since the tornado?	0 1 2 3 4	0 1 2 3 4
20. Is your child hypervigilant (very, very alert)?	0 1 2 3 4	0 1 2 3 4
21. Does your child startle easily?	0 1 2 3 4	0 1 2 3 4
22. Do these symptoms cause considerable distress or interfere in their life or school work?	0 1 2 3 4	0 1 2 3 4
23. Is your child afraid or worried to be apart from you?	0 1 2 3 4	0 1 2 3 4
24. Has your child stated they knew the tornado (or something bad) was going to happen before the actual storm occurred?	0 1 2 3 4	0 1 2 3 4

	Immediately after	Present Now
25. Does your child complain of headaches, stomachaches or other physical problems more often since the tornado?	0 1 2 3 4	0 1 2 3 4
26. Does your child express feeling guilty since the tornado?	0 1 2 3 4	0 1 2 3 4

Appendix J

Child Form DSM-IV Questionnaire

Please circle the number that best describes how you have often you have felt this way since the tornado. Check how often you felt this way right after the tornado and also how often you feel this way right now. 0=never, 1=sometimes, 2=often, 3=most of the time, 4=always

	Right after the tornado	Now
1. I was in a tornado. Y N		
2. I get really very scared thinking about the tornado.	0 1 2 3 4	0 1 2 3 4
3. I felt like I couldn't help myself during the tornado	0 1 2 3 4	0 1 2 3 4
4. I talk about the tornado a lot (several times a week)	0 1 2 3 4	0 1 2 3 4
5. I dream about the tornado.	0 1 2 3 4	0 1 2 3 4
6. I have more bad dreams now than before the tornado.	0 1 2 3 4	0 1 2 3 4
7. I feel like the tornado is happening again sometimes.	0 1 2 3 4	0 1 2 3 4
8. Sometimes, things do not feel real.	0 1 2 3 4	0 1 2 3 4
9. Sometimes I feel like I'm outside my body.	0 1 2 3 4	0 1 2 3 4
10. I get upset when I see tornadoes on TV.	0 1 2 3 4	0 1 2 3 4
11. I shake, get angry, get hyper, or like to sleep with Mom and Dad when I think about the storm.	0 1 2 3 4	0 1 2 3 4
12. I shake, get angry, get hyper, or like to sleep with Mom and Dad when I see pictures of the storm	0 1 2 3 4	0 1 2 3 4
13. I do not like to think about the tornado.	0 1 2 3 4	0 1 2 3 4
14. I do not like to hear people talk about the tornado.	0 1 2 3 4	0 1 2 3 4
15. I try and not go places that make me think about the tornado.	0 1 2 3 4	0 1 2 3
16. I try and not see people that make me think about the tornado.	0 1 2 3 4	0 1 2 3 4
17. I cannot remember some important things about the tornado.	0 1 2 3 4	0 1 2 3 4
18. I am not interested in things I used to like since the tornado.	0 1 2 3 4	0 1 2 3 4
19. I feel different from others since the tornado.	0 1 2 3 4	0 1 2 3 4
20. I have more problems with my friends since the tornado.	0 1 2 3 4	0 1 2 3 4
21. I worry about the future now.	0 1 2 3 4	0 1 2 3 4
22. I worry that I might die before I grow up.	0 1 2 3 4	0 1 2 3 4
23. I don't feel I will marry.	0 1 2 3 4	0 1 2 3 4
24. I don't feel like I will have children.	0 1 2 3 4	0 1 2 3 4
25. I get angry more since the tornado.	0 1 2 3 4	0 1 2 3 4
26. I have trouble thinking since the tornado.	0 1 2 3 4	0 1 2 3 4
27. I watch out for bad things since the tornado. I am very alert.	0 1 2 3 4	0 1 2 3 4
28. I am more jumpy (startle more easily) since the tornado.	0 1 2 3 4	0 1 2 3 4
29. These feelings make me feel bad and cause trouble with my life or my schoolwork.	0 1 2 3 4	0 1 2 3 4
30. I don't like to be away from my parents now.	0 1 2 3 4	0 1 2 3 4
31. I knew something bad was going to happen before the tornado.	0 1 2 3 4	0 1 2 3 4
32. I have headaches, stomachaches or feel bad in other ways since the tornado came.	0 1 2 3 4	0 1 2 3 4

	Right after the tornado	Now
33. I feel guilty since the tornado, like maybe the tornado would not have happened if I had been a better child.	0 1 2 3 4	0 1 2 3 4
34. My family works together when there are problems.	0 1 2 3 4	0 1 2 3 4
35. My grandparents and other family help me if I need it.	0 1 2 3 4	0 1 2 3 4
36. My other family help me if I need it.	0 1 2 3 4	0 1 2 3 4
37. My church (or other group) helps if there are problems.	0 1 2 3 4	0 1 2 3 4

Appendix K

Oklahoma State University
PTSD Inventory for Children

ID Number _____

Please tell how often you do these things. 0=never, 1=sometimes, 2=often, 3=most of the time, 4=always

Behavioral

Before the tornado did you.....After the tornado do you		Before the tornado	After the tornado
1P.	play tornado games?	0 1 2 3 4	0 1 2 3 4
15P.	play rescue games?	0 1 2 3 4	0 1 2 3 4
2P.	play different games?	0 1 2 3 4	0 1 2 3 4
3P.	ever try to hurt yourself?	0 1 2 3 4	0 1 2 3 4
4P.	get into fights?	0 1 2 3 4	0 1 2 3 4
5P.	ever take something that did not belong to you?	0 1 2 3 4	0 1 2 3 4
6P.	like doing unsafe things that might have hurt your or someone else?	0 1 2 3 4	0 1 2 3 4
65P.	like dong crazy things that might have hurt your or someone else?	0 1 2 3 4	0 1 2 3 4
7P.	go to sleep easily at night?	0 1 2 3 4	0 1 2 3 4
8P.	go back to sleep easily if you woke up on the night?	0 1 2 3 4	0 1 2 3 4
9P.	eat lots of food?	0 1 2 3 4	0 1 2 3 4
10P.	eat very little food?	0 1 2 3 4	0 1 2 3 4
11P.	do things you thought you were too old to do?	0 1 2 3 4	0 1 2 3 4
12P.	make up stories or not tell the truth?	0 1 2 3 4	0 1 2 3 4
13P.	find it easy to sit still when you had to at school or home?	0 1 2 3 4	0 1 2 3 4
14P.	do things like suck your thumb or bite your nails?	0 1 2 3 4	0 1 2 3 4
15P.	sleep with your parents?	0 1 2 3 4	0 1 2 3 4
16P.	wet your bed?	0 1 2 3 4	0 1 2 3 4
17P.	have accidents in the day like wetting or soiling your pants?	0 1 2 3 4	0 1 2 3 4

Cognitive

Before the tornado did you.....After the tornado do			
1P.	think you would grow up someday?	0 1 2 3 4	0 1 2 3 4
2P.	think you would marry someday?	0 1 2 3 4	0 1 2 3 4
25P.	think you would have children someday?	0 1 2 3 4	0 1 2 3 4
3P.	expect to live to be as old as most people get to be?	0 1 2 3 4	0 1 2 3 4
4P.	like school?	0 1 2 3 4	0 1 2 3 4
5P.	make good grades in school?	0 1 2 3 4	0 1 2 3 4
6P.	find it easy to concentrate?	0 1 2 3 4	0 1 2 3 4
7P.	stick to one job until it is finished?	0 1 2 3 4	0 1 2 3 4
8P.	worry that something bad might happen to your family?	0 1 2 3 4	0 1 2 3 4
9P.	find it easy to remember things?	0 1 2 3 4	0 1 2 3 4
10P.	fear thunderstorms?	0 1 2 3 4	0 1 2 3 4
11P.	fear tornados?	0 1 2 3 4	0 1 2 3 4
115	fear tornado warnings?	0 1 2 3 4	0 1 2 3 4
12P.	think a tornado would ever hit your town?	0 1 2 3 4	0 1 2 3 4
13P.	ever "space out" and lose rack of what was going on near you?	0 1 2 3 4	0 1 2 3 4
14P.	ever try to "forget" about bad or unpleasant thing then they happened?	0 1 2 3 4	0 1 2 3 4

ID Number _____

Please tell how often you do these things. 0=never, 1=sometimes, 2=often, 3=most of the time, 4=always

Before the tornado did you.....After the tornado do you		**Before the tornado**	**After the tornado**
15P.	ever feel that you knew things that would happen in the future	0 1 2 3 4	0 1 2 3 4
16P.	ever feel that being good kept bad things from happening?	0 1 2 3 4	0 1 2 3 4
17P.	ever feel that if a bad thing happened it was your fault?	0 1 2 3 4	0 1 2 3 4
18P.	ever feel God would punish you if you did something wrong?	0 1 2 3 4	0 1 2 3 4
19P.	bad dreams about scary things?	0 1 2 3 4	0 1 2 3 4
20P.	dream you might die?	0 1 2 3 4	0 1 2 3 4

Affective

Before the tornado did you.....After the tornado do you...			
1P.	get easily irritated over little things?	0 1 2 3 4	0 1 2 3 4
2P.	get angry easily?	0 1 2 3 4	0 1 2 3 4
25P.	throw temper tantrums?	0 1 2 3 4	0 1 2 3 4
3P.	feel sad?	0 1 2 3 4	0 1 2 3 4
35P.	you cry?	0 1 2 3 4	0 1 2 3 4
4P.	feel scared?	0 1 2 3 4	0 1 2 3 4
5P.	feel happy?	0 1 2 3 4	0 1 2 3 4
6P.	worry about your family's safety?	0 1 2 3 4	0 1 2 3 4
7P.	feel like you couldn't feel anything or were a robot?	0 1 2 3 4	0 1 2 3 4

Social

Before the tornado did you.....After the tornado do you...			
1.	have stomaches?	0 1 2 3 4	0 1 2 3 4
2.	have headaches?	0 1 2 3 4	0 1 2 3 4
3.	feel your heart beat really fast?	0 1 2 3 4	0 1 2 3 4
4.	feel jumpy, edgy or nervous?	0 1 2 3 4	0 1 2 3 4
5.	have to see the school nurse?	0 1 2 3 4	0 1 2 3 4
5A.	have to see your doctor?	0 1 2 3 4	0 1 2 3 4
6.	ever have a hard time breathing?	0 1 2 3 4	0 1 2 3 4
7.	have bad dreams?	0 1 2 3 4	0 1 2 3 4
8.	find that loud noises make you jump?	0 1 2 3 4	0 1 2 3 4

Severity

Please circle the answer that best describes how you feel

1SE How scared were you during the tornado? Not scared at all a little scared very scared panicked
2SE Did the tornado damage your home? Not at all a little quite a bit it was destroyed
3SE Did the tornado damage your school? Not at all a little quite a bit it was destroyed
4SE Did your hear the tornado? Yes No
5SE Did you see the tornado? Yes No
6SE Did you see the tornado hit anything? Yes No
7SE Did you see the tornado hurt someone? Yes No
8SE Did you see any injured people after the tornado? Yes No
9SE Did you see any dead people after the tornado? Yes No
9SE Who were you with at the time of the tornado? Family Friends Day Care/School Alone
10SE How close were you to the tornado? Not close Close Very Close In it
11SE Did you have a storm shelter to go to? Yes No

ID Number _____

Social Support

Please tell how often you do these things. 0=never, 1=sometimes, 2=often, 3=most of the time, 4=always

Behavioral

1SS	Before the tornado, did your family do things together?	0 1 2 3 4
2SS	Now does your family do things together?	0 1 2 3 4
3SS	How much does your family talk about the tornado?	0 1 2 3 4
4SS	How often do your teachers talk about the tornado?	0 1 2 3 4
5SS	How often do your friends talk about the tornado?	0 1 2 3 4
6SS	Does your family have as much money now as before the tornado?	0 1 2 3 4
7SS	How much do your grandparents help your family?	0 1 2 3 4

Cognitive

1SS	Before the tornado, how often did your parents say they were afraid of storms?	0 1 2 3 4
2SS	Now, how often do your parents say they are afraid of storms?	0 1 2 3 4
3SS	How often do your friends say they are afraid of storms?	0 1 2 3 4
4SS	How often do your teachers say they are afraid of storms?	0 1 2 3 4

Appendix L

WHEN BAD THINGS HAPPEN

DIRECTIONS

The questions on the next pages ask you about something bad that happened to you. Your answers will help us see how you feel about what happened. There are no right or wrong answers.

Try to tell us what happened to the space below. If you need more room you can use the back of this page. Then answer the questions on the next pages. Answer by putting an X under NEVER, or under SOME, or under LOTS. Be sure to answer each question just once.

Thank you.

Your Name:_____Age:_____

Use the rest of the page to describe this bad thing:_____

	NEVER	SOME	LOTS
1. Was the bad thing scary?			
2. Did you think you might get hurt?			
3. Were you afraid you might die?			
4. Did you think someone else might get hurt?			
5. Do you think about the bad thing now even when you do not want to?			
6. Do thoughts of the bad thing just pop into your head? Things like pictures or sounds or smells from the bad thing?			
7. Is there anything about the bad thing you keep thinking about? Even when you do not want to?			
8. Do you have bad dreams or nightmares about the bad thing?			
9. Do you dream about monsters or other scary things at night? Like you are trapped? Or you are somewhere strange? Or you are scared but can not run?			
10. Since the bad thing happened, do you dream at night that you die?			
. Since the bad thing, do you have bad dreams, that later you can not remember what they were about?			
12. Do you daydream about the bad thing?			
13. Do pictures of what happened run over and over again in your head like a movie?			
14. Do you ever feel like the bad thing is still happening?			
15. To you ever act like the bad thing is happening again?			
16. Does it bother you when things make you think of the bad thing?			
17. Does it bother you when you see someone who reminds you of the bad thing? Or when you go somewhere that reminds you?			
18. Does it bother you when it gets to be the same time as when the bad thing happened?			
19. Do you try to forget all about the bad thing?			
20. Do you try not to feel anything about the bad thing? Like you are a robot or machine, without any feelings?			
21. Do you ever feel like what happened was a bad dream and not real? Like it never happened?			
22. Do you wish you could turn off feelings that remind you of what happened?			
23. Do you try to push away thoughts about the bad thing and think about other th[illegible]s?			

	NEVER	SOME	LOTS
24. Is it easy to be around people who make you think about the bad thing?			
25. Is it hard to do things that make you think of the bad thing?			
26. Do you stay away from places or things that make you think of the bad thing?			
27. Do you forget parts of what happened?			
28. Do you remember everything that happened?			
29. Since the bad thing happened, do you do things that you used to think you were too old for?			
30. Are there games you used to play before the bad thing that you do not like to play now?			
31. Do you feel like you do not want to play with other kids since the bad thing happened?			
32. Do you feel different from other kids since the bad thing?			
33. Do you feel more alone since the bad thing?			
34. Do you sometimes feel like you can not feel anything? Like you are a robot? Or like you are made out of stone?			
35. Are you good at hiding your feelings since the bad thing happened?			
36. Do you think you will live to be as old as most people get to be?			
37. Do you think you will get married when you grow up?			
38. Do you think you will have kids of your own when you grow up?			
39. Do you think you will grow up and have a job of your own?			
40. Is it hard for you to plan ahead for anything? Even for holidays or parties or special events?			
41. Do you try to live just one day at a time?			
42. Is it easy for you to go to sleep at night?			
43. Is it easy for you to go back to sleep if you wake up in the middle of the night?			
44. Do you get really mad about things since the bad thing happened?			
45. Do you get so mad that you really blow your top? Or you feel like hitting or kicking something?			
46. Do you lose your temper more now than you did before the bad thing happened?			
47. Is it easy for you to pay attention to things that you have to do at home or school?			
48. Is it easy for you to finish things you start? Like games or homework or TV shows?			

	NEVER	SOME	LOTS
49. Is it easy for you to keep your mind on school work these days?			
50. Is it easy for you to remember things since the bad thing happened?			
51. Do you ever feel jumpy or nervous for no reason you can think of?			
52. Is it easy for you to sit still when you have to at school or home?			
53. Do you keep your eyes open for trouble these days?			
54. Are you on the look out for something bad to happen?			
55. Do things ever catch you by surprise and make you jump these days?			
56. Do you jump when you hear a sudden noise?			
57. Does it make you feel sick in some way when you are reminded of the bad thing?			
58. Do you feel sicker these days then you did before the bad thing?			
59. Do you feel scared or afraid since the bad thing happened?			
60. Do you worry much since the bad thing happened?			
61. Do you worry that the bad thing will happen again?			
62. Do you ever have a hard time catching your breath? Even when you are sitting and not running or playing hard?			
63. Do you ever feel like your heart is beating a mile a minute? Or like it might even explode? Even when you are sitting and not running or playing hard?			
64. Do you feel sadder now than you did before the bad thing happened?			
65. Do you feel so sad these days that you feel like crying?			
66. Do you think you were happier before the bad thing than now?			
67. Do you think that something that happened before the bad thing was a warning to you about the bad thing?			
68. Since the bad thing happened, do you think you can tell the future?			
69. Do you feel like you could have tried harder to keep the bad thing from happening? Or to keep it from turning out like it did?			
70. Do you feel bad that others were hurt more than you because of the bad thing?			
71. Do you feel like the bad thing would not have happened if not for you?			
72. Do you feel like what happened is your fault?			
73. Do you pretend that something different happened from what really did?			
74. Do you pretend that the bad thing turned out in a different way than it really did?			

R4

	NEVER	SOME	LOTS
75. Do you feel like hurting yourself since the bad thing happened?			
76. Have you tried to hurt yourself since the bad thing?			
77. Have you tried to kill yourself since the bad thing?			
78. Do you ever space out and lose track of what is going on around you?			
79. Does it ever happen that time goes by, and then you can not really remember what you did during that time?			
80. Does it ever seem to you like things are not real? Like everything is just a dream?			
81. Do you ever do things that surprise you, and later you think, "Why did I do that?"			
82. Do you get into more fights now than you did before the bad thing happened?			
83. Do you make up stories or not tell the truth more now than before the bad thing?			
84. Have you taken something that did not belong to you since the bad thing happened?			
85. Do you like doing unsafe things since the bad thing? Like doing crazy things that might get you or someone else hurt?			
86. Do you like to take more chances than you used to before the bad thing? Like riding your bike or driving wildly? Or like not being careful when you cross the street?			
87. Do you eat a *lot more* since the bad thing happened?			
88. Do you eat a *lot less* since the bad thing happened?			
89. Have you *lost a lot* of weight since the bad thing happened?			
90. Have you *gained a lot* of weight since the bad thing happened?			

Thank you.

Appendix M

PROJECT MAILE SURVEY - ELEMENTARY

NAME

Instructions

Please answer all questions.

Erase all stray marks.

Use only original copies.
Do not duplicate.

Part I

Please bubble in the answer that is right for you.

1. Were you living in Hawaii during Hurricane Iniki? ○ yes ○ no

   If "no", raise your hand. Your teacher will collect your paper.

   If "yes", answer all questions in Part I and Part II.

2. Where were you when Hurricane Iniki hit Kauai?
   - ○ a. at home on Kauai
   - ○ b. in a shelter on Kauai
   - ○ c. in somebody else's home on Kauai
   - ○ d. somewhere else on Kauai
   - ○ e. on another island in Hawaii (Oahu, Maui, Molokai, Lanai, Big Island, Niihau)
   - ○ f. other

3. During the hurricane, did you think you would die or get hurt? ○ yes ○ no

4. During the hurricane, did you think your mom or dad or brother or sister, or other close relatives, would die or get hurt? ○ yes ○ no

5. How much did the hurricane hurt your home?
   - ○ a. not at all
   - ○ b. a little
   - ○ c. a lot
   - ○ d. a lot and we couldn't live in it for a long time
   - ○ e. We still have to live in a different home now.

6. How scared were you during the hurricane?
   - ○ a. not scared at all
   - ○ b. a little scared
   - ○ c. scared
   - ○ d. very scared
   - ○ e. panicked

Part II

Please bubble in the answer that best describes your feelings.	No	Some-times	Almost all the time
1. Does your heart beat faster when something reminds you about the hurricane?	O	O	O
2. Do your thoughts and feelings about the hurricane make it hard for you to remember things like what you learned in school?	O	O	O
3. Do you try not to think about the hurricane?	O	O	O
4. Nowadays, do you feel more scared or nervous than before the hurricane?	O	O	O
5. Nowadays, do you have stomachaches, headaches, or other sick feelings?	O	O	O
6. Do you sleep okay?	O	O	O
7. Do you have a hard time remembering what happened during the hurricane?	O	O	O
8. Since the hurricane, do you do things that you used to do only when you were little, like suck your thumb, bite your nails, sleep with your parents, or wet your bed?	O	O	O
9. Do you try not to talk about your feelings about the hurricane?	O	O	O
10. Nowadays, are you extra careful so that bad things don't happen?	O	O	O
11. When something reminds you about the hurricane, do you get scared or worried?	O	O	O
12. Do you think about the hurricane over and over again?	O	O	O
13. Nowadays, is it hard for you to get along with your friends and family?	O	O	O
14. Do you feel bad because of something you did during the hurricane?	O	O	O
15. Do you feel bad because you didn't do something during the hurricane?	O	O	O
16. Nowadays, do you feel nervous or jumpy?	O	O	O
17. Do you have bad dreams?	O	O	O
18. Do you have bad dreams about the hurricane?	O	O	O
19. Nowadays, do you feel grouchy or mad?	O	O	O
20. Nowadays, is it hard for you to concentrate or pay attention?	O	O	O
21. Do you think about the hurricane even when you don't want to?	O	O	O
22. Nowadays, are there things that happen that make you think a hurricane is going to happen?	O	O	O
23. Do you try to stay away from things that remind you about the hurricane?	O	O	O
24. Do you think you'll have a good life in the future?	O	O	O

Appendix N

Childhood PTSD Interview -- Parent Form

ID#:_____ Today's Date:_____

Birthdate:_____ Sex:_____ Ethnicity:_____ Grade:_____

Dates Event(s) Described Below BEGAN_____ and ENDED_____

Enter the child's description of what happened to the child:

CONTINUE ON THE OTHER SIDE OF PAGE OR OTHER SHEETS IF NECESSARY

R4

COMPLETE ONLY IF CHILD'S DESCRIPTION CAN BE OBTAINED – AND CHILD'S PTSD INTERVIEW IS NOT COMPLETE
[RATER: How does the child's description compare to the parent or guardian's description of the event(s)?
___much less detail ___less detail ___about the same detail ___more detail ___much more detail
___important aspects left out ___nothing important left out
___detail less vividly described ___detail equally vivid ___detail more vividly described
___many events out of order ___some out of order ___few out of order ___none out of order]

A. DID THE CHILD PERCEIVE THE EVENT(S) AS MARKEDLY DISTRESSING? ___NO ___YES

Was your child very frightened by _____? ___No ___Yes ___ DK (Don't Know)

Did your child ever think you might get really hurt while _____ was happening?
___No ___Yes ___DK

Was your child ever afraid he/she might die while _____ was happening? ___No ___Yes ___DK

Did your child ever think someone else might get really hurt while _____ was happening?
___No ___Yes ___DK

[Check Yes if any answer to the left is answered Yes.]

B. IS THE STRESSFUL OR TRAUMATIC EVENT PERSISTENTLY REEXPERIENCED BY THE CHILD IN AT LEAST ONE OF THE FOLLOWING WAYS? ___NO ___YES

B1. Does the child have recurrent and intrusive recollections of the event? ___No ___Yes

Does your child think about _____ when he/she doesn't want to? ___No ___Yes ___DK

Do memories of _____ever just pop into your child's mind? ___No ___Yes ___DK

Is there anything about _____ that your child just keep thinking about? ___No ___Yes ___DK

Does your child talk a lot about what happened? ___No ___Yes ___DK

Are there any kinds of things your child started doing after _____ that he/she didn't use to do before?
___No ___Yes ___DK

[RATER: If Yes, do any of these behaviors provide evidence of repetitive reenactments of personally significant aspects of the stressful / traumatic event(s)? ___No ___Yes ___DK]

Does your child play any new games that your child made up after _____? ___No ___Yes ___DK

If Yes, ask the parent to describe the game(s). If there is any evidence of replay of the stressful/ traumatic event(s), describe these here. OTHERWISE, indicate ___no evidence of traumatic replay.

[Check YES if thinks about the event when doesn't want to OR there is evidence of traumatic reenactment of the event or of traumatic play.]

[NOTE: Both reenactment and traumatic play involve repetition of parts of the stressful event(s). Play is an obviously enjoyable activity for the child. Reenactment is not.]

R4

B2. Does the child report recurrent distressing dreams of the event(s)? ___No ___Yes

Does your child ever have bad dreams or nightmares about _____? ___No ___Yes ___DK	[Check YES if either the first or the last answer to the left is Yes OR if Yes to middle 2 AND No didn't have more before.]
Has your child had more bad dreams about monsters or other bad things than he/she used to have before _____? ___No ___Yes ___DK	
Has your child had more bad dreams or nightmares since _____? ___No ___Yes ___DK If Yes, did he/she use to have as many bad dreams before _____? ___No ___Yes ___DK	
Has your child ever dreamed that he/she died since _____? ___No ___Yes ___DK	

B3. Does the child ever suddenly act or feel as if the event(s) were recurring? ___ No ___Yes

Does your child tend to daydream or stare off into space more than before _____? ___No ___Yes ___DK	[Check YES if any of the answers to the left is Yes.]
Does your child ever complain that the events of _____ keep replaying in his/her mind like it was a movie? ___No ___Yes ___DK	
Does your child ever complain that he/she feels like ____ was happening all over again? ___No ___Yes ___DK If Yes, describe these instances here:	
Does your child ever act like _____ was happening again? ___No ___Yes ___DK If Yes, describe these instances here:	

B4. Does the child experience intense psychological distress at exposure to events that symbolize or resemble an aspect of the event(s)? ___No ___Yes

Does it bother your child when things reminded him/her of _____? ___No ___Yes ___DK If Yes, in what way Did it bother your child? (Make him/her angry, sad, afraid or what?)	[Check YES if any of the answers to the left is Yes.]
Does it bother your child when he/she sees someone or go someplace that reminds your child of _____? ___No ___Yes ___DK	
Does it bother your child when it gets to be the same time as when _____ (usually) happened? ___No ___Yes ___DK	

C. DOES THE CHILD PERSISTENTLY AVOID STIMULI ASSOCIATED WITH THE STRESSFUL OR TRAUMATIC EVENT(S) OR SHOW EVIDENCE OF "NUMBING OF GENERAL RESPONSIVENESS" (NOT PRESENT BEFORE THE TRAUMA) AS INDICATED BY AT LEAST THREE OF THE FOLLOWING? ___NO ___YES

C1. Does the child try to avoid thoughts or feelings associated with the event(s)? ___No ___Yes

Does your child ever say he/she just wants to forget all about _____? ___No ___Yes ___ DK
Does your child ever seem to just turn off his/her feelings about _____? ___No ___Yes ___ DK
Does your child ever say he/she feels like _____ never happened, that it was all just a bad dream? ___No ___Yes ___ DK
Does your child ever say he/she wishes he/she didn't have any feelings that remind him/her of _____? ___No ___Yes ___ DK
Does your child ever try to stop thinking about _____? ___No ___Yes ___ DK

[Check YES if any of the answers to the left is Yes.]

C2. Does the child try to avoid activities or situations that might bring back memories of the event(s)? ___No ___Yes

Does your child try to stay away from places or things that remind him/her of _____? ___No ___Yes ___ DK
Does your child try to keep from doing things that remind him/her of _____? ___No ___Yes ___ DK
Is it easy for your child to be around people who remind him/her of _____? ___No ___Yes ___ DK
Is it hard for your child to do things that remind him/her of _____? ___No ___Yes ___ DK

[Check YES if any of the FIRST 2 or last answer to the left is Yes OR the third answer is No OR if the child had trouble describing the event(s) on Page 1.]

C3. Is the child unable to recall important aspects of the event(s)? ___No ___Yes

Does your child seem to forget important parts of _____? ___No ___Yes ___DK If Yes, What makes you say that?
[ASK THE FOLLOWING ONLY IF THE ABOVE ANSWER IS NO.] Do you think your child remembers everything about what happened? ___No ___Yes ___DK If Yes, What makes your child say that?

[Check YES if the full answer to either question to the left indicates the child is unable to remember – OR if the child's description of the event – Page 1 – leaves out important information.]

R4

C4. Has the child lost interest in previously important activities, or has the child shown a loss of recently acquired developmental skills? ___No ___Yes

Are there any activities your child used to like to take part in before _____ happened that he/she doesn't want to do anymore? ___No ___Yes ___DK *If Yes: Like what?*	[Check Yes if the answer to any of the questions to the left is Yes AND examples are related to the trauma, not just due to growing up, etc.]
Since _____ happened, does your child do things you thought he/she had outgrown? ___No ___Yes ___DK *If Yes: Like what?*	
Are there games your child used to like to play before _____ happened that he/she doesn't like to play anymore? ___No ___Yes ___DK *If Yes: Like what?*	

C5. Does the child display or feel detachment or estrangement from others? ___No ___Yes

Does your child ever feel like he/she doesn't want to play with other kids since _____happened? ___No ___Yes ___ DK	[Check Yes if any of the answers here is Yes.]
Does your child ever seem to feel different from other kids since _____? ___No ___Yes ___DK	
Does your child ever feel more alone or misunderstood since _____? ___No ___Yes ___DK	

C6. Does the child display restricted affect? ___No ___Yes

Since _____ does it sometimes seem like your child shows less feelings (except maybe anger) than he/she did before _____? ___No ___Yes ___DK	[Check Yes if Yes to either question.]
Does your child seem to hide his/her feelings since _____ happened? ___No ___Yes ___DK	

C7. Does the child display a sense of foreshortened future? ___No ___Yes

Does your child think he/she will live to be as old as most people get to be?___No ___Yes ___DK	[Check Yes if any of the answers but the second or third is No OR if the second or third answer is Yes.]
Since_____ is it hard for your child to plan ahead for anything? Even for parties or special events?___No ___Yes ___DK	
Does your child try to just live one day at a time these days? ___No ___Yes ___DK	
Does your child think he/she will grow up and get married some day? ___No ___Yes ___DK	
Does your child think he/she will grow up and have children of his/her own some day? ___No ___Yes ___DK	
Does your child think he/she will grow up and have a job of his/her own some day? ___No ___Yes ___DK	

D. DOES THE CHILD SHOW "PERSISTENT SYMPTOMS OF INCREASED AROUSAL (NOT PRESENT BEFORE THE STRESSFUL OR TRAUMATIC EVENT(S)) AS INDICATED BY AT LEAST TWO OF THE FOLLOWING? ___NO ___YES

D1. Does the child have difficulty falling or staying asleep? ___No ___Yes

Is it easy for your child to fall asleep at night? ___No ___Yes ___DK

If No, Why not?

If your child wakes up in the middle of the night, is it hard for him/her to get back to sleep?
___ No ___Yes

If No, Why not?

[Check Yes if the first is No and the second answer is Yes If the reasons appear to be related to the event(s).]

D2. Is the child easily irritated or have outbursts of anger since the event(s)? ___No ___Yes

Is your child more easily irritated than he/she used to be before _____? ___No ___Yes ___DK

Does your child have more outbursts of anger than he/she did before _____? ___No ___Yes ___DK

Does your child throw more temper tantrums now than he/she did before _____?
___No ___Yes ___DK

[Check Yes if any answer to the left is Yes.]

D3. Does the child have difficulty concentrating? ___No ___Yes

Is it easy for your child to pay attention to things that he/she has to do at home or school?
___No ___Yes ___DK

Is it as easy as it used to be for your child to stick to one task until he/she finishes it?
___No ___Yes ___DK

Is it as easy for your child to keep his/her mind on his/her school work as it used to be?
___No ___Yes ___DK

Is it as easy as it used to be for your child to remember things since _____? ___No ___Yes ___DK

[Check Yes if any answer is No and the child does not have ADHD.]

D4. Does the child appear hypervigilant? ___No ___Yes

Does your child sometimes feel more jumpy or nervous than he/she used to since _____ happened?
___No ___Yes ___DK

Is it easy as it used to be for your child to sit still when he/she has to at school or home?
___No ___Yes ___DK

Is your child always watchful or on guard nowadays for no good reason? ___No ___Yes ___DK

Is your child always on the look out for something bad to happen nowadays? ___No ___Yes ___DK

[Check Yes if the first, third, or last answer is Yes OR the second answer is No.]

R4

D5. Does the child display exaggerated startle response? ___No ___Yes

Does your child seem jumpier or more easily startled since_____? ___No ___Yes ___DK Does your child tend to jump more when he/she hears a sudden noise than he/she did before _____? ___No ___Yes ___DK	[Check Yes if either answer to the left is Yes.]

DSM-III-R D6. Does the child complain of physiological reactions upon exposure to reminders of the event(s)?
DSM-IV B5. (See Criterion B - Reexperiencing - page 2) ___No ___Yes

Does it ever make your child feel sick in any way when he/she is reminded of _____? ___ No ___ Yes If Yes, In what way does it make him/her feel sick? [Describe] Does your child seem to feel sicker these days than he/she did before _____? ___ No ___ Yes ___ DK	[Check Yes if either answer to the left is Yes.]

_____ END OF DSM-III-R AND DSM-IV CRITERIA _____

ASSOCIATED SYMPTOMS

Anxiety ___No ___Yes

Does your child ever feel more afraid or scared nowadays than he/she did before _____ ? ___ No ___ Yes ___DK If Yes, What makes your child afraid? [Describe.] Does your child seem to worry more nowadays than he/she did before _____? ___No ___Yes ___DK If Yes, About what? [Describe.] Does your child ever seem to be afraid that _____ will happen again? ___ No ___ Yes ___DK Since _____ does your child ever have a hard time breathing or catching his/her breath? Even when sitting still and not running or playing hard? ___ No ___ Yes ___DK *[Rater: If Yes, does the child have asthma? ___ No ___ Yes]* Since _____ does your child ever feel like he/she feels like his/her heart is beating a mile a minute so that it feels like it might burst?? Even when not running or playing hard? ___ No ___ Yes ___DK	[Check Yes if any two answers to the left are Yes AND the reasons are related to the traumatic event(s). Note that the last two are indicative of possible panic disorders.]

R4

Depression ___No ___Yes

Does your child seem to feel sadder now than he/she did before _____? ___No ___Yes ___DK

Does your child seem to cry more nowadays than he/she did before _____? ___ No ___ Yes ___DK

Was your child a lot happier before _____ than he/she is nowadays? ___ No ___ Yes ___DK

[Check Yes if any answer to the left is Yes.]

Omens ___No ___Yes

Does your child ever think that something that happened before _____ was a warning to him/her that _____ was going to happen? ___ No ___ Yes ___ DK

If Yes, describe what he/she takes as a warning.

Since _____ happened, did your child sometimes think he/she can predict or tell the future? ___No ___ Yes ___DK

If Yes, What makes you say that?

[Check Yes if either answer to the left is Yes AND the event either DID NOT happen OR it COULD NOT have served as a warning.]

Survivor Guilt ___No ___Yes

Does your child feel like he/she could have didn't do enough to keep _____ from or from turning out like it did? ___ No ___ Yes ___DK

Does your child ever seem to feel sad or guilty that others were hurt more than he/she because of _____? ___ No ___ Yes ___DK

[Check Yes if either answer to the left is Yes.]

Guilt/Self Blame ___No ___Yes

Does your child ever feel like _____ would not have happened if it weren't for him/her? ___ No ___ Yes ___DK

Does your child ever feel like what happened was his/her fault? ___ No ___ Yes ___DK

If Yes to either of the above two questions, Why does he/she seem to feel that way?

[*RATER: Rate the extent to which the child may be or is to blame for the event(s):*
___ *Not at all* ___ *Very little* ___ *Somewhat* ___ *Very much*]

[Check Yes if either answer to the left is Yes AND the child can be realistically blamed very little or not at all.]

Fantasy Denial ___No ___Yes

Does your child ever imagine or pretend that things happened differently from what really happened? ___ No ___ Yes ___DK

Does your child ever imagine or pretend that things turned out in a different way from the way they really turned out? ___ No ___ Yes ___DK

If Yes to either of the above two questions, What does your child pretend or imagine?

[Check Yes if either answer to the left is Yes.]

R4

Self-destructive Behavior ___No ___Yes

Has your child ever felt like hurting him/herself in some way since _____? ___No ___Yes ___DK	[Check Yes if any answer to the left is Yes.]
Has your child ever tried to hurt him/herself in some way since _____? ___No ___Yes ___DK If Yes, in what way? And how many times? Describe.	
Has your child ever tried to end his/her life since _____ happened? ___ No ___ Yes ___DK	

Dissociation ___No ___Yes

Does your child ever kind of space out and lose track of what's going on around him/her? ___ No ___ Yes ___DK	[Check Yes if 3 or more of the questions to the left are answered Yes.]
Does it ever happen that time goes by, and then your child can't really remember what he/she was doing during that time? ___ No ___ Yes ___DK	
Does it ever seem to your child since _____ happened like things aren't real, like everything is just a dream? ___No ___Yes ___DK	
Does your child ever do things that surprise him/her, so that afterwards he/she stops and wonders why he/she did that? ___No ___ Yes ___DK	

Antisocial Behavior ___No ___Yes

Does your child get into more fights now than he/she did before _____ ? ___ No ___ Yes ___ DK	[Check Yes if any answer to the left is Yes.]
Does your child seem to tell more lies nowadays than he/she did before _____? ___ No ___ Yes ___ DK	
Has your child begun to take things that don't belong to him/her more often than he/she did before _____ happened? ___ No ___ Yes ___ DK	

Risk-taking behavior ___No ___Yes

Has your child started doing more risky things since _____ happened? Like doing crazy things he/she knows are dangerous? ___ No ___ Yes ___ DK	[Check Yes if either answer to the left is Yes.]
Does your child like to take more chances than he/she used to before _____ happened? Like riding his/her bike or driving wildly, or not being careful when he/she cross the street. ___ No ___ Yes ___ DK	

Changed Eating Habits ___No ___Yes

Does your child eat a <u>lot more</u> now than he/she used to eat before _____ happened? ___ No ___ Yes ___ DK [If NO or DK, Does he/she eat a <u>lot less</u> now than before? ___ No ___ Yes ___DK]	[Check Yes if either answer to the left is Yes.]
Has your child lost a <u>lot</u> of weight since _____ happened? ___ No ___ Yes ___ DK [If NO or DK, has your child gained a <u>lot</u> of weight since _____ happened? ___ No ___ Yes ___ DK]	

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Appendix O

Childhood PTSD Interview

ID#:_____ Today's Date:_____

Birthdate:_____ Sex:_____ Ethnicity:_____ Grade:_____

Dates Event(s) Described Below BEGAN_____ and ENDED_____

Enter the child's description of the event(s):

CONTINUE ON THE OTHER SIDE OF PAGE OR OTHER SHEETS IF NECESSARY

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[*RATER: How willing was the child to describe [those times/the event?*
____very unwilling ____somewhat unwilling ____fairly unwilling ____very willing/verbose

Is there reason to believe that the child described events that did NOT happen? ___No ___Yes (If so, note when this may have been so on the previous pages.)

Is there reason to believe the child misperceived or described details incorrectly? ___No ___Yes (If so, note when this may have happened on the previous pages.)]

[*RATER: How does the child's description compare to the parent or guardian's description of the event(s)?*
___much less detail ___less detail ___about the same detail ___more detail ___much more detail
___important aspects left out ___nothing important left out
___detail less vividly described ___detail equally vivid ___detail more vividly described
___many events out of order ___some out of order ___few out of order ___none out of order]

A. DID THE CHILD PERCEIVE THE EVENT(S) AS MARKEDLY DISTRESSING?	___NO ___YES

Was _____ REAL scary sometimes? ___No ___Yes
Did you ever think you might get really hurt while _____ was happening? ___No ___Yes
Were you ever afraid you might die while _____ was happening? ___No ___Yes
Did you ever think someone else might get really hurt while _____ was happening? ___No ___Yes

[Check YES above if any answer to the left is answered YES.]

B. IS THE STRESSFUL OR TRAUMATIC EVENT "PERSISTENTLY REEXPERIENCED BY THE CHILD IN AT LEAST ONE OF THE FOLLOWING WAYS"?	___NO ___YES

B1. Does the child have recurrent and intrusive recollections of the event(s)? ___No ___Yes

Do you sometimes think about _____ when you don't want to? ___No ___Yes
Do thoughts of _____ever just pop into your mind? ___No ___Yes (Pictures, sounds, smells, etc.)
Is there anything about _____ that you just keep thinking about? ___No ___Yes
Are there any kinds of things you do now that you didn't use to do before _____ happened? ___No ___Yes *[RATER: If yes, do any of these behaviors provide evidence of repetitive reenactments of personally significant aspects of the stressful / traumatic event(s)? ___No ___Yes If yes, list.]*

[Check YES if thinks about the event when doesn't want to OR there is evidence of traumatic reenactment of the event.]

[NOTE: Reenactment involves repetition of parts of the stressful event(s).]

B2. Does the child report recurrent distressing dreams of the event(s)? ___No ___Yes

Do you ever have bad dreams or nightmares about _____? ___No ___Yes	[Check YES if either the first or the last answer to the left is Yes OR if Yes to middle 2 AND No didn't have more before.]
Do you ever have bad dreams or nightmares that you later can't remember what they were about since _____?___No ___Yes If Yes, did you used to have as many bad dreams before? ___No ___Yes	
Since _____, do you ever dream at night that you die? ___No ___Yes	

B3. Does the child ever suddenly act or feel as if the event(s) were recurring? ___ No ___Yes

Do you ever find yourself daydreaming about _____? ___No ___Yes	[Check YES if any of the answers to the left is Yes.]
Do pictures of what happened sometimes run over and over again in your head like a movie? ___No ___Yes	
Do you ever feel like ____ was happening all over again? ___No ___Yes If Yes, describe these instances here:	
Do you ever act like _____ was happening again? ___No ___Yes Yes, describe these instances here:	

B4. Does the child experience intense psychological distress at exposure to events that symbolize or resemble an aspect of the event(s)? ___No ___Yes

Does it bother you when things make you think of _____? ___No ___Yes If Yes, in what way does it bother you? (Make you angry, sad, afraid or what?)	[Check YES if any of the answers to the left is Yes.]
Does it bother you when you see someone or go someplace that reminds you of _____? ___No ___Yes	
Does it bother you when it gets to be the same time as when _____ (usually) happened? ___No ___Yes	

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C. DOES THE CHILD PERSISTENTLY AVOID STIMULI ASSOCIATED WITH THE STRESSFUL OR TRAUMATIC EVENT(S) OR SHOW EVIDENCE OF "NUMBING OF GENERAL RESPONSIVENESS" (NOT PRESENT BEFORE THE TRAUMA) AS INDICATED BY AT LEAST THREE OF THE FOLLOWING? ___NO ___YES

C1. Does the child try to avoid thoughts or feelings associated with the event(s)? ___No ___Yes

Do you ever just try to forget all about _____? ___No ___Yes
Do you ever try not to feel anything about _____? Like you are a robot or machine, with no feelings? ___No ___Yes
Do you ever feel like _____ was all just a bad dream and not real? Like it never really happened? ___No ___Yes
Do you ever wish you could turn off feelings that remind you of _____? ___No ___Yes
Do you ever try to push away thoughts about _____ and think about other things? ___No ___Yes

[Check YES if any of the answers to the left is Yes.]

C2. Does the child try to avoid activities or situations that might bring back memories of the event(s)? ___No ___Yes

Do you try to stay away from places or things that make you think of _____? ___No ___Yes
Is it easy for you to be around people who make you think of _____? ___No ___Yes
Is it hard to do things that make you think of _____? ___No ___Yes

[Check YES if the FIRST or the LAST answer is Yes OR the middle answer is No OR if the child had trouble describing the event(s) on Page 1.]

C3. Is the child unable to recall important aspects of the event(s)? ___No ___Yes

Do you forget parts of what happened? ___No ___Yes ___DK (Don't Know) If Yes, What makes you say that? (OR, How do you know that you forget parts?)
[RATER: ONLY IF NO TO ABOVE, ASK:] Do you think you remember everything about what happened? ___No ___Yes ___DK If Yes, What makes you say that?

[Check YES if the full answer to either question to the left indicates the child is unable to remember – OR if the child's description of the event – Page 1 – leaves out important information.]

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C4. Has the child lost interest in previously important activities, or has the child shown a loss of recently acquired developmental skills? ___No ___Yes

Are there things you used to like to do that you do not like to do anymore, since _____ happened? ___No ___Yes *If yes: WHAT THINGS?*	[Check Yes if the answer to any of the questions to the left is Yes, AND the loss of interest is related to the trauma, not just due to growing up, etc.]
Since _____ happened, do you do things that you used to think you were too old for? ___No ___Yes *If yes: WHAT THINGS?*	
Are there games you used to play before _____ happened that you don't like to play anymore? ___No ___Yes *If yes: WHAT THINGS?*	

C5. Does the child display or feel detachment or estrangement from others? ___No ___Yes

Do you ever feel like you don't want to play with other kids since _____ happened? ___No ___Yes	[Check Yes if any of the answers here is Yes.]
Do you ever feel any different from other kids since _____? ___No ___Yes	
Do you ever feel more alone since _____? ___No ___Yes	

C6. Does the child display restricted affect? ___No ____Yes

Since _____ does it sometimes seem like you can't feel anything, like you are a robot or you are made out of stone? ___No ___Yes	[Check Yes, if any of the answers here is Yes, including the rater's question.]
Are you good at hiding your feelings since _____ happened? ___No ___Yes	
[Rater: Did the child display little or no affect while describing [those times/the event] and while answering your questions about [his/her] behaviors since [those times/the event]? ___*No* ___ *Yes]*	

C7. Does the child display a sense of foreshortened future? ___No ___Yes

Do you think you will live to be as old as most people get to be? ___No ___Yes	[Check Yes if the second or third answer is YES or any other answer to the left is NO.]
Since_____ is it hard for you to plan ahead for anything? Even for holidays or parties or special events? ___No ___Yes	
Do you try to just live one day at a time? ___No ___Yes	
Do you think you will grow up and have a job of your own some day? ___No ___Yes	
Do you think you will grow up and get married some day? ___No ___Yes	
Do you think you will grow up and have children of your own some day? ___No ___Yes	

D. DOES THE CHILD SHOW "PERSISTENT SYMPTOMS OF INCREASED AROUSAL (NOT PRESENT BEFORE THE STRESSFUL OR TRAUMATIC EVENT(S)) AS INDICATED BY AT LEAST TWO OF THE FOLLOWING? ___NO ___YES

D1. Does the child have difficulty falling or staying asleep? ___No ___Yes

Is it easy for you to go to sleep at night? ___No ___Yes

If No, Why not?

Is it easy for you to go back to sleep if you wake up in the middle of the night? ___ No ___Yes

If No, Why not?

[Check Yes if the answer to either question is No and the reasons appear to be related to the event(s).]

D2. Is the child easily irritated or have outbursts of anger since the event(s)? ___No ___Yes

Do you lose your temper more now than you used to before _____ happened? ___No ___Yes

Do you ever get so mad that you really blow your top? Or do you feel like hitting or kicking something? ___No ___Yes

Yes, Did you ever feel this way before _____? ___No ___Yes

[Check Yes if the first answer is Yes OR the second answer is yes AND Not so much before.]

D3. Does the child have difficulty concentrating? ___No ___Yes

Is it easy for you to pay attention to things that you have to do at home or school? ___No ___Yes

Is it easy for you to finish things you start? Like games or homework or TV shows? ___No ___Yes

Is it easy for you to keep your mind on your school work these days? ___No ___Yes

Is it easy for you to remember things since _____? ___No ___Yes

[Check Yes if any answer is No and the child does not have ADHD.]

D4. Does the child appear hypervigilant? ___No ___Yes

Do you sometimes feel jumpy or nervous nowadays for no reason that you can think of? ___No ___Yes

Is it easy these days for you to sit still when you have to at school or at home? ___No ___Yes ___DK

Do you keep your eyes open for trouble these days? ___No ___Yes ___DK

Are you always on the look out for something bad to happen these days? ___No ___Yes ___DK

[Check Yes if the first, third, or last answer is Yes OR the second answer is No.]

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D5. Does the child display exaggerated startle response? ___No ___Yes

Do things ever catch you by surprise and make you jump these days? ___No ___Yes ___DK Do you jump when you hear a sudden noise these days? ___No ___Yes ___DK	[Check Yes if either answer to the left is Yes.]

DSM-III-R D6. Does the child complain of physiological reactions upon exposure to reminders of the event(s)?
DSM-IV B5. (See Criterion B - Reexperiencing - page 2) ___No ___Yes

Does it ever make you feel sick in any way when you are reminded of _____? ___ No ___ Yes If yes, In what way does it make you feel sick? [Describe]	[Check Yes if either answer to the left is Yes.]
Do you feel sicker these days than you did before _____? ___ No ___ Yes ___ DK	

_____ END OF DSM-III-R AND DSM-IV CRITERIA _____

ASSOCIATED SYMPTOMS

Anxiety ___No ___Yes

Do you ever feel afraid or scared since _____ happened? ___ No ___ Yes If Yes, What makes you afraid? [Describe.]	[Check Yes if any two answers to the left are Yes AND the reasons are related to the traumatic event(s). Note that the last two are indicative of possible panic attacks.]
Do you worry much since _____ happened? ___No ___Yes If Yes, About what? [Describe.]	
Are you ever afraid that _____ will happen again? ___ No ___ Yes	
Since _____ do you ever have a hard time breathing or catching your breath? Even when you are sitting and not running or playing hard? ___ No ___ Yes *[Rater: If Yes, does the child have asthma? ___ No ___ Yes]*	
Since _____ do you ever feel like your heart is beating a mile a minute and might even explode? Even when you are sitting and not running or playing hard? ___ No ___ Yes	

Depression ___No ___Yes

Do you feel sadder now than you did before _____? ___No ___Yes	[Check Yes if either answer to the left is Yes.]
Do you ever feel so sad that you just feel like crying? ___ No ___ Yes	
Were you a lot happier before _____ than you are now? ___ No ___ Yes ___DK	

Omens ___No ___Yes

Do you ever think that something that happened before _____ was a warning to you that _____ was going to happen? ___ No ___ Yes ___ DK If Yes, What makes you say that?	[Check Yes if either answer to the left is Yes AND the event either DID NOT happen OR it COULD NOT have served as a warning.]
Since _____ happened, did you start to think you can tell the future? ___No ___ Yes ___DK If Yes, What makes you say that?	

Survivor Guilt ___No ___Yes

Do you feel like you could have tried harder to keep _____ from happening? Or to keep it from turning out like it did? ___ No ___ Yes	[Check Yes if either answer to the left is Yes and the reasons are indicative of traumatic response.]
Do you ever feel bad that others were hurt more than you because of _____? ___ No ___ Yes	
If yes to either or both of the above questions, describe why:	

Guilt/Self Blame ___No ___Yes

Do you ever feel like _____ would not have happened if it weren't for you? ___ No ___ Yes	[Check Yes if either answer to the left is Yes AND the child can be realistically blamed very little or not at all.]
Do you ever feel like what happened is your fault? ___ No ___ Yes	
If yes to either of the above two questions, Why do you feel that way?	
[RATER: Rate the extent to which the child may be or is to blame for the event(s): *___ Not at all ___ Very little ___ Somewhat ___ Very much]*	

Fantasy Denial ___No ___Yes

Do you ever imagine or pretend that something different happened from what really did? ___ No ___ Yes	[Check Yes if either answer to the left is Yes.]
Do you ever imagine or pretend that things turned out in a different way from the way they really did? ___ No ___ Yes If yes to either of the above two questions, What do you pretend or imagine?	

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Self-destructive Behavior ___No ___Yes

Have you ever felt like hurting yourself in some way since _____? ___No ___Yes

Have you ever tried to hurt yourself in some way since _____? ___No ___Yes

If Yes, in what way? And how many times? Describe.

Have you ever tried to kill yourself since _____? ___ No ___ Yes

If Yes, are you thinking about doing this now? *(This is for the interviewers use.)*

[Check Yes if any answer to the left is Yes.]

Dissociation ___No ___Yes

Do you ever kind of space out and lose track of what's going on around you? ___ No ___ Yes

Does it ever happen that time goes by, and then you can't really remember what you did during that time? ___ No ___ Yes

Does it seem like things aren't real, like everything is just a dream? ___ No ___ Yes

Do you ever do things that surprise you, and later you stop and say to yourself, "Why did I do that?" ___No ___ Yes

[Check Yes if 3 or more of the questions to the left are answered Yes.]

Antisocial Behavior ___No ___Yes

Do you get into more fights now than you used to before _____ happened? ___ No ___ Yes ___ DK

Do you make up more stories or not tell the truth more now than you did before _____ happened? ___ No ___ Yes ___ DK

Have you ever taken anything that didn't belong to you since _____ happened? ___ No ___ Yes

[Check Yes if any answer to the left is Yes.]

Risk-taking behavior ___No ___Yes

Do you like doing unsafe or dangerous things since _____ happened? Like doing crazy things that might get you or someone else hurt? ___ No ___ Yes

Do you like to take more chances than you used to before _____ happened? Like riding your bike or driving wildly, or not being careful when you cross the street. ___ No ___ Yes

[Check Yes if either answer to the left is Yes.]

Changed Eating Habits ___No ___Yes

Do you eat a <u>lot more</u> now than you used to before _____ happened? ___ No ___ Yes ___ DK
[If NO or DK, Do you eat a <u>lot less</u> now than you used to before? ___ No ___ Yes ___DK]

Have you gained a <u>lot</u> of weight since _____ happened? ___ No ___ Yes ___ DK
[If NO or DK, have you lost a <u>lot</u> of weight since _____ happened? ___ No ___ Yes ___ DK]

[Check Yes if either answer to the left is Yes.]

R4

Appendix P

Parent Report of The Child's Reaction To Stress

DIRECTIONS

Please take the time to carefully complete this report. It is designed to help us come to a better understanding of your child's reactions to the stressful event or events. Thank you.

Today's Date:_____ Birthdate:_____ ID#:_____

Relationship of Parent or Guardian to Child:_____

If Not Parent, Does Child Now Live With You?_____

Date the Event(s) Described Below BEGAN:_____ and Date Ended: _____

Use this space to describe the stressful event or events from the child's point of view as completely as possible. You may use the back of this sheet if you need more room.

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DIRECTIONS

For each of the questions below and on the following pages, please check the answer that best describes your understanding of how you child has reacted to the stressful event or events. If you do not know the answer to a question, check DON'T KNOW. Sometimes you are asked to describe some of you child's behaviors as well as check an answer. **Please be sure to answer every question.** Thank you for your help.

1. How much was your child scared by what happened?

___Not at all ___A little ___Some ___Lots ___Completely ___DON'T KNOW

2. How much did your child think he or she might get hurt during the event(s)?

___Not at all ___A little ___Some ___Lots ___Completely ___DON'T KNOW

3. How afraid was your child that he or she might die during the event(s)?

___Not at all ___A little ___Some ___Lots ___Completely ___DON'T KNOW

4. How afraid was your child that someone else might get hurt during the event(s)?

___Not at all ___A little ___Some ___Lots ___Completely ___DON'T KNOW

5. How often does your child talk about the event(s)?

___Never ___Rarely ___Sometimes ___Often ___Very Often ___Always ___DON'T KNOW

6. How often does your child ask questions about the event(s)?

___Never ___Rarely ___Sometimes ___Often ___Very Often ___Always ___DON'T KNOW

7. Does your child seem to have a hard time putting the event or events out of his or her mind?

___No ___Yes ___ DON'T KNOW

8. How often do things seem to remind your child of the event(s)?

___Never ___Rarely ___Sometimes ___Often ___Very Often ___Always ___DON'T KNOW

IF YOUR CHILD IS REMINDED OF THE EVENT(S), PLEASE DESCRIBE HERE WHAT SEEMS TO REMIND HIM OR HER:

_____

_____

_____

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9. How often does your child act in new or unusual ways since the event(s) occurred?

___Never ___Rarely ___Sometimes ___Often ___Very Often ___Always ___DON'T KNOW

IF YOUR CHILD DOES ACT IN NEW OR UNUSUAL WAYS, PLEASE DESCRIBE THEM HERE:

_____

_____

_____

10. How often does your child play any special game or games that he or she has made up since the event(s) occurred?

___Never ___Rarely ___Sometimes ___Often ___Very Often ___Always ___DON'T KNOW

IF YOUR CHILD DOES PLAY A SPECIAL GAME OR GAMES, PLEASE DESCRIBE IT OR THEM HERE:

_____

_____

_____

11. How often does your child seem to have upsetting dreams or nightmares related to the stressful event(s)?

___Never ___Rarely ___Sometimes ___Often ___Very Often ___Always ___DON'T KNOW

IF YOUR CHILD DOES SEEM TO HAVE SUCH DREAMS, PLEASE EXPLAIN HERE HOW YOU KNOW AND WHAT THEY ARE, IF YOU KNOW:

_____

_____

_____

12. How often since the stressful event(s) has your child had upsetting dreams or nightmares about monsters, or had bad dreams that you don't know what they were about?

___Never ___Rarely ___Sometimes ___Often ___Very Often ___Always ___DON'T KNOW

13. Has your child ever dreamed that he or she died since the stressful event(s)?

___No ___Yes ___DON'T KNOW

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14. How often does your child seem to act as if the stressful event(s) were happening all over again?

___Never ___Rarely ___Sometimes ___Often ___Very Often ___Always ___DON'T KNOW

IF THIS EVER HAPPENS, PLEASE DESCRIBE WHAT HAPPENS HERE:

_____

_____

_____

15. How often do reminders of the stressful event(s) seem to upset your child?

___Never ___Rarely ___Sometimes ___Often ___Very Often ___Always ___DON'T KNOW

16. How often does your child get upset when it gets to be about the same time as when the stressful event(s) occurred or usually occurred?

___Never ___Rarely ___Sometimes ___Often ___Very Often ___Always ___DON'T KNOW

17. How upset does your child get when he or she goes someplace or sees someone who reminds him of her of the stressful event(s)?

___Not at all ___A little ___Some ___Lots ___Completely ___DON'T KNOW

18. How willing is your child to talk about the stressful event(s) when asked?

___Very Willing ___Somewhat Willing ___Somewhat Unwilling ___Very Unwilling

19. How often does your child say he or she does not want to talk about or think about what happened?

___Never ___Rarely ___Sometimes ___Often ___Very Often ___Always ___DON'T KNOW

20. How often does your child say he or she just wants to forget all about what happened?

___Never ___Rarely ___Sometimes ___Often ___Very Often ___Always ___DON'T KNOW

21. How often does your child say he or she feels like the stressful event(s) never happened, that it was all just a bad dream?

___Never ___Rarely ___Sometimes ___Often ___Very Often ___Always ___DON'T KNOW

22. How often does your child try to avoid places, people, or things that remind him or her of the stressful event(s)?

___Never ___Rarely ___Sometimes ___Often ___Very Often ___Always ___DON'T KNOW

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23. How often does your child stay away from activities that remind him or her of the stressful event(s)?

___Never ___Rarely ___Sometimes ___Often ___Very Often ___Always ___DON'T KNOW

24. Are there parts of the stressful event(s) that the child seems to have forgotten or is unable to remember?

___No ___Yes ___DON'T KNOW

IF YES, PLEASE DESCRIBE YOUR REASONS FOR SAYING THIS:

_____

_____

_____

25. Does your child seem to have lost interest in activities that he or she used to enjoy before the stressful event(s) occurred?

___No ___Yes ___DON'T KNOW

IF YES, PLEASE DESCRIBE WHICH ACTIVITIES HERE:

_____

_____

_____

26. Are there games your child used to play before the stressful event(s) took place that he or she doesn't like to play now?

___No ___Yes ___DON'T KNOW

IF YES, PLEASE DESCRIBE THESE GAMES HERE:

_____

_____

_____

27. How difficult is it for your child to get interested in new activities since the stressful event(s)?

___Not at all ___A little ___Some ___Lots ___Completely ___DON'T KNOW

R4

28. Since the stressful event(s) has your child seemed to have "slipped back" to younger ways of acting or to have unlearned skills like toilet training or talking skills?

___No ___Yes ___DON'T KNOW

IF YES, PLEASE DESCRIBE THESE BEHAVIORS HERE:

_____

_____

_____

29. Compared to before the stressful event(s), how much time does you child spend alone not interacting with others these days?

___Much Less ___Somewhat Less ___About the Same ___Somewhat More ___Much More ___DON'T KNOW

30. Does your child ever say he or she feels that others don't understand him as much as they did before the stressful event(s)?

___Never ___Rarely ___Sometimes ___Often ___Very Often ___Always ___DON'T KNOW

31. How often since the stressful event(s) took place has your child indicated that he or she feels different or set apart from others?

___Never ___Rarely ___Sometimes ___Often ___Very Often ___Always ___DON'T KNOW

32. How much emotion would you say your child shows these days compared to before the stressful event(s)?

___Much Less ___Somewhat Less ___About the Same ___Somewhat More ___Much More ___DON'T KNOW

33. Compared to before the stressful event(s), how easy is it for your child to plan for things, like holidays or parties or special events?

___Much Less ___Somewhat Less ___About the Same ___Somewhat More ___Much More ___DON'T KNOW

34. Does your child expect to live to be as old as most people get to be?

___No ___Yes ___DON'T KNOW

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35. Does your child expect to grow up and get married some day?

___No ___Yes ___DON'T KNOW

36. Does your child expect to grow up and have children some day?

___No ___Yes ___DON'T KNOW

37. Does your child expect to grow up and have a job some day?

___No ___Yes ___DON'T KNOW

38. Compared to before the stressful event(s), how easy is it for your child to get to sleep at night?

___Much Easier ___Easier ___About as Easy or Hard ___Harder ___Much Harder
___DON'T KNOW

39. Compared to before the stressful event(s), how easy is it for your child to stay asleep these days once he or she falls asleep?

___Much Easier ___Easier ___About as Easy or Hard ___Harder ___Much Harder
___DON'T KNOW

40. Compared to before the stressful event(s), how easy is it for your child to get annoyed or irritated these days?

___Much Easier ___Easier ___About as Easy or Hard ___Harder ___Much Harder
___DON'T KNOW

41. Compared to before the stressful event(s), how often does your child get angry or throw temper tantrums these days?

___Much Less Often ___Less Often ___About the Same ___More Often ___Much More Often
___DON'T KNOW

44. Compared to before the stressful event(s), how easy is it for your child to concentrate on things these days?

___Much Easier ___Easier ___About as Easy or Hard ___Harder ___Much Harder
___DON'T KNOW

43. Compared to before the stressful event(s), how easy is it these days for your child to stick to one task until it is completed?

___Much Easier ___Easier ___About as Easy or Hard ___Harder ___Much Harder
___DON'T KNOW

44. Compared to before the stressful event(s), how easy is it these days for your child to keep his or her mind on schoolwork?

___Much Easier ___Easier ___About as Easy or Hard ___Harder ___Much Harder
___DON'T KNOW

R4

45. Compared to before the stressful event(s), how often these days does your child seem to feel jumpy or "edgy" or nervous for no apparent reason?

___Much Less Often ___Less Often ___About the Same ___More Often ___Much More Often
___DON'T KNOW

46. Compared to before the stressful event(s), how easy is it for your child to keep still for any length of time these days?

___Much Easier ___Easier ___About as Easy or Hard ___Harder ___Much Harder
___DON'T KNOW

47. Compared to before the stressful event(s), how often does your child seem to be watchful or on guard for no good reason?

___Much Less Often ___Less Often ___About the Same ___More Often ___Much More Often
___DON'T KNOW

48. Compared to before the stressful event(s), how often do things seem to catch your child by surprise and make him or her jump these days?

___Much Less Often ___Less Often ___About the Same ___More Often ___Much More Often
___DON'T KNOW

49. Compared to before the stressful event(s), how often do sudden noises make your child jump?

___Much Less Often ___Less Often ___About the Same ___More Often ___Much More Often
___DON'T KNOW

50. How often does your child seem to complain of feeling sick (with something like a stomachache, headache, or nausea) when something reminds him or her of the stressful event(s)?

___Never ___Rarely ___Sometimes ___Often ___Very Often ___Always ___DON'T KNOW

51. Compared to before the stressful event(s), how sick is your child these days in general?

___Much Less ___Somewhat Less ___About the Same ___Somewhat More ___Much More
___DON'T KNOW

52. Compared to before the stressful event(s), how fearful in general does your child seem to feel these days?

___Much Less ___Somewhat Less ___About the Same ___Somewhat More ___Much More
___DON'T KNOW

53. Compared to before the stressful event(s), how much does your child worry these days?

___Much Less ___Somewhat Less ___About the Same ___Somewhat More ___Much More
___DON'T KNOW

R4

54. How often does your child indicate that he or she is afraid the stressful event(s) will happen again?

___Never ___Rarely ___Sometimes ___Often ___Very Often ___Always ___DON'T KNOW

55. Since the stressful event(s), how often has your child seemed to have trouble catching his or her breath?

___Never ___Rarely ___Sometimes ___Often ___Very Often ___Always ___DON'T KNOW

56. Since the stressful event(s), how often has your child complained that his or her heart feels like it is beating a mile a minute or that it might burst?

___Never ___Rarely ___Sometimes ___Often ___Very Often ___Always ___DON'T KNOW

57. Compared to before the stressful event(s), does your child now feel:

___Much Happier ___Somewhat Happier ___Neither Happier Nor Sadder
___Somewhat Sadder ___Much Sadder ___DON'T KNOW

58. Compared to before the stressful event(s), how often does your child cry even though he or she is not hurt?

___Much Less ___Somewhat Less ___About the Same ___Somewhat More ___Much More
___DON'T KNOW

59. Does your child seem to believe that something that happened before the stressful event(s) was a warning that the stressful event(s) would happen?

___No ___Yes ___DON'T KNOW

IF YES, PLEASE DESCRIBE HERE WHAT YOUR CHILD BELIEVES WAS A WARNING:

_____

_____

_____

60. Since the stressful event(s), does your child think he or she can predict the future?

___No ___Yes ___DON'T KNOW

61. How often does your child seem to feel guilty that he or she didn't do more to prevent the stressful event(s) from happening or from turning out the way things did?

___Never ___Rarely ___Sometimes ___Often ___Very Often ___Always ___DON'T KNOW

61A. IF HE OR SHE DOES EVER FEEL GUILTY, HOW GUILTY DOES HE OR SHE USUALLY SEEM TO FEEL?

___Very Little ___Some ___Quite a Bit ___Very Much ___Extremely ___DON'T KNOW

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62. How often does your child seem to feel guilty that others were hurt worse than he or she because of the stressful event(s)?

___Never ___Rarely ___Sometimes ___Often ___Very Often ___Always ___DON'T KNOW

62A. IF HE OR SHE DOES EVER FEEL GUILTY, HOW GUILTY DOES HE OR SHE USUALLY SEEM TO FEEL?

___Very Little ___Some ___Quite a Bit ___Very Much ___Extremely ___DON'T KNOW

63. How much does your child seem to feel like he or she caused the stressful event(s)?

___Not at all ___A little ___Some ___Lots ___Completely ___DON'T KNOW

64. How much does your child blame himself or herself for what happened during or after the stressful event(s)?

___Not at all ___A little ___Some ___Lots ___Completely ___DON'T KNOW

IF YOUR CHILD DOES BLAME HIMSELF OR HERSELF AT ALL, PLEASE EXPLAIN WHY:

_____

_____

_____

65. How often does your child seem to fantasize or pretend that things went differently during the stressful event(s) than they actually did?

___Never ___Rarely ___Sometimes ___Often ___Very Often ___Always ___DON'T KNOW

66. How often does your child seem to fantasize or pretend that things turned out in a different way after the stressful event(s) than they actually did?

___Never ___Rarely ___Sometimes ___Often ___Very Often ___Always ___DON'T KNOW

67. Compared to before the stressful event(s) how often does your child speak of hurting himself or herself or committing suicide these days?

___Much Less ___Somewhat Less ___About the Same ___Somewhat More ___Much More ___DON'T KNOW

68. How often has your child tried to hurt himself or herself since the stressful event(s)?

___Never ___Rarely ___Sometimes ___Often ___Very Often ___Always ___DON'T KNOW

69. How often since the stressful event(s) does your child seem to "blank out" or "stare off into space" or look at something no one else can see?

___Never ___Rarely ___Sometimes ___Often ___Very Often ___Always ___DON'T KNOW

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Appendix Q

Institutional Review Board Approval

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD

Date:	April 7, 2000	IRB #: ED-00-236
Proposal Title:	"THEORETICAL CONSTRUCTS OF POST TRAUMATIC STRESS DISORDER AS ASSESSED IN CHILDREN IN A NATURAL DISASTER INVOLVING TORNADOES IN THEIR COMMUNITIES"	
Principal Investigator(s):	Judy Oehler-Stinnett Linda Palmer	
Reviewed and Processed as:	Expedited (special population)	

Approval Status Recommended by Reviewer(s): Approved

Signature:

Carol Olson

Carol Olson, Director of University Research Compliance

April 7, 2000
Date

Approvals are valid for one calendar year, after which time a request for continuation must be submitted. Any modification to the research project approved by the IRB must be submitted for approval with the advisor's signature. The IRB office MUST be notified in writing when a project is complete. Approved projects are subject to monitoring by the IRB. Expedited and exempt projects may be reviewed by the full Institutional Review Board.

VITA

Linda Sue Garner Evans

Candidate for the Degree of

Doctor of Philosophy

Thesis: THEORETICAL CONSTRUCTS OF POST TRAUMATIC STRESS DISORDER AS ASSESSED IN CHILDREN IN A NATURAL DISASTER INVOLVING TORNADOES IN THEIR COMMUNITIES

Major Field: Educational Psychology

Biographical:

Education: Graduated from Stillwater High School, Stillwater, Oklahoma in May 1964; received a Bachelor of Science degree in Elementary Education from Oklahoma State University, Stillwater, Oklahoma in May 1968; received a Master of Science degree in Psychology from Oklahoma State University, Stillwater, Oklahoma in May, 1984. Completed the requirements for the Doctor of Philosophy with an option in Educational Psychology and an emphasis in School Psychology at Oklahoma State University in August 2002.

Experience: Private Practice, Tulsa, Oklahoma 1993-1999; Senior Treatment Supervisor, Christopher Youth Center, 1986-1993; Psychological Assistant, 1986-1993; Theatre Arts Teacher Round Rock, Texas 1985-1986; Clinical Director of San Gabriel Treatment Center, 1985-1986; Primary Residential Care Therapist, Monarch, Inc., 1984-1985; Therapist, Hillcrest Eating Disorders Clinic, Tulsa, Oklahoma 1984; Teacher, Stillwater Public Schools, 1968-1973.

Professional Memberships: American Psychological Association, Oklahoma Psychological Association, Oklahoma School Psychology Association, Kappa Delta Pi Honor Society, Texas School Psychology Association.

Awards and Honors: Outstanding Educator in America, 1974; Consultant to the Oklahoma State Legislature on the Ryan Luke Bill.