

A Comparative Analysis of the Child Behavior Checklist Scores of Traumatized Youth With and  
Without Posttraumatic Stress Disorder Relative to Nontraumatized Controls

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## ABSTRACT

### A Comparative Analysis of the Child Behavior Checklist Scores of Traumatized Youth With and Without Posttraumatic Stress Disorder Relative to Nontraumatized Controls

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This study compared the CBCL scores of clinically referred youth with PTSD to the CBCL scores of clinically referred traumatized youth without PTSD. It also compared the CBCL scores of youth with PTSD, as well as those of traumatized youth without PTSD, to those of a nontraumatized comparison group. Participants included a total of 123 youth aged 7 through 18 who were tested at Bellevue Hospital in New York City: 34 youth with PTSD, 56 traumatized youth without PTSD, and 33 nontraumatized controls. Participants in the PTSD and traumatized PTSD-negative groups were referred to the study subsequent to exposure to a variety of traumatic events (e.g., sexual assault, physical assault, motor vehicle accident, dog attack). Among the PTSD-positive group, 8 participants met DICA-R criteria for major depression, and 1 met criteria for substance dependence. Of the traumatized PTSD-negative participants, 2 met DICA-R criteria for major depression, 2 met criteria for CD, and 1 met criteria ADHD. Youth with a history of abuse or neglect were excluded. Additional exclusionary criteria included intellectual disability (i.e.,  $IQ \leq 69$ ), the inability to speak or understand English, a history of significant head trauma, and the use of medication that could influence cognitive functioning.

An ANOVA was used to compare the groups on standardized CBCL Total score, and a MANOVA was performed to test for group differences in standardized CBCL Internalizing and Externalizing aggregate scale scores. A MANCOVA procedure was performed with age, gender, and SES as covariates, to identify significant group differences in CBCL syndrome scale raw scores. Results of all analyses indicated significant differences between groups. The PTSD group

had significantly higher CBCL Total and Internalizing aggregate scale scores than both comparison groups and significantly higher Externalizing aggregate scale scores than traumatized PTSD-negatives. No significant differences were observed between the mean CBCL Total, Internalizing aggregate scale, and Externalizing aggregate scale scores of the traumatized PTSD-negatives and nontraumatized controls. The scores of the PTSD-positive group significantly exceeded the scores of both comparison groups on the following CBCL syndrome scales: Anxious/Depressed, Delinquent Behavior, Attention Problems, Thought Problems, and Other Problems. The scores of the PTSD-positives were significantly higher than those of the traumatized PTSD-negatives on the Withdrawn and Somatic Complaints syndrome scales; they significantly exceeded those of nontraumatized controls on the Aggressive Behavior and Social Problems syndrome scales. The CBCL syndrome scale scores of traumatized PTSD-negatives and nontraumatized controls did not significantly differ.

The results of this study suggest that parent-reported internalizing and externalizing behavior problems are associated with PTSD and not with exposure to trauma alone. Its findings also suggest that exposure to trauma in the absence of PTSD is not associated with higher estimates of psychiatric morbidity. As such, this study provides powerful empirical support for the differential validity of the *DSM-IV* PTSD classification as it applies to children and adolescents.

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## Dedication

This manuscript is dedicated to the memory of my father, Sherman R. Lewis, Jr., a principled man of great intelligence and compassion whose example inspires me daily to value the pursuit of knowledge, aspire to great heights, and always treat others with dignity and respect. His unconditional love and faith in me has been a source of tremendous strength. He undoubtedly lives in these pages, which I dedicate wholeheartedly to his memory.

## Chapter 1

### Posttraumatic Stress Disorder

#### History of Posttraumatic Stress Disorder

Although *posttraumatic stress disorder* (PTSD) was first recognized as a psychiatric disorder in 1980 (American Psychiatric Association, 1980), the deleterious effects of traumatic exposure have been chronicled for hundreds of years. Since the seventeenth century, posttraumatic emotional morbidity has been documented in victims of a wide variety of traumatic incidents. Although clinicians and researchers have used a multitude of names (e.g., *railway spine*, *combat neurosis*, and *shell shock*) to denote the constellation of symptoms that currently define PTSD, the same set of symptoms has characterized individuals' responses to various types of trauma throughout history. This chapter presents a review of the history of posttraumatic stress and PTSD from 1666 through the present day.

One of the earliest accounts of posttraumatic stress can be found in the diary of Samuel Pepys, a man who survived and chronicled the Great Fire of London in 1666 (Daly, 1983). Pepys recounted the events of September 2, a day on which over 300 houses were burned to the ground, and described the community's reaction to the fire as one of severe distress, writing, "great was our fear" (quoted in Daly, 1983, p. 65). Pepys' fear reaction lasted for several days. As described in his diary entry dated September 7, he "still, both sleeping and waking, had fear of fire in my heart" (quoted in Daly, 1983, p. 65). As many as 6 months later, Pepys suffered from recurrent nightmares, intrusive recollections of the fire, and insomnia. On February 18, 1667, he wrote, "It is strange to think how to this very day I cannot sleep at night without great terrors of fire; and this very night could not sleep till almost 2 in the morning through thoughts of fire" (quoted in Daly, 1983, p.66).

Accompanying the widespread increase in the use of the railway system as a means of passenger transport in the mid-nineteenth century was an increase in the number of railway accidents resulting in personal injury. Railway accident survivors often suffered from what was commonly referred to as railway spine, a condition characterized by neurological symptoms (e.g., limb numbness or paralysis) accompanied by increased irritability, fretfulness, emotional instability, and difficulty concentrating (Trimble, 1981). In 1885, surgeon Herbert Page concluded that these symptoms were psychological in origin and coined the term *general nervous shock* to replace railway spine, arguing that the fear and alarm invoked by the traumatic experience of a railway accident was “of itself sufficient” (quoted in Trimble, 1981, p. 29) to produce the persistent symptoms so often observed in railway accident survivors.

Indeed, as described by the writer Charles Dickens, who himself was in a rail accident, escaped an overturned train car, and spent the next several hours “among the dying and dead” (Forster, 1969, p. 293), railway accidents could be horrifying, and their psychological impact long-lasting. Some time after the accident, Dickens wrote:

I am getting right, though still low in pulse and very nervous. Driving into Rochester yesterday I felt more shaken than I have since the accident. I cannot bear railway travelling yet. A perfect conviction, against the senses, that the carriage is down on one side . . . comes upon me with anything like speed, and is inexpressibly distressing (quoted in Forster, 1969, p. 294).

Historically, interest and research in posttraumatic pathology have peaked during times of military combat (Davidson, 1995; Trimble, 1985). Physicians DaCosta (1871) and Mitchell, Morehouse and Keen (1864), who treated casualties of the American Civil War, described

hyperarousal, irritability, and elevated heart rate in soldiers exposed to combat. DaCosta dubbed this constellation of symptoms *irritable heart syndrome*.

During World War I, the term shell shock was used to describe the traumatic stress reactions observed in combat soldiers. Mott (1919) argued that while this term was derived from the belief that combatants' reactions were due to pathological changes in the nervous system caused by soldiers' proximity to exploding missiles, emotional shock was in fact the cause of the tremor, fatigue, headache, insomnia, extreme sensitivity to sudden noises or bright lights, terrifying dreams, inability to concentrate, and diminished libido he observed in a majority of so-called shell shock victims.

Similarly, Myers (1940) concluded that "emotions of extreme horror or fear" (p. 36) precipitated the shell shock he observed in thousands of World War I soldiers whose symptoms, in addition to those observed by Mott (1919), included irritability, emotional outbursts, depression, loss of appetite, sweating, and rapid pulse. For example, an officer who had been subjected to heavy fire "became abnormally irritable, . . . was found to be very depressed, with loss of . . . appetite and sleep, and . . . tremulous hands" (Myers, 1940, p. 48). Southard (1919), too, analyzed over 500 cases of shell shock and other neuropsychiatric disturbances in World War I combatants and concluded that shell shock was of psychological origin. In one case study, a 28-year-old infantry sergeant reported, "Shells dropped on the dug-out and killed the other chaps. I have not slept properly since this. If I go to sleep, I wake up seeing people killed, shells dropping and all kinds of horrid dreams about the war" (Southard, 1919, p. 446).

Psychiatrists Grinker and Spiegel (1945) studied the effects of combat stress on thousands of U.S. Army Air Force personnel who fought in World War II. They identified as *operational fatigue* a set of symptoms they observed most frequently in combat soldiers "with

nervous reactions” (Grinker & Spiegel, 1945, p. 212). These symptoms included irritability and aggressive behavior, sleeplessness, startle reaction, depression, difficulty concentrating, preoccupation with combat experiences, nightmares, and battle dreams. In one case study, a 23-year-old fighter pilot who had “narrowly escaped death” (Grinker & Spiegel, 1945, p. 86) on two occasions, once when his plane was caught in the explosion of his own bomb, and again when he nearly flew straight into the ridge of a mountain, was described as follows:

He began to dread going on missions. . . . He would lie awake at night, tense and anxious, and think about flying. He kept seeing the mountain suddenly flash in front of his field of vision. If he fell asleep, he dreamed that his plane had been disabled and was falling. . . . During the day, when he was at leisure, it was impossible to relax. He stopped playing cards with his friends because he could not concentrate (Grinker & Spiegel, 1945, p. 86).

In an investigation of *flying stress*, a clinical diagnosis developed in the 1920’s to describe the effects of stress to which fighter pilots were exposed, Symonds (1943) analyzed 2,000 cases of psychiatric disturbance in Great Britain’s Royal Air Force flying personnel who fought in World War II. He concluded that the incidence of “functional nervous disorder” (Symonds, 1943, p. 703) was proportionate to the amount of hazard flying personnel encountered and was precipitated by “a persistent state of fear” (Symonds, 1943, p. 705). Symptoms commonly observed included headache, insomnia, anxiety, depression, and preoccupation with anxiety-provoking stimuli.

Abram Kardiner (1941), a psychiatrist who treated American veterans of the first and second World Wars, believed that the traumatic stress reactions he observed in combat veterans were no different from those exhibited by civilian survivors of natural disasters. He used the term *traumatic neurosis* to refer to the set of symptoms he recognized as common to survivors of all

extreme stressors. Irrespective of the nature or severity of its precipitating traumatic experience, traumatic neurosis was characterized by five “constant features” (Kardiner, 1941, p. 86). These features included: a fixation on the trauma, redundant and perseverative dreams about the trauma, hypersensitivity to sensory stimuli, aggressive or violent emotional outbursts, and impaired general functioning due to such symptoms as loss of interest in work, distractibility, tremors, and a restricted range of affect.

In the early 1960’s, Israeli, Norwegian, German, and American researchers studied the impact of the chronic stress to which World War II concentration camp survivors had been exposed (Kinston & Rosser, 1974). Alternately dubbed *concentration camp syndrome*, *post-KZ syndrome*, and *survivor syndrome*, commonly observed symptoms included anxiety, nightmares, insomnia, excessive startle response, loss of concentration, and chronic depression with guilt and isolation (Kinston & Rosser, 1974). In his study of Danish concentration camp survivors, Eitinger (1961) noted that as many as 12 years after the war, many former prisoners were unable to adapt to normal life.

Modlin (1967) coined the term *postaccident anxiety syndrome* to describe the state of chronic anxiety he observed in patients referred for psychiatric evaluation following their experience of “frightening and potentially life-threatening” (p. 1009) accidents, including car collisions and work-site explosions. Symptoms of this syndrome included anxiety, restlessness, fatigability, insomnia, hypersensitivity to noise and commotion, impaired concentration and memory, repetitive nightmares in which the patient reexperienced the accident, sexual inhibition, and social withdrawal.

Other researchers have documented similar symptoms in disaster survivors. Leopold and Dillon (1963) examined seamen who survived the collision and subsequent explosion of the



Mission San Francisco gasoline tanker and Elna II freighter in the Delaware River in March of 1957. They assessed the psychological effects of the disaster both immediately following the collision and again four years later and were struck by “the almost monotonous similarity of the psychological patterns” (Leopold & Dillon, 1963, p. 919) they observed at the latter point in time. Of the 34 men examined at that time, an overwhelming majority reported mood, sleep, and affect disturbances that included restlessness, depression, phobic reactions, feelings of isolation, and hostility toward others. Leopold and Dillon (1963) further reported that a majority of collision survivors who resumed their work following the disaster suffered disabling psychiatric symptoms that subsequently resulted in their leaving their jobs or working reduced hours. Four years following the explosion, those who continued to work reported feeling anxious, nervous, and fearful at sea.

Following the 1972 Buffalo Creek disaster, in which an enormous dam collapsed and flooded the Buffalo Creek valley in southern West Virginia, Titchener and Kapp (1976) organized teams of mental health workers to interview survivors and assess the psychological effects of the flood. A *traumatic neurotic syndrome* was diagnosed in 80% of the survivors. More specifically, Titchener and Kapp observed “disabling psychiatric symptoms” (p. 296) in an overwhelming majority of survivors, including emotional outbursts, emotional numbness, loss of interest in former hobbies and sports, hallucinations and delusions, severe sleep disturbances and nightmares, haunting visual memories of blackened bodies and body parts, reenactments of the trauma, a sense of isolation, and feelings of alienation. These symptoms were evident up to 2 years after the disaster.

Coinciding with a growing interest in the psychiatric functioning of children at the turn of the twentieth century (Morris & Kratochwill, 1998), mental health practitioners began studying

the psychological effects of traumatic stress on youth in the 1900's. Psychiatrists Bender and Blau (1937) observed 16 youth, aged 5 to 12 years, who were referred to the Children's Ward of the Psychiatric Division of Bellevue Hospital after reportedly having sexual relations with adults. These children exhibited repetitive genital play, a markedly diminished interest in school often resulting in impaired academic performance, hyperactivity, and general restlessness.

Numerous mental health practitioners documented the psychological impact of air raids and forced evacuation on children living in Europe during World War II. The term *raid shock* (Burt, 1943; Mons, 1941) was used to describe the "great damage" (Mons, 1941, p. 625) observed in some children's psychological functioning following their exposure to "even a single 'harmless' air raid" (Mons, 1941, p. 625). In a survey of 8,000 British school children who had been exposed to air raids, psychiatrists at the Child Guidance Clinic in Bristol noted general nervousness, trembling, crying, aggressive behavior, enuresis, headaches, and dizziness (Bodman, 1941; Pritchard & Rosenzweig, 1942). Bodman (1941) examined children, aged 9 months to 13 years, following their exposure to a severe air raid on the Children's Hospital in Bristol, and documented "persistent signs of strain" (p. 486) that included nightmares, hypersensitivity to trauma-related stimuli (e.g., sirens, gas masks), nervousness, sleep disturbance, and enuresis. Carey-Trefzer (1949) sought to determine the extent to which youth who attended a child guidance clinic in London during and shortly after the war suffered from nervous symptoms. Of the 212 children treated at the clinic, 55% evidenced general anxiety, 33% exhibited withdrawn behavior, 31% suffered from school difficulties, 30% engaged in more aggressive behavior, and 20% exhibited sleep disturbances that had been precipitated by wartime exposure.

In a study of 420 children who had been referred to a child guidance clinic in rural England for psychological investigation following their forced evacuation from London, Alcock (1941) documented “psychoneurotic disorders” (p. 121) and educational difficulties in 25% and 17% of cases, respectively. Psychoneurotic disorders included anxiety, depression, and general nervousness, while educational difficulties consisted primarily of the inability to concentrate. Similarly, Brander (1943) noted anxiety, “strong depressive reactions” (p. 315), and night terrors in Finnish children following their forced evacuation from frontier zones during the Russo-Finnish War. A full year after the war ended, he observed after-effects of wartime exposure that included Finnish children’s war-themed play and physiological reactivity to war-related stimuli. For example, upon hearing sirens, children often “interrupted their play immediately, to return pale and trembling to their homes” (Brander, 1943, p. 319).

Researchers began to investigate the psychological impact of various disasters on youngsters in the latter half of the twentieth century. Bloch, Silber, and Perry (1956) visited Vicksburg, Mississippi following an incident wherein a tornado killed several children in a matinee cinema performance. Nearly one third of the 185 children included in the study exhibited mild to severe emotional disturbance, as manifested in general irritability, sensitivity to noise, phobic and avoidant responses to tornado-related stimuli, reexperiencing of the tornado in nightmares and repetitive play, and regressive behaviors such as enuresis and the loss of previously learned skills. In the wake of the collapse of the Buffalo Creek dam, psychiatric evaluations were conducted with 224 child survivors, a majority of whom were found to be significantly or severely emotionally impaired (Newman, 1976). Noted symptoms included depression, hopelessness, guilt, chronic anxiety, hyperactivity, clinginess, sleep disturbances, irritability, social withdrawal, enuresis, and temper outbursts (Newman, 1976).

In July of 1976, a school bus carrying 26 children in Chowchilla, California was hijacked by masked men with guns, who drove the children around in complete darkness before burying them alive in a truck-trailer for 16 hours. Terr (1981) interviewed 23 of the hijacking victims and noted “posttraumatic emotional sequelae” (p. 14) that included emotional outbursts, aggressive behavior, avoidance of stimuli associated with the incident, repetitive, kidnapping-themed dreams and play, and the reenactment of behaviors that occurred immediately before or during the trauma. Four years after the hijacking, the child victims continued to suffer from fear that the trauma would reoccur, repetitive nightmares and play, panic attacks, startle reactions, physical discomfort, and extreme anxiety when confronted with kidnapping-related stimuli. Additionally, nearly every one of them had the sense of a foreshortened future (Terr, 1983).

### **PTSD and the *Diagnostic and Statistical Manual of Mental Disorders (DSM)***

Prompted by a growing psychiatric case load and need to account accurately for all causes of morbidity during World War II (Raines, 1952), the American Psychiatric Association’s (APA) Committee on Nomenclature and Statistics published the first edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-I)* in 1952. The *DSM-I* assigned posttraumatic stress responses to the category of *transient situational personality disorders*, as posttraumatic stress was considered to be the temporary response of an otherwise “normal personality” (APA, 1952, p. 40) to an overwhelming situation. More specifically, the diagnosis of *gross stress reaction* was designated to describe the “acute symptom response” (APA, 1952, p. 40) of an individual who has been exposed to “severe physical demands or extreme emotional stress, such as in combat or in civilian catastrophe (fire, earthquake, explosion, etc.)” (APA, 1952, p. 40). Intended to serve only as a temporary diagnosis, gross stress reaction was to be replaced by a

“more definitive diagnosis” (APA, 1952, p. 40) in cases where symptoms failed to recede when the situational stress diminished.

Posttraumatic stress reactions were also described as being temporary or short-lived in the second edition of the *DSM (DSM-II)*, which was published in 1968. Assigned to the category of *transient situational disturbances*, “acute reaction[s] to overwhelming environmental stress” (APA, 1968, p. 49) occurring in “individuals without any apparent underlying mental disorders” (APA, 1968, p. 49) were indicated by the diagnosis of *adjustment reaction*. If symptoms persisted after the stress was removed, this diagnosis was to be replaced by one of a more permanent nature. Neither of the first two editions of the *DSM* specified operational criteria to be used in diagnosing posttraumatic stress reactions.

The diagnosis of PTSD first appeared in the *DSM-III*, published in 1980. Reflecting many of the advances that had been made in the field of psychological trauma during the 1970s (Davidson, 1995), as well as the expansion of the manual to include operational diagnostic criteria (Saigh & Bremner, 1999), the *DSM-III* PTSD classification was comprehensive and accompanied by a list of diagnostic criteria. “The essential feature” (APA, 1980, p. 236) of PTSD was described as “the development of characteristic symptoms following a psychologically traumatic event that is generally outside the range of human experience ” (APA, 1980, p. 236). Beyond mandatory exposure to “a recognizable stressor that would evoke symptoms of distress in almost everyone” (APA, 1980, p. 238), operational diagnostic criteria for PTSD included one of three reexperiencing symptoms, one of three symptoms indicative of a “numbing of responsiveness . . . or reduced involvement with the external world” (APA, 1980, p. 238), and two of six autonomic symptoms that were not apparent before the trauma (e.g., exaggerated startle response, memory impairment, sleep disturbance; APA, 1980). PTSD was no

longer regarded as strictly transient in nature, and a chronic, as well as acute, form of the disorder was represented.

Following the formal recognition of PTSD in the *DSM-III*, researchers and clinicians documented the disorder in young victims of war, accidents, and terrorist attacks. For example, Saigh (1987b, 1988, 1989a) determined that Lebanese children and adolescents developed PTSD following their ongoing exposure to civil war-related attacks and explosions. Within the context of the Cambodian genocide, Kinzie and colleagues (1986) initiated a longitudinal study involving a community of Cambodian adolescents who had emigrated to the United States after being severely traumatized as children in the Pol Pot concentration camps. The authors reported that half of their sample met *DSM-III* PTSD criteria. PTSD was also diagnosed in young victims of terrorist attacks. Pynoos et al. (1987) determined that a majority of survivors of a schoolyard sniper attack met *DSM-III* diagnostic criteria for PTSD. Similarly, Schwarz and Kowalski (1991) documented the disorder in elementary school students who had witnessed a school shooting. Within the context of accident research, Stoddard, Norman, and Murphy (1989) investigated children and adolescents who had been admitted to a pediatric burn center for reconstructive surgery after suffering severe burns. The authors determined that a sizable proportion of their sample met *DSM-III* criteria for PTSD.

A number of treatment studies demonstrated the efficacy of in vitro flooding in the treatment of PTSD, as it was described in the *DSM-III*. For example, Saigh (1987b) described the successful treatment of a 14-year-old Lebanese boy who had been abducted and tortured by a Lebanese militia. Six months after the abduction, the youth met criteria for PTSD as measured by the *DSM-III* version of the Children's PTSD Inventory (Saigh, 1989b). Following a course of prolonged exposure therapy, the boy reported clinically significant reductions in distress relative

to trauma-specific scenes he was asked to imagine. Clinically significant reductions in distress were also apparent on standardized measures of anxiety and depression at posttreatment and follow-up.

With the publication of a revised version of the *DSM-III* (*DSM-III-R*) in 1987, specific reference was first made to the unique manifestation of PTSD in children. Newly introduced, age-specific features of PTSD included repetitive play reflecting aspects of the trauma, generalized nightmares, and the sense of a foreshortened future in young children. Also new to this edition of the *DSM* were symptoms of active and “persistent avoidance of stimuli associated with the trauma” (APA, 1987, p. 247).

Over a period of 10 years, McLeer and colleagues (1988, 1992, 1994, 1998) used *DSM-III-R* diagnostic measures in several studies involving young victims of sexual abuse. Participants in these studies had experienced “sexual touching, with or without force, by anyone five or more years older” (McLeer, Deblinger, Henry, & Orvaschel, 1992, p. 875). The authors reported high rates of PTSD in this population. Using *DSM-III-R* diagnostic criteria, other researchers documented PTSD in young victims of physical abuse (Deblinger, McLeer, Atkins, Ralphe, & Foa, 1989; Pelcovitz et al., 1994).

Within the context of war-related research, Kinzie and colleagues (1989) reevaluated their original sample of young Cambodian refugees using *DSM-III-R* diagnostic criteria. The authors reported that a sizable proportion of their sample had PTSD. In 6- and 12-year follow-up studies involving the same sample of Cambodian refugees, Sack and colleagues (1993, 1999) determined that PTSD rates remained considerable in this population. Young refugees of civil wars in Afghanistan (Mghir, Freed, Raskin, & Katon, 1995) and Bosnia (Weine et al., 1995) were also found to meet *DSM-III-R* criteria for PTSD.

Using *DSM-III-R* diagnostic measures, a handful of researchers documented PTSD in young survivors of natural disasters. For instance, Najarian, Goenjian, Pelcovitz, Mandel, and Najarian (1996) diagnosed PTSD in Armenian children following their exposure to an earthquake measuring 6.9 on the Richter scale. Young survivors of the class IV hurricanes Hugo and Mitch were also found to meet *DSM-III-R* PTSD criteria (LaGreca, Silverman, Vernberg, & Prinstein, 1996; Shannon, Lonigan, Finch, & Taylor, 1994).

Following the publication of the *DSM-III-R*, work was initiated on the publication of a fourth edition of the psychiatric manual. Revisions to PTSD diagnostic criteria were driven by the findings of an APA-designated workgroup on PTSD, which was comprised of leading researchers in the field. The workgroup identified a number of key questions concerning the diagnosis of PTSD. These included questions regarding the course, duration, and subtypes of PTSD, as well as the nature of the stressor criteria (Criterion A). Other issues raised included the manifestation of PTSD symptoms in different victim groups, risk factors and community prevalence, the neurobiology of PTSD, and the relation of PTSD to simple phobia, dissociative disorders, and anxiety (Davidson & Foa, 1993). In an effort to resolve these issues, the PTSD workgroup conducted extensive literature reviews as well as clinical and community-based field trial studies (Davidson & Foa, 1993; Saigh & Bremner, 1999). Notably, children were not included in these field trials, which required that participants be at least 15 years old at the time of assessment (Kilpatrick & Resnick, 1993).

The findings of the PTSD workgroup resulted in the establishment of the *DSM-IV* PTSD criteria. Chief among the changes to *DSM-III-R* PTSD criteria was the removal of the Criterion A provision that the precipitating trauma be “outside the range of normal human experience” (APA, 1987, p. 247). Criterion A was revised to redefine exposure to a traumatic event as an



incident in which a person had “experienced, witnessed, or been confronted with an event or events that involve actual or threatened death or serious injury, or a threat to the physical integrity of self or others” (APA, 1994, p. 428). The criterion further specifies that a person’s response to a traumatic event must have “involved intense fear, helplessness, or horror” (APA, 1994, p. 428). Important additions to the *DSM-IV* PTSD classification were criteria E and F, which state that the duration of symptoms must be more than one month and that the disturbance must cause “clinically significant distress or impairment in social, occupational, or other important areas of functioning” (APA, 1994, p. 429), respectively. The *DSM-IV* criteria for PTSD are presented in Table 1.

Table 1

*DSM-IV Diagnostic Criteria for Posttraumatic Stress Disorder*

- 
- A. The person has been exposed to a traumatic event in which both of the following have been present:
1. the person has experienced, witnessed, or been confronted with an event or events that involve 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 reexperienced 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 dissociative 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 upon 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 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) of 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 of 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 3 months

**Chronic:** if duration of symptoms is 3 months or more

*Specify if:*

**With Delayed Onset:** if onset of symptoms is at least 6 months after the stressor

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*Note.* From *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*, (p. 428), by American Psychiatric Association, 1994, Washington, DC: American Psychiatric Association. Copyright 1994 by the American Psychiatric Association. Reprinted with permission.

Since the publication of the *DSM-IV*, a plethora of studies have documented PTSD in young victims of various types of traumatic experiences. In an investigation of war-traumatized youth, Geltman et al. (2005) reported that nearly one fifth of their sample of young Sudanese refugees who emigrated to the United States after surviving a brutal civil war in their native country met *DSM-IV* diagnostic criteria for PTSD. Also using *DSM-IV* diagnostic criteria, a number of researchers have diagnosed PTSD in young survivors of earthquakes (Hsu, Chong, Yang, & Yen, 2002; Roussos et al., 2005) and hurricanes (Goenjian et al., 2001). Jones, Ribbe,

Cunningham, Weddle, and Langley (2002) documented *DSM-IV* PTSD symptoms in children whose families had lost their homes in a major wildfire. In the wake of the massive tsunami of 2004 that devastated the shorelines of Indonesia, Sri Lanka, India, and Thailand, Thienkrua et al. (2006) found that young Thai survivors of the storm exhibited several *DSM-IV* PTSD symptoms.

In recent years, *DSM-IV*-based PTSD diagnoses have been made in children who were hospitalized for injuries sustained in automobile accidents (Keppel-Benson, Ollendick, & Benson, 2002; Stallard, Velleman, & Baldwin, 1999; Zink & McCain, 2003). Using *DSM-IV* diagnostic criteria, researchers have also documented PTSD in seriously ill children and adolescents who have undergone radical medical procedures, such as organ transplants (Mintzer et al., 2005; Shemesh et al., 2000), heart surgery (Connolly, McClowry, Hayman, Mahony, & Artman, 2004), and pediatric cancer treatment (Butler, Rizzi, & Handwerger, 1996; Pelcovitz et al., 1998). Finally, a handful of researchers have recently conducted studies involving young victims of terrorist attacks. Pfefferbaum et al. (2002) documented *DSM-IV* PTSD symptoms in youngsters who lived in Oklahoma City when the Alfred P. Murrah Federal Building was bombed. Similarly, children and adolescents who resided in New York City during the attack on the World Trade Center in 2001 have been found to exhibit *DSM-IV* PTSD symptoms (Fairbrother, Stuber, Galea, Fleischman, & Pfefferbaum, 2003; Hoven et al., 2005; Pfefferbaum, Stuber, Galea, & Fairbrother, 2006).

## **Summary**

For centuries, diarists, clinicians, and researchers have chronicled the enduring physical and psychological symptoms that develop in some individuals following their exposure to extremely stressful incidents and situations. Beginning in the 1900's, a growing interest in child psychiatry led mental health practitioners to investigate posttraumatic psychiatric morbidity in

stress-exposed youth as well as adults. Although identified by a host of terms prior to 1980, the same set of symptoms has characterized responses to various types of trauma throughout history. These symptoms include irritability, emotional instability, intrusive recollections of the trauma, sleep disturbance, and generally impaired functioning. PTSD was first formally recognized as a clinical disorder in the *DSM-III* in 1980. However, it was not until the *DSM-III-R* was published in 1987 that the diagnostic criteria for PTSD made specific reference to the expression of the disorder in youth. Extensive, empirically driven revisions were made to the PTSD classification prior to the publication of the *DSM-IV* in 1994. However, the clinical and community-based field trials that culminated in the *DSM-IV* PTSD diagnostic criteria did not involve youth below the age of 15 years.

## Chapter 2

### Epidemiology of Child-Adolescent Posttraumatic Stress Disorder

Epidemiological research regarding child-adolescent PTSD typically focuses on the frequency of PTSD in youngsters and specific factors that influence the distribution of this disorder among youth (Saigh, Yasik, Sack, & Koplewicz, 1999). As such, it provides essential information about traumatic stress responses (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995) and about the risk associated with traumatic exposure in youth (Kilpatrick et al., 2003). Such information may increase our understanding of the etiology, causes, and treatment of child-adolescent PTSD (Angold, Costello, & Erkanli, 1999). PTSD prevalence estimates may be used by policy makers to guide decisions regarding the allocation of resources for prevention and treatment (Saigh, Yasik, Sack et al., 1999). Given its importance, epidemiological research regarding PTSD in children and adolescents is the focus of this chapter. Following a discussion of stress exposure among youth, literature documenting the prevalence of PTSD in children and adolescents who were exposed to criminal victimization, war-related stressors, natural and industrial disasters and accidents, and life-threatening medical illnesses and procedures will be reviewed.

In preparing this review, PsycINFO and MEDLINE searches were conducted using descriptors including *posttraumatic stress disorder*, *PTSD*, *youth*, *children*, *adolescents*, *war*, *disaster*, *terrorism*, *fire*, *injury*, *road traffic accident*, *illness*, and *cancer*. The reference sections of all identified articles were examined to glean additional articles. Studies included in the current review were limited to those that used standardized measures to assess for a *DSM* diagnosis of PTSD and that reported PTSD prevalence rates. A chapter published by Saigh,

Yasik, Sack et al. (1999) was also reviewed, and 22 of the original 51 references from their work were examined and included.

### **Prevalence of Exposure to Stress**

Government statistics suggest that American children and adolescents are exposed to a disproportionate number of extreme stressors every year. For example, the United States Department of Justice's (2006) national crime statistics indicate that, between 1973 and 2005, teens and young adults consistently experienced the highest rates of violent crime in the nation. Between 1992 and 1994, Americans aged 12 to 24 suffered approximately half of all violent crimes committed, even though they constituted less than a quarter of the U.S. population at that time (United States Department of Justice, 1997). Similarly, more 16- to 20-year-old people were killed in motor vehicle accidents each year between 1996 and 2005 than Americans in any other age group (United States Department of Transportation, 2007). In 2005, an average of 640 American children were injured every day in motor vehicle accidents (United States Department of Transportation, 2006).

Several surveys investigating child-adolescent exposure to traumatic events in the United States have yielded high rates of violence exposure. In a large study of youngsters in urban America, Bell and Jenkins (1993) surveyed 536 elementary school students and 1,011 middle- and high-school students in south Chicago. Of the younger sample, 78%, 30%, and 26% reported that they had witnessed a beating, stabbing, and shooting, respectively. Thirty-four percent, 39.4%, and 23.5% of the adolescents surveyed endorsed having witnessed a stabbing, shooting, and killing, respectively. A large subset of the older sample reported having been directly victimized. Adolescents reported having been shot at (10.9%), threatened with a knife (22.7%) or gun (17%), stabbed (4.3%), shot (3.2%), and sexually assaulted (2.5%).

More recently, Schwab-Stone and colleagues (1995, 1999) administered written surveys to 5,348 adolescents in an urban public school system, more than one third of whom (36%) reported having directly experienced at least one type of violent act. Eighteen percent of the adolescents reported that they had been chased by a gang or individual, 18% reported being threatened with physical harm, and between 5% and 10% reported each of the following: being attacked or stabbed with a knife, being beaten or mugged, being seriously wounded, or being shot or shot at. Alarming, 46% of the adolescents in 1994 and 39% in 1996 endorsed that they had seen someone shot or shot at. More than 1 in 4 adolescents at both data collection points reported having seen someone being attacked or stabbed with a knife.

Despite growing public concern regarding youngsters' exposure to violence (Gabbay, Oatis, Silva, & Hirsch, 2004), relatively few researchers have documented the incidence of PTSD in community-based samples of youth. Giaconia et al. (1995) administered the National Institute of Mental Health (NIMH) Diagnostic Interview Schedule (DIS; Robins, Helzer, Cottler & Golding, 1989) to 384 eighteen-year-olds enrolled in a longitudinal study that began when they were 5 years old. The sample was originally drawn from a predominantly Caucasian, working class community in the northeastern United States. Giaconia et al. reported that 165 participants (43%) endorsed having experienced a trauma at some point in their lives. Of these, 14.5% met criteria for a lifetime diagnosis of PTSD. The authors reported a lifetime prevalence of 6.3% for the overall sample.

Cuffe et al. (1998) examined PTSD prevalence in a community-based sample of 490 twelfth-grade students in a suburban South Carolina school district. Using an author-devised, semistructured clinical interview, Cuffe et al. determined that 80 participants (15%) had experienced a traumatic event. Of these, 12.4% met *DSM-IV* criteria for PTSD. Three percent of

females and 1% of male subjects in the overall sample had PTSD. Being female, experiencing rape or child sexual abuse, and witnessing an accident or medical emergency were associated with increased risk of PTSD.

Using data from the National Survey of Adolescents (NSA), Kilpatrick et al. (2003) documented the prevalence of PTSD in a nationally representative sample of 4,023 youngsters aged 12 to 17 years. A modified version of the National Women's Study (NWS) PTSD Module (Kilpatrick, Resnick, Saunders, & Best, 1989) was administered to participants. The authors reported that 3.7% of boys and 6.3% of girls met *DSM-IV* criteria for PTSD. An additional finding was that nearly three fourths of all adolescents diagnosed with PTSD had at least one comorbid diagnosis. Sexual assault, physical assault, and having witnessed violence were associated with an increased risk of PTSD that was comorbid with a major depressive episode or substance abuse/dependence.

As may be seen in Table 2, studies that have documented the incidence of PTSD in representative samples of American youth determined that between 3% and 6.3% of young American females and 1% to 3.7% of their male counterparts met PTSD criteria. Of youth who experienced a traumatic event, between 12.4% and 14.5% developed PTSD.



Table 2

*Prevalence of PTSD in Community-Based Samples of American Youth*

Study	Measure	Sample		Prevalence of trauma exposure	PTSD prevalence
		<i>N</i>	Age		
Giaconia et al., 1995	NIMH DIS	384	18 years	43%	14.5% traumatized youth 6.3% overall sample
Cuffe et al., 1998	Author-devised <i>DSM-IV</i> interview	490	12 <sup>th</sup> grade students	15%	12.4% traumatized youth 3% of females 1% of males
Kilpatrick et al., 2003	<i>DSM-IV</i> NWS PTSD module	4,023	12-17 years	Not reported	6.3% of females 3.7% of males

*Note.* NIMH = National Institute of Mental Health; DIS = Diagnostic Interview Schedule; NWS = National Women's Study.

## **Criminal Victimization Studies**

In one of the first studies involving youth who were exposed to violent crime, Pynoos et al. (1987) assessed PTSD in 159 children aged 5 to 12 years following a sniper attack on their elementary school playground. Armed with a semiautomatic weapon and two shotguns, the sniper repeatedly shot at students on the playground, killing one child and injuring 13 others. Using the author-developed PTSD Reaction Index (Pynoos et al., 1987), Pynoos et al. interviewed a sample (14.5%) of the student body approximately 1 month after the incident. The authors determined that 60.4% of study participants met *DSM-III* criteria for PTSD, with 38.4% of children exhibiting moderate or severe PTSD symptoms and 22% reporting mild symptoms. Pynoos et al. also reported that PTSD prevalence was positively associated with degree of exposure to the event. While 94.3% of participants who were directly exposed to the sniper attack had PTSD, only 44.2% of children who were at home at the time of the shooting met PTSD criteria.

In a similar vein, Schwarz and Kowalski (1991) administered the *DSM-III* Reaction Index to 64 children 8 to 14 months after a woman went on a shooting spree in their elementary school, killing one child, injuring six students, and threatening others with several handguns while classmates watched. Conservative estimates indicated that 16% of participants met *DSM-III* criteria, 8% met *DSM-III-R* criteria, and 9% met proposed *DSM-IV* criteria for PTSD.

A handful of researchers have investigated PTSD prevalence in correctional settings for youth exhibiting criminal, often violent behaviors. For example, Steiner, Garcia, and Matthews (1997) assessed PTSD prevalence among 85 incarcerated boys aged 13 to 20, the majority of whom had committed rape, robbery, or other violent crimes. A nonclinical comparison group of 79 adolescent males was recruited from a nearby high school. Using the PTSD module of the

Psychiatric Diagnostic Interview – Revised (PDI-R; Othmer, Penick, Powell, Read, & Othmer, 1981), Steiner et al. determined that 31.7% of the juvenile delinquents met *DSM-III-R* criteria for PTSD, as compared to only 9.3% of the comparison group. The most commonly reported traumatizing stressors included intra-familial violence, such as abuse, murder, and grave injury, and witnessing gang-related violence in the community. Only 5% of PTSD-positives identified their own committing offense as the precipitating trauma.

In a similar study, Cauffman, Feldman, Waterman, and Steiner (1998) administered the PTSD module of the PDI-R (Othmer et al., 1981) to 96 incarcerated female juvenile delinquents. Seventy-four percent, 76%, and 60% of the sample, respectively, reported having been badly hurt or in danger of being hurt, raped or in danger of being raped, and having witnessing someone severely injured or killed. Cauffman et al. reported a PTSD point prevalence of 48.9% and a lifetime prevalence of 65.3%.

In a study of stress-exposed urban youth, Lipschitz, Rasmusson, Anyan, Cromwell, and Southwick (2000) assessed 90 female adolescents aged 12 to 21 years who presented for routine medical appointments at an inner-city primary care clinic. An overwhelming majority of participants (92%) reported having experienced at least one trauma. The most common traumatic events endorsed were witnessing community violence (85.6%) and hearing about a homicide (65.8%). Administration of the Child PTSD Checklist (Newman & Amaya-Jackson, 1996) revealed that 13% of the overall sample met *DSM-IV* criteria for PTSD. Of the girls who had been traumatized, 14.4% presented with symptoms warranting a diagnosis of PTSD. Lipschitz et al. reported that PTSD was significantly associated with depression, cigarette and marijuana use, poor school performance, and criminal arrest.

More recently, Dixon, Howie, and Starling (2005) documented the rate of PTSD in 100

incarcerated Australian female offenders aged 13 to 19 years. More than two thirds of participants reported having witnessed a violent crime (70%) and being confronted with traumatic news (66%). Fifty percent and 49% of the sample, respectively, endorsed having been sexually and physically abused. Administration of the Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS-PL; Kaufman, Birmaher, Brent, Rao, & Ryan, 1996) revealed a PTSD point prevalence of 20% and lifetime prevalence of 17%, with sexual abuse the precipitant in an overwhelming 70% of cases. Notably, comorbid diagnoses were present in all cases of PTSD. Dixon et al. determined that offenders with PTSD were significantly more likely than their PTSD-negative counterparts to report comorbid depression, substance/alcohol abuse or dependence, other anxiety disorders, psychoses, and eating disorders. Participants with PTSD were also more likely to have attempted suicide.

Community-based surveys have assessed PTSD in youth who lived in New York City at the time of the World Trade Center attacks in September of 2001. Six months after the attacks, Hoven et al. (2005) administered the Diagnostic Interview Schedule for Children (DISC) Predictive Scales (DPS; Lucas et al., 2001) to a random, representative sample of 8,236 New York City public school students in grades 4 through 12. A screening measure derived from the DISC-IV, the DPS includes only the DISC items that are most predictive of *DSM-IV* DISC diagnoses. Hoven et al. reported that 10.6% of their sample had probable PTSD. They also determined that there was a significant dose-response effect, with higher rates of probable PTSD among children who had higher levels of exposure, as measured by an author-devised questionnaire that assessed the extent to which participants and any of their family members directly witnessed or were injured in the attack. Females and younger children had significantly higher rates of probable PTSD than males and older children, respectively.

Pfefferbaum, Stuber, Galea, and Fairbrother (2006) surveyed a community sample of 161 adolescents who lived in New York City at the time of the World Trade Center attacks. Participants ranged from 12 to 17 years of age and were interviewed over the telephone 6 to 9 months following the incident. Using the UCLA Adolescent PTSD Index (Pynoos, Rodriguez, Steinberg, Stuber, & Frederick, 1998), Pfefferbaum and her colleagues determined that 12.6% of their sample reported symptoms consistent with a probable diagnosis of PTSD. The authors also reported that an additional 26.2% of the subjects had subthreshold PTSD symptoms.

### **Sexual and/or physical abuse studies.**

Much research has been conducted examining the prevalence of PTSD in young victims of sexual and/or physical abuse. McLeer, Deblinger, Atkins, Foa, and Ralphe (1988) administered an author-devised, *DSM-III-R* PTSD symptom checklist to 31 sexually abused children and adolescents at an outpatient psychiatric unit, 48.4% of whom met criteria for PTSD. The authors reported that 75% of subjects who had been abused by their natural fathers and 25% of those who were victimized by trusted adults met criteria, as opposed to none of the children abused by older children.

Deblinger, McLeer, Atkins, Ralphe, and Foa (1989) compared the prevalence of PTSD across 29 sexually abused, 29 physically abused, and 29 non-abused psychiatrically hospitalized children ranging in age from 3 to 13 years old. Using an author-devised symptom checklist, Deblinger et al. determined that 20.7%, 6.9%, and 10.3% of the sexually abused, physically abused, and non-abused children, respectively, met *DSM-III-R* criteria for PTSD. While the difference in PTSD prevalence rates across groups was not significant, the authors reported that sexually and physically abused participants exhibited significantly more avoidant symptoms than their non-abused counterparts.

Famularo, Kinscherff, and Fenton (1992) examined psychiatric morbidity in severely maltreated children between 5 and 10 years of age. The authors administered the Diagnostic Interview for Children and Adolescents, Revised 6<sup>th</sup> Version (DICA-6-R; Reich & Welner, 1988) to 96 children, 61 whose parents had legal charges of child abuse or multiple child abuse reports filed against them, and 35 of whom served as controls. The parents of participants were also interviewed using the DICA-6-R. Famularo et al. reported that 39.3% of the maltreated children, by their own report, met *DSM-III-R* diagnostic criteria for PTSD, as opposed to none of the controls. Parents of abused youth reported less psychopathology, endorsing a PTSD prevalence rate of 21.31% in their children. The authors did not differentiate between those children who were sexually maltreated and those who were physically maltreated.

McLeer, Deblinger, Henry, and Orvaschel (1992) examined psychiatric morbidity in 92 sexually abused children aged 3 to 16 whom the authors recruited from an outpatient diagnostic and treatment center. The authors determined that nearly half (43.9%) of the sample met *DSM-III-R* criteria for PTSD. While a majority of subjects who had been abused by their natural fathers (53.8%) met PTSD criteria, a significantly smaller percentage of those abused by a stranger (10%), and none of those victimized by an older child warranted a diagnosis of PTSD. A randomly selected subset of this sample (26 sexually abused children) was subsequently compared to a matched sample of non-sexually abused children referred for psychiatric outpatient evaluations (McLeer, Callaghan, Henry, & Wallen, 1994). Using the Kiddie Schedule for Affective Disorders and Schizophrenia for School Age Children – Epidemiologic Version (K-SADS-E; Orvaschel, Puig-Antich, Chambers, Tabrizi, & Johnson, 1982; Orvaschel, Weisman, Padier, & Lowe, 1981), McLeer et al. (1994) determined that sexually abused youth were significantly more likely than non-abused controls to exhibit symptoms consistent with a

diagnosis of PTSD; 42.3% of sexually abused children met *DSM-III-R* PTSD criteria compared with 8.7% of non-sexually abused children.

Merry and Andrews (1994) examined psychiatric morbidity in 66 sexually abused children aged 4 through 16 who were recruited from child welfare agencies throughout New Zealand. The authors administered a semistructured, *DSM-III-R*-based interview to participants and the DISC-2 (Shaffer, Fisher, Piacenti, Schwab-Stone, & Wicks, 1989) to their non-abusing parents 12 months after the disclosure of recent sexual abuse. They reported that 18.2% of their sample had PTSD.

In a study of the psychological impact of physical abuse on adolescents, Pelcovitz et al. (1994) compared 27 physically abused youngsters to a random community sample of 27 non-abused controls. Physically abused participants were recruited from the New York State central register for abuse. Using the PTSD module of the Structured Clinical Interview for Diagnosis (SCID; Spitzer, Williams, & Gibbon, 1987), Pelcovitz et al. determined that 11.1% of the abused adolescents met *DSM-III-R* PTSD criteria, as opposed to none of the non-abused controls. The difference in PTSD prevalence rate between groups was not significant.

McLeer et al. (1998) administered the K-SADS-E (Orvaschel et al., 1981, 1982) to 80 nonclinically referred children aged 6 to 16 who disclosed to the Philadelphia Department of Human Services that they had been sexually abused. In all cases, data collection occurred 30 to 60 days after the sexual abuse had been disclosed and terminated. McLeer et al. also interviewed a school-based comparison group of 73 students and a group of 99 non-sexually abused children referred for psychiatric outpatient evaluations. The authors reported that a significantly greater number of sexually abused youth (36.3%) met criteria for PTSD than did youth in either of the comparison groups. A majority of sexually abused youths who did not meet full *DSM-III-R*

criteria exhibited subthreshold PTSD symptoms.

Ackerman, Newton, McPherson, Jones, and Dykman (1998) assessed 127 sexually abused youngsters, 43 physically abused youngsters, and 34 children who had been both sexually and physically abused. Participants ranged in age from 7 to 13 years old and were referred to the study by inpatient and outpatient evaluation and treatment centers. The authors administered the DICA (Reich & Welner, 1988) to subjects and their parents. Using an author-devised algorithm to reconcile parent and child reports, Ackerman et al. determined that 34% of the combined sample had PTSD. The authors reported a significantly higher PTSD prevalence rate in children who had been both sexually and physically abused (55%) than in youngsters who were sexually (32%) or physically (26%) abused.

More recently, Pelcovitz, Kaplan, DeRosa, Mandel, and Salzinger (2000) compared 57 physically abused adolescents to 32 adolescents who were both physically abused and exposed to inter-parental violence, as measured by a structured family interview that assessed the frequency with which one parent was hit, slapped, threatened with a weapon, or pushed by their adult partner. Also included in the study was a non-abused random community sample of 96 adolescents whose parents reported no familial violence. Participants were interviewed using the PTSD module of the Structured Clinical Interview for the *DSM-III-R* (SCID-NP; Spitzer, Williams, Gibbon, & First, 1990). Pelcovitz et al. reported that participants who both experienced and witnessed physical abuse in their homes were significantly more likely than youngsters in the other two groups to develop PTSD. While 19% of subjects with double exposure to domestic violence met criteria for a lifetime diagnosis of PTSD, only 2% and 4% of physically abused adolescents and non-abused controls, respectively, received lifetime PTSD diagnoses.



Table 3 presents an overview of the crime-related child-adolescent PTSD studies referenced in this section. In these samples, PTSD prevalence rates ranged from 0% to 75%. Reported intervals between stress exposure and data collection ranged from 1 to 18 months.

Table 3

*Prevalence of Criminal Victimization-Related PTSD*

Study	Measure	Subjects		Time Since Trauma	PTSD prevalence
		Gender	Age		
<b>Criminal victimization studies</b>					
Pynoos et al., 1987	<i>DSM-III</i> Reaction Index	80 males; 79 females	5-12 years	1 month	60.4%
Schwarz & Kowalski, 1991	<i>DSM-III</i> Reaction Index	32 males; 32 females	5-14 years <i>M</i> = 8.6 years	6-14 months	16% <i>DSM-III</i> criteria 8% <i>DSM-III-R</i> criteria 9% <i>DSM-IV</i> criteria
Steiner et al., 1997	<i>DSM-III-R</i> PDI-R	85 incarcerated males	13-20 years	Not reported	31.7%
Cauffman et al., 1998	<i>DSM-III-R</i> PDI-R	96 incarcerated females	13-22 years	Not reported	48.9% point prevalence 65.3% lifetime prevalence
Lipschitz et al., 2000	<i>DSM-IV</i> Child PTSD Checklist	90 females	12-21 years	Not reported	14.4% stress-exposed 13% overall sample
Dixon et al., 2005	<i>DSM-IV</i> K-SADS-PL	100 incarcerated females	13-19 years <i>M</i> = 16.5 years	Not reported	20% point prevalence 17% lifetime prevalence
Hoven et al., 2005	<i>DSM-IV</i> DPS	3920 males; 4316 females	Grades 4-12	6 months	10.6% probable PTSD
Pfefferbaum et al., 2006	<i>DSM-IV</i> UCLA PTSD Index	161 adolescents; Gender not reported	12-17 years	6-9 months	12.6% probable PTSD 26.2% subthreshold PTSD symptoms

Sexual &/or physical abuse studies					
McLeer et al., 1988	<i>DSM-III-R</i> Author-devised interview	6 males; 25 females	<i>M</i> = 8.4 years	Not reported	48.4% overall 75% father 25% trusted adult 0% older youth
Deblinger et al., 1989	<i>DSM-III-R</i> Author-devised interview	46 males; 41 females	3-13 years	Not reported	20.7% sexually abused 6.9% physically abused 10.3% non-abused, psychiatric inpatients
Famularo et al., 1992	<i>DSM-III-R</i> DICA-6-R	27 males; 34 females	5-10 years	Not reported	39.3%
McLeer et al., 1992	<i>DSM-III-R</i> Author-devised interview K-SADS-E	21 males; 71 females	3-16 years; <i>M</i> = 8.9 years	Not reported	43.9% overall 53.8% father 10% adult stranger 0% older youth
McLeer et al., 1994	<i>DSM-III-R</i> K-SADS-E	17 males; 9 females	6-16 years; <i>M</i> = 9 years	Not reported	42.3%
Merry & Andrews, 1994	<i>DSM-III-R</i> DISC-2	11 males; 55 females	4-16 years	12-18 months	18.2%
Pelcovitz et al., 1994	<i>DSM-III-R</i> SCID	12 males; 15 females	<i>M</i> = 15.1 years	Not reported	11.1%
McLeer et al., 1998	<i>DSM-III-R</i> K-SADS-E	15 males; 65 females	6-16 years; <i>M</i> = 9 years	≥ 30 days	36.3%
Ackerman et al., 1998	<i>DSM-III</i> DICA	73 males; 131 females	7-13 years	≥ 4 weeks	34% overall 55% sexually and physically abused 32% sexually abused 26% physically abused
Pelcovitz et al., 2000	<i>DSM-III-R</i> SCID-NP	41 males; 48 females	12-18 years; <i>M</i> = 15.4 years	Not reported	19% physically abused in violent families 2% physically abused

*Note.* *M* = mean age; PDI-R = Psychiatric Diagnostic Interview – Revised; K-SADS-PL = Schedule for Affective Disorders and

Schizophrenia for School-Age Children; DPS = Diagnostic Interview Schedule for Children (DISC) Predictive Scales; DICA-6-R = Diagnostic Interview for Children and Adolescents, Revised 6<sup>th</sup> Version; K-SADS-E = Kiddie Schedule for Affective Disorders and Schizophrenia for School-Age Children – Epidemiologic Version; DISC-2 = Diagnostic Interview Schedule for Children, Version 2; SCID = Structured Clinical Interview for Diagnosis; DICA = Diagnostic Interview for Children and Adolescents; SCID-NP = Structured Clinical Interview for *DSM-III-R*, Non-Patient Version.

## War-Related Studies

### War victim studies.

PTSD has also been documented in young survivors of war. For instance, Saigh (1989c) examined emotional morbidity in 840 Lebanese children aged 9 through 12 who were referred for assessment following their exposure to civil war-related stressors. Using the Children's PTSD Inventory (Saigh, 1987a), Saigh determined that 231 participants (27.5% of the sample) exhibited symptoms warranting a *DSM-III* diagnosis of PTSD. In a similar study involving 92 Lebanese adolescents, Saigh (1988) observed a PTSD point prevalence of 29.3%, as measured by the Children's PTSD Inventory.

In an examination of the psychological impact of the Persian Gulf War on Israeli youngsters, Schwarzwald, Weisenberg, Waysman, Solomon, and Klingman (1993) assessed 492 schoolchildren in grades 5 (age 11), 7 (age 13), and 10 (age 16) who were living in Israel when it was bombarded with 39 SCUD missiles in 18 different attacks over 6 weeks. During that time, requisite safety precautions included traveling everywhere with a gas mask and seeking shelter in sealed rooms during attacks. Three hundred and ten participants were sampled from a region that was hit by 17 missiles in three direct attacks, while the remainder of the sample lived in an area that suffered no actual missile hits. Using an author-modified, *DSM-III-R* version of the Child Post-Traumatic Stress Reaction Index (Frederick & Pynoos, 1988), Schwarzwald et al. determined that 24.9% of participants who resided in the region directly impacted by the attacks had PTSD. Significantly fewer youngsters (12.9%) in the area not hit by SCUD missiles met *DSM-III-R* PTSD diagnostic criteria.

Within the context of the Lebanese civil war, Saigh, Mroueh, and Bremner (1997) administered the Children's PTSD Inventory (Saigh, 1989) to 95 randomly selected, non-referred

Lebanese adolescents enrolled in six private Lebanese schools. Participants were assessed at a time when war-related attacks and explosions were occurring regularly throughout Lebanon. Of the 95 students assessed, 30 endorsed having been exposed to extreme forms of war-related stress. Saigh et al. determined that 14 subjects met *DSM-III* criteria for PTSD, representing 46.6% of participants who had been traumatized, or 14.7% of the entire sample.

Goldstein, Wampler, and Wise (1997) assessed emotional morbidity in 358 predominantly Muslim Bosnian children aged 7 through 12 years who had been forced by civil war to flee their homes and live with their parents in rural refugee camps in central Bosnia-Herzegovina. According to parent reports, 64.2% of participants had a significant person in their life killed in the war, 39.8% witnessed the violent death of a parent or sibling, and 23.5% were physically threatened or tortured by the military or police. Using an adaptation of the Sead Picture Survey tool, a cartoon-based interview instrument that was modified by the authors to depict child war victims and refugees living in war-zone collective centers, Goldstein et al. determined that an overwhelming 93.8% of their sample met *DSM-IV* criteria for PTSD.

Allwood, Bell-Dolan, and Husain (2002) administered the PTSD Reaction Index (Pynoos et al., 1987) to 791 children aged 6 to 16 years who lived and attended school in Sarajevo while the city was under siege for more than 600 days in 1994 during the Bosnian civil war. In terms of traumatic stressors, 79.4% of participants reported the death of a family member, 73.4% had family members wounded during the war, and 72.8% were exposed to close shootings. Allwood et al. reported a PTSD point prevalence rate of 41%. The authors also determined that there was an additive effect of trauma exposure on trauma reactions, such that the number of traumatic experiences reported was significantly correlated with the number of posttraumatic symptoms endorsed.

### **War refugee studies.**

Many researchers have studied the psychological impact of war-related stressors and emigration in young refugees. For example, a handful of researchers (Kinzie, Sack, Angell, Clarke, & Ben, 1989; Kinzie, Sack, Angell, & Manson, 1986; Sack et al., 1993; Sack, Him, & Dickason, 1999) have extensively studied a cohort of 40 Cambodians who resettled in the United States after being severely traumatized as children during the Pol Pot regime in their homeland. As young children in Cambodia, subjects endured separation from family, forced labor in work camps, direct personal injury, and starvation. Some had witnessed the execution of family members. Kinzie et al. (1986) administered the *DSM-III* version of the Diagnostic Interview Schedule (DIS; Robbins, Helzer, Croughan, & Ratcliff, 1981) to this group roughly 2 years after their arrival in the United States at an average age of 17. The authors reported a PTSD point prevalence of 50%. Thirty of the original 40 youth were reinterviewed 3 years later (Kinzie et al., 1989), at which time 48% of the sample met *DSM-III-R* diagnostic criteria for PTSD.

In an effort to examine the natural course of PTSD across the developmental transition from adolescence to young adulthood, Sack et al. (1993) conducted a 6-year follow-up study of the Cambodian cohort when participants averaged 23 years of age. The authors administered the PTSD module of the *DSM-III* version of the DICA (Welner, Reich, Herjanic, Jung, & Amado, 1987) to 31 of the original subjects and reported a PTSD point prevalence of 38%. The decline in PTSD from 3-year follow-up to 6-year follow-up was nonsignificant. Thirty-one of the original study participants were interviewed for the fourth and final time in 1996 (Sack et al., 1999). Using the PTSD module of the DICA (Welner et al., 1987), Sack et al. (1999) determined that 35% of the sample met *DSM-III* criteria for PTSD.

In a larger study, Sack and his colleagues (1994) administered the PTSD section of the

*DSM-III* version of the DICA (Werner et al., 1987) to a randomly selected sample of 209 Khmer youth, aged 13 to 25 years, who had resettled with their parents in the northwest continental United States. Participants had lived in Cambodia during the Pol Pot regime and had ranged in age from infancy through 12 years old at the time. Sack et al. reported a PTSD point prevalence of 18.2% and lifetime prevalence of 21.5%. A diagnosis of PTSD was strongly related to age, with older adolescents significantly more likely to receive a PTSD diagnosis.

Similarly, Mghir, Freed, Raskin, & Katon (1995) examined the prevalence of PTSD among a community sample of adolescent and young adult refugees from Afghanistan who had immigrated to the Seattle, Washington metropolitan area with their families. Participants had been traumatized as children or adolescents during the Soviet invasion of Afghanistan and ensuing civil war. Fifty-nine percent of the sample reported having one or more experiences of being close to death, 27% had witnessed the murder of strangers, 26% had suffered from a lack of food and water, and 21% had experienced the unnatural death of a family member or friend. Mghir et al. administered the Clinician-Administered PTSD Scale (CAPS; Blake et al., 1990) to 38 adolescents and young adults ranging in age from 12 to 24 years and reported that 5 of the 38 subjects (13.2%) met *DSM-III-R* criteria for PTSD.

Weine et al. (1995) conducted clinical assessments of 12 Bosnian refugees aged 12 to 19 years who had resettled in the United States after escaping genocide in former Yugoslavia. Traumas suffered by participants in their homeland included the destruction of their homes and belongings, forced evacuation from their towns, serious lack of food and water, exposure to acts of violence or death, and forced emigration. Nine of the participants had resettled with their families of origin, while three had left their families behind in Bosnia. Weine et al. administered the Posttraumatic Stress Disorder Symptoms Scale (PSS; Foa, Riggs, Dancu, & Rothbaum,



1993) to the refugees during their first year in the United States and reported a PTSD point prevalence of 25%.

In another study of young refugees in the United States, Geltman et al. (2005) administered the Harvard Trauma Questionnaire (HTQ; Mollica et al., 1992) to 241 Sudanese minors in refugee foster care programs. Participants had been forced by civil war to flee their burning villages as very young children and trek hundreds of miles through the desert to seek refuge in Kenya. A majority of the youths reported witnessing close friends or family being tortured (60%), injured (74%), or killed (76%). Twenty percent of the sample reported having been tortured themselves. Geltman et al. determined that 20% of the sample scored in the *DSM-III-R* diagnostic range for PTSD approximately 1 year after coming to the United States. The authors also reported that PTSD was significantly associated with having been separated from immediate family and directly injured or tortured. Experiences in the United States that were associated with PTSD included living in a group home or being in foster care alone with an American family, feeling lonely or isolated, and less participation and satisfaction with group activities.

Table 4 presents a summary of the cited war-related, child-adolescent PTSD studies. The prevalence estimates derived from these investigations range from 12.9% to 93.8%. Reported intervals between stress exposure and data collection varied widely, ranging from 4.2 to 21 years.

Table 4

*Prevalence of War-Related PTSD*

Study	Measure	Subjects		Time Elapsed Since Trauma	PTSD prevalence
		Gender	Age		
War Victim Studies					
Saigh, 1988	<i>DSM-III</i> Children's PTSD Inventory	42 males; 50 females	<i>M</i> = 13 years	Not reported	29.3%
Saigh, 1989c	<i>DSM-III</i> Children's PTSD Inventory	403 males; 437 females	9-12 years	Not reported	27.5%
Schwarzwald et al., 1993	<i>DSM-III-R</i> Reaction Index	227 males; 265 females	Grades 5, 7, 10	Not reported	24.9% high-impact 12.9% low-impact
Saigh et al., 1997	<i>DSM-III-R</i> Children's PTSD Inventory	95 adolescents	Not reported	<i>M</i> = 4.2 years	14.7%
Goldstein et al., 1997	<i>DSM-IV</i> Author-devised interview	167 males; 191 females	7-12 years	Not reported	93.8%
Allwood et al., 2002	<i>DSM-III</i> Reaction Index	389 males; 402 females	6-16 years	Not reported	41%

War Refugee Studies					
Kinzie et al., 1986	<i>DSM-III</i> DIS	25 males; 15 females	<i>M</i> = 17 years	5-9 years	50%
Kinzie et al., 1989	<i>DSM-III-R</i> DIS	20 males; 10 females	<i>M</i> = 20 years	8-12 years	48%
Sack et al., 1993	<i>DSM-III</i> DICA	22 males; 9 females	<i>M</i> = 23 years	11-15 years	38%
Sack et al., 1994	<i>DSM-III-R</i> DICA	104 males; 105 females	<i>M</i> = 19.8 years	13 years	18.2% point prevalence 21.5% lifetime prevalence
Sack et al., 1999	<i>DSM-III-R</i> DICA	17 males; 14 females	<i>M</i> = 29 years	17-21 years	35%
Mghir et al., 1995	<i>DSM-III-R</i> CAPS	21 males; 17 females	12-24 years	Not reported	13.2%
Weine et al., 1995	<i>DSM-III-R</i> PSS	7 males; 5 females	12-19 years <i>M</i> = 15.6 years	Not reported	25%
Geltman et al., 2005	<i>DSM-III-R</i> HTQ	241 males	<i>M</i> = 17.6 years	Not reported	20%

*Note.* *M* = mean; DIS = Diagnostic Interview Schedule; DICA = Diagnostic Interview for Children and Adolescents; CAPS = Clinician-Administered PTSD Scale; PSS = Posttraumatic Stress Disorder Symptom Scale; HTQ = Harvard Trauma Questionnaire.

## **Disaster/Accident Studies**

A number of researchers have examined emotional morbidity in young survivors of industrial disasters, natural disasters, such as earthquakes, hurricanes, and tsunamis, and accidents.

### **Earthquake studies.**

Bradburn (1991) examined child survivors of a major earthquake that struck the San Francisco Bay area in 1989. Six to 8 months following the earthquake, Bradburn administered the PTSD Reaction Index (Frederick & Pynoos, 1998) to 22 children aged 10 to 12 years who lived in three different Bay Area communities at the time of the earthquake. The authors determined that 27% and 36% of the sample reported experiencing moderate and mild levels of PTSD symptomatology, respectively. Notably, participants that lived within a mile of the earthquake-induced collapse of a highway that killed many people were more likely to have experienced stress-related symptoms than were children who lived further away.

Najarian et al. (1996) administered the PTSD module of the revised DICA (DICA-R; Kaplan & Reich, 1991) to 49 children aged 11 to 13 years who were living in Gumri, Armenia when the city was struck by an earthquake measuring 6.9 on the Richter scale. Twenty-five of these children remained in Gumri after the earthquake, living in tents while their homes were rebuilt and attending schools in newly constructed temporary buildings. Twenty-four subjects left Gumri immediately following the earthquake and resettled with their families in Yerevan, a city that was only mildly damaged during the earthquake. Najarian et al. also evaluated a comparison group of 25 children who lived and attended schools in Yerevan during the earthquake. The authors determined that 32% and 28% of the current and former residents of

Gumri, respectively, met *DSM-III* criteria for PTSD. In contrast, only one child in Yerevan (4% of the comparison group) had PTSD.

Hsu et al. (2002) investigated 323 junior high school students 6 weeks after an earthquake measuring 7.3 on the Richter scale struck their hometown of Chungliao, Taiwan in September of 1999. Participants ranged in age from 12 to 14. The authors reported that 10% of the sample had close family members who died in the earthquake, 27% witnessed others being hurt, 12% had physical injuries, and 3% had been trapped in the rubble. Using the clinician-administered Children's Interview for Psychiatric Syndromes (ChIPS; Rooney, Fristad, Weller, & Weller, 1999), Hsu et al. determined that 21.7% of subjects met *DSM-IV* criteria for a diagnosis of PTSD. The authors also indicated that PTSD was significantly associated with having been physically injured during the earthquake and with the death of a household family member.

Three months after an earthquake measuring 5.9 on the Richter scale struck just north of Athens, Greece, Roussos et al. (2005) administered the UCLA PTSD Reaction Index (Pynoos et al., 1998) to 1,685 elementary, junior high, and high school students who resided in the city at the epicenter of the earthquake. Of these youth, 4.9% reported the loss of a close friend, and 38% endorsed that their homes had been seriously damaged as a result of the earthquake. The authors also evaluated a comparison group of 252 youth from a city located 10 kilometers from the epicenter, where no lives had been lost and where there was significantly less property damage. Roussos et al. reported a PTSD point prevalence estimate of 4.5% for both cities combined, with no significant differences in PTSD rates between cities.

### **Hurricane studies.**

In a large study conducted 3 months after Hurricane Hugo, Shannon et al. (1994) administered a self-report version of the Frederick Reaction Index for Children (RI; Frederick, 1985) to 5,687 school-aged youth living in a rural area of South Carolina that had been devastated by the class IV storm. The authors determined that 5.4% of their sample met *DSM-III-R* criteria for PTSD. Significant gender and age effects were reported, with more females and children under the age of 12 developing PTSD than males and older adolescents.

Several researchers assessed PTSD in young survivors of Hurricane Andrew, a class IV hurricane that killed 40 people in Dade County, Florida. Using a modified version of the DIS (Kilpatrick et al., 1989), Garrison et al. (1995) determined that 7.3% of the 400 adolescent participants in their study met *DSM-III-R* PTSD criteria. Significant correlates of PTSD included increasing age and being female. LaGreca, Silverman, Vernberg, and Prinstein (1996) administered an author-modified, *DSM-III* version of the PTSD Reaction Index (Frederick, Pynoos, & Nader, 1992) to students in the third, fourth, and fifth grades at three elementary schools severely affected by the storm. Four hundred and forty-two children were evaluated 3, 7, and 10 months after the hurricane, and the authors reported respective PTSD prevalence rates of 39.1%, 24%, and 18.1%.

More recently, Goenjian et al. (2001) examined the prevalence of PTSD among 158 Nicaraguan adolescents 6 months after Hurricane Mitch caused massive destruction in Central America. Participants resided in three cities that suffered varying degrees of storm-inflicted damage. Of the subjects who lived in a city located in the most devastated region of the country, 31% reported the death of a family member, 27% were seriously hurt, and 63% lived in homes that were destroyed or severely damaged during the storm. The second cohort resided in a city

where there was massive flooding but considerably less property damage. Fifteen percent and 13% of this group, respectively, suffered the loss of family and serious injury. In contrast, only a handful of participants who resided in a third city were hurt or lost a home or family member in the storm. Using empirically derived cutoff scores on the Child PTSD Reaction Index (Nader, Pynoos, Fairbanks, & Frederick, 1990), Geonjian et al. reported PTSD point prevalence estimates of 90%, 55%, and 14% in the respective cohorts.

### **Tsunami study.**

Thienkrua et al. (2006) conducted a study of 371 Thai children aged 7 to 14 years who survived the massive tsunami of 2004 that devastated the shorelines of Indonesia, Sri Lanka, India, and Thailand. The children lived in provinces that were differentially affected by the disaster. One cohort lived in camps for tsunami-displaced persons in the Thai province most severely damaged by the tsunami. The second cohort resided in villages that suffered extensive damage but had not been displaced from their homes. The third cohort lived in villages that were unaffected by the tsunami. Using the child version of the UCLA PTSD Reaction Index (Steinberg, Brymer, Decker, & Pynoos, 2004), Thienkrua et al. determined that 13.2%, 11.1%, and 6.7% of the children from displacement camps, affected villages, and unaffected villages, respectively, met *DSM-IV* criteria for PTSD 2 months after the tsunami. The authors reevaluated the displaced children 9 months post-tsunami and determined that 10% of the sample continued to suffer from PTSD. The decline in PTSD prevalence in this cohort from 2 to 9 months post-tsunami was not statistically significant. A PTSD diagnosis 2 months post-tsunami was significantly associated with having had a delayed evacuation, having felt that one's life own or the life of a family member was in danger, and having felt extreme panic or fear during the tsunami.

**Wildfire study.**

McFarlane (1987) examined the psychological impact of a devastating bushfire on 808 Australian school-aged children. Parents and teachers completed *DSM-III*-adapted questionnaires 8 and 26 months after the fire. The impact of the disaster on participants was substantial, with 32% of the sample having sustained property damage in the fire, 27% having been bereaved, and 25% having been separated from their parents for up to 3 days after the fire. Parental ratings generated PTSD point prevalence rates of 52.8% and 57.2%, respectively, 8 and 26 months post-disaster. Teachers reported considerably less psychological morbidity, endorsing prevalence rates of 29.5% and 26.3% at the two assessment points.

**Industrial disaster studies.**

PTSD has also been studied in young victims of industrial disasters. Handford et al. (1986) administered an author-developed inventory to 35 children approximately 1.5 years after the Three Mile Island nuclear accident. While participants reported experiencing residual anxiety related to the incident, none of them met PTSD criteria. Similarly, Earls, Smith, Reich, and Jung (1988) determined that none of the 32 children they interviewed using the *DSM-III* DICA (Herjanic & Reich, 1983) had PTSD one year following their exposure to severe flooding that forced the evacuation of many people from their homes and resulted in unsafe environmental dioxin levels.

March, Amaya-Jackson, Terry, and Costanzo (1997) administered an author-developed PTSD inventory to 1,019 fifth- to eighth-grade students in Hamlet, North Carolina 9 months after an industrial fire at a chicken-processing plant there killed 25 people and seriously injured 56 others. The study was conducted in two elementary and two junior high schools that had a high



density of students who were offspring of fire victims. March et al. determined that 11.9% of their sample met *DSM-III-R* criteria for PTSD.

### **Accidental injury studies.**

With regard to accident research, Stoddard et al. (1989) examined the emotional morbidity of 30 burn victims aged 7 to 19 years who had undergone extensive, elective reconstructive surgery at a pediatric burn center. The child and parent versions of the *DSM-III*-based DICA (Herjanic & Reich, 1982) were administered an average of 8.9 years post-burn. In consensus meetings, a board-certified child psychiatrist, child psychologists, and assistants on the research team reviewed child and parent DICA responses and *DSM-III* PTSD criteria. Stoddard et al. reported a lifetime PTSD prevalence of 53.3% and a point prevalence of 6.7%.

Stallard et al. (1999) investigated 170 children and adolescents aged 7 to 18 years, one hundred and nine of whom had been involved in a road traffic accident, and 61 of whom suffered a sporting injury while horseback riding, roller-skating, or playing football, rugby, or cricket. The Clinician Administered PTSD Scale for Children (CAPS-C; Nader, Kriegler, Blake, & Pynoos, 1994) was administered to participants approximately 6 weeks following their visit to the Accident and Emergency Department at a hospital in Bath, England. Thirty-five percent of the children and adolescents who were involved in road traffic accidents met *DSM-IV* criteria for PTSD, while only 3% of those injured while playing sports met such criteria.

In a similar vein, Daviss, Mooney, et al. (2000) administered the CAPS-CA (Nader et al., 1996) to 48 children and adolescents aged 7 to 17 years an average of 3 months following their hospitalization for accidental injuries. Participants' injuries resulted from involvement in car accidents, auto-pedestrian or auto-bicyclist collisions, falls, sport-related accidents, burns or explosions, and accidental gunshots (Daviss, Racusin, et al., 2000). Daviss, Mooney, and

colleagues determined that 12.5% of the sample met *DSM-IV* diagnostic criteria for PTSD. They also reported that PTSD was significantly associated with prior psychopathology, prior sexual abuse, and parental distress in the immediate aftermath of the injury.

Keppel-Benson et al. (2002) conducted an assessment of 50 children aged 7 to 16 years who had been injured in automobile accidents as a passenger, pedestrian, or bicyclist. The *DSM-III-R* DICA (Reich & Welner, 1988) was administered to participants an average of 9 months post-accident. The authors determined that 14% of their sample had PTSD. Similarly, Zink and McCain (2003) administered the PTSD module of the DICA (Welner et al., 1987) to 143 children between the ages of 7 and 15 years who were hospitalized within 24 hours of suffering an unintentional motor vehicle-related injury. Subjects' injuries resulted from having been a passenger in an automobile crash, pedestrian struck by an automobile, or bicyclist struck by an automobile. Participants were interviewed 2 and 6 months following their injury. Zink and McCain reported that 18% and 10% of subjects met *DSM-III* criteria for a diagnosis of PTSD at 2 and 6 months post-injury, respectively. The authors also reported that there were no associations for PTSD status with age, gender, race, injury, or cause of injury.

Table 5 presents the prevalence estimates for the disaster- and accident-related child-adolescent PTSD studies referenced in this section. In these samples, PTSD prevalence rates ranged from 0% to 90%. Reported intervals between stress exposure and data collection ranged from 6 weeks to 8.9 years.

Table 5

*Prevalence of Disaster/Accident-Related PTSD*

Study	Measure	Subjects		Time Elapsed Since Trauma	PTSD prevalence
		Gender	Age		
<b>Earthquake Studies</b>					
Bradburn, 1991	<i>DSM-III</i> Reaction Index	12 males; 10 females	10-12 years	6-8 months	27% moderate symptoms 36% mild symptoms
Najarian et al., 1996	<i>DSM-III</i> DICA-R	37 males; 37 females	11-13 years	2.5 years	30% high-impact 4% low-impact
Hsu et al., 2002	<i>DSM-IV</i> ChIPS	141 males; 182 females	12-14 years	6 weeks	21.7%
Roussos et al., 2005	<i>DSM-IV</i> UCLA Reaction Index	847 males; 1090 females	9-18 years	3-4 months	4.5%
<b>Hurricane Studies</b>					
Shannon et al., 1994	<i>DSM-III-R</i> Reaction Index	2787 males; 2900 females	9-19 years	3 months	5.4%
Garrison et al., 1995	<i>DSM-III-R</i> DIS	189 males; 211 females	12-17 years	6 months	7.25%
LaGreca et al., 1996	<i>DSM-III-R</i> Reaction Index	187 males; 255 females	Grades 3, 4, 5	3 months (T1) 7 months (T2) 10 months (T3)	39.1% (T1) 24% (T2) 18.1% (T3)
Goenjian et al., 2001	<i>DSM-III-R</i> Reaction Index	81 males; 77 girls	<i>M</i> = 13 years	6 months	90% high-impact 55% moderate-impact 14% low-impact
<b>Tsunami Study</b>					
Thienkrua et al., 2006	<i>DSM-IV</i> UCLA Reaction Index	173 males; 198 females	7-14 years	8 weeks (T1) 9 months (T2)	13.2% high-impact (T1) 11.1% moderate-impact (T1) 6.7% low-impact (T1) 10% overall sample (T2)
<b>Wildfire Study</b>					

McFarlane, 1987	<i>DSM-III</i> Rutter Parent & Teacher Questionnaires	427 males; 381 females	<i>M</i> = 8.2 years	8 months (T1) 26 months (T2)	52.8% parent-reported (T1) 57.2% parent-reported (T2) 29.5% teacher-reported (T1) 26.3% teacher-reported (T2)
<b>Industrial Accident Studies</b>					
Handford et al., 1986	<i>DSM-III</i> Author-devised Inventory	16 males; 19 females	6-19 years	1.5 years	0.0%
Earls et al., 1988	<i>DSM-III</i> DICA	16 males; 16 females	6-17 years	1 year	0.0%
March et al., 1997	<i>DSM-III-R</i> Author-devised Inventory	509 males; 510 females	Grades 5-8	9 months	11.9%
<b>Accidental Injury Studies</b>					
Stoddard et al., 1989	<i>DSM-III</i> DICA	13 males; 17 females	7-19 years <i>M</i> = 13.3 years	> 6 months <i>M</i> = 8.9 years	53.3% lifetime prevalence 6.7% point prevalence
Stallard et al., 1999	<i>DSM-IV</i> CAPS-C	97 males; 73 females	7-18 years <i>M</i> = 14.05 years	6 weeks	35% traffic accident victims 3% sporting injuries
Daviss et al., 2000	<i>DSM-IV</i> CAPS-CA	31 males; 17 females	7-17 years <i>M</i> = 13.5 years	3 months	12.5%
Keppel-Benson et al., 2002	<i>DSM-III-R</i> DICA	29 males; 21 females	7-16 years <i>M</i> = 11.1 years	9 months	14%
Zink & McCain, 2003	<i>DSM-III</i> DICA	85 males; 58 females	7-15 years <i>M</i> = 10.8 years	2 months (T1) 6 months (T2)	18% (T1) 10% (T2)

*Note.* *M* = mean; DICA-R = Diagnostic Interview for Children and Adolescents – Revised; ChIPS = Children’s Interview for Psychiatric Syndromes; DIS = Diagnostic Interview Schedule; DICA = Diagnostic Interview for Children and Adolescents; CAPS-C = Clinician-Administered PTSD Scale for Children; CAPS-CA = Clinician-Administered PTSD Scale, Child and Adolescent Version; T1 = initial assessment; T2 = follow-up assessment; T3 = second follow-up assessment.

## **Medical Illness-Related Studies**

A number of researchers have examined the emotional consequences of life-threatening medical conditions and procedures.

### **Asthma study.**

Kean, Kelsay, Wamboldt, and Wamboldt (2006) administered the UCLA PTSD Reaction Index (Pynoos et al., 1998) to 49 adolescents who had experienced a life-threatening asthma-related event, such as admission to an intensive care unit, continuous albuterol nebulizer treatment for more than 12 hours, or seizure or loss of consciousness. Also included in the study were 71 adolescents who suffered from chronic asthma but had never experienced a life-threatening event and 80 healthy controls. The authors determined that participants who had experienced a life-threatening asthma event were significantly more likely to develop PTSD than were asthma controls or healthy controls, with 20%, 11%, and 8% of the respective groups meeting *DSM-IV* criteria for a diagnosis of PTSD.

### **Cardiac surgery study.**

In a study of children with chronic heart disease, Connolly et al. (2004) interviewed 43 children aged 5 to 12 years who were undergoing cardiac surgery. The authors administered the PTSD module of the DISC (Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000) to participants and their parents 1 to 3 days before surgery and again 4 to 8 weeks following their discharge from the hospital. Connolly et al. did not observe PTSD in any of the subjects prior to surgery but reported a post-operative PTSD prevalence of 12%. Length of stay in the intensive care unit (ICU) following surgery was a significant predictor of postoperative PTSD symptomatology, with more symptoms observed in those subjects who spent 48 or more hours in the ICU.

**Organ transplant studies.**

Shemesh et al. (2000) assessed the prevalence and correlates of PTSD in 19 pediatric liver transplant recipients aged 8 to 20 years. Using the UCLA PTSD Reaction Index (Rodriguez, Steinberg, & Pynoos, 1998), the authors determined that 31.6% of the sample met *DSM-IV* symptom criteria for PTSD at least 1 year post-transplant. Shemesh et al. also reported that PTSD was significantly associated with nonadherence to medical management, or a recurrent, persistent pattern of noncompliance regarding clinic visits, dietary requirements, and medication intake.

Similarly, Mintzer et al. (2005) administered the UCLA PTSD Reaction Index (Steinberg et al., 2004) to 104 liver, heart, and kidney transplant recipients between the ages of 12 and 20 at least 1 year post-transplant. The authors determined that 16.3% of their sample met *DSM-IV* symptom criteria for PTSD. Nonsignificant effects for gender, ethnicity, age at interview, type of organ received, time elapsed since transplant, and age at transplant were reported.

**Pediatric cancer studies.**

Butler et al. (1996) administered a modified version of the PTSD Symptom Scale (PSS; Foa et al., 1993) to the parents of 72 pediatric cancer patients or survivors aged 3 to 16 years. Forty-two of the children had completed cancer treatment an average of nearly 3 years prior to participation and were considered survivors, while 30 participants were receiving various forms of cancer treatment at the time of the study. Butler and his colleagues determined that 21% of the sample met criteria for PTSD. They also reported that being on treatment or awaiting a bone marrow transplant (BMT) at the time of the evaluation was significantly associated with a diagnosis of PTSD.

In another study of pediatric cancer victims, Pelcovitz et al. (1998) investigated 23 adolescents who had been diagnosed with cancer before the age of 18 and who had subsequently undergone radiation and/or chemotherapy treatment. As measured by the PTSD module of the SCID (Spitzer et al., 1987), subjects had a lifetime PTSD prevalence of 34.8% and a point prevalence of 17.4%. Pelcovitz et al. also determined that subjects who met criteria for lifetime PTSD perceived their families as significantly more chaotic than those who did not have PTSD.

Table 6 presents a summary of prevalence estimates with regard to medical illness-related PTSD in children and adolescents. Cited studies suggest that rates vary from 11% in chronic asthma patients to 34.8% in pediatric cancer survivors. Reported intervals between stress exposure and data collection varied widely, ranging from 4 weeks to 14.5 years.

Table 6

*Prevalence of Medical Illness-Related PTSD*

Study	Measure	Subjects		Time Elapsed Since Trauma	PTSD prevalence
		Gender	Age		
<b>Asthma Study</b>					
Kean et al., 2006	<i>DSM-IV</i> UCLA Reaction Index	105 males; 95 females	<i>M</i> = 14.6 years	Not reported	20% life-threatening asthma-related event 11% chronic asthma controls 8% healthy controls
<b>Cardiac Surgery Study</b>					
Connolly et al., 2004	<i>DSM-IV</i> DISC	26 males; 17 females	5-12 years; <i>M</i> = 8.2 years	4-8 weeks	12%
<b>Organ Transplant Studies</b>					
Shemesh et al., 2000	<i>DSM-IV</i> UCLA Reaction Index	19 liver transplant recipients; Gender not reported	8-20 years	≥ 1 year	31.6%
Mintzer et al., 2005	<i>DSM-IV</i> UCLA Reaction Index	61 males; 43 females	12-20 years <i>M</i> = 15.6 years	1-14.5 years <i>M</i> = 7.3 years	16.3%
<b>Pediatric Cancer Studies</b>					
Butler et al., 1996	Author-modified <i>DSM-III-R</i> PSS	72 patients or survivors; Gender not reported	3-16 years <i>M</i> = 8.8 years	Not reported	21% parent-reported
Pelcovitz et al., 1998	<i>DSM-III-R</i> SCID	11 males; 12 females	<i>M</i> = 16 years	<i>M</i> = 5.5 years	34.8% lifetime prevalence 17.4% point prevalence

*Note.* *M* = mean; DISC = Diagnostic Interview Schedule for Children; PSS = PTSD Symptom Scale; SCID = Structured Clinical Interview for Diagnosis.



## Comorbidity of PTSD with Other Psychiatric Disorders

With respect to psychiatric diagnoses, comorbidity refers to the co-occurrence of two or more psychiatric disorders in the same individual. PTSD is often associated with one or more comorbid disorders (Ballenger et al., 2000; Foa, Keane, & Friedman, 2000; Schnurr, Friedman, & Bernardy, 2002; Shea & Zlotnick, 2002). Indeed, in one of the few studies to document the incidence of PTSD in a large, community-based sample of youth, Kilpatrick et al. (2003) determined that nearly three fourths of all adolescents diagnosed with PTSD had at least one comorbid diagnosis. While comorbidity has important implications for the diagnosis and treatment of PTSD (Foa et al., 2000; Schnurr et al., 2002; Shea & Zlotnick, 2002), relatively few studies have reported on the prevalence of comorbid diagnoses among children and adolescents with PTSD (Saigh, Yasik, Sack et al., 1999; Yasik, 1998). Saigh, Yasik, Sack et al. (1999) reported that only 17.6% of the 51 child-adolescent PTSD studies they reviewed used structured clinical interviews to determine the prevalence of comorbid psychiatric diagnoses among youth with PTSD. Similarly, of the 53 articles reviewed in this chapter, only 8 (15.1%) examined the prevalence of comorbid conditions in youth diagnosed with PTSD.

Using the K-SADS-E (Orvaschel et al., 1981, 1982), McLeer and colleagues (1994) determined that PTSD frequently co-occurred with attention deficit hyperactivity disorder (ADHD) and conduct disorder (CD) in a clinical sample of sexually abused youth. Twenty-three percent of sexually abused children met diagnostic criteria for PTSD and ADHD, 15.4% had PTSD and CD, and 11.5% had PTSD, ADHD, and CD. In a similar study involving nonclinically referred, sexually abused youth, McLeer et al. (1998) reported that 20.7% of sexually abused study participants with PTSD also met *DSM-III-R* diagnostic criteria for separation anxiety disorder, 13.8% had PTSD and major depression, and 10.3% had PTSD and dysthymia.

Disruptive behavior disorders were evidenced in 10.3% of youth with PTSD; two subjects met criteria for CD and ADHD and one for CD only. Ackerman et al. (1998) administered the DICA (Reich & Welner, 1988) to sexually and/or physically abused youth and determined that only 6 out of 70 children with PTSD failed to have at least one other diagnosis. PTSD was found to be significantly comorbid with major depression, bipolar disorder, dysthymia, and separation anxiety disorder.

Dixon et al. (2005) reported that comorbid diagnoses were present in all cases of PTSD amongst incarcerated female juvenile offenders. Using the K-SADS-PL (Kaufman et al., 1996), the authors determined that 100% of participants with PTSD reported substance/alcohol abuse or dependence, 75.6% met diagnostic criteria for depression, 18.9% had comorbid psychosis, panic disorder, and separation anxiety disorder, respectively, 13.5% were diagnosed with generalized anxiety disorder, and 10.8% had an eating disorder.

Using the Schedule for Affective Disorders and Schizophrenia (SADS; Endicott & Spitzer, 1978), Kinzie et al. (1986) determined that 85% of young Cambodian refugees met diagnostic criteria for PTSD and unspecified affective disorders. Thirty-five percent of participants with PTSD had unspecified anxiety disorders, and 15% met criteria for panic disorder. In a follow-up study conducted 3 years later, Kinzie and colleagues (1989) found that 76.9% of PTSD diagnoses were comorbid with unspecified depressive disorders. Comorbid panic disorder was diagnosed in 7.7% of participants with PTSD. In a 6-year follow-up investigation of the Cambodian cohort, Sack et al. (1993) reported that subjects with PTSD were largely free of comorbid diagnoses.

Sack et al. (1994) administered the DICA (Welner et al., 1987) and the K-SADS-E (Puig-Antich, 1983; Puig-Antich, Orvaschel, Tabrinzi, & Chambers, 1980) to Cambodian adolescents

who had fled the Pol Pot war and determined that PTSD was highly comorbid with depression. Adolescents with PTSD were 4.3 times more likely to have an associated depressive disorder than those without PTSD. Similarly, participants diagnosed with PTSD were 3.5 times more likely than their PTSD-negative counterparts to have a comorbid anxiety disorder.

### **Summary**

Although American youth are exposed to an alarming number of extreme stressors every year, the reviewed epidemiological literature suggests that the majority of children and adolescents who experience a traumatic event do not develop PTSD. On the other hand, PTSD can result from a wide variety of stressors. Reported PTSD prevalence estimates varied widely within and across stressor types, ranging from 0.0% in young children exposed to nuclear or chemical contamination to 93.8% in young survivors of a war. Amongst young victims of crime, PTSD prevalence rates ranged from 0% to 75%. In studies involving young war victims, PTSD prevalence estimates ranged from 12.9% to 93.8%. It was reported that between 0% and 90% of young survivors of disasters and accidents developed PTSD. Finally, PTSD prevalence rates ranged from 12% to 34.8% in youth exposed to life-threatening medical conditions and procedures. In general, war-related stressors and criminal victimization were associated with higher estimates of PTSD than unintentional acts or events, such as natural disasters and life-threatening medical illness. While only 15.1% of the studies that were reviewed assessed for comorbidity, these studies suggest that PTSD frequently presents in conjunction with depressive disorders, anxiety disorders, ADHD, disruptive behavior disorders, and substance abuse and dependence.

There are inconsistencies within the literature reviewed regarding the predictive power of gender and age in determining PTSD status. Of the studies that examined gender differences

relative to PTSD diagnosis, none that involved young victims of war (Sack et al., 1994; Saigh et al., 1997; Saigh, 1989c; Mghir et al., 1995), youth with life-threatening medical conditions (Butler et al., 1996; Mintzer et al., 2005), or young victims of sexual and physical abuse (Ackerman et al., 1998; McLeer et al., 1998) found an association between PTSD status and gender. While Hoven et al. (2001), Shannon et al. (1994), and Garrison et al. (1995) determined that females were significantly more likely than males to develop PTSD following their exposure to, respectively, the terrorist attack on the World Trade Center in 2001, Hurricane Hugo, and Hurricane Andrew, other investigations involving young crime victims (Pynoos et al., 1987) and natural disaster survivors (Hsu et al., 2002) reported nonsignificant gender effects relative to PTSD status.

With regard to age effects, Schwarzwald et al. (1993) reported that PTSD prevalence rates were significantly higher for fifth graders than for either seventh- or tenth-grade students who lived in Israel during the Persian Gulf War. Similarly, preadolescent survivors of Hurricane Hugo and the 2001 terrorist attacks on New York City were more likely than their adolescent counterparts to develop PTSD (Hoven et al., 2005; Shannon et al., 1994). On the other hand, age was positively correlated with PTSD prevalence in adolescent survivors of Hurricane Andrew (Garrison et al., 1995) and the Pol Pot War in Cambodia (Sack et al., 1994). Studies involving young earthquake survivors (Hsu et al., 2002), pediatric cancer patients (Butler et al., 1996), organ transplant patients (Mintzer et al., 2005), and accident victims (Daviss, Mooney, et al., 2000; Zink & McCain, 2003) found no association between age and PTSD status.

A handful of the studies reviewed assessed the prevalence of PTSD over time. LaGreca et al. (1996) reported that while 39.1% of young survivors of Hurricane Andrew had PTSD 3 months following the trauma, significantly fewer participants met PTSD diagnostic criteria 7

months (24%) and 10 months (18.1%) after the hurricane. On the other hand, nonsignificant declines in PTSD prevalence over time were reported in investigations of Cambodian war refugees (Sack et al., 1993; Sack et al., 1999), survivors of a wild fire (McFarlane, 1987), and tsunami victims (Thienkura et al., 2006).

Finally, the reviewed literature suggests that there is a correlation between PTSD prevalence and proximity to a trauma. Six of the seven studies reviewed that addressed proximity, six reported significant findings. More specifically, youth who lived in cities or areas closest to the site of missile attacks (Schwarzwald et al., 1993), an earthquake (Bradburn, 1991; Najarian et al., 1996), a hurricane (Goenjian et al., 2001), a tsunami (Thienkura et al., 2006), and the attack on the World Trade Center in 2001 (Hoven et al., 2006) were significantly more likely to develop PTSD than youngsters living in less affected or unaffected villages and regions. On the other hand, Roussos et al. (2005) reported a nonsignificant association between PTSD status and distance from the trauma in young survivors of an earthquake.

## Chapter 3

### Validity of the PTSD Classification Among Youth

According to the fourth edition of the *DSM (DSM-IV)*, trauma exposure is indicated by experiencing, witnessing, or being confronted by an “event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others” (APA, 1994, p. 428). The *DSM-IV* further asserts that trauma exposure may induce PTSD. PTSD symptoms include trauma-related thoughts and nightmares, avoidance of trauma-related stimuli, increased arousal, emotional numbing, and clinically significant occupational or social impairments. Clinical research suggests that traumatized individuals with PTSD may also experience increased feelings of anxiety, depression, and anger relative to trauma victims who do not develop the disorder (Saigh, 1988, 1989a, 1989c; Saigh, Yasik, Oberfield, Halamandaris, & McHugh, 2002).

Although the *DSM-IV* makes reference to the expression of PTSD in children and adolescents, it is important to note that youth below the age of 15 were not included in the field trials that informed *DSM-IV* PTSD diagnostic criteria (Kilpatrick & Resnick, 1992; Saigh & Bremner, 1999). This chapter reviews comparative research that addresses the validity of the PTSD classification as it applies to children and adolescents. More specifically, given this study’s focus on the internalizing and externalizing behaviors of PTSD-positive youth, research examining the emotional and behavioral correlates of childhood PTSD will be reviewed.

#### **Anxiety**

Against the backdrop of the Lebanese Civil War, Saigh (1988) administered the Revised Children’s Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1978) to three groups of 13-year-old Lebanese adolescents. The first group was comprised of chronic PTSD cases, the

second group presented with test phobia, and the third group consisted of nonclinical controls. Data analysis revealed that youth with PTSD endorsed significantly higher levels of anxiety on the RCMAS than did adolescents in the test phobia and control groups. Follow-up studies involving younger Lebanese children (Saigh, 1989a, 1989c) yielded similar findings. Saigh (1989c) determined that the RCMAS scores of 9- to 12-year-old youngsters diagnosed with PTSD were significantly greater than those of nonclinical controls and of children with simple phobia. In a replication of this study with 6- to 9-year-old children, Saigh (1989a) again found that youngsters diagnosed with PTSD presented with a significantly higher level of morbidity on the RCMAS than an associated clinical sample and nonclinical controls.

Similar findings have been reported within the context of research involving young disaster and accident victims. For example, Lonigan et al. (1994) administered the RCMAS to school-aged children and adolescents 3 months after their exposure to Hurricane Hugo. The authors reported that participants who met *DSM-III-R* criteria for PTSD had RCMAS scores that significantly exceeded those of young hurricane survivors without PTSD. Similarly, Udwin et al. (2000) reported that high scores on the RCMAS were associated with a diagnosis of PTSD in adolescent survivors of the 1988 sinking of the cruise ship Jupiter in Greece.

Six weeks after a severe earthquake struck Thailand, Hsu et al. (2002) administered the Symptom Checklist-90-Revised (SCL-90-R; Derogatis, Lipman, & Covi, 1973) to adolescents living in the region closest to the earthquake's epicenter. Adolescent survivors with PTSD reported experiencing significantly more anxiety symptoms than their PTSD-negative counterparts. Within the context of accident research, Stallard et al. (1999) administered the RCMAS to youth an average of 6 weeks following their injury in road traffic or sporting

accidents. The authors determined that the RCMAS scores of children with PTSD were significantly greater than those of injured youth without PTSD.

In a study involving young adult survivors of childhood cancer, Hobbie et al. (2000) compared the Brief Symptom Inventory (BSI; Derogotis & Melisaratos, 1983) and State-Trait Anxiety Inventory (STAI; Spielberger, 1983) scores of survivors with and without PTSD. Participants meeting *DSM-IV* criteria for a diagnosis of PTSD endorsed significantly higher levels of anxiety symptoms on the BSI and had higher trait anxiety than survivors without PTSD. The authors reported nonsignificant differences, however, in state anxiety scores of survivors with and without PTSD.

Steiner et al. (1997) administered the Weinberger Adjustment Inventory (WAI; Feldman & Weinberger, 1994; Steiner & Feldman, 1995) to incarcerated adolescent boys with and without PTSD, as well as to a nonclinical, sex- and age-matched group. Self-reported anxiety was significantly higher in juvenile delinquents with PTSD than in their incarcerated PTSD-negative counterparts. Anxiety scores did not significantly differ between incarcerated youngsters without PTSD and nonclinical controls.

## **Depression**

In a study of Lebanese adolescents exposed to civil war-related stressors, Saigh (1988) determined that youngsters who met *DSM-III* criteria for PTSD reported experiencing significantly more depression symptoms, as measured by the Children's Depression Inventory (CDI; Kovacs, 1981), than both age-matched youth with simple phobia and nonclinical controls. A similar study involving children between the ages of 9 and 12 (Saigh, 1989c) revealed that the CDI scores of children with PTSD were appreciably greater than the CDI scores of their phobic and nonclinical peers. With regard to children aged 6 to 9, Saigh (1989a) again reported that



subjects with PTSD had significantly higher CDI scores than phobic and nonclinical comparison groups.

More recently, Hsu et al. (2002) compared SCL-90 (Derogatis et al., 1973) scores of young earthquake survivors with and without PTSD. Six weeks after an earthquake measuring 7.3 on the Richter scale struck Thailand, adolescent victims who presented with PTSD reported suffering from significantly more depression symptoms than their PTSD-negative counterparts.

Stallard et al. (1999) compared Birleson Depression Inventory (Birleson, 1981) scores of young accident victims with and without PTSD. The authors reported that participants with PTSD had significantly higher Birleson Depression Inventory scores than their PTSD-negative counterparts. Similarly, Udwin et al. (2000) administered the Birleson Depression Inventory (Birleson, 1981) to British school children who survived the sinking of the cruise ship *Jupiter*. The authors reported that Birleson Depression Inventory scores 5 months following the disaster were significantly higher in participants who developed PTSD than in those survivors without PTSD.

Similar findings have been reported within the context of research involving young adult survivors of childhood cancer. Hobbie et al. (2000) found that a subgroup of childhood cancer survivors who met diagnostic criteria for PTSD presented with higher levels of depression, as measured by the BSI (Derogatis & Melisaratos, 1983), than survivors who did not report PTSD. Similarly, Erickson and Steiner (2000) reported that the WAI (Feldman & Weinberger, 1994; Steiner & Feldman, 1995) distress scale scores of pediatric cancer survivors with PTSD significantly exceeded those of their PTSD-negative counterparts. More recently, Schwartz and Drotar (2006) administered the Center for Epidemiological Depression Scale (CES-D; Radloff, 1977) to survivors of childhood cancer and a comparison group of healthy young adults. Data

analysis determined that the CES-D scores of childhood cancer survivors with PTSD were significantly higher than those of the comparison group and of cancer survivors without PTSD.

Self-reported depression symptoms have also been found to differentiate between young abuse victims with and without PTSD. McLeer et al. (1992) determined that the CDI scores of sexually abused youth with PTSD significantly exceeded those of their PTSD-negative counterparts. Wolfe, Sas, and Wekerle (1994) also found the CDI scores of PTSD-positive sexually abused youth to be appreciably higher than those of sexually abused children without PTSD.

A handful of researchers have found depression scores to be elevated in violence-exposed youth with PTSD. For example, Steiner et al. (1997) determined that incarcerated male juvenile delinquents with PTSD reported experiencing significantly more depression symptoms, as measured by the WAI (Feldman & Weinberger, 1994; Steiner & Feldman, 1995), than did their PTSD-negative counterparts and a community sample of nonclinical controls. Lipschitz et al. (2000) administered the Beck Depression Inventory (BDI; Beck & Steer, 1987) to female adolescents who presented for routine medical appointments at an inner-city primary care clinic. The authors reported that participants who met *DSM-IV* criteria for PTSD had appreciably higher BDI scores than their peers without PTSD.

### **Behavioral Ratings**

Using the Conners Teacher Rating Scale (CTRS; Conners, 1969), Saigh (1988) compared the classroom behavior of war-exposed Lebanese adolescents with PTSD to that of their war-exposed peers with simple phobia and war-exposed, nonclinical controls. Teacher reports indicated that youngsters with PTSD exhibited significantly more classroom misconduct than participants in the phobia and control groups. Saigh (1989a, 1989c) replicated these findings in

subsequent studies involving 9- to 12-year-old and 6- to 9-year-old Lebanese children, respectively. The CTRS scores of the phobic and control groups were not significantly different in any of the aforementioned studies (Saigh, 1988, 1989a, 1989c).

Giaconia and colleagues (1995) administered the Youth Self-Report (YSR; Achenbach & Edelbrock, 1983) to a community-based sample of 18-year-olds. The authors reported that youth with PTSD were significantly more likely than youth without PTSD to report behavioral and emotional problems, interpersonal difficulties, suicidal behavior, health problems, and academic failure.

In a study of young adult cancer survivors who had been in remission for at least 5 years, Erickson and Steiner (2000) determined that survivors with PTSD endorsed experiencing significantly more somatic symptoms, as measured by the SCL-90-R (Derogatis, 1997), than did their PTSD-negative counterparts.

Several researchers have found PTSD to be associated with behavioral difficulties in young witnesses to community-based violence. For example, in their study of incarcerated adolescents males, Steiner et al. (1997) determined that participants with PTSD had WAI (Feldman & Weinberger, 1994; Steiner & Feldman, 1995) restraint scores that were significantly lower than those of incarcerated boys without PTSD and a nonclinical comparison group. A low WAI restraint score represents limited impulse control, suppression of aggression, consideration of others, and responsibility. Lipschitz et al. (2000) determined that PTSD in a sample of female adolescent patients at an inner-city primary care clinic was associated with increased nicotine and marijuana use, criminal arrest, academic failure, and suspension from school.

### **PTSD and the Child Behavior Checklist.**

Within the context of pediatric cancer research, Butler et al. (1996) administered the Child Behavior Checklist (CBCL; Achenbach, 1991) to the parents of children undergoing or awaiting treatment for a wide range of cancer diagnoses. The authors reported that the Anxious/Depressed syndrome scale scores of children with PTSD significantly exceeded those of young cancer patients without PTSD.

In a study investigating the differential validity of the PTSD classification among preschool youth, Diamond (1995) compared the teacher-derived CBCL ratings of three groups of children. The first group was comprised of PTSD cases, the second group met criteria for ADHD, and the third group consisted of nonclinical controls. Diamond determined that participants with PTSD had significantly higher CBCL Withdrawn and Internalizing scale scores than did their peers diagnosed with ADHD. It was also observed that the Aggression and Externalizing scale scores of the ADHD group were significantly greater than the scores of the control group.

McLeer and colleagues (1988, 1992) compared the CBCL scores of sexually abused children with PTSD to those of sexually abused children without PTSD. These authors determined that sexually abused youth with PTSD had significantly higher scores on the CBCL Internalizing and Externalizing scales than did their PTSD-negative counterparts. Likewise, Wolfe et al. (1994) observed that the CBCL Internalizing scale scores of sexually abused children with PTSD significantly exceeded the scores of sexually abused children without PTSD. On the other hand, the CBCL Externalizing scale scores of traumatized youth with and without PTSD were not significantly different.

In a similar vein, De Bellis et al. (1999) reported that sexually and/or physically abused youth with PTSD evidenced significantly higher CBCL Internalizing, Externalizing, Total, and syndrome scale scores than did a nontraumatized control group. More recently, Saigh et al. (2002) compared the CBCL ratings of traumatized youth with PTSD to those of traumatized youth without PTSD and nontraumatized controls. After systematically excluding youth with major comorbid disorders (i.e., ADHD, CD, major depressive disorder, intellectual disability, and substance dependence), Saigh and colleagues determined that youth with PTSD had significantly higher ratings on the CBCL Internalizing and Total scales, as well as on several CBCL syndrome subscales, than did their traumatized counterparts without PTSD and nontraumatized controls.

While these studies suggest that the CBCL may be sensitive to the expression of PTSD in youth, they are marked by methodological limitations. McLeer et al. (1988, 1992), Wolfe et al. (1994), and Butler et al. (1996) compared traumatized youth with and without PTSD but did not provide information about the functioning of traumatized PTSD-negatives relative to nontraumatized controls. While Diamond (1995) and De Bellis et al. (1999) documented important differences in CBCL ratings between youth with PTSD and nontraumatized controls, these studies did not include traumatized youth without PTSD. Thus, comparative information regarding possible distress among traumatized PTSD-negatives was not considered. In sum, it is not clear if the differences reported in these studies can be attributed to PTSD specifically, as opposed to trauma exposure in general.

While Saigh and colleagues (2002) used a three-group comparative design, these authors excluded from their study youth with major comorbid disorders. Although this approach is theoretically sound from a nosological perspective, PTSD is often associated with one or more

comorbid disorders (Ballenger et al., 2000; Foa et al., 2000; Schnurr et al., 2002; Shea & Zlotnick, 2002). Indeed, in one of the few studies to document the prevalence of PTSD in a large, community-based sample of youth, Kilpatrick et al. (2003) determined that nearly three fourths of all adolescents diagnosed with PTSD had at least one comorbid diagnosis. In this context, Saigh et al. (2002) acknowledged that the exclusion of comorbid cases from their study might have presented a different picture of PTSD in youth than that which presents in clinical practice.

### **Summary**

Several researchers have examined the validity of the PTSD classification as it applies to children and adolescents. With few exceptions, these studies have determined that youth diagnosed with PTSD exhibit significantly more internalizing and externalizing behavior problems than clinical and nonclinical controls. Self-reported anxiety and depression symptom scores have been found to differentiate between PTSD-positive and PTSD-negative youth traumatized by war (Saigh, 1988, 1989a, 1989c), natural disasters (Hsu et al., 2002; Lonigan et al., 1994), accidents (Stallard et al., 1999; Udwin et al., 2000), fatal illness (Butler et al., 1996; Hobbie et al., 2000), sexual abuse (McLeer et al., 1992; Wolfe et al., 1994), and community-based violence (Lipschitz et al., 2000; Steiner et al., 1997). Youth who develop PTSD following exposure to war, sexual abuse, and community-based violence have been found to exhibit higher levels of misconduct than their PTSD-negative counterparts (Lipschitz et al., 2000; McLeer et al., 1992, 1998; Saigh, 1988, 1989a, 1989c; Steiner et al., 1997).

Comparative research suggests that the CBCL may be sensitive to the expression of PTSD in young victims of various types of trauma (Diamond, 1995; Saigh et al., 2002), including fatal illness (Butler et al., 1996) and sexual and/or physical abuse (De Bellis, 1999;

McLeer et al., 1988, 1992; Wolfe et al., 1994). However, methodological limitations render it unclear if the differences reported in these studies can be attributed to PTSD specifically, as opposed to trauma exposure in general. Further research that compares the CBCL scores of traumatized youth with PTSD, traumatized youth without PTSD, and nontraumatized controls would make a substantive contribution to the literature. More specifically, such research has the potential to provide powerful empirical support for the validity of the PTSD classification as it applies to children and adolescents.

## **Chapter 4**

### **Methodology**

This chapter presents a statement of the problem addressed in this study, as well as the purpose of the study. In addition, the research hypotheses, participant characteristics, experimental procedures, diagnostic measures, dependent variable, and research design are discussed.

#### **Statement of the Problem**

While research suggests that youth with PTSD have significant internalizing and externalizing behavior problems as denoted by parent-derived CBCL scores, methodological problems are apparent. Studies involving preschoolers (Diamond, 1995), pediatric cancer survivors (Butler et al., 1996), and young victims of sexual and/or physical abuse (De Bellis, 1999; McLeer et al., 1988, 1992; Wolfe et al., 1994) either did not include a nontraumatized control group (Butler et al., 1996; McLeer et al., 1988, 1992; Wolfe et al., 1994) or did not include a traumatized PTSD-negative group (De Bellis, 1999; Diamond, 1995). As such, these investigations do not provide comparative information about the behaviors of traumatized youth who do not develop PTSD relative to nontraumatized controls. Thus, their findings cannot be attributed to PTSD specifically, as opposed to trauma exposure in general. While Saigh and colleagues (2002) observed CBCL variations between youth with PTSD, traumatized PTSD-negatives, and nontraumatized controls, this investigation excluded youth with major comorbid disorders. As such, it has limited external validity.

#### **Purpose of the Study**

This study sought to compare the CBCL scores of clinically referred youth with PTSD to those of clinically referred traumatized youth without PTSD. It also sought to compare the



CBCL scores of clinically referred traumatized youth with and without PTSD to those of a nontraumatized comparison group. In so doing, data from a study that was previously approved by the institutional review boards of Bellevue Hospital, The Graduate Center of the City University of New York, and Teachers College was analyzed. This study included youth with comorbid disorders.

## **Hypotheses**

### **Rationale for hypotheses 1-12.**

As a number of studies have reported that children and adolescents with PTSD evidence internalizing and externalizing problems relative to traumatized youth without PTSD (McLeer et al., 1988, 1992; Saigh, 1989a, 1989c; Saigh et al., 2002; Saigh, Yasik, Oberfield, & Halamandaris, 2007; Wolfe et al., 1994), it was hypothesized that youth with PTSD would have significantly higher scores on all CBCL scales than traumatized PTSD-negatives. More specifically, the following research hypotheses were examined:

H01: Children and adolescents with PTSD will have significantly higher CBCL Total scores than traumatized youth without PTSD.

H02: Children and adolescents with PTSD will have significantly higher CBCL Internalizing scale scores than traumatized youth without PTSD.

H03: Children and adolescents with PTSD will have significantly higher CBCL Withdrawn syndrome scale scores than traumatized youth without PTSD.

H04: Children and adolescents with PTSD will have significantly higher CBCL Somatic Complaints syndrome scale scores than traumatized youth without PTSD.

H05: Children and adolescents with PTSD will have significantly higher CBCL Anxious/Depressed syndrome scale scores than traumatized youth without PTSD.

H06: Children and adolescents with PTSD will have significantly higher CBCL Externalizing scale scores than traumatized youth without PTSD.

H07: Children and adolescents with PTSD will have significantly higher CBCL Delinquent Behavior syndrome scale scores than traumatized youth without PTSD.

H08: Children and adolescents with PTSD will have significantly higher CBCL Aggressive Behavior syndrome scale scores than traumatized youth without PTSD.

H09: Children and adolescents with PTSD will have significantly higher CBCL Attention Problems syndrome scale scores than traumatized youth without PTSD.

H10: Children and adolescents with PTSD will have significantly higher CBCL Social Problems syndrome scale scores than traumatized youth without PTSD.

H11: Children and adolescents with PTSD will have significantly higher CBCL Thought Problems syndrome scale scores than traumatized youth without PTSD.

H12: Children and adolescents with PTSD will have significantly higher CBCL Other Problems syndrome scale scores than traumatized youth without PTSD.

**Rationale for hypotheses 13-24.**

As a number of studies have reported that children and adolescents with PTSD evidence internalizing and externalizing problems relative to nontraumatized controls (Blanchard, Hickling, Taylor, & Loos, 1995; Chemtob, Hamada, Roitblat, & Muraoka, 1994; De Bellis et al., 1999; Glod & Teicher, 1996; Lonigan, Shannon, Taylor, Finch, &

Sallee, 1994; Riggs, Dancu, Gershuny, & Greenberg, 1992; Saigh, 1989a, 1989c; Saigh et al., 2002; Steiner et al., 1997), it was expected that youth with PTSD would have significantly higher CBCL scores than their nontraumatized counterparts. The following research hypotheses were examined:

H13: Children and adolescents with PTSD will have significantly higher CBCL Total scores than nontraumatized controls.

H14: Children and adolescents with PTSD will have significantly higher CBCL Internalizing scale scores than nontraumatized controls.

H15: Children and adolescents with PTSD will have significantly higher CBCL Withdrawn syndrome scale scores than nontraumatized controls.

H16: Children and adolescents with PTSD will have significantly higher CBCL Somatic Complaints syndrome scale scores than nontraumatized controls.

H17: Children and adolescents with PTSD will have significantly higher CBCL Anxious/Depressed syndrome scale scores than nontraumatized controls.

H18: Children and adolescents with PTSD will have significantly higher CBCL Externalizing scale scores than nontraumatized controls.

H19: Children and adolescents with PTSD will have significantly higher CBCL Delinquent Behavior syndrome scale scores than nontraumatized controls.

H20: Children and adolescents with PTSD will have significantly higher CBCL Aggressive Behavior syndrome scale scores than nontraumatized controls.

H21: Children and adolescents with PTSD will have significantly higher CBCL Attention Problems syndrome scale scores than nontraumatized controls.

H22: Children and adolescents with PTSD will have significantly higher CBCL Social Problems syndrome scale scores than nontraumatized controls.

H23: Children and adolescents with PTSD will have significantly higher CBCL Thought Problems syndrome scale scores than nontraumatized controls.

H24: Children and adolescents with PTSD will have significantly higher CBCL Other Problems syndrome scale scores than nontraumatized controls.

**Rationale for hypotheses 25-36.**

As several studies comparing traumatized youth without PTSD to nontraumatized controls failed to report significant differences on measures of anxiety and depression (Saigh, 1989a, 1989c; Saigh, 1991), anger (Saigh et al., 2007), and misconduct (Saigh et al., 2002; Saigh et al., 2007), it was expected that the CBCL scores of traumatized youth without PTSD would not significantly differ from those of nontraumatized controls. The following research hypotheses were examined:

H25: Traumatized children and adolescents without PTSD will not have significantly different CBCL Total scores than nontraumatized controls.

H26: Traumatized children and adolescents without PTSD will not have significantly different CBCL Internalizing scale scores than nontraumatized controls.

H27: Traumatized children and adolescents without PTSD will not have significantly different CBCL Withdrawn syndrome scale scores than nontraumatized controls.

H28: Traumatized children and adolescents without PTSD will not have significantly different CBCL Somatic Complaints syndrome scale scores than nontraumatized controls.

H29: Traumatized children and adolescents without PTSD will not have significantly different CBCL Anxious/Depressed syndrome scale scores than nontraumatized controls.

H30: Traumatized children and adolescents without PTSD will not have significantly different CBCL Externalizing scale scores than nontraumatized controls.

H31: Traumatized children and adolescents without PTSD will not have significantly different CBCL Delinquent Behavior syndrome scale scores than nontraumatized controls.

H32: Traumatized children and adolescents without PTSD will not have significantly different CBCL Aggressive Behavior syndrome scale scores than nontraumatized controls.

H33: Traumatized children and adolescents without PTSD will not have significantly different CBCL Attention Problems syndrome scale scores than nontraumatized controls.

H34: Traumatized children and adolescents without PTSD will not have significantly different CBCL Social Problems syndrome scale scores than nontraumatized controls.

H35: Traumatized children and adolescents without PTSD will not have significantly different CBCL Thought Problems syndrome scale scores than nontraumatized controls.

H36: Traumatized children and adolescents without PTSD will not have significantly different CBCL Other Problems syndrome scale scores than nontraumatized controls.

## **Method**

### **Participants.**

Participants included youth aged 7 to 18 years who were drawn from an existing data set that was part of a study previously approved by the institutional review boards of Bellevue Hospital, The Graduate Center of the City University of New York, and Teachers College, Columbia University. The sample consisted of 34 PTSD-positives, 56 traumatized PTSD-negatives, and 33 nontraumatized controls. Among the PTSD-positive group, eight met DICA-R (Reich, Leacock, & Shanfeld, 1995) criteria for major depression, and one met criteria for substance dependence. Of the traumatized PTSD-negative participants, two met DICA-R criteria for major depression, two met criteria for CD, and one met criteria ADHD. The age range for participants was 7.08 to 18.42 years ( $M = 13.4$ ,  $SD = 2.89$ ). Sixty-eight males and 55 females participated. The parents or guardians of the participants completed the Hollingshead (1975) Four-Factor Index of Social Status questionnaire. The demographic characteristics of the sample are presented in Table 8 in Chapter 5.

**Examiners.*****Clinical interviews.***

All participants received two clinical interviews by one of two board-certified child psychiatrists and a licensed psychologist, respectively. The child psychiatrist and psychologist independently interviewed participants and determined if they met study inclusion criteria. In cases wherein diagnostic disagreement occurred, case conferences were conducted to review reported symptoms and reach a consensus regarding diagnosis.

***Other measures.***

Doctoral school psychology students administered the Children's PTSD Inventory (Saigh, 1998), Hollingshead Four Factor Index of Social Status (Hollingshead, 1975), and CBCL (Achenbach, 1991) to participants in a counterbalanced design that controlled for an order effect.

**PTSD group inclusion criteria.**

In order to have been included in the study as a PTSD case, a participant must have received two independent PTSD clinical diagnoses from one of two board-certified child psychiatrists and a licensed psychologist, respectively, and two independent PTSD diagnoses as determined by two administrations of the Children's PTSD Inventory (Saigh, 1998) by doctoral school psychology students.

**Traumatized PTSD-negative group inclusion criteria.**

In order to have been included in the study as a traumatized PTSD-negative case, a participant must have received two independent negative PTSD clinical diagnoses from one of two board-certified child psychiatrists and a licensed psychologist, respectively, and two independent negative PTSD diagnoses as determined by administrations of the Children's PTSD Inventory (Saigh, 1998). In addition, verbatim responses to the

Children's PTSD Inventory trauma exposure questions must have reflected the *DSM-IV* Criterion A1 definition of trauma exposure<sup>1</sup>, as judged by two independent psychiatrists or psychologists.

**Nontraumatized control group inclusion criteria.**

In order to have been included in the study as a nontraumatized control case, a participant must have received two independent negative PTSD clinical diagnoses from one of two board-certified child psychiatrists and a licensed psychologist, respectively, and two independent negative PTSD diagnoses as determined by administrations of the Children's PTSD Inventory (Saigh, 1998). In addition, verbatim responses to the Children's PTSD Inventory trauma exposure questions must not have reflected the *DSM-IV* Criterion A1 definition of trauma exposure, as judged by two independent psychiatrists or psychologists. Finally, control cases must have received negative ADHD, CD, major depressive disorder, substance dependence, and psychotic symptom diagnoses, as measured DICA-R (Reich, Leacock, & Shanfeld, 1995).

**General exclusionary criteria.**

Inasmuch as youth with a history of abuse or neglect may experience ongoing distress through court proceedings and/or foster care placements (McLeer et al., 1994; Merry & Andrews, 1994), participants with a history of abuse or neglect, as defined by the New York State Family Court Act, Article 10, Section 1012, were excluded from the study. This law indicates that it is a felony:

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<sup>1</sup> *DSM-IV-TR* Criterion A1 specifies that during exposure to a traumatic event, "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," and "2) the person's response involved intense fear, helplessness, or horror" (APA, 2000, p. 467).



for a parent or guardian or other persons legally responsible for a child's care to inflict or allow to be inflicted on a child physical injury . . . which causes or creates a substantial risk of death, or serious or protracted disfigurement, or protracted impairment of physical or emotional health or . . . commits or allows to be committed, a sex offense against such a child (p. 300).

Accordingly, youth who had been abused by a parent or guardian were excluded from the study, while youth who had been sexually or physically assaulted by a person other than a parent or guardian were included.

Youth who scored in the deficient range ( $\leq 69$ ) on the third edition of the Wechsler Intelligence Scale for Children (WISC-III; Wechsler, 1991) were also excluded, as Saigh (2003) determined that cases within this IQ range experienced difficulty understanding Children's PTSD Inventory (Saigh, 2004) test questions and verbalizing responses. Youth who are unable to speak or understand English were also excluded from the study. Youth with a history of significant head trauma, as well as those receiving medication that could influence cognitive functioning, were also excluded.

### **Diagnostic measures.**

#### ***Children's PTSD Inventory.***

The Children's PTSD Inventory (Saigh, 1998) is a structured clinical interview for children and adolescents. It consists of five subtests that are scored on a dichotomous basis, each of which reflects one of the *DSM-IV* criteria for PTSD. Reliability studies have generated estimates of internal consistency, interrater reliability, and test-retest reliability at the diagnostic level. In terms of internal consistency, Saigh, Yasik, Oberfield, Green, & Halamandaris (2000) reported a coefficient alpha of .95. With reference to inter-rater reliability, 98.1% agreement was

evident, and an inter-rater intraclass correlation coefficient (ICC) of .98 and inter-rater reliability kappa of .96 were observed. In terms of test-retest reliability, 97.6% agreement was evident, and a test-retest kappa of .91 and ICC of .88 were observed at the diagnostic level; the test-retest interval was 2 weeks. In an assessment of the measure's validity, Children's PTSD Inventory diagnoses were compared to clinician-derived diagnoses as well as diagnoses obtained via administrations of the SCID (First, Gibbon, Williams, & Spitzer, 1996) and the revised DICA (Reich et al., 1995) PTSD modules. Moderate to high levels of sensitivity (.91-1.00), specificity (.90-.97), positive (.68-.94) and negative (.95-1.00) predictive power, and diagnostic efficiency (.92-.95) were reported (Yasik et al., 2001).

***Diagnostic Interview for Children and Adolescents-Revised (DICA-R).***

The DICA-R (Reich et al., 1995) is a semistructured clinical interview that consists of a series of modules that reflect the *DSM-IV* criteria for various disorders that occur in childhood and adolescence. A trained examiner administered the MDD, ADHD, CD, substance dependence (i.e., alcohol, tobacco, glue sniffing, marijuana, and street drugs), and psychotic symptoms modules to each study participant. Reich (2000) reported test-retest kappa coefficients that ranged from .55 to .80 for the MDD module and from .32 to .59 for the ADHD module. A test-retest kappa of .92 was reported for the CD module. Test-retest kappas for the substance dependence module ranged from .66 to 1.00, and a coefficient of .76 was reported for the psychotic symptoms module (Saigh, Yasik, Oberfield, Halamandaris, & Bremner, 2006). Sensitivity coefficients of .82, .85, .92, 1.00, and 1.00 were reported for the MDD, ADHD, CD, substance abuse, and psychotic symptoms modules, respectively; specificity coefficients of .72, .73, .71, .80, and .72 were reported for these respective modules (Saigh et al., 2006).

**Dependent measure.*****Child Behavior Checklist (CBCL).***

The CBCL (Achenbach, 1991) is a parent-completed, norm-referenced behavior rating scale that consists of 113 Likert-type items. Item scores range from 0 (“Not True [as far as you know]”) to 2 (“Very True or Often True”). The measure generates one Total score and two contrasting aggregate scores, which represent internalizing and externalizing behaviors, respectively. The Internalizing aggregate scale is comprised of three syndrome scales. These include the Withdrawn syndrome scale, which consists of nine statements that reflect isolating behaviors (e.g., “Withdrawn, doesn’t get involved with others”), a 9-item Somatic Complaints syndrome scale that assesses physical complaints (e.g., “Nausea, feels sick” without known medical cause), and the 14-item Anxious/Depressed syndrome scale, which reflects symptoms of anxiety (e.g., “Nervous, highstrung, or tense”) and depression (e.g., “Unhappy, sad, or depressed”). The Externalizing aggregate scale consists of two syndrome scales. The 13-item Delinquent Behavior syndrome scale assesses transgressive behaviors (e.g., “Sets fires”), and the Aggressive Behavior syndrome scale consists of 20 statements that reflect destructive or aggressive conduct (e.g., “Destroys things belonging to his/her family or others”).

An 8-item Social Problems syndrome scale assesses interpersonal problems (e.g., “Doesn’t get along with other kids”), and a Thought Problems syndrome scale consists of seven items that denote bizarre behaviors or hallucinations (e.g., “Hears things that aren’t there”). The Attention Problems syndrome scale contains 11 statements that reflect an inability to concentrate (e.g., “Can’t concentrate, can’t pay attention for long”). Finally, the 33-item Other Problems syndrome scale assesses the presence of a broad range of

problematic behaviors (e.g., “Eats or drinks things that are not food,” “Trouble sleeping”).

Achenbach (1991) reported mean alpha coefficients of .89, .93, and .96 for the Internalizing, Externalizing, and Total scales, respectively. Alpha coefficients for the syndrome scales ranged from .70 to .92. When the CBCL Total score was correlated with the Conners Parent Rating Scale (CPRS; Conners, 1973) and the Revised Behavior Problem Checklist (RBPC; Quay & Peterson, 1983), coefficients of .82 and .81, respectively, were observed. Coefficients ranged from .59 to .86 when the CBCL syndrome scales were correlated with CPRS total scores.

**Social status measure.**

***Hollingshead Four Factor Index of Social Status.***

The Hollingshead Four Factor Index of Social Status (Hollingshead, 1975) was used to determine subjects' socioeconomic status (SES). In the Hollingshead (1975) system, information on parental education and occupation is combined to generate one status score for an individual or nuclear family unit. Each parent or guardian is assigned an education score and an occupation score, based on education level completed and current work status. Education and occupation scores range from 1 through 7 and 1 through 9, respectively, and are positively correlated with years of education and income level. These scores are then weighted to obtain a single score for each parent or guardian. Weighted scores range from a low of 8 to a high of 66 and reflect one of five social strata (classes I through V), with higher scores indicative of higher SES. For families with multiple caretakers, scores for each are averaged to obtain a single SES score.

In a study of the measure's reliability and validity, Cirino et al. (2002) found the Hollingshead Four Factor Index of Social Status to have high inter-rater reliability. The authors reported 89% agreement and a Pearson product-moment correlation of .91. In an assessment of the instrument's validity, Cirino et al. (2002) compared the Hollingshead measure with the more recently developed Nakao and Treas (1992) job coding scale and a Canadian occupational socioeconomic index (Blishen, Carroll, & Moore, 1987). Hollingshead scale scores correlated highly with both measures ( $r = .81$  and  $r = .86$ , respectively).

### **Research design.**

A three-group comparative design was used in this study. Designation to the PTSD, traumatized PTSD-negative, and nontraumatized control groups denoted the independent variable, and performance on the CBCL (Achenbach, 1991) denoted the dependent variable. Table 7 depicts a schematic representation of the research design.

Table 7

*Schematic Representation of the Research Design*

Dependent Variable	Group (Independent Variable)		
Child Behavior Checklist (CBCL)	PTSD  ( <i>n</i> = 34)	Traumatized  PTSD-negatives ( <i>n</i> =56)	Nontraumatized  Controls ( <i>n</i> = 33)
Total Scale			
Aggregate/ <i>Syndrome</i> Scales:			
Internalizing			
<i>Withdrawn</i>			
<i>Somatic Complaints</i>			
<i>Anxious/Depressed</i>			
Externalizing			
<i>Delinquent Behavior</i>			
<i>Aggressive Behavior</i>			
<i>Attention Problems</i>			
<i>Social Problems</i>			
<i>Thought Problems</i>			
<i>Other Problems</i>			
<i>Note.</i> <i>n</i> = subsample size.			

## **Chapter 5**

### **Results**

In this chapter, the demographic and dependent variable data analyses are presented.

#### **Demographic Analysis**

Table 8 presents the basic demographic characteristics of the selected sample.

Table 8

*Demographic Characteristics of the Sample*

Variable	Group			Group Comparisons
	PTSD ( <i>n</i> = 34)	Traumatized PTSD-negative ( <i>n</i> = 56)	Nontraumatized control ( <i>n</i> = 33)	
Age (years)				
<i>M</i>	14.71	13.19	12.51	$F(2, 120) = 5.70, p < .01$
<i>SD</i>	2.80	2.94	2.49	$1 > 2^*, 3^{**}$
Socioeconomic Rating <sup>a</sup>				
<i>M</i>	27.62	35.32	34.59	$F(2, 118) = 3.96, p < .05$
<i>SD</i>	14.39	11.46	13.56	$1 < 2^*$
Gender				
	%	%	%	
Boys	50.0	66.1	42.4	$X^2(N = 123) = 5.22, p >$
				.05
Girls	50.0	33.9	57.6	
Race/Ethnicity				
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	



African-American	3 (8.8)	15 (26.8)	5 (15.2)
Asian	1 (2.9)	6 (10.7)	0 (0.0)
Caucasian	3 (8.8)	10 (17.9)	3 (9.1)
Hispanic	27 (79.4)	25 (44.6)	24 (72.7)
Other	0 (0.0)	0 (0.0)	1 (3.0)

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*Note.* 1 = PTSD group, 2 = Traumatized PTSD-negative group, 3 = Nontraumatized control group.

<sup>a</sup> Socioeconomic ratings were determined using Hollingshead's (1975) Four-Factor Index of Social Status.

\*  $p < .05$ , \*\*  $p < .01$ .

As noted in Table 8, a chi-square test of independence indicated nonsignificant differences between the comparison groups with regard to gender. The ethnicity of participants is reported by comparison group<sup>2</sup>. ANOVA analyses revealed significant group differences with regard to age and SES. Post hoc tests revealed that the PTSD group was significantly older than the traumatized PTSD-negatives,  $t(90) = 2.59, p < .05$ , and the control group participants,  $t(67) = 3.24, p < .01$ . All other age comparisons were nonsignificant. Post hoc tests also revealed that the PTSD group had a significantly lower Hollingshead SES score than the traumatized PTSD-negatives,  $t(90) = 2.70, p < .05$ . All other SES comparisons were nonsignificant. The correlations between CBCL scores and SES and age are represented in Table 9. As noted, SES was modestly correlated with the CBCL Total scale, Internalizing and Externalizing aggregate scales, and Withdrawn, Anxious/Depressed Behavior, Social Problems, Thought Problems, Attention Problems, Delinquent Behavior, Aggressive Behavior, and Other Problems syndrome scales. The respective coefficients accounted for .08%, .06%, .05%, .06%, .04%, .09%, .05%, .06%, .03%, .06%, and .08% of the variance. Age was correlated with the CBCL Withdrawn and Aggressive Behavior syndrome scales, and those correlations accounted for .06% and .03% of the variance, respectively.

Table 9

*Correlations Between CBCL Scores and Socioeconomic Rating<sup>a</sup> and Age*

CBCL Scale	SES	Age
Total	-.289**	.010

<sup>2</sup> As there were several cells containing fewer than five participants, the assumptions of the chi-square test of independence were violated, rendering a chi-square test of independence comparing ethnicity between groups invalid (J. Monroe, personal communication, April 28, 2010).

Internalizing	-.247**	.088
Externalizing	-.229*	-.082
Withdrawn	-.244**	.247**
Somatic Problems	-.118	.072
Anxious/Depressed Behavior	-.195*	.153
Social Problems	-.315*	-.147
Thought Problems	-.227*	.072
Attention Problems	-.250*	.023
Delinquent Behavior	-.180*	.111
Aggressive Behavior	-.245**	-.188*
Other Problems	-.292**	-.016

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<sup>a</sup> Socioeconomic ratings were assessed using Hollingshead's (1975) Four-Factor Index of Social Status.

\*  $p < .05$ , \*\*  $p < .01$ .

Table 10 lists the number and types of traumatic events that were reported by male and female participants in the PTSD and traumatized PTSD-negative groups. The mean number of traumas reported by the PTSD group ( $M = 1.79$ ,  $SD = .98$ ) was significantly greater than the mean number of traumas reported by the traumatized PTSD-negatives ( $M = 1.29$ ,  $SD = 0.56$ ),  $F(1, 88) = 9.82$ ,  $p < .01$ . Among the PTSD group, 47.1% reported exposure to a single traumatic event, 35.3% reported exposure to two traumatic events, and 17.6% reported exposure to more than two traumatic events. Among the traumatized PTSD-negative group, 76.7% reported exposure to a single traumatic event, 17.8% reported exposure to two traumatic events, and 5.4% reported exposure to more than two traumatic events.

Table 10

*Number and Types of Traumas Reported by Participants in PTSD-Positive and PTSD-Negative Groups by Gender*

Trauma	PTSD+ <sup>a</sup>		PTSD- <sup>b</sup>		Total <sup>c</sup>	
	Male <i>n</i> (%)	Female <i>n</i> (%)	Male <i>n</i> (%)	Female <i>n</i> (%)	Male <i>n</i> (%) <sup>*</sup>	Female <i>n</i> (%) <sup>*</sup>
Sexual Assault	1 (5.9)	8 (47.1)	0 (0.0)	0 (0.0)	1 (1.9)	8 (22.2)
Physical Assault	8 (47.1)	4 (23.5)	9 (24.3)	2 (10.5)	17 (31.5)	6 (16.7)
Shot	4 (23.5)	0 (0.0)	4 (10.8)	1 (5.3)	8 (14.8)	1 (2.8)
Dog Attack	0 (0.0)	0 (0.0)	2 (5.4)	3 (15.8)	2 (3.7)	3 (8.3)
Motor Vehicle Accident	1 (5.9)	3 (17.6)	8 (19.5)	8 (38.1)	9 (16.7)	9 (25.0)
Hand Injury	1 (5.9)	0 (0.0)	9 (24.3)	2 (10.5)	10 (18.5)	2 (5.6)
Smoke Inhalation	1 (5.9)	1 (5.9)	0 (0.0)	2 (10.5)	1 (1.9)	3 (8.3)
Other	1 (5.9)	0 (0.0)	5 (13.5)	0 (0.0)	6 (11.1)	0 (0.0)
Witnessed Trauma	0 (0.0)	1 (5.9)	0 (0.0)	3 (15.8)	0 (0.0)	4 (11.1)

<sup>a</sup> *n* = 34. <sup>b</sup> *n* = 56. <sup>c</sup> *n* = 33.

<sup>\*</sup>Reflects percentage of males and females in both groups.

## Dependent Variable Data Analysis

In this section, descriptive statistics regarding the scores of the three groups on the CBCL Total, Internalizing aggregate scale, Externalizing aggregate scale, and syndrome scales are reported. Additionally, the results of univariate *F* tests utilizing CBCL scores as the dependent variables are reported. Finally, this section presents the results of ANOVA, MANOVA, and MANCOVA procedures performed with the CBCL Total, aggregate scale, and syndrome scale scores, respectively, as dependent variables.

Initially, CBCL Total, Internalizing aggregate scale, and Externalizing aggregate scale raw scores were converted to standard scores based on the procedures outlined in the CBCL manual (Achenbach, 1991). In the analysis of CBCL syndrome scales, on the other hand, raw scores were entered, as the use of standardized CBCL syndrome scale scores reduces variability (Achenbach, 1991). Mean scores and standard deviations for the CBCL Total, Internalizing aggregate scale, Externalizing aggregate scale, and syndrome scales were calculated. To explore group differences with regard to the standardized CBCL Total score, an ANOVA procedure was performed with group as the independent variable. A MANOVA was conducted with standardized CBCL Internalizing and Externalizing aggregate scale scores as the dependent variables<sup>3</sup>. As the meaning of CBCL scores varies by age and gender (Achenbach, 1991), a MANCOVA procedure was conducted with group membership as the independent variable, CBCL syndrome scale raw scores as the dependent variables, and age, gender, and SES as

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<sup>3</sup> As the CBCL Total, Internalizing, and Externalizing standard scores are based on gender and age differences (Achenbach, 1991), age and gender were not included as covariates in these analyses.

covariates.<sup>4</sup> When significant values were evident, univariate *F* tests and Bonferroni post hoc comparisons were performed to identify group differences. Table 11 presents the CBCL Total, Internalizing aggregate scale, Externalizing aggregate scale, and syndrome scale means and standard deviations for the comparison groups, as well as the results of univariate analyses. Table 12 presents the results of Bonferroni post hoc tests.

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<sup>4</sup> Using Levene's test of equality of error variance provided by SPSS for Windows, Version 17.0 (2009), unequal variance on seven of the nine dependent variables was observed. Therefore, data were subsequently analyzed using square-root-transformed data.

Table 11

*Means, Standard Deviations, and Results of Univariate F tests for CBCL Scores*

Scale	PTSD <sup>a</sup>		Traumatized PTSD- negative <sup>b</sup>		Control <sup>c</sup>		Univariate Results	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>F</i> <sup>d</sup>	<i>p</i>
Total Score	61.44	11.72	50.19	11.07	51.60	9.53	12.14	.000
Internalizing	61.47	11.55	50.43	9.57	52.12	8.95	13.65	.000
Withdrawn	4.50	3.23	2.12	2.29	2.67	2.35	3.97	.021
Somatic Complaints	3.85	3.99	1.52	2.21	1.90	1.99	4.28	.016
Anxious/Depressed	7.91	6.2	3.18	3.47	3.27	3.06	12.79	.000
Externalizing	56.62	12.92	50.27	10.96	50.18	10.53	3.84	.024
Delinquent Behavior	4.32	3.76	2.11	2.59	1.67	1.67	4.70	.011
Aggressive Behavior	10.47	7.60	6.69	6.61	6.51	5.72	4.57	.012
Attention Problems	5.91	5.38	2.64	2.77	2.21	2.23	8.56	.000
Social Problems	2.97	2.96	1.80	2.40	1.51	1.44	3.61	.030
Thought Problems	1.71	1.99	.54	1.26	.42	.71	7.43	.001
Other Problems	7.32	5.26	3.68	3.17	4.42	2.89	8.00	.001

*Note.*  $M$  = mean,  $SD$  = standard deviation. Means and standard deviations represent standard scores for CBCL Total, Internalizing aggregate, and Externalizing aggregate scales; they represent raw scores for CBCL syndrome scales.

<sup>a</sup> $n=34$ . <sup>b</sup> $n=56$ . <sup>c</sup> $n=33$ . <sup>d</sup> $df(2, 120)$  for the CBCL Total, Internalizing, and Externalizing scale analyses;  $df(2, 115)$  for CBCL syndrome scale analyses, since the MANCOVA included three demographic covariates, and two study participants did not provide demographic information.



Table 12

*Bonferroni Post Hoc Comparisons for CBCL scores*

Scale	PTSD vs. Traumatized		PTSD vs. Control		Traumatized PTSD-negative		Post Hoc Comparisons
	PTSD-negative				vs. Control		
	<i>t</i> (90)	<i>p</i>	<i>t</i> (67)	<i>p</i>	<i>t</i> (89)	<i>p</i>	
Total Score	-4.76	< .001	3.79	< .001	.59	N.S.	1>2 <sup>***</sup> , 3 <sup>***</sup>
Internalizing	-5.08	< .001	3.83	< .001	-.77	N.S.	1>2 <sup>***</sup> , 3 <sup>***</sup>
Withdrawn	-2.77	< .05	2.14	N.S.	-.37	N.S.	1>2 <sup>*</sup>
Somatic Complaints	-2.84	< .05	2.29	N.S.	-.28	N.S.	1>2 <sup>*</sup>
Anxious/Depressed	-4.76	< .001	4.21	< .001	-.02	N.S.	1>2 <sup>***</sup> , 3 <sup>***</sup>
Externalizing	-2.56	< .05	2.31	N.S.	.03	N.S.	1>2 <sup>*</sup>
Delinquent Behavior	-2.68	< .05	2.80	< .05	.50	N.S.	1>2 <sup>*</sup> , 3 <sup>*</sup>
Aggressive Behavior	-2.42	N.S.	2.90	< .05	.89	N.S.	1>3 <sup>*</sup>
Attention Problems	-3.44	< .01	3.91	< .001	1.02	N.S.	1>2 <sup>**</sup> , 3 <sup>***</sup>
Social Problems	-2.22	N.S.	2.54	< .05	.67	N.S.	1>3 <sup>*</sup>
Thought Problems	-3.51	< .01	3.39	< .01	.31	N.S.	1>2 <sup>**</sup> , 3 <sup>**</sup>

Other Problems	-3.92	< .001	2.98	< .01	-.59	N.S.	1>2 <sup>***</sup> , 3 <sup>**</sup>
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*Note.* 1 = PTSD group, 2 = Traumatized PTSD-negative group, 3 = Nontraumatized control group; N.S. = nonsignificant.

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

An ANOVA indicated significant differences in the Total CBCL score between groups. Bonferroni post hoc comparisons revealed that the mean CBCL Total score of youth with PTSD significantly exceeded the means of the stress-exposed youth without PTSD and nontraumatized controls. As such, hypotheses 1 and 13, respectively, were supported. In contrast, the means of the PTSD-negative and nontraumatized control groups did not significantly differ. Accordingly, hypothesis 25 was also supported.

A MANOVA identified significant group differences in CBCL Internalizing and Externalizing aggregate scale scores based on a Wilks' lambda test,  $F(4, 238) = 6.50, p < .001$ . Univariate  $F$  tests denoted significant differences between groups in mean Internalizing and Externalizing aggregate scale scores. Bonferroni post hoc comparisons determined that the mean Internalizing scale score of the PTSD group significantly exceeded the mean Internalizing scale scores of the traumatized PTSD-negative and nontraumatized control groups. As such, hypotheses 2 and 14, respectively, were supported. Youth with PTSD had significantly higher Externalizing scale scores than traumatized PTSD-negatives. Thus, hypothesis 6 was also supported. In contrast, the mean Externalizing scale score of the PTSD group did not significantly differ from that of nontraumatized controls. Given that youth with PTSD did not have significantly higher CBCL Externalizing scale scores than controls, hypothesis 18 was rejected. No statistically significant differences were evident when the Internalizing and Externalizing scale score means of the traumatized PTSD-negative and nontraumatized control groups were compared. Thus, hypotheses 26 and 30 were supported.

A MANCOVA controlling for age, gender, and SES revealed significant differences on the CBCL syndrome scales based on a Wilks' lambda test,  $F(18, 24) = 1.85, p < .05$ . Univariate analyses indicated that the groups differed on the following CBCL subscales: Withdrawn,

Somatic Complaints, Anxious/Depressed, Delinquent Behavior, Aggressive Behavior, Attention Problems, Social Problems, Thought Problems, and Other Problems. The scores of the PTSD group significantly exceeded the means of the PTSD-negatives and nontraumatized controls on the Anxious/Depressed, Delinquent Behavior, Attention Problems, Thought Problems, and Other Problems scales. As such, hypotheses 5, 7, 9, 11, 12, 17, 19, 21, 23, and 24 were supported. The PTSD group had significantly higher scores than PTSD-negatives on the Withdrawn and Somatic Complaints syndrome scales. Thus, hypotheses 3 and 4 were supported. As youth with PTSD did not exhibit significantly higher scores than the nontraumatized control group on the Withdrawn and Somatic Complaints syndrome scales, hypotheses 15 and 16 were rejected. The PTSD group had significantly higher scores than controls on the Aggressive Behavior and Social Problems scales. As such, hypotheses 20 and 22 were supported. As youth with PTSD did not have significantly higher scores than the traumatized PTSD-negatives on the Aggressive Behaviors and Social Problems scales, hypotheses 8 and 10 were rejected. The PTSD-negative and nontraumatized control groups did not significantly differ on any of the CBCL syndrome scales. Thus, hypotheses 27, 28, 29, 31, 32, 33, 34, 35, and 36 were supported.

## Chapter 6

### Discussion

In this chapter, the purpose and results of the study are summarized. The findings are discussed, with an emphasis on their theoretical and clinical implications. Finally, potential limitations of the study are presented within the context of recommendations for future research in the area of child and adolescent PTSD.

#### Summary

This study compared the CBCL scores of clinically referred youth with PTSD to the CBCL scores of clinically referred traumatized youth without PTSD. It also compared the CBCL scores of youth with PTSD, as well as those of traumatized youth without PTSD, to those of a nontraumatized comparison group. In so doing, data from a study that was previously approved by the institutional review boards of Bellevue Hospital, The Graduate Center of the City University of New York, and Teachers College was analyzed. Participants included a total of 123 youth aged 7 through 18 who were tested at Bellevue Hospital in New York City. They were assigned to one of three groups: youth with PTSD ( $n = 34$ ), traumatized youth without PTSD ( $n = 56$ ), and nontraumatized controls ( $n = 33$ ). Among the PTSD-positive group, eight participants met DICA-R (Reich, Leacock, & Shanfeld, 1995) criteria for major depression, and one met criteria for substance dependence. Of the traumatized PTSD-negative participants, two met DICA-R criteria for major depression, two met criteria for CD, and one met criteria ADHD. Youth with a history of abuse or neglect were excluded from the study. Additional exclusionary criteria included intellectual disability (i.e.,  $IQ \leq 69$ ), the inability to speak or understand English, a history of significant head trauma, and the use of medication that could influence cognitive functioning. Statistical analyses revealed nonsignificant differences between

comparison groups with regard to gender. On the other hand, participants in the PTSD group were significantly older than their counterparts in the traumatized PTSD-negative and nontraumatized control groups and had significantly lower Hollingshead SES ratings than the traumatized youth without PTSD. CBCL scores were only weakly correlated with age. Likewise, negative correlations between CBCL scores and SES were weak.

An ANOVA was used to compare the groups on standardized CBCL Total score, and a MANOVA, followed by univariate *F* tests and Bonferroni post hoc tests, was performed to test for group differences in standardized CBCL Internalizing and Externalizing aggregate scale scores. Results of all analyses indicated significant differences between groups. The mean CBCL Total score of the PTSD group significantly exceeded the means of the traumatized PTSD-negatives and nontraumatized controls. The PTSD group had significantly higher Internalizing aggregate scale scores than both comparison groups and significantly higher Externalizing aggregate scale scores than traumatized PTSD-negatives. On the other hand, the mean Externalizing aggregate scale scores of the PTSD and nontraumatized control groups did not significantly differ. As hypothesized, nonsignificant differences were observed between the mean CBCL Total scores of the traumatized PTSD-negatives and nontraumatized controls. Similarly, the Internalizing and Externalizing aggregate scale scores of traumatized PTSD-negatives and nontraumatized controls did not significantly differ.

A MANCOVA procedure was performed with age, gender, and SES as covariates, followed by univariate *F* tests and Bonferroni post hoc tests, to identify significant group differences in CBCL syndrome scale raw scores. Results of all analyses indicated significant differences between groups. The scores of the PTSD-positives significantly exceeded the scores of the traumatized PTSD-negatives on the following CBCL syndrome scales: Withdrawn,

Somatic Complaints, Anxious/Depressed, Delinquent Behavior, Attention Problems, Thought Problems, and Other Problems. The scores of the PTSD-positives significantly exceeded those of nontraumatized controls on the Anxious/Depressed, Delinquent Behavior, Aggressive Behavior, Attention Problems, Social Problems, Thoughts Problems, and Other Problems syndrome scales. As hypothesized, the CBCL syndrome scale scores of traumatized PTSD-negatives and nontraumatized controls did not significantly differ.

### **Discussion of Findings**

As predicted, the PTSD group evidenced significantly higher Withdrawn, Somatic Complaints, and Anxious/Depressed ratings relative to the traumatized PTSD-negatives. The PTSD group also had significantly higher Anxious/Depressed ratings relative to the nontraumatized control group. Accordingly, the mean Internalizing aggregate scale score of PTSD-positives was significantly greater than that of both comparison groups, as was hypothesized. This is consistent with the categorization of PTSD in the *DSM-IV* as an anxiety disorder that is characterized by trauma-related, anxiety-inducing thoughts and symptoms of social estrangement (American Psychiatric Association, 1994). It is also concordant with research that found self-reported anxiety and depression symptom scores to differentiate between PTSD-positive and PTSD-negative youth traumatized by war (Saigh, 1988, 1989a, 1989c), natural disasters (Hsu et al., 2002; Lonigan et al., 1994), accidents (Stallard et al., 1999; Udwin et al., 2000), fatal illness (Butler et al., 1996; Hobbie et al., 2000), sexual abuse (McLeer et al., 1992; Wolfe et al., 1994), and community-based violence (Lipschitz et al., 2000; Steiner et al., 1997). In contrast to what was hypothesized, the mean Externalizing aggregate scale score of the PTSD group did not significantly exceed that of the nontraumatized control group. This is consistent with the findings of Saigh and colleagues (2002), who reported nonsignificant

differences between the mean Externalizing aggregate scale scores of PTSD-positive, traumatized PTSD-negative, and control group participants.

Although it was predicted that the CBCL Withdrawn and Somatic Complaints syndrome scale scores of children and adolescents with PTSD would significantly exceed those of the nontraumatized controls, these scores did not significantly differ. Saigh et al. (2002) also reported nonsignificant differences between the Withdrawn syndrome scale scores of PTSD-positive and nontraumatized control groups. One possible explanation for the failure of the Somatic Complaints syndrome scale score to discriminate between PTSD-positives and nontraumatized controls is that an overwhelming majority (72%) of control group participants identified themselves as Hispanic. Research has found high prevalence rates of somatic symptoms in both clinical and community samples of Latino youth (Pina & Silverman, 2004; Varela et al., 2004) and adults (Canino, Escobar, Canino, & Rubio-Stipec, 1992; Escobar & Canino, 1989).

As hypothesized, the PTSD group evidenced significantly higher scores on the Delinquent Behavior and Attention Problems syndrome scales relative to both comparison groups. These findings are consistent, respectively, with those from an earlier case-control study involving youth with PTSD, which determined that adolescent girls with PTSD were significantly more likely than their traumatized PTSD-negative and nontraumatized counterparts to use narcotics and have been arrested (Lipschitz et al., 2000), and with research documenting attentional deficits in individuals with PTSD (Bremner et al., 1993; Litz & Keane, 1989; Saigh et al., 1997). The Aggressive Behavior and Social Problems syndrome scale scores of the PTSD-positives were significantly higher than those of nontraumatized controls. These findings are concordant with research documenting limited impulse control, limited suppression of



aggression, and less consideration of others in young male witnesses to community-based violence who developed PTSD relative to a nonclinical comparison group (Steiner et al., 1997). The significantly higher ratings that were evidenced by the PTSD group on the Aggressive Behavior scale are also in keeping with the *DSM-IV* PTSD diagnostic criterion “irritability or outbursts of anger” (American Psychiatric Association, 1994, p. 428).

In contrast to what was hypothesized, the Aggressive Behavior and Social Problems syndrome scale scores of the PTSD group did not significantly exceed those of traumatized participants without PTSD. While PTSD in adulthood has been associated with anger regulation deficits (Chemtob, Novaco, Hamada, Gross, & Smith, 1997; Feeny, Zoellner, & Foa, 2000) and interpersonal difficulties (Carroll, Rueger, Foy, & Donahoe, 1985; McDonald, Chamberlain, Long, & Flett, 1999; Warshaw, Fierman, Pratt, Hunt, et al., 1992), Carrion and colleagues (2002) determined that traumatized youth with and without PTSD did not significantly differ in terms of social impairment. Similarly, Saigh et al. (2002) found that the CBCL Social Problems syndrome scale did not discriminate between youth with PTSD and traumatized PTSD-negatives.

The significantly greater Thought Problems and Other Problems syndrome scale scores of the PTSD group, relative to those of both comparison groups, are consistent with *DSM-IV* PTSD diagnostic criteria. The first of these syndrome scales includes items that reflect reexperiencing symptoms (e.g., “Can’t get his/her mind off certain problems,” “Repeats certain acts over and over”), while the latter consists of items representing some of the primary features of PTSD (e.g., nightmares and fearing certain situations or places). Saigh et al. (2002) also determined that these syndrome scales distinguished between youth with PTSD, traumatized PTSD-negatives, and nontraumatized controls.

Finally, as several studies comparing traumatized youth without PTSD to nontraumatized

controls failed to report significant differences on measures of anxiety and depression (Saigh, 1989a, 1989c, 1991), anger (Saigh et al., 2007), and misconduct (Saigh et al., 2002, 2007), it was hypothesized that the CBCL ratings of these groups would not significantly vary. Indeed, the CBCL Total, Internalizing aggregate scale, Externalizing aggregate scale, and Withdrawn, Somatic Complaints, Anxious/Depressed, Delinquent Behavior, Aggressive Behavior, Attention Problems, Social Problems, Thought Problems, and Other Problems syndrome scale scores of the nontraumatized controls and trauma-exposed participants without PTSD did not significantly differ.

### **Theoretical Significance**

The significant differences that were noted between the CBCL scores of PTSD-positives and traumatized PTSD-negatives, together with the nonsignificant differences that were observed between stress-exposed PTSD-negatives and controls, provide powerful empirical support for the differential validity of the *DSM-IV* PTSD classification as it applies to children and adolescents. Although the *DSM-IV* makes reference to the expression of PTSD in children and adolescents, the *DSM-IV* PTSD field trials did not include youth below the age of 15 years (Kilpatrick & Resnick, 1992; Saigh & Bremner, 1999). While researchers have documented elevated CBCL scores in youngsters who developed PTSD following exposure to fatal illness (Butler et al., 1996), sexual and/or physical abuse (DeBellis, 1999; McLeer et al., 1988, 1992; Wolfe et al., 1994), and various types of trauma (Diamond, 1995; Saigh et al., 2002), these studies are marked by methodological limitations. They either did not include traumatized youth without PTSD or did not provide information about the functioning of traumatized PTSD-negatives relative to nontraumatized controls. Saigh et al. (2002) excluded from their study youth with major comorbid disorders. As nearly three fourths of all adolescents diagnosed with PTSD have at least

one comorbid diagnosis (Kilpatrick et al., 2003), the inclusion of comorbid cases in this study serves to augment its external validity. In comparing the CBCL scores of children and adolescents with PTSD, traumatized children and adolescents without PTSD, and nontraumatized controls, this study made the important determination that parent-reported internalizing and externalizing behavior problems, as measured by the CBCL, are associated with PTSD and not with exposure to trauma alone. Its findings also suggest that exposure to trauma in the absence of PTSD is not associated with higher estimates of psychiatric morbidity.

### **Clinical Significance**

As PTSD is a treatable disorder (Bisson et al., 2007; Saigh, 1987b; Saigh, Brassard, & Peverly, 2004; Saigh et al., 2008; Saigh, Yasik, Oberfield, & Inamdar, 1999; Taylor & Chemtob, 2004) that has been associated with a number of long-term negative outcomes such as academic failure, exclusion from higher education, and economic impoverishment (Fairbank, Ebert, & Zarkin, 1999; Saigh et al., 1997), this investigation provided a significant clinical benefit to participants and their families. Participants received free and comprehensive psychiatric and psychological evaluations. The results of these evaluations denoted the presence or absence of psychiatric morbidity and provided a wealth of information regarding participants' affective and behavioral functioning. Test outcomes were incorporated into individualized psychological reports that were given to participants and their parents/guardians. The provision of these reports, coupled with referrals for mental health services, may have served to offset the serious consequences that are associated with PTSD and frequently seen comorbid disorders.

This study determined that the CBCL Total, Internalizing aggregate, and Anxious/Depressed, Delinquent Behavior, Attention Problems, Thought Problems, and Other Problems syndrome scales are sensitive to the expression of PTSD in clinically referred children

and adolescents. Psychologists, school personnel, physicians, social workers, and others who are involved in the early identification and treatment of youth with PTSD may benefit from this knowledge. More specifically, they might explore the use of the CBCL as a PTSD screening or treatment outcome measure.

### **Future Directions**

The results of this study must be tempered with the understanding that this sample represents a select group. It is highly representative of an ethnically diverse, urban population. For example, 19%, 6%, 13%, 59% and 3% of study participants were from African-American, Asian, Caucasian, Hispanic, and other ethnic backgrounds, respectively. This study did not include children under the age of 7. Youth with a history of abuse or neglect were also excluded from the investigation. Additional exclusionary criteria included intellectual disability, the inability to speak or understand English, a history of significant head trauma, and the use of medication that could influence cognitive functioning. As such, the external validity of the study may be limited to youth with similar demographic and developmental characteristics, as well as comparable trauma histories. It should also be understood that this is a cross-sectional investigation; the possibility that psychiatric morbidity may have existed before trauma exposure cannot be ruled out.

Given these points, researchers should attempt to replicate these findings with different populations of trauma-exposed children and adolescents (e.g., suburban youth). Given the high point prevalence rates of PTSD in children and adolescents who have been physically and/or sexually abused (Ackerman et al., 1988; McLeer, 1998; McLeer et al., 1988, 1998) and preliminary findings suggesting that the CBCL may be sensitive to the expression of PTSD in this population (De Bellis et al., 1999; McLeer et al., 1988, 1992; Wolfe et al., 1994), a similar

investigation incorporating youngsters with a history of abuse or neglect may have important clinical implications. A comparable study with a younger sample might provide valuable insight into the differential validity of the PTSD diagnosis at an earlier developmental stage. Finally, it would be of interest to conduct a similar study using the Youth Self-Report version of the CBCL (Achenbach, 1991b), as this might contribute to our understanding of how traumatized children and adolescents with and without PTSD perceive their own behaviors relative to nontraumatized controls.

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