

A Comparative Analysis of the Revised Children's Manifest Anxiety Scale
Scores of Traumatized Youth With and Without PTSD
Relative to Non-Traumatized Controls

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ABSTRACT

A Comparative Analysis of the Revised Children's Manifest Anxiety Scale Scores of Traumatized Youth With and Without PTSD Relative to Non-Traumatized Controls

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This study compared the *Revised Children's Manifest Anxiety Scale* (RCMAS) scores of traumatized youth with or without PTSD to the scores of a nonclinical comparison group. Child diagnostic interviews identified children with PTSD (28), traumatized children without PTSD (63), and a nonclinical comparison group (41). In the absence of major comorbid disorders, children with PTSD had significantly higher RCMAS total scores and significantly higher scores on the RCMAS Physiological Anxiety, Worry/Oversensitivity, and Social Concern/Concentration subscales. Nonsignificant differences were observed between groups on the RCMAS Lie subscale. The RCMAS scores of the traumatized PTSD negatives and controls did not significantly differ. Implications for research and practice are considered.

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Chapter I

THE HISTORY OF POSTTRAUMATIC STRESS DISORDER

Posttraumatic stress disorder (PTSD) was introduced to the psychiatric nomenclature with the publication of the third edition of the *Diagnostic and Statistical Manual for Mental Disorders* (DSM-III, APA, 1980). However, the historical record of trauma-related stress reactions preceded this publication. Indeed, psychiatric reactions to traumatic events have been documented for centuries. Records describing the physical and emotional effects of traumatic experiences date as far back as the 17th century. Interest in the effects of war-related and civil traumas led to the growth and development of what is currently referred to as PTSD. This chapter reviews historical anecdotes, clinical reports, and research to chronicle examples of the onset of psychiatric morbidity following trauma exposure throughout history and briefly discusses the future of PTSD.

Historical Background

The psychological effects of exposure to traumatic stress were chronicled for centuries before PTSD was recognized as a formal diagnostic classification by the American Psychiatric Association (APA). Some of the earliest accounts of the psychological effects of stress exposure can be found in literature. Historically, Shakespeare's *Henry IV* described many of the diagnostic symptoms of PTSD (Davidson, 1996). Taken in this context, Shakespeare's (1597) character represented,

Oh, my good lord, why are you thus alone?
For what offence have I this fortnight been
A banish'd woman from my Harry's bed?

...In thy faint slumbers I by thee have watched,
 And heard thee murmur tales of iron wars,
 Speak terms of manage to thy bounding steed,
 Cry "Courage! To the field!" And thou hast talked
 Of sallies and retires, of trenches, tents,
 Of palisades, frontiers, parapets,
 Of basilisks, of cannon, culverin,
 Of prisoner's ransom, and of soldiers slain,
 And all the currents of a heady fight.
 Thy spirit within thee hath been so at war
 And thus hath so bestirred thee in thy sleep
 That beads of sweat have stood upon thy brow....
 (pp. 40-61)

One of the earliest autobiographic examples of the psychological effects of actual exposure to exceptional stress can be found in Samuel Pepys's 1667 diary entry, written six months subsequent to witnessing the Great Fire of London, which destroyed the city in five days. Pepys recorded reexperiencing, phobic avoidance, emotional constriction, and symptoms of hyperarousal following the fire, and recounted that:

It is strange to think that how to this very day I cannot sleep a night without great terrors of the fire; and this very night could not sleep to almost two in the morning through great terrors of the fire. (Pepys, 1666, as cited in Daly, 1983, p. 66)

In addition to disasters, war-related studies have offered insights regarding the physical and emotional effects of traumatic events. Silas Weir Mitchell's (1864) observations during the American Civil War are among the earliest medical references to traumatic stress (as cited in Davidson, 1996). Mitchell was in charge of Turner's Lane Hospital in Philadelphia, a 400-bed army hospital for nervous diseases. Mitchell observed that male veterans and female citizens exposed to trauma often self-medicated with opiates and alcohol in order to manage their symptoms (Davidson, 1996). He also represented that a soldier in continuous pain became a coward and the strongest man became hysterical. Analogously, Jacob Mendez DaCosta reported that many American Civil War soldiers presented with symptoms of increased arousal, irritability, and elevated heart rate (Jones & Wessely, 2005; Saigh & Bremner, 1999). These biological

reactions to combat were referred to as “Da Costa’s Syndrome” (Saigh & Bremner, 1999), soldier’s/irritable heart (Jones & Wessely, 2005; Trimble, 1985), and disordered action of the heart (Jones & Wessely, 2005).

During the 19th century, technological demands resulting from the industrial revolution led to the development of extensive railway systems. As a result of traumatic transportation accidents, numerous cases of “railway spine,” “nervous shock,” and “hysteria” were documented (Page, 1885). In Charles Dickens’s account of delayed emotional distress following a railway accident on June 9, 1865, he represented:

I am not quite right within, but believe it to be an effect of the railway shaking. There is no doubt of the fact that, after the Staplehurst experience, it tells more and more, instead of, as one might have expected, less and less.... Driving in Rochester yesterday I felt more shaken than I have since the accident. I cannot bear railway traveling yet. (quoted in Trimble, 1981)

In 1866, a physician named John Eric Erichsen was one of the first individuals to assert that there was a unique pattern of symptoms, including fatigue, weakness, irritability, and insomnia, associated with railway accidents (Trimble, 1981). Erichsen believed that “railway spine” resulted from a concussion of the spine caused by weakening of the nerves and regarded the symptoms to be associated with hypochondriasis, which is an imagined physical illness. Patients with “railway spine” were described as “fretful,” “irritable,” and unable to concentrate; their sleep was characterized as being “disturbed, restless and broken” and their “dreams ... distressing and horrible” (Erichsen, 1867, p. 73).

One of the first attempts to classify psychological disorders was made by Emil Kraepelin, a German nosologist, in 1896. His classification system was comprised of medical conditions, and it grouped disorders together based on observable symptoms (Sue, Sue, & Sue, 1990). For example, he utilized the term “schreckneurose” (“fright neuroses”) to describe a specific clinical syndrome understood to be

multiple nervous and psychic phenomena arising as a result of severe emotional upheaval or sudden fright which would build up great anxiety; it can therefore be observed after serious accidents and injuries, particularly fires, railway derailments or collisions. (translated by Jablensky, 1985, p. 737)

Increased incidence of emotional distress experienced by soldiers after exposure to highly traumatic events during World Wars I and II led to enormous advances relative to the understanding of the emotional and physiological effects of traumatic stress. During the First World War, cases of “shell shock” and “soldier’s heart” were identified by medical officers at base hospitals in France to describe individuals suffering from mental shock (Davidson, 1996; Howorth, 2000). Initially, it was believed that symptoms such as hyperarousal were due to neurological damage caused by exploding ammunition shells (Cohen, 1998). Other psychiatrists believed that extensive marching in conjunction with carrying heavy packs led to symptoms (Cotton, Lewis, & Thiele, 1915). The condition was eventually renamed “combat neurosis” after it was realized that symptoms were psychologically rather than physiologically based (Cohen, 1998). Examined in this context, a British physician, William Aldren Turner (1916), wrote the following description of British soldiers who evidenced nervous shock, neurasthenia (e.g., symptoms of fatigue, anxiety, headache, neuralgia, and depressed mood), and mental breakdown after being exposed to highly traumatic events:

Cases of nervous and mental breakdown due to shock, fatigue, exposure, and other conditions incidental to a campaign began to arrive in England in September, 1914, shortly after the commencement of hostilities and could be classified into three main groups. One group was recognized whose symptoms were due to the bursting of high-explosive shells in the immediate vicinity of the patient or to the secondary effects of the explosion, such as burial under earth and debris or the inhalation of noxious gases. The second group included cases of general neurasthenic character (using this term in the widest sense) attributable to exhaustion of the nervous system resulting from physical and nervous strain, sleeplessness, anxiety, and harassing sights and experiences. The third group included cases of mental breakdown – the milder as well as the more severe psychoses – mental confusion, mania, melancholia, and delusional and hallucinatory psychoses. (p. 1073)

Similarly, Mott (1919) described a British soldier's recollections of being trapped behind enemy lines, enduring continual shellfire, witnessing the death of his sergeant, and suffering without food and water for several days, and his subsequent increased arousal, dissociation, and re-experiencing of the trauma through recurring thoughts and dreams. By 1919, Ernest Southard documented over 500 cases of soldiers who experienced various war-related emotional consequences. For example, one case study of a 28-year-old infantry sergeant who was described to "jump at the least sound" recounted "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" (p. 446).

Southard (1919) also described the case of a 39-year-old man who had been working under shellfire. The man reported feeling depressed and complained of noises in his head, pricking pain, unsteady legs, fatigue, irritability, and loss of confidence. He said, "My legs have been very unsteady, especially when someone is looking at me. They must have thought me drunk at times" (p. 452). He reportedly experienced tremors in his arms, legs, head, and tongue. Southard also described a soldier whose camp was bombarded by an airplane escadrille. The soldier was reportedly frightened, ran away, and hid in a ditch. He was evacuated to Calais and then to Chateaugiron as a result of feeling sick, not eating, and wanting to kill himself. He was described as follows:

He was found to be well oriented, but depressed and bewildered. There was an emotional tachycardia. At night, he would fall into delirium like the oniric delirium of Régis, always dreaming of the same bombardment scene, saying it was like a *moving picture in his head*. The delirium affected him so that he actually tried to make away with himself. The dream delirium did not last long but recurred several times on very slight emotional occasions. It was possible to excite his hallucinatory dreams experimentally by showing him battle pictures. (p. 460)

Case reports from soldiers in World War II contributed to the understanding of traumatic stressors and as a result affected literature of the time. For example, researchers

documented the psychiatric morbidity evidenced by children exposed to extreme stress. Bender and Blau (1937) examined the effects of trauma on 16 children at the Children's Ward of the Psychiatric Division of Bellevue Hospital in New York City who reportedly had sexual relations with adults. These children presented with fearfulness, irritability, nightmares, trauma, reminiscent re-enactments, and hypervigilance. For some of the children, academic impairments were also present. They also reported that one child was "so backward that she was placed in an ungraded class for children with defective intelligence" (p. 505). In describing the children, Bender and Blau reported:

Their interest in school diminished, they paid little attention to their homework, and some became chronic truants. In some cases this effected a school retardation so marked that the child was considered defective.... Hyperactivity and general restlessness in other activities was also commonly noted. (p. 505)

With regard to World War I combat veterans, American psychiatrist Abram Kardiner conducted psychological evaluations at the Bronx Department of Veteran Affairs in 1941. Kardiner (1941) described the clinical features of what he called "psychoneurosis" in his book *The Traumatic Neurosis of War*. According to Kardiner, the symptoms of this syndrome included increased startle, irritability, aggressive outbursts, fixation on the traumatic event, constricted personality functioning, and disturbed dreams.

Given the prevailing understanding that exposure to traumatic stressors could lead to negative emotional outcomes, psychiatrists played a significant role relative to screening and prevention during World War II (Jones & Wessely, 2005). Examined in this context, a 1941 study of 200 military cases was performed by Paul Wood, who determined that the most common symptom was breathlessness, followed by palpitations, fatigue, sweats, nervousness, dizziness, and left chest pain, respectively (cited in Paul, 1987). Wood also asserted that DaCosta's Syndrome should be considered "an emotional reactive pattern" (p. 311).

During the Second World War, a majority of war-related studies focused on the symptoms of adults exposed to war-related stressors. However, researchers also examined the psychological functioning of children who were exposed to wartime stressors (e.g., Bodman, 1941; Brander, 1943; Carey-Trefzer, 1949; Friedman, 1949; Freud & Burlingham, 1943; Mercer & Despert, 1943). Within this context, Bodman (1941) surveyed 8,000 British children between 5 and 14 years of age who were exposed to Nazi air raids. He found that 4% reported with psychological (e.g., nightmare, war-related fears, psycho-physiological reactivity, avoidance, aggression) or psychosomatic (e.g., headaches, enuresis, encopresis, indigestion) symptoms during the period of time when air raids were occurring. Bodman conducted a two-month follow-up study with 54 children between 2 months and 12 years of age who had been evacuated from the Children's Hospital in Bristol. Two months after the air raids ceased, 61% of these children exhibited symptoms, and 11% presented with symptoms seven months after the air raids. Interestingly, Bodman noted that older children (seven-and-a-half years of age and greater) tended to view the air raids as an adventure.

Also within the realm of war-related stressors, Mercer and Despert (1943) identified a sample of French children who presented with increased heart rate, enuresis, nightmares, trauma-related recollection, memory impairments, and academic impairments following the German occupation of France. For example, when an eleven-year-old boy was asked the profession he would work at a later age, he replied, "When I am 26, I will have been killed at war a long time ago" (p. 267). Mercer and Despert also described two siblings who crossed the border between occupied and unoccupied zones by train, alone, and without identification papers, as they were not required by German authorities for children less than 14 years of age. The children traveled with a man they had never seen before who was posing as their father. During the hour-and-a-half inspection, which consisted of luggage searches and questioning, the children reported feeling anxious and remaining quiet and immobile. They never referred to the trip and were ambiguous when

questioned by their mother. They spoke about their experiences for the first time nine months later when they had arrived to America. The younger sibling said, “Didn’t we fool them when they believed that the man was our father?” while the other replied, “Don’t speak about it, they might still take us” (p. 269). Notably, this research indicated that the children were able to adjust better than the adults.

Similarly, in *War and Children*, Freud and Burlingham (1943) provided in-depth case studies of children in wartime England. They described these children as exhibiting anxious and “cranky” behavior. Within this context of war-related stressors, Brander (1943) reported the psychological reactions of Finnish children during the Russo-Finnish War of 1939 to 1940. Many Finnish families were forced to leave their homes during the Russo-Finnish War, crowded into unheated railroad cars, relocated to unspecified areas at night, and repeatedly exposed to machine gun attacks by Soviet aircraft. Brander reported that many of these children exhibited traumatic stress reactions, including fears, avoidance, and reactivity to war-related stimuli, and that these symptoms were still present one year after the war had ended. Brander reported,

Even a year after the war, the sight of ruins had a profoundly depressing effect upon the children ... war films, saddening war pictures in illustrated magazines, reports of war of any kind, still caused such symptoms of wartime to return at any given moment. (p. 319)

Analogously, Grinker and Spiegel (1945) examined the effects of the combat during the Second World War. Symptoms of “combat neuroses” included restlessness, aggression, memory impairment, sympathetic overactivity, depression, alcoholism, concentration impairment, suspicion, phobias, and nightmares (Saigh, 1992). Grinker and Spiegel (1945) described “neurotic reactions to severe combat stress” as “a parade of every type of psychological and psychosomatic symptom, and of unadaptive behavior” (p. 83). Additionally, Grinker and Spiegel suggested four different presentations of trauma, thus foreshadowing the various expressions and associated features of PTSD

embedded within the current diagnostic criteria. Examined within this context, they reported that:

(1) Those whose regressive reactions originated overseas, but who are now undergoing a successful and spontaneous process of "unwinding," "uncoiling," "cooling off," or "decompression." (2) Those with neuroses which originated overseas, but which persisted with unabated severity, sometimes becoming progressively worse. (3) Those who develop new conflicts, due to failure of adaptation to the home environment, because their personalities have been altered by overseas experiences. (4) Those who show a recrudescence of former anxiety states, or who develop them for the first time owing to apprehension concerning new duty assignments or fear for their future. (p. 345)

In a similar vein, Wolf and Ripley (1947) found that 23% of returning American prisoner-of-war (POW) survivors who were subjected to physical torture suffered significant emotional distress, including trauma-related nightmares, blunted affect, irritability, psychosomatic symptoms, and difficulty in thinking. Wolf and Ripley interviewed 35 randomly selected Allied prisoners of war who had been detained in prisons on either Luzon Island in the Philippines or in Japan and reported that the POWs had concentration and memory difficulties.

After the Second World War, Carey-Trefzer (1949) examined the effects of various war-related stressors (e.g., air raids, evacuation, change in family life, loss of schooling, and housing problems) on 1,203 British children. Of these, 212 (17.6% of the sample) exhibited "disturbances caused or aggravated by war experiences" (p. 556), such as irritability, impairments in concentration and memory, sleep disturbance, and avoidance behaviors. In addition, 30.6% of the affected youth experienced academic difficulties, demonstrating "the degree to which emotional disturbances affects the capacity to learn" (p. 546). In a related study, Friedman (1949) used the term "Buchenwald Syndrome" to describe a pattern of symptoms, such as somatic complaints, sleep disturbance, startle response, and anxiety, that was found to occur in Jewish child survivors of Nazi death camps. Based on medical and psychiatric evaluations, 50% to 60% of the children

exhibited physical complaints without an organic etiology. In a related effort, Etinger's (1951) examination of 227 Norwegian survivors of German concentration camps also revealed symptoms of fatigue, poor concentration, irritability, and traumatic recollections. Seventy-six percent of the survivors evidenced "impairments in memory, especially of recent events, impairment in the ability to concentrate, concreteness and poverty of thoughts and ideas" (p. 141).

The DSM-I: Gross Stress Reaction

In response to an increase in war-related psychiatric morbidity following the First and Second World Wars, the American Psychiatric Association's (APA) Committee on Nomenclature and Statistics included "Gross Stress Reaction" as a psychiatric diagnosis in the DSM-I (1952). According to the DSM-I, "Gross Stress Reaction" was diagnosed in individuals who were exposed to "severe physical demands or extreme stress, such as combat or civilian catastrophe (fire, earthquake, explosion, etc.)" (APA, 1952, p. 40). This classification was subdivided into two types: civilian and combat types. Contrary to the accepted psychodynamic view, the DSM-I asserted, "In many instances this diagnosis applies to previously more or less 'normal' persons who experience intolerable stress" (p. 40). Under this classification, "Gross Stress Reaction" was viewed as a transient situational personality disorder and described an acute response to stress (Fletcher, 1996). Such conditions were expected to quickly dissipate when treated promptly. The DSM-I's inclusion of this diagnosis acknowledged the significance of exposure to extreme stress and that this diagnosis may be obtained by an otherwise "normal" person (APA, 1952, p. 40). However, the DSM-I neither provided operational criteria necessary for making a diagnosis nor did it mention utilizing this diagnosis for children (Saigh, Green, & Korol, 1996).

Subsequent to the publication of the DSM-I (APA, 1952), studies involving American veterans from the Korean War continued to illustrate psychiatric morbidity linked to traumatic events (Noble, Roudebush, & Price, 1952; Temperau, 1956). Within the realm of the DSM-I, Noble et al. (1952) examined 75 American veterans from the Korean War who had been admitted to hospitals. Psychiatric symptoms were present in 56% of the veterans, and approximately 50% presented with startle reactions, occasional combat dreams, slight stammering, and other evidence of tension that had arisen during combat experience (Noble et al., 1952; Temperau, 1956, p. 496). Three of the veterans presented with “delayed startle reaction” wherein they threw themselves on the ground in response to war-related noises (e.g., a car backfiring).

Also within the parameters of the DSM-I, Temperau (1956) observed fear of flying in 15 American Air Force pilots in the Korean War. Although it was noted that fear of flying was directly related to preexisting psychiatric conditions among some of the men, others developed fears due to flying-related traumatic incidents. In one case, the jet pilot lost control of his plane during a thunderstorm. The pilot reported that “the instrument panel began to swim before his eyes, he felt that the plane was trembling ... and out of control and his orientation in space was lost” (p. 220). The pilot ejected himself from the plane and parachuted to safety. Following a brief hospitalization, the pilot was cleared and returned to combat training. Temperau’s reports indicated that the pilot became extremely “panicky, lost confidence in his instruments, and seemed to be obsessed with the idea that he would crash” (p. 220) whenever he was required to fly in bad weather conditions. After six weeks of psychotherapy, the pilot was able to return to active flight duty.

A few instances of natural or industrial disasters in the 1950s and 1960s provided additional insights into psychiatric morbidity following traumatic events. For example, in 1956, Bloch, Silber, and Perry reported on the emotional adjustment of 185 children who survived a tornado in Vicksburg, Mississippi on December 5, 1953. The tornado caused

considerable damage, killed several children, and injured many other children in the town. One week subsequent to the tornado, the authors compiled comprehensive reports from parents, children, pediatricians, school officials, teachers, and community leaders. The authors determined that the children who were directly affected by the disaster suffered the worst outcomes as compared to those who were not in close physical proximity to the tornado and did not have close emotional ties to someone who was seriously involved with or injured by the tornado. Two months following the tornado, 47 youth (25.4% of the sample) presented with mild to severe symptoms, including night terrors, trauma specific reenactments (e.g., tornado games), irritability, fear, avoidance, hypersensitivity to loud noises, and enuresis (Bloch et al., 1956). Similar symptoms in children were observed relative to earthquakes (Langdon & Parker, 1964), floods (Bennet, 1966), and nautical disasters (Friedman & Linn, 1957; Yule, 1990; Yule, Udwin, & Murdoch, 1990).

Similarly, Frankl (1959) identified symptoms of anxiety, motor restlessness, hyperapprehensiveness, difficulty sleeping, night terrors, fatigue, phobic reactions, and recurrent thoughts of persecutory experiences among German concentration camp survivors, which resulted in this condition being referred to as “concentration camp syndrome” (Davidson, 1996). Friedman and Linn (1957) reported similar findings among survivors of the 1956 *Andrea Doria* disaster wherein the Italian ship collided with the *MS Stockholm* and 46 people died. Subsequent to the incident, rescued passengers initially presented with psychomotor retardation, sleep impairment, flat affect, and, in some instances, amnesia regarding their personal identification. Some of the passengers exhibited a need to frequently retell their stories in detail. These symptoms were likened to repetitive dreams reported by other traumatic event survivors. Similar symptoms were noted by Langdon and Parker (1964) following the 1962 Alaskan earthquake.

The DSM-II: Transient Situational Disturbance

As research on natural and civil disasters identified more information regarding psychiatric morbidity in response to traumatic events, modifications were made to the diagnostic perspective. When the APA Committee on Nomenclature and Statistics published the DSM-II in 1968, “Gross Stress Reaction” classification was omitted from the manual and was replaced by “Transient Situational Disturbance.” This new diagnosis was designated for “transient disorders of any severity (including those of psychotic proportions) that occur in individuals without any apparent underlying mental disorders and that represent an acute reaction to overwhelming environmental stress” (APA, 1968, p. 48). If the disorder failed to remit following the removal of the stressor, a diagnosis of Adjustment Reaction of Childhood, Adolescence, or Adult Life was made according to an individual’s developmental level. An improvement from the DSM-I, the DSM-II enumerated related sub-classifications (e.g., adjustment reaction of adolescence). Similar to the DSM-I, the DSM-II did not provide clearly stated symptoms to diagnose “Transient Situational Disturbance” (Saigh & Bremner, 1999).

The inclusion of the “Transient Situational Disturbance” category in the DSM-II reflected a growing recognition of the effects of trauma exposure, and more research began to examine the relationship between traumatic incidents and psychiatric morbidity. Additionally, interest in psychological reactions to traumatic stress was renewed as many Vietnam War veterans reported psychological symptoms and activist groups demanded that greater attention should be afforded to Vietnam veterans (Cohen, 1988). In the 1970s, there was also a movement to address the psychological impact of rape. In 1974, Burgess and Holmstrom used the term “rape trauma syndrome” to describe the development of characteristic symptoms experienced by victims of sexual abuse, rape, or domestic violence. “Rape trauma syndrome” was conceptualized as involving an acute phase and a long-term phase. The acute phase was characterized by physical trauma (e.g., general

soreness, bruising), skeletal muscle tension, gastrointestinal irritability, genitourinary disturbance, and a wide range of emotional reactions (e.g., fear, humiliation, anger, self-blame). The long-term phase included increased motor activity, nightmares, and the development of phobias related to the traumatic events (e.g., sexual fears) and typically began two to three weeks after the event. Burgess and Holstrom documented the psychological effects of sexual assault using a sample of 109 female adults, 34 female children, and 3 male children, whose symptoms were similar to those exhibited by war-victims and natural disaster victims. Additionally, this sample exhibited the presence of symptoms of depression, psychotic behaviors, psychosomatic disorders, suicidal behaviors, and various acting out behaviors (e.g., alcohol and drug use). Within the realm of war-related stressors, Horowitz and Solomon (1975) found “Delayed Stress Response Syndrome” in a large percentage of returning veterans and described symptoms including nightmares, painful and emotional moods, aggressive and self-destructive behavior, and impulsivity.

Research in the 1970s also considered the psychological effects of natural disasters. For example, Titchner and Kapp (1976) assessed 625 survivors of a collapsed slag dam in Buffalo Creek, West Virginia after legal action was taken against the company that owned the dam. The collapsed dam caused a flood that killed 125 people and left another 4,000 people homeless. Many of the 224 surviving children were reported to be significantly psychologically impaired (Newman, 1976). The major factors related to impairment were the child’s developmental level at the time of the flood, his perceptions of his family’s reactions, and his direct exposure to the disaster. These children shared a modified sense of reality, increased vulnerability to future stresses, and early awareness of fragmentation and death. In addition, the children presented with sleep disturbances, nightmares, and the development of water-related phobias. The authors determined that 80% of their adult sample presented with clinical symptoms of anxiety and depression. Rangell (1976) added that many who experienced this incident also suffered from

“psychic numbness” (p. 313), which is characterized by apathy, withdrawal, and sluggishness.

With regard to the Vietnam War, Figley (1978) sent self-report questionnaires to randomly selected ex-servicemen who were receiving educational benefits from the Department of Veterans Affairs (VA). The responses were divided into those who were exposed to combat and those who were not. Figley’s questionnaire measured Interpersonal Adjustment (IPA) before and after serving in the war. IPA was operationally defined as “a state of general emotional well-being, satisfaction, and relative comfort with others in general and with family and intimate friends in particular” (p. 107). Results demonstrated that there were no IPA differences between the two groups before the war, but veterans who were exposed to combat reported significantly lower post-service scores. Of note is that both pre- and post-service scores were determined retrospectively.

Information from the early 17th through the mid-20th century collectively demonstrates the potential for severe psychiatric morbidity following exposure to traumatic incidents. Symptoms were initially clinically identified by terms such as DaCosta’s syndrome, soldier’s heart, shell shock, and rape trauma syndrome, but further research led to their classification as diagnosable trauma-specific diagnostic categories in the DSM-I (APA, 1952) and DSM-II (APA, 1968) but failed to provide clear diagnostic symptoms.

The DSM-III and the DSM-III-R: Posttraumatic Stress Disorder

In response to criticism that the mental disorders described in the DSM-II were characterized by a lack of operational criteria, poor reliability, and limited coverage, the APA reformulated the manual and published the DSM-III in 1980 (Morey, Skinner, & Blashfield, 1986; Saigh, 1992). Revisions by Robert Spitzer’s Reactive Disorders

Committee provided specific diagnostic criteria to enhance the reliability of diagnostic classifications and specifically formulated the criteria for what was now known as posttraumatic stress disorder (PTSD) (DSM-III, APA, 1980).

According to the DSM-III, PTSD was marked by the “development of characteristic symptoms following a psychiatrically traumatic event that is generally beyond the realm of normal human experience” (APA, 1980, p. 236). The DSM-III also indicated that the “stressor producing this syndrome would evoke significant symptoms of distress in most people and is generally outside the range of such common experiences as simple bereavement, chronic illness, business losses or marital conflict” (p. 236). The characteristic symptoms for PTSD included reexperiencing symptoms (e.g., nightmares and intrusive recollections involving traumatic exposures), numbing/avoidance symptoms (e.g., diminished interest in significant activities, constricted affect), and the onset of various symptoms (e.g., sleep disturbance, memory impairment, or hyperalertness) that were not evident prior to trauma exposure. The DSM-III stated that symptoms could present acutely (e.g., within six months), in a chronic fashion (e.g., lasting longer than six months), or in a delayed form (e.g., presenting more than six months following the traumatic event). The manual enumerated associated features of the disorder, such as depression, anxiety, irritability, aggression, and impulsivity. Of note is that PTSD in DSM-III was put together without a field trial and the validity of the classification was questioned (Saigh & Bremner, 1999). Since that time, multiple studies have addressed the validity of the DSM-III, -III-R, and -IV classifications.

Following the formal recognition of PTSD in the DSM-III, researchers and clinicians were able to systematically study the expression of the disorder with a wide range of traumatized subjects in different settings. In 1984, Kinzie, Frederickson, Ben, Fleck, and Karls utilized DSM-III PTSD criteria to evaluate 13 Cambodian immigrants who had survived between two and four years in Cambodian concentration camps, where they were exposed to forced labor and the violent deaths of family and friends. All of the

patients arrived to the clinic with diagnoses other than PTSD. Due to suspicions of PTSD, Kinzie and his colleagues administered the *Diagnostic Interview Schedule (DIS)* (Robins, Helzer, & Craughan, 1982) to these cases. All of the patients reportedly avoided discussion of their concentration camp experience and anything that reminded them of Cambodia (e.g., news or movies about violence or natural disasters). Other common symptoms included nightmares, a startle response to sudden noises, detachment or emotional numbness, irritability and aggression, and memory deficits. Kinzie et al.'s research clearly outlined the intense and potentially chronic ramifications of trauma, extending use of the DSM-III criteria to non-Western populations.

Kluznik, Speed, Van Valkenburg, and Magraw (1986) administered a symptom checklist based on the DSM-III criteria for PTSD to 188 former World War II Prisoners of War (POWs) and observed that 67% met criteria for lifetime PTSD diagnoses. PTSD was also associated with depression and anxiety. Also within the realm of the DSM-III, Blanchard, Kolb, Gerardi, Ryan, and Pallmeyer (1986) sought to identify aspects of heart rate response that may have diagnostic utility. They assessed the heart rate of 91 Vietnam War veterans with ($n = 57$) and without ($n = 34$) PTSD under different conditions. More specifically, they recorded resting heart rate, heart rate during a mental arithmetic task (e.g., participants were instructed to count backwards from ten), and heart rate as participants listened to emotionally meaningful combat sounds such as helicopters and machine gun fire. Results indicated heightened cardiac response to war-related stimuli among the veterans with PTSD as well as significantly higher resting heart rates in comparison to veterans without PTSD. Similar findings were not observed among the combat veterans without PTSD. Further examination of individual subject data revealed that 70.2% of PTSD veterans and 88.2% of non-PTSD veterans could be accurately identified, with 9.7% false positives.

Additionally, within the context of the DSM-III, Saigh (1988) described the self-reported posttraumatic symptoms of twelve female students at the American University of

Beirut before and after a major military offensive. These students reportedly were forced to take shelter in their apartment stairwells or basements and were deprived of sleep for 36 to 48 hours. All of the women reported that they had never experienced a more threatening situation. The course of self-reported anxiety, depression, and assertion was charted 63 days prior to exposure to the war-related stressor as well as 8, 37, and 316 days after. The majority of respondents reported significantly higher levels of anxiety and depression in addition to lower levels of assertion 8 days following the trauma. However, estimates observed 37 and 316 days following the trauma were not significantly different from the estimates observed 63 days prior to the trauma. Thirty-seven days after the bombardment, nine students (75% of the sample) reported symptoms consistent with a DSM-III acute diagnosis of PTSD. In addition, they evidenced significantly higher anxiety, depression, and anger estimates in comparison to estimates recorded 63 days before trauma exposure. Only one student presented with chronic PTSD 316 days after the incident and complained of repeated thoughts and nightmares about the bombardment, loss of interest in activities, dulled affect, an exaggerated startle response, and memory impairment.

Saigh (1989a) conducted the first study to examine the differential validity of the DSM-III PTSD diagnosis as it applies to children. In this context, he compared three groups of Lebanese children who were approximately 10 years of age. The first group ($n = 231$) presented with PTSD, the second group ($n = 32$) presented with simple phobia (e.g., test phobia), and the third group ($n = 35$) was composed of nonclinical controls. Saigh administered the *Children's PTSD Inventory* (Saigh, 1989b) to diagnose PTSD. The *Revised Children's Manifest Anxiety Scale (RCMAS)* (Reynolds & Richmond, 1978) *Children's Depression Inventory (CDI)* (Kovacs, 1981), and the *Conners' Teacher Rating Scale (CTRS)* (Conners, 1969) served as outcome measures. Results indicated that PTSD cases had appreciably higher levels of anxiety, depression, and misconduct as compared to the phobic and nonclinical control groups. Although the *CTRS* scores of the test phobic

and control groups were not significantly different, the phobic groups had markedly higher levels of anxiety and depression than did their nonclinical peers. These variations conceptually supported the validity of the classification as it applies to children between the ages of 9 and 13 years of age.

Additionally, within the context of the DSM-III and differential validity, Saigh, Mroueh, and Bremner (1997) sought to determine if exposure to exceptional stress is associated with academic deficits or whether academic deficits are specifically associated with PTSD as measured by the DSM-III version of the *Children's PTSD Inventory* (Saigh, 1989b). Saigh et al. compared the performance of traumatized Lebanese adolescents with or without PTSD to the performance of nontraumatized controls on the *Metropolitan Achievement Test (MAT)* (Prescott, Balow, Hogan, & Farr, 1988). Results indicated that adolescents with PTSD demonstrated significantly lower levels of scholastic performance relative to the performance of traumatized youth without PTSD and non-traumatized controls (Saigh et al., 1997). There were no significant differences between the academic achievement (*MAT*) scores of the traumatized PTSD-negative group and the non-traumatized control group. These results show that the diagnostic state itself (e.g., having PTSD) was a risk factor for academic impairment, rather than pure trauma exposure. The results also show that individuals who were exposed to stressors but did not develop PTSD were not at increased risk for academic impairment. Most importantly, the results of this study supported the DSM-IV provision that PTSD is partially manifested by significant functional impairments.

The DSM-III not only allowed for more accurate diagnoses of PTSD, but also provided a standard for treatment studies to gauge themselves against. Fairbank, DeGood, and Jenkins (1981) used these standards to utilize progressive-muscle, autogenic-type relaxation training exercises and a behavioral rehearsal procedure in the treatment of a 32-year-old woman with a post-traumatic startle response and anxiety. The woman's involuntary startle response developed after an automobile accident and consisted of

pronounced motor movements that occurred while driving. While driving, she reportedly rapidly jerked the steering wheel to the right when cars approached from the opposite direction. The authors used a combination of directed relaxation, self-monitoring, and *in vivo* or actual exposure to treat these symptoms. *In vivo* flooding, or actual physical exposure, involved exercises wherein the woman drove on a one-mile segment of a heavily used highway twice a day for five weeks. After five sessions of the *in vivo* flooding regimen, her startle responses ceased, and self-reported anxiety while driving diminished. These results were fully maintained at one-, four-, and six-month follow-ups.

In a similar vein, Keane and Kaloupek (1982) published an article on the use of “imaginal flooding” (p. 138) in the treatment of a 36-year-old male Vietnam veteran with DSM-III diagnosed war-related PTSD. During clinical interviews, the patient revealed a number of highly disturbing war-related thoughts and nightmares. The patient was directed to imagine these specific war-related trauma cues during 19 40-minute treatment exposure sessions. The patient reported a marked decrease in self-reported anxiety as well as significant increases in sleep and work-related productivity, which were maintained at 3- and 12-month follow-ups.

Analogously, Saigh (1987c) described the treatment of a 14-year-old Lebanese boy who had been abducted and tortured by Lebanese militia. Six months following the abduction, the adolescent met criteria for PTSD as measured by the DSM-III version of the *Children’s PTSD Inventory* (Saigh, 1989b). A *Behavior Avoidance Test (BAT)* was developed to quantify aspects of the adolescent’s trauma-related avoidance behaviors. Completion of the BAT required a 10-minute behavioral walk, wherein the boy left his home and walked to the location where the abduction occurred. The *Wechsler Intelligence Scale for Children – Revised (WISC-R)* (Wechsler, 1974) Digit Span and Coding subtests were administered in order to gauge defects in short-term memory and concentration problems. The boy also filled out the *State Trait Anxiety Inventory* (Spielberger, Gorsuch, & Lushene, 1968), *Beck Depression Inventory* (Beck, Ward,

Mandelson, Mock, & Erbaugh, 1961), and the *Rathus Assertiveness Schedule* (Rathus, 1973).

Prior to treatment, the boy and his parents were informed about the nature and course of PTSD, the flooding process, short-term reactivity, and the importance of familial support. They were also informed about the importance of collecting reliable and valid indices of emotional functioning and subjective distress before, during, and following treatment. After consent was obtained, four anxiety-evoking scenes were identified through a series of clinical interviews with the adolescent (e.g., walking to the store, being stopped by armed men, being forced into a car at gunpoint). Treatment sessions included 10 minutes of therapist-initiated and directed relaxation exercises followed by 60 minutes of prolonged imaginal exposure and child-ratings of feelings of distress. Following treatment, the adolescent reported no distress as indicated by subjective units of distress (SUDS) and evidenced improvements in estimates of anxiety, depression, and aggression. Additionally, he was able to complete 100% of the BAT tasks, as compared to only completing one-third of the BAT tasks prior to treatment.

With regard to the efficacy of flooding in the treatment of children or adolescents with PTSD, Farrell, Hains, and Davies (1998) used the *PTSD Reaction Index (CPTS-RI)* (Frederick, Pynoos, & Nader, 1992) to identify four sexually abused children aged 8-10 years with PTSD as denoted by DSM-III criteria. A multi-faceted regimen was presented according to a multiple baseline design over a ten-week interval. The regimen involved building rapport, introducing the practice of cognitive behavioral therapy (CBT), identifying positive and negative emotions, self-monitoring exercises, deep muscle relaxation training, positive self-talk exercises, role play involving relevant upsetting incidents, and cognitive restructuring training. Farrell et al. (1998) administered the *PTSD Reaction Scale* (Frederick et al., 1992) and the *Revised Children's Manifest Anxiety Scale (RCMAS)* (Reynolds & Richmond, 1978) to the participants at baseline, posttreatment, and a three-month follow-up. None of the participants met criteria for PTSD after

completing treatment (Farrell et al., 1998). Farrell et al. also reported marked reductions in distress at posttreatment and three-month follow-up on the *Reynolds Child Depression Scale* (Reynolds, 1989) and the *Revised Children's Manifest Anxiety Scale (RCMAS)* (Reynolds & Richmond, 1978).

Despite the DSM-III's wide acceptance by mental health practitioners in the United States and abroad, revisions to address consistency, clarity, and conceptual accuracy of the diagnostic criteria and systematic descriptions of various disorders were initiated in 1983, and a revised edition (the DSM-III-R) was published in 1987. Similar to the DSM-III, the DSM-III-R indicated that PTSD might be induced by a "psychologically distressing event that is outside the range of normal human experience" (APA, 1987a, p. 247) and provided objective criteria for making diagnoses. The DSM-III-R reorganized the symptoms into three major categories: reexperiencing, numbing/avoidance, and psychophysiological reactivity. In addition, the DSM-III-R asserted that "the disorder is apparently more severe and longer lasting when the stressor is of human design" (p. 248). Most notably, the DSM-III-R provided detailed age-specific features. For example, the revised edition noted that children "may be mute or refuse to discuss the trauma," and clarified that "this should not be confused with inability to remember what occurred" (p. 249). Additionally, it was noted that a child's trauma-related dreams may generalize into dreams about monsters, rescuing others, or self-harm, and that the child may relive the past through repetitive play. The manual recommended interviewing parents, teachers, and other observers in addition to assessing the children when working with younger children. Lastly, the manual noted that children may experience somatic symptoms (e.g., stomach aches, headaches), which did not typically occur in adults with PTSD (APA, 1987a).

Extensive research was done utilizing DSM-III-R criteria with regard to characteristics and associated features of PTSD. For example, Hickling and Blanchard's 1992 study utilizing DSM-III-R (APA, 1987a) criteria examined twenty victims of motor

vehicle accidents (MVAs) who were referred to them by physicians due to persistent headaches, unremitting pain, and/or anxiety. Clinical interviews indicated that 50% of the participants met criteria for PTSD, and 15% met two out of the three symptomatic criteria. Participants with PTSD additionally presented with dysthymia (20%), simple phobia (specifically driving phobia; 60%), and adjustment disorder with anxiety or depressed mood (20%).

Differential validity studies were also conducted utilizing the DSM-III-R criteria for PTSD. McNally, English, and Lipke (1993) utilized a modified Stroop (1935) color-naming paradigm (Mathews & MacLeod, 1985) in order to assess intrusive cognitions in Vietnam combat veterans with and without PTSD as measured by DSM-III-R criteria. Participants were shown words of varying emotional significance and were asked to name the colors in which the words were printed while ignoring the meaning of the words. Delays in naming (e.g., Stroop interference) occur when the meaning of the word automatically attracts the participant's attention despite the participant's effort to attend to the color of the word. Delays in color-naming reflect involuntary semantic activation; therefore, color-naming of trauma-related words can provide an objective index of intrusive cognition. Results indicated that Stroop interference existed for trauma-related words (e.g., 'Nam, Charlie, or bodybags) but not for other threat words (e.g., input), positive words (e.g., love, pleasant, happy), or neutral words (e.g., millionaire, concrete, mix). According to McNally and his coauthors, delays in color naming produced by trauma-related words may tap into the same mechanisms that lead to the involuntary recollection of traumatic memories.

Also within the realm of the DSM-III-R and differential validity, Orr, Meyerhoff, Edwards, and Pitman (1998) studied the resting heart rate and systolic and diastolic blood pressure of drug-free Vietnam combat veterans with ($n = 20$) and without ($n = 15$) PTSD. Responses to three generic stressor challenges (e.g., orthostatic, mental arithmetic, and cold pressor) were also measured. In the orthostatic stressor condition, diastolic blood

pressure increased over time among the non-PTSD veterans but not among the PTSD veterans. There were no other significant group differences in resting levels or responses to any of the stressor challenges for any measure. The authors went on to suggest that individuals with PTSD have a paradoxically reduced autonomic response.

Extensive research has been done regarding efficacy of treatment utilizing cases that met the DSM-III-R criteria for PTSD. For example, Deblinger, McLeer, and Henry (1990) measured the benefit of utilizing cognitive behavioral therapy (CBT) for PTSD. The researchers described the posttraumatic symptoms of 19 sexually abused female children (ages 3 to 16 years). Before entering treatment, all of the children presented with significant reexperiencing phenomena, avoidance behavior, and hyperarousal symptoms. Additionally, the children reported symptoms of anxiety and depression. The CBT treatment consisted of gradual exposure, modeling, coping, and prevention skills training for the girls, and education, coping, communication, modeling, graduated exposure, and behavior management skills for the caretakers. Following treatment, the authors reported significant reductions in depression, abnormal internalizing and externalizing behaviors, and anxiety.

Also with regard to the treatment of PTSD, as defined by the DSM-III-R, Foa, Dancu, Chambree, Jaycox, Meadows, and Street (1999) assessed the effectiveness of three treatments for PTSD: Prolonged Exposure (PE), Stress Inoculation Training (SIT), and Prolonged Exposure with Stress Inoculation Training (PE-SIT). Participants were 96 female sexual and nonsexual assault victims with chronic PTSD. The sample consisted of 69 victims of sexual assault, such as rape or attempted rape, and 27 victims of nonsexual assault, such as aggravated assault or assault with a weapon. Participants with major comorbid disorders, such as schizophrenia, bipolar disorder, organic mental disorder, and alcohol or drug dependence, and individuals with severe suicidal ideation or an ongoing intimate relationship with their assailants were excluded.

Participants were randomly assigned to one of four conditions: Prolonged Exposure, Stress Inoculation Training, Prolonged Exposure with Stress Inoculation Training, or a Wait List (control group). Prolonged Exposure involved imaginal exposure wherein participants relived the traumatic event in the present tense. Stress Inoculation Training involved teaching coping skills to manage assault-related anxiety and post-assault problems and included deep muscle relaxation, cue-controlled and differential relaxation, thought stopping, cognitive restructuring, guided self-dialogue, covert modeling, and role-play. Prolonged Exposure with Stress Inoculation Training, which was essentially a combination of the two aforementioned treatments, involved education, training in SIT skills, *in vivo* exposure, and imaginal exposure. The Wait List participants (e.g., no treatment) were told that they would receive treatment five weeks later. Treatment consisted of nine twice-weekly individual sessions.

Independent evaluations were conducted at pretreatment, posttreatment, and 3-, 6-, and 12-month follow-ups. Interview measures included the Structured *Clinical Interview for DSM-III-R Disorders (SCID)* (Spitzer, Williams, & Gibbon 1987), which was used to assess comorbid disorders and administered only at pretreatment, the *PTSD Symptom Scale – Interview (PSS-I)* (Foa, Riggs, Dancu, & Rothbaum, 1993), which measures the frequency and severity of DSM-III-R PTSD symptoms, and the *Social Adjustment Scale (SAS)* (Weissman & Paykel, 1974), which assessed an individual's functioning in eight specific areas of work and social activities. Self-report measures included the *Beck Depression Inventory (BDI)* (Beck, Ward, Mendelsohn, Mock, & Erbaugh, 1961) and the *State-Trait Anxiety Inventory (STAI)* (Spielberger, 1983). Outcomes indicated that all three active treatments reduced severity of PTSD and depression compared with the Wait List but did not differ significantly from each other. These gains were maintained throughout the 12-month follow-up period. In addition, a large number of participants in active treatment lost their PTSD diagnosis and reached clinically improved end-state functioning compared with Wait List (WL) participants. Overall, PE was statistically

superior to SIT and PE-SIT on the posttreatment *STAI*, *BDI*, and global social adjustment at follow-up and had larger effect sizes on PTSD severity. PE also had fewer dropouts in comparison to the other treatment groups, while SIT and PE-SIT groups did not differ significantly from each other on any outcome measure. These results underscore the efficacy of exposure relative to cognitive restructuring.

The DSM-IV and the DSM-IV-TR: The Most Recent Criteria

Given that the diagnostic criteria that appeared in the DSM-III and DSM-III-R for the PTSD classification were established without a field trial, the DSM-IV committee for PTSD employed clinical and community-based field trials, extensive literature reviews, and consideration of the outcomes of case-controlled research in deriving the diagnostic criteria for PTSD (Saigh, 1992). Field trials sought to examine the relationship between divergent stressors and PTSD symptoms, determine the likelihood that stressful events would lead to symptoms of varying onset and duration, and identify variables (e.g., nature and severity of traumatic event) that may be associated with PTSD. The committee withdrew the provision that a traumatic stressor must be “outside the range of normal human experience” (APA, 1987a, p. 247). PTSD diagnostic criterion A, which describes exposure to a traumatic event, was redefined and required that the individual 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 oneself or others” (APA, 1994, p. 428). The DSM-IV specified three different pathways for traumatization, which included

military combat, violent personal assault (sexual assault, physical attack, robbery, mugging), being kidnapped, being taken hostage, terrorist attack, torture, incarceration as a prisoner of war or in a concentration camp, natural or manmade disasters, severe automobile accidents, [and] being diagnosed with a life-threatening illness (APA, 1994, p. 424)

as directly experienced events. Criterion A was also revised to specify that responses during trauma exposure must have “involved intense fear, helplessness, or horror” (p. 428). Furthermore, the DSM-IV asserts that this response may be expressed in children by “disorganized or agitated behavior” (p. 428). The manual also noted that, for children, developmentally inappropriate sexual experiences qualify as traumatic events, even if no threatened or actual violence is present.

In accordance with research suggesting that witnessing a traumatic event could lead to the development of PTSD (Saigh, 1991; Smith & Holford, 1993), the DSM-IV included events such as “observing the serious injury or unnatural death of another person due to violent assault, accident, war, or disaster or unexpectedly witnessing a dead body or body parts” (APA, 1994, p. 242) in its operational definition of the disorder. In addition, the manual included events witnessed by others that are learned about, such as “violent personal assault, serious accident, or serious injury experienced by a family member or close friend; or learning that one’s child has a life threatening disease” (p. 424) as a pathway to PTSD. Criterion A also stated that the response to the event must have “involved intense fear, helplessness, or horror” (p. 428).

The DSM-IV PTSD (APA, 1994) section included more information about associated features than the earlier editions. For example, it noted that victims of traumatic experiences may feel guilt and blame themselves for surviving when others did not and victims may engage in phobic avoidance of situations that resemble or recall the trauma. Additionally, the manual noted that certain symptoms, such as “impaired affect modulation, self-destructive impulsive behavior, [and] dissociative symptoms,” may be more common when the traumatic event is of an interpersonal nature, such as physical or sexual assault (p. 425). The DSM-IV further notes, “The disorder may be especially severe or long lasting when the stressor is of human design” (p. 424).

Diagnostically, the DSM-IV includes the following three clusters of symptoms: reexperiencing, avoidance/numbing, and increased arousal. Individuals must evidence at

least one reexperiencing symptom, three avoidance/numbing symptoms, and two arousal symptoms for more than one month in order for a diagnosis to be made. Additionally, the disturbance must result in clinically significant distress or impairment in functioning, such as academic problems (Saigh, Green, & Korol, 1996).

The DSM-IV (APA, 1994) indicates that individuals with PTSD may be at an increased risk for presenting with Panic Disorder, Agoraphobia, Obsessive-Compulsive Disorder, Social Phobia, Specific Phobia, Major Depressive Disorder, Somatization Disorder, and substance-related disorders. The prevalence of comorbid disorders was strongly supported by Kessler, Sonnega, Bromet, Hughes, and Nelson's (1995) national comorbidity survey. The authors determined that 48% of men and women with PTSD had a lifetime history of Major Depressive Disorder, as compared to 11.7% of PTSD-negative males and 18.8% of PTSD-negative females. Further, 51.9% of males and 28% of females with PTSD additionally met criteria for a substance abuse problem. These numbers were in contrast to 34.4 % and 13.5% of PTSD-negative males and females, respectively.

The DSM-IV provides examples of ways in which PTSD symptoms may manifest in children. These include re-experiencing symptoms in children such as traumatic play, dreams without recognizable content, and trauma-specific re-enactments. Also, children may have the sense of a "foreshortened future," which may "be evidenced by the belief that life will be too short to include becoming an adult" (APA, 1994, p. 426) and/or the belief that they have the capacity to foresee negative events.

A text revision of the DSM-IV, the DSM-IV-TR (APA, 2000) was introduced in order to maintain the current diagnostic symptoms without major revisions. While no major changes were made to the diagnostic criteria, new information was added regarding associated features, comorbidity, prevalence rates, and the course of the disorder (APA, 2000). The DSM-IV-TR also added a Familial Patterns section that indicates that having

a first-degree relative with a lifetime history of depression may make one more vulnerable to PTSD. The DSM-IV-TR (APA, 2000) criteria for PTSD are presented in Table 1.1.

Table 1.1

DSM-IV-TR (APA, 2000) Diagnostic Criteria for Posttraumatic Stress Disorder: 309.81

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

(1) the person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others

(2) the person's response involved intense fear, helplessness, or horror. **Note:** In children, this may be expressed instead by disorganized or agitated behavior.

B. The traumatic event is persistently 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 upon awakening or when intoxicated). **Note:** In young children, trauma-specific reenactment may occur.

(4) intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.

(5) physiological reactivity on exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.

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

(1) efforts to avoid thoughts, feelings, or conversations associated with the trauma

(2) efforts to avoid activities, places, or people that arouse recollections of the trauma

(3) inability to recall an important aspect of the trauma

(4) markedly diminished interest or participation in significant activities

(5) feeling of detachment or estrangement from others

(6) restricted range of affect (e.g., unable to have loving feelings)

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

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

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

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More recent research provides evidence for the differential validity of the *Diagnostic and Statistical Manual of Mental Disorders* – Fourth Edition (DSM-IV, APA, 1994) PTSD classification as it applies to children and adolescents. Saigh et al. (2002) provided evidence to support the differential validity for the PTSD classification as it

applies to children. They examined youth with PTSD ($n = 39$), traumatized youth without PTSD ($n = 59$), and nontraumatized controls ($n = 36$). Diagnostic measures used included the *Children's PTSD Inventory* (Saigh, 2003) and the *Diagnostic Interview for Children and Adolescents – Revised – Parent Version (DICA-R-P)* (Reich et al., 1994) to rule out comorbid disorders, and two diagnostic clinical interviews to identify PTSD. Saigh et al. (2002) also administered the *Child Behavior Checklist (CBCL)* (Achenbach, 1991) to measure internalizing, externalizing, and overall behaviors. Results indicated that, while controlling for a number of confounding psychiatric disorders and conditions, *CBCL* ratings were associated with PTSD and not with exposure to exceptional stress in the absence of PTSD. Results also indicated that traumatic exposure in the absence of PTSD was not associated with higher estimates of psychiatric morbidity.

Also with regard to differential validity, Golier, Yehuda, Lupien, Harvey, Grossman, and Elkin (2002) utilized DSM-IV PTSD criteria in a study of Holocaust concentration camp survivors. The authors compared concentration camp survivors and age-matched pairs who did not experience any type of extreme trauma using the Clinician-Administered PTSD Scale (Blake et al., 1995) and the *Structured Clinical Interview for DSM-IV Axis-I Disorders* (First, Spitzer, Gibbon, & Williams, 1997) to determine PTSD status. Participants also completed an author-developed paired associations test that measured explicit memory and a word stem task that measured implicit memory. Various subtests from the *Wechsler Adult Intelligence Scale – Revised* (Wechsler, 1981) were used to measure IQ. Results showed that Holocaust survivors with PTSD had significantly lower scores than Holocaust survivors without PTSD and non-exposed control participants on the explicit memory task, indicating a relationship between PTSD and poor explicit memory. There were no significant differences between Holocaust survivors without PTSD and non-exposed control participants on this task.

Also within the context of the DSM-IV differential validity research, Saigh, Yasik, Oberfield, Halamandaris, and Bremner (2006) explored whether lower intelligence

scores, as measured by the *Wechsler Intelligence Scale for Children-Third Edition (WISC-III)* (Wechsler, 1991), are associated with PTSD and if trauma exposure in the absence of PTSD is associated with lower scores. The sample was composed of three groups: traumatized youth with or without PTSD and a non-traumatized control group. Participants in the PTSD group demonstrated significantly lower verbal intelligence in comparison to the traumatized PTSD-negative group and the non-traumatized control group. There were no significant differences between the traumatized PTSD-negative group and the non-traumatized control group. It was concluded that PTSD is associated with deficits in verbal intelligence and that trauma exposure without PTSD is not. One possible explanation for these findings is that many of the verbal subtests are related to school-based knowledge; therefore, lower scores may be due to trauma-related interruptions in education. Another possible explanation for these findings is that verbal functions are associated with the left hippocampus, and some research shows that young adults with PTSD have smaller left hippocampal volume (Saigh et al., 2006).

With regard to the relationship between PTSD and memory and learning performance in youth, Yasik, Saigh, Oberfield, and Halamandaris (2007) examined whether memory deficits are associated with PTSD or with trauma exposure in the absence of PTSD. The researchers utilized DSM-IV clinical and structured interviews to diagnose PTSD and excluded major comorbid disorders and other conditions, such as limited intellectual functioning, current substance abuse, and psychopharmacological treatment. Three groups of participants were identified: PTSD ($n = 29$), traumatized PTSD negatives ($n = 62$), and nontraumatized control subjects ($n = 40$). Participants completed the *Wide Range Assessment of Memory and Learning (WRAML)* (Sheslow & Adams, 2003). Results indicated that youth with PTSD evidenced significantly lower scores on the *WRAML* General Memory, Verbal Memory, and Learning indices compared with nontraumatized control subjects. PTSD had no effect on performance, with the exception of Verbal Memory. Nonsignificant differences were noted on the Visual

Memory Index. Conclusions indicated that general memory and verbal memory deficits as evidenced in adult populations were observed among this sample of youth.

Within the realm of psychopathology of children exposed to war-related stressors, Goldstein, Wampler, and Wise (1997) examined 364 Bosnian children between the ages of 6 and 12 years. The children and their families had been internally displaced as a result of the war and were residing in central Bosnian collectives. Most of the children were exposed to war-related events, and the majority had endured separations from their families, bereavement, and extreme deprivation. Ninety-four percent of the children met DSM-IV criteria for PTSD and reported reexperiencing war-related events, avoiding stimuli that reminded them of the war, increased arousal, and feelings of sadness, anxiety, and guilt. Ehlers, Mayou, and Bryant (2003) also assessed 86 British children and adolescents (between 5 and 16 years) who were admitted to an emergency room as a result of being a passenger, pedestrian, or cyclist in a road-traffic accident. Three months after the accident, 25% of the children met criteria for PTSD, and six months after the accident, 18% of the children met criteria for PTSD as denoted by the DSM-IV. Commonly reported symptoms associated with the trauma included negative interpretation of intrusive memories, alienation from other people, anger, rumination, thought suppression, and persistent dissociation.

With regard to sexual abuse, Cohen, Deblinger, Mannarino, and Steer (2004) assessed DSM-IV PTSD symptoms in 229 sexually abused children between the ages of 8 and 14 years who were seeking treatment. Eighty-nine percent of the children met full DSM-IV diagnostic criteria for PTSD. Cohen et al. (2004) found that the children evidenced significant symptoms of PTSD, including reexperiencing the traumatic events, avoidance of trauma-related stimuli, and hypervigilance. Additional symptoms associated with the trauma included anxiety, depression, behavior problems, feeling stigmatized, shame and incompetent, self-blame for the negative events, and abuse-related attributions. These children additionally reported that they engaged in inappropriate sexual behaviors.

Jamil, Nassar-McMillan, and Lambert (2004) used the DSM-IV based *PTSD Checklist-Military Version (PCL-M)* (Weathers, Litz, Herman, Huska, & Keane, 1993) to compare 32 Iraqi Gulf War refugees with and without PTSD who were living in the United States. The authors additionally assessed depression, anxiety, and panic using the *Primary Care Evaluation of Mental Disorders (PRIME-MD)* (Spitzer et al., 1996) and social desirability using the *Marlowe-Crowne Social Desirability Scale (MCSDS)* (Strahan & Gerbasi, 1972). Results demonstrated that 59% of the sample scored above the PTSD cutoff on the *PCL-M*. The results further indicated that veteran refugees with higher PTSD symptoms additionally presented with significantly higher levels of depression, panic, and anxiety.

Blanchard, Rowell, Kuhn, Rogers, and Wittrock (2005) also utilized DSM-IV criteria in their examination of 1,306 undergraduate college students from three public universities on or around the first anniversary of the September 11, 2001 terrorist attacks on the World Trade Center. Participants anonymously completed a set of questionnaires that included the *Beck Depression Inventory (BDI)* (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), *Life Events Checklist* (Gray, Wang, Litz & Lombardo, 2001), and the DSM-IV based *PTSD Checklist (PCL)* (Weathers et al., 1993). Results showed that students attending a university in close proximity to New York City and the World Trade Center reported higher rates of PTSD symptoms. Similar results were found for students with a permanent residence within New York City or within New York counties, as compared to those who lived outside of the counties or were not present on the day of the attack. Additionally, results showed that females reported greater *BDI* scores than males, and males attending university closer to New York City reported higher rates of depressive symptoms as compared to males attending university in the Midwest. Results also indicated a non-significant trend for probable PTSD among students attending college closer to Ground Zero relative to those attending university further away.

The DSM-5: Future Criteria

Despite the widespread use of the DSM-IV, efforts to revise the manual have been going on for several years (APA, 2000). The planned criteria for the fifth version of the APA's diagnostic manual (DSM-5) were released for public comment and will be field tested for two years prior to the DSM-5's expected release in May, 2013. A proposed new diagnosis of "developmental trauma disorder" is also being considered. Anticipated changes to the PTSD criteria include removing an evaluation of an individual's emotional response at the time of a traumatic event (DSM-IV criterion A2), augmenting features considered to be important with regard to intrusion symptoms (DSM-IV criterion B), and creating developmentally appropriate criteria for children and adolescents. In addition, the proposed DSM-5 classification will divide avoidance and numbing symptoms (DSM-IV criterion C) into two separate categories. Criterion C will focus solely on avoidance behaviors or physical/temporal reminders of the traumatic experiences, and criterion D will focus on negative changes in cognition and mood associated with traumatic events. Criterion E (DSM-IV criterion D) is expected to include revised and new symptoms in addition to the original symptoms. Criterion F (DSM-IV criterion E) and criterion G (DSM-IV criterion F) will remain the same. Finally, the "acute" vs. "delayed" distinction will most likely be removed.

Chapter Summary

Historically, children, adolescents, and adults exposed to extreme stressors evidenced physical and psychological reactions (e.g., trauma-related recollections, reversals of developmental milestones, avoidance behaviors, functional impairments). Prior to the 1980 establishment of PTSD as a diagnostic classification by the American Psychiatric Association, a wide array of expressions was utilized to describe the symptomology observed in individuals exposed to extreme stress. In 1980, PTSD was

officially recognized as a legitimate clinical disorder in the DSM-III. However, the DSM-III PTSD classification acknowledged only the symptoms experienced by adults, and diagnostic criteria were not based on empirically derived data. Although the DSM-IV makes reference to the expression of PTSD in children and adolescents, it is important to note that the DSM-IV PTSD field trial did not involve subjects below the age of 15 years (Kilpatrick et al., 1998; Saigh & Bremner, 1999). Furthermore, the field trial did not examine the differential expression of PTSD in men and women (Kilpatrick et al., 1998). The transformation of our understanding of PTSD over time is reflected in changes made throughout consecutive editions of the DSM. For the first time, the committee working on the DSM-5's proposed revision to this classification has the opportunity to access research on the expression of PTSD in youth. While much progress has been made within the field of traumatic stress research over a relatively short period of time, there is still a great deal to be learned about the expression of PTSD in youth.

Chapter II

CHILD AND ADOLESCENT PTSD:

EPIDEMIOLOGY, COMORBIDITY, AND RISK FACTORS

Epidemiology refers to the “study of health and morbidity in human populations” (Saigh, Yasik, Sack, & Koplewicz, 1999, p. 18). Epidemiological analyses typically examine the prevalence, causes, risk factors, distribution, and control of disorders/diseases in populations as well as possible associations between two or more disorders/diseases. With regard to child and adolescent PTSD, epidemiological research 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 enhance understanding of the etiology and treatment of child-adolescent PTSD (Angold, Costello, & Erkanli, 1999). In addition, PTSD prevalence approximations may influence policymakers with regard to the allocation of resources for prevention and treatment. Given the importance of epidemiological research, this chapter examines the epidemiology of PTSD with respect to diverse populations of children and adolescents. Following a discussion of the frequency of trauma exposure among youth, literature documenting the prevalence of PTSD among children and adolescents who were exposed to war-related traumas, disasters and accidents, and criminal victimization will be presented. The remainder of this chapter highlights the point prevalence of comorbid psychiatric disorders commonly observed among youth with PTSD and discusses several risk factors associated with the disorder.

In generating this review, PsycINFO, Psych Articles, PubMed, MedLine, PILOTS, and JSTOR literature searches were conducted using the primary descriptors of “posttraumatic stress disorder” or “PTSD” and “child or adolescent” or “youth,” and separate secondary descriptors of “criminal victimization,” “war,” “natural disasters,” “accidental trauma,” and “motor vehicle accidents,” in order to identify articles involving youth aged 2 to 20 years presenting with PTSD. Literature searches covered both U.S. and international studies assessing the epidemiology of PTSD after individual traumatic stressors. In addition, the reference sections of identified articles were examined in order to glean additional articles. Articles were also retrieved from previously written chapters regarding the epidemiology of child-adolescent PTSD by Brewin, Andrews, and Valentine (2000) and Saigh, Yasik, Sack, and Koplewicz (1999). Research included in the following review was restricted to studies that utilized tests that reportedly measured PTSD and estimated prevalence rates.

General Population Studies

Government data and surveys indicate that exposure to traumatic events is common (Breslau, David, Andreski, & Peterson, 1991; Breslau et al., 1998; Kessler et al., 1995; Norris, 1992; Resnick et al., 1993). More than two-thirds of the general population may experience a significant traumatic event at some point during their lives, and up to one-fifth of people in the United States may experience such an event in any given year (Breslau et al., 1991, 1998; Kessler et al., 1995; Norris, 1992; Resnick et al., 1993). In 2005, the American Red Cross reported that its representatives responded to 72,883 disasters across the country and noted that fire victims accounted for 92% of the disaster populations they served.

Consistent with information in the previous chapter, exposure to traumatic events can lead to the development of varying rates of PTSD in adults. According to the

DSM-IV (APA, 1994), the prevalence of PTSD ranges from 1% to 14% in the population at large. The updated DSM-IV-TR (APA, 2000) specifies an 8% lifetime prevalence estimate among the general adult population in the United States. Both the DSM-IV and the DSM-IV-TR provide varying prevalence estimates for groups who may be at increased risk for the development of PTSD (e.g., “survivors of rape, military combat and captivity, and ethnically or politically motivated internment or genocide”) (APA, 2000, p. 466). Neither version of the Diagnostic and Statistical Manual of Mental Disorders has specified PTSD prevalence rates with regard to youth populations or individuals living outside the United States. Among research assessing PTSD in young adults, Breslau and colleagues (1991) found that 11.3% of women and 6% of men had a lifetime history of PTSD. Analogously, a telephone survey of a United States national probability household sample of adult women conducted by Resnick et al. (1993) indicated a lifetime prevalence rate of PTSD of 12.3%. Little is known about the risk of posttraumatic stress disorder across different types of trauma exposure in children (Copeland, Keeler, Angold, & Costello, 2007). The current chapter considers information about rates of exposure to various traumatic events, community-based and clinically derived point prevalence and lifetime estimates of PTSD, rates of comorbidity, and risk factors that may contribute to the development of the disorder in children and adolescents.

Prevalence of Exposure to Traumatic Events in Youth Populations

Government statistics indicate that children are exposed to a disproportionate number of traumatic events each year, and trauma exposure is commonly related to psychiatric impairment in childhood. For example, between 1992 and 1994, Americans aged 12 to 24 years suffered approximately half of all violent crimes committed, despite comprising less than a quarter of the United States population at that time (United States Department of Justice, 1997). Similarly, 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. Additionally, the United State Bureau of Justice (2007) reported in the *2004 National Crime Victimization Survey* that 24 million United States residents, aged 12 and older, were victims of violent and/or property crimes. Higher rates of victimization were reported for adolescents aged 12 to 19 years than for adults. Males were more likely to be victims of violent crimes; however, females were more likely to report having been the victims of rape.

With regard to motor vehicle accidents, the United States Department of Transportation (2006) reported that in 2005 approximately 640 American children were injured every day. Similarly, the New York State Department of Motor Vehicles reported that in 2006, 10.3% of motor vehicle accident victims were children aged 17 years and under. In total, 7,867 children aged 17 and under were killed or seriously injured in car accidents that year. Additionally, the United States Department of Transportation (2007) reported that more 16-to-20-year-old individuals were killed in motor vehicle accidents each year between 1996 and 2005 than Americans in any other age group.

While many studies have assessed PTSD in children following specific stressors, very few community-based studies have assessed child and adolescent exposure to a full range of potentially traumatic events (Copeland et al., 2007). Copeland and colleagues examined the prevalence of exposure to traumatic events and the range and frequency of PTSD symptoms in a longitudinal community sample of 1,420 children using annual child and parent reports on the *Child and Adolescent Psychiatric Assessment (CAPA)* (Angold & Costello, 2000). Specifically, they utilized a representative sample of children aged 9, 11, and 13 years at intake and followed up with them annually through 16 years of age. Results indicated that more than two-thirds of children reported at least one traumatic event by 16 years of age, with 13.4% of those children developing some symptoms of PTSD. The most common traumatic events reported were witnessing or learning about a traumatic event. Few PTSD symptoms or psychiatric disorders were

observed for individuals experiencing their first event, and any effects were short-lived. Less than 0.5% of children met the criteria for full-blown DSM-IV (APA, 1994) PTSD. Violent or sexual trauma was associated with the highest rates of symptoms. The PTSD symptoms were predicted by previous exposure to multiple traumas, anxiety disorders, and family adversity. In sum, exposure to traumatic events is fairly common in the general population of children and does not often result in PTSD symptoms, except after multiple traumas or a history of anxiety.

Given the paucity of community-based studies examining the prevalence of PTSD among children and adolescents (Giaconia et al., 1995), effort has been directed toward investigating prevalence estimates, in both large epidemiological studies as well as government surveys, following youth exposure to specific types of traumas. Several studies investigating child-adolescent exposure to traumatic events in the United States have yielded similarly high rates of violence exposure. For example, in a study of urban youth in America, Bell and Jenkins (1993) surveyed 536 elementary school students and 1,011 students from four high schools and two middle schools in Chicago. With regard to the younger sample, youth reported experiencing events such as witnessing a beating (78%), stabbing (30%), or shooting (26%). A large subset of the older sample reported having been directly victimized. Specifically, the middle and high school-aged youth reported experiencing events such as being shot at (10.9%), threatened with a knife (22.7%) or gun (17%), stabbed (4.3%), shot (3.2%), and sexually assaulted (2.5%). Many also reported having witnessed a stabbing (34.6%), shooting (39.4%), or killing (25.3%).

In the *National Comorbidity Survey (NCS)*, Kessler and colleagues (1995) reported that 60.7% of American males and 51.2% of females aged 15 to 24 years reported exposure to one or more traumatic events. Similarly, in a telephone survey of a nationally representative sample of 4,023 American youth between the ages of 12 and 17, Kilpatrick and Saunders (1997) estimated that 39.4% of the sample had witnessed one or more incidents of serious interpersonal violence, 17.4% of the sample had experienced a

serious physical assault, and 8.1% of the sample had experienced sexual assault. Likewise, Schwab-Stone and colleagues (1995, 1999) administered written surveys to 5,348 adolescents in an urban public school system. More than one-third (36%) of the adolescents reported having directly experienced at least one type of violent act. In addition, 18% of the adolescents reported having been chased by a gang or individual, and 18% reported having been threatened with physical harm. Between 5% and 10% reported events such as being attacked or stabbed with a knife, being beaten or mugged, being seriously wounded, being shot at, or being shot. In the Schwab-Stone (1994, 1996) surveys, 46% and 39% of adolescents reported that they had seen someone shot or shot at, respectively. More than 25% of the adolescents in each year's survey endorsed having seen someone attacked or stabbed with a knife.

Breslau et al. (2004) estimated the cumulative occurrence of traumatic events and posttraumatic stress disorder (PTSD), using the Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM-IV) (APA, 1994) criteria, in a high-risk sample of urban youth. The sample ($n = 2,311$) was recruited in 1985 through 1986 at entry into first grade of a public school system in a large mid-Atlantic city. Participants were interviewed about history of trauma and PTSD in 2000 through 2002 when their mean age was 21 years ($n = 1,698$). The lifetime prevalence of exposure to assaultive violence was greater for males (62.6%) than for females (33.7%). However, females had a higher risk of PTSD than males following assaultive violence, but not following other traumas.

In a related study, Finkelhor, Ormrod, Turner, and Hamby (2005) used the *Developmental Victimization Survey (DVS)* (Finkelhor et al., 2005) to examine exposure to 34 forms of victimization experiences in a nationally representative sample of 2,030 youth aged 2 to 17 years. The *DVS* assessed exposure to various acts of criminal victimization, exposure to assaults by peers and siblings, nonsexual assaults to genitals, dating violence, bias and hate crimes, and property thefts. Results indicated widespread exposure to victimization incidents, as 71% of the participants were exposed to one or

more victimization incidents in the past year. In a related study by Finkelhor and colleagues (2005), nearly 70% of victimized children reported that they had experienced multiple traumatic experiences, with an average of three different kinds of victimization reported on the *Juvenile Victimization Questionnaire (JVQ)* (Hamby, Finkelhor, Ormrod, & Turner, 2004).

Community-Based Surveys Examining Child-Adolescent PTSD Prevalence Rates

Given the high rates of youth exposure to traumatic events, it is important to recognize that children and adolescents who experience such extreme stress may be at risk for developing PTSD. In addition to the studies and government statistics that reported prevalence rates for exposure to traumatic events, many community-based surveys have also reported child-adolescent prevalence rates for PTSD following exposure to a variety of traumatic events. For example, Giaconia et al. (1995) documented the prevalence of PTSD in a sample of 384 adolescents who were participating in an ongoing longitudinal study. The sample was drawn from a predominantly Caucasian working class community in the northeastern United States. The study was initiated when the youth were 5 years old, and data were collected at ages 9, 15, and 18 years. When participants reached age 18, structured clinical interviews using the *National Institute of Mental Health Diagnostic Interview Schedule III-R (DIS-III-R)* (Robins, Helzer, Cottler & Golding, 1989) indicated that 165 participants (43% of the sample) reported that they experienced a trauma that met the DSM-III-R (APA, 1987a) traumatic event criteria by age 18. The most commonly reported trauma involved learning about another's sudden death or accident (13.0%). Frequently reported traumas also included having seen someone hurt or killed (12.8%) or having experienced personal injury (10.4%). Less prevalent traumas included physical assault (6.5%), rape (2.1%), being threatened (2.1%), and natural disasters (1.3%). Giaconia et al. (1995) indicated

that 14.5% of the sample met criteria for a lifetime diagnosis of PTSD, which comprised 6.3% of the total sample. The authors further reported higher PTSD prevalence rates for rape (50%) relative to physical assault (12.0%) and natural disasters (0.0%).

In another community study, Cuffe et al. (1998) examined the prevalence of PTSD in a community-based sample of 490 twelfth grade students in a school district in suburban South Carolina. Using an author-devised, semi-structured clinical interview, Cuffe and colleagues concluded that 15% ($n = 80$) of the participants had experienced a traumatic event. Of these, 12.4% met DSM-IV (APA, 1994) criteria for PTSD. In the overall sample, 3% of females and 1% of males had PTSD. Cuffe et al. (1998) further reported that there was an increased risk of PTSD among females, rape or child sexual abuse victims, and youth who witnessed an accident or medical emergency.

Perkonig, Kessler, Storz, and Wittchen (2000) assessed lifetime and 12-month prevalence of exposure to traumatic events and DSM-IV (APA, 1994) PTSD, as well as comorbidity patterns, in a representative community sample of 3,021 individuals between 14 and 24 years. The *Munich Composite International Diagnostic Interview (M-CIDI)* (Wittchen & Pfister, 1997) was utilized to assess traumatic events and PTSD. Overall, 21.4% of the sample reported having experienced at least one A1 event (e.g., 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) at some point in their lives. However, only 17% of the total sample also qualified for the A2 entry criterion for DSM-IV (APA, 1994) PTSD, qualifying traumatic events by acknowledging that experiencing these events also caused feelings of horror and/or helplessness at the time. Among those who met both A1 and A2 entry criteria, 7.8% met all of the diagnostic criteria for PTSD, resulting in a lifetime prevalence of 1.3%.

Utilizing 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 adolescents aged 12 to 17 years. Participants completed a modified version of the

National Women's Study (NWS) PTSD Module (Kilpatrick, Resnick, Saunders, & Best, 1989). Results indicated that 4.8% of the overall sample met DSM-IV (APA, 1994) PTSD criteria. Specifically, 3.7 % of male adolescents and 6.3% of female adolescents met DSM-IV criteria for PTSD. Furthermore, it was found that three-fourths of adolescents that were diagnosed with PTSD had one or more comorbid diagnoses. Kilpatrick and colleagues (2003) further indicated that 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. After controlling for the presence of comorbid disorders, only 1.4% ($n = 55$) of the sample met diagnostic criteria for PTSD only.

Breslau, Lucia, and Alvarado (2006) conducted a longitudinal study involving 713 youth from divergent socioeconomic backgrounds. Participants completed the *DIS-III-R* (Robins et al., 1989) at 6, 11, and 17 years of age. Results indicated a lifetime prevalence of 75.9% for traumatic exposure, with trauma exposure rates being significantly higher for urban youth (86.0%) as compared to suburban youth (65.3%). Moreover, males reported having been exposed to traumatic events significantly more often than females (79.2% versus 72.9%, respectively). A lifetime PTSD prevalence rate of 8.3% was indicated for the entire sample.

Finally, Storr, Ialongo, Anthony, and Breslau (2007) completed a long-term study that assessed exposure to traumatic events and estimated PTSD prevalence among a sample of urban youth. Initially 2,311 first grade students from 19 public schools within the same district were administered the PTSD module of the *Composite International Diagnostic Interview (CIDI)* (World Health Organization, 1997). Follow up evaluations occurred 15 years later sampling 1,698 young adults (794 males, 904 females; mean age = 21) from the original cohort. Traumatic events were categorized into two categories: assaultive violence (e.g., rape, sexual assault other than rape, and being badly beaten) and non-assaultive violence (e.g., serious motor vehicle accident, natural disaster,

and life-threatening illness). Storr et al. (2007) reported that 82.5% of the sample had a lifetime prevalence of exposure to a DSM-IV (APA, 1994) qualifying traumatic event; 47.2% experienced one or more traumatic events that involved assaultive violence; and 91% of individuals who experienced assaultive violence additionally experienced at least one non-assaultive traumatic experience. Moreover, the authors reported that males and older adolescents had higher prevalence rates for exposure to assaultive violence as compared to females and younger adolescents. Storr et al. (2007) also observed a lifetime PTSD prevalence rate of 8.8%.

Examined collectively, the community-based surveys indicate prevalence rates for child-adolescent exposure to traumatic events that ranged from 21.4% to 82.5%. Lifetime PTSD prevalence rates for the entire samples ranged from 1.3 to 8.8%. Given the outcomes of the community-based surveys and government statistics that were considered, it may be concluded that youth in the United States are at a high risk for being exposed to traumatic events and that the majority of cases that were exposed to traumatic events did not evidence PTSD.

Empirical Studies by Stressor Type

Studies utilizing clinical samples have been employed to determine the prevalence rates of PTSD following various specific types of trauma exposure. Much of the recent work in this area has focused on child-adolescent PTSD prevalence rates following war-related traumas, criminal victimizations (e.g., shooting, sexual assault, and physical assault), natural disasters, and serious accidents. PTSD prevalence rates for these categories are discussed in the following sections.

War-Related Studies of Child-Adolescent PTSD

Studies of child and adolescent psychopathology following war-related traumatic experiences, such as terrorist attacks, air strikes, genocide, and the journeys of refugees, have yielded significant information regarding the epidemiology of PTSD. Many current studies have examined prevalence rates of PTSD for youth exposed to violence in the Middle East (e.g., Ahmad, Sofi, Sundelin-Wahlsten, & von Knorring, 2000; Almqvist & Broberg, 1999; Saigh, Mroueh, & Bremner, 1997), while others considered similar populations in Asia (e.g., Kinzie et al., 1986, 1989; Sack et al., 1993, 1994) and Africa (e.g., Bayer, Klasen, & Adam, 2007; Schaal & Elbert, 2006).

Middle Eastern Studies. During a vicious civil war in Lebanon (1975-1990), the country's social, political, and economic systems were shattered, as Lebanese people were exposed to periodic and often unpredictable eruptions of violence, including air raids, street combat, shelling of neighborhoods, and displacement of entire communities. Against this background, Saigh and his colleagues (Saigh, 1988a, 1988b, 1989a; Saigh, Mroueh, & Bremner, 1997) initiated several investigations involving Lebanese youth affected by the conflict.

Saigh (1988a) administered a structured clinical interview based on DSM-III (APA, 1980) criteria to 12 Lebanese students enrolled at the American University of Beirut 63 days before participants were exposed to a devastating artillery bombardment as well as 37 and 316 days following the event. While none of the participants had PTSD prior to the bombardment, 75% ($n = 9$) reported symptoms that were consistent with an acute PTSD diagnosis 37 days after the incident, and 8.3% ($n = 1$) met PTSD criteria 316 days subsequent to the bombardment. In a study examining the discriminant validity of the PTSD classification with regard to adolescents, Saigh (1988b) administered the DSM-III (APA, 1980) version of the *Children's PTSD Inventory* to 92 Lebanese 13-year-olds who reportedly developed psychological and academic difficulties following exposure to war-related stressors. Although the interval between stress exposure and assessment was not

reported, Saigh indicate that 29.3% ($n = 27$) met criteria for PTSD. Similarly, Saigh (1989a) administered the *Children's PTSD Inventory* to 840 Lebanese youth who were referred for clinical evaluations by Red Cross personnel, physicians, mental health practitioners, and educators after exposure to extreme forms of war-related stress (e.g., being hit by shrapnel). Although the interval between stress exposure and assessment ranged from one to two years after the participants' exposure to traumatic events, 32.5% ($n = 231$) met diagnostic criteria for PTSD.

Also within the context of research regarding the Lebanese conflict, Saigh, Mroueh, and Bremner (1997) administered the DSM-III (APA, 1980) version of the *Children's Posttraumatic Stress Disorder Inventory (CPTSDI)* (Saigh, 1989b) to 95 non-referred Lebanese students enrolled in six English-speaking Lebanese private secondary schools. The authors reported that highly stressful incidents (e.g., bombings, terrorist attacks, and artillery fire) had been taking place when the data were collected. Saigh and his colleagues reported that 14 of the adolescents met DSM-III (APA, 1980) criteria for PTSD (46.7% of the participants who were exposed to extreme stress or 14.7% of the overall sample).

In a similar vein, Almqvist and Broberg (1999) examined the psychological adjustment of 50 Iranian refugees (36 boys and 14 girls) aged 4 to 8 years who had resettled in Sweden with their families. The examiners administered an author-developed semi-structured clinical interview based on the DSM-IV (APA, 1994) PTSD criteria to each child and a parent. Assessments were made three and a half years after the participants left Iran. Participants reported experiencing traumatic events such as air raids or attacks by long-range missiles and/or witnessing a parent being assaulted (Almqvist & Brandell-Forsberg, 1995). Results indicated that 18% of the children met full PTSD criteria and another 18% presented with severe clinical symptoms but did not meet full PTSD criteria.

Analogously, Ahmad and colleagues (2000) assessed PTSD prevalence in Kurdish youth following the military operation “Anfal” in Iraqi Kurdistan. “Anfal” was the 1988 genocidal campaign against the Kurdish people and other ethnic groups in Northern Iraq, led by the Saddam Hussein’s regime. When the military was given orders to kill men aged 15 to 60 years, many Kurds fled for the Turkish border. Five years after the military operation, 45 families were randomly selected among the survivors in two displacement camps. Ahmad et al. administered the DSM-III-R (APA, 1987a) version of the *Posttraumatic Stress Symptoms for Children (PTSS-C)* and the *Harvard Trauma Questionnaire (HTQ)* to the oldest child (24 males, 31 females) and the principal caregiver in each family, respectively. Ahmed and colleagues (2000) indicated that 87% of the children and 60% of their caregivers met PTSD criteria. While childhood PTSD was significantly associated with child trauma scores and the duration of captivity, it was not predicted by maternal PTSD, nor did it remit after the reunion with the PTSD-free father.

Similarly, Khamis (2005) assessed Palestinian school-age children residing in either East Jerusalem or the West Bank, many of whom were under constant threat of trauma exposure. In total, 1,000 youth (523 males, 477 females; 12-16 years of age), selected from government, private, and United Nations Relief Work Agency (UNRWA) schools, were administered an author-devised questionnaire that followed the DSM-IV (APA, 1994) criteria for PTSD. A sub-group of 54.7% ($n = 547$) of the children reported having experienced at least one lifetime trauma. The most commonly reported events were political traumas inflicted by the Israeli army ($n = 270$, 49.4%), among which 22.9% ($n = 125$) involved injuries, 17.6% ($n = 96$) involved having a family member killed, 8.2% ($n = 45$) were imprisoned and beaten, and 0.7% ($n = 4$) had their houses demolished. Approximately 30.9% ($n = 169$) of the traumatized children were in a car accident, and 14.8% ($n = 81$) had been physically abused or assaulted. Other children reported situations in which they felt their lives endangered, 3.1% ($n = 17$) drowning, and

1.1% ($n = 6$) armed burglary. Only 0.7% ($n = 4$) reported sexual assault. PTSD was diagnosed in 34.1% of the entire sample, a majority of whom were refugees, males, and working. Among the stress-exposed subgroup, 62.3% reportedly had PTSD.

With regard to Israeli youth, Schwarzwald, Weisenberg, Waysman, Solomon, and Klingman (1993) administered the DSM-III (APA, 1980) version of the *CPTSD-RI* (Frederick & Pynoos, 1988) in order to assess PTSD prevalence in 492 Israeli fifth, seventh, and tenth grade children who were exposed to ongoing missile attacks during the Persian Gulf War. Three hundred ten (63%) of the youth lived in areas that experienced direct missile hits, while 182 (37%) of the participants did not experience any direct hits. Results indicated that fifth graders living in areas that were directly hit developed significantly higher rates of PTSD (25.4%) than both seventh (3.4%) and tenth (1.6%) graders living in equally dangerous environments. No significant differences were reported for youth living in the no-hit zones. The authors reported that this trend was maintained at a one-year follow-up (Schwarzwald, Weisenberg, Solomon, & Waysman, 1994).

More recently, Lavi and Solomon (2005) examined PTSD prevalence rates among three different groups of Israeli youth aged 11.5 to 15 years. The authors administered the DSM-III-R (APA, 1987a) version of the *CPTSD-RI* (Pynoos et al., 1987) to 740 youth living in the Israeli cities of Jerusalem, Gilo, and Jewish settlements in disputed territories. Results indicated that youth living in disputed territories reportedly experienced significantly more terrorist attacks (mean = 10.3) as compared to youth living in either Jerusalem (mean = 2.3) or Gilo (mean = 3.4). Furthermore, it was indicated that youth living in the settlements had significantly higher rates of PTSD (27.6%) than both the Jerusalem youth (12.4%) and those living in Gilo (11.2%).

In a similar vein, Pat-Horenczyk et al. (2007) assessed the incidence of PTSD among Israeli high school students who had been exposed to ongoing violence. The researchers examined 695 students (315 males, 380 females) ages 12 to 18 years by

administering the *UCLA PTSD Index for the DSM-IV* (Rodriguez, Steinberg, & Pynoos, 1999). Responses to the self-report instrument indicated that 7.6% of the children sampled met full criteria for a PTSD diagnosis.

Finally, Elbedour, Onwuegbuzie, Ghannam, Whitecome, and Hein (2007) assessed prevalence rates of PTSD among Palestinian children and adolescents living in the Gaza Strip during the Second Uprising of 2000. Youth in this study reported experiencing traumatic events such as witnessing a friend or family member being injured or killed, seeing their homes being demolished, being shot or physically assaulted, and being exposed to the firing of missiles. PTSD was assessed through administrations of the DSM-IV (APA, 1994) version of the *Posttraumatic Stress Disorder Inventory (PTSD-I)* (Watson, Juba, Manifold, Kucala, & Anderson, 1991). Elbedour and colleagues (2007) reported a PTSD incidence rate of 68.9%.

Asian Studies. Researchers have also examined child-adolescent PTSD prevalence rates following exposure to war-related traumatic experiences in Asia. Much of this research has focused on the psychological repercussions of the Khmer Rouge and Pol Pot takeover of Cambodia during the late 1970s. During this period, the Khmer Rouge regime, under the leadership of Pol Pot, attempted to restore a Marxist government in Cambodia. This regime subsequently committed horrific acts of war, such as executions and torture, and practiced social engineering, which resulted in genocide (Mollica et al., 1993). Against this background, Kinzie and his colleagues (Kinzie, Sack, Angell, Clarke, & Ben, 1989; Kinzie, Sack, Angell, Mason, & Ben, 1986) described the psychopathology of a sample of Cambodian adolescents who immigrated to the United States after the fall of the Pol Pot regime (1975-1979). Between the ages of 8 and 12 years, the participants reported enduring “catastrophic trauma caused by separation from their families, forced labor, starvation, personal injuries, and the witnessing of many deaths and executions” (Kinzie et al., 1989, p. 501). Kinzie et al. (1986) administered standardized interviews to 40 Cambodian high school students (mean age = 14 years) in the United States

approximately 2.5 years after the end of the Pol Pot regime and .5 years subsequent to their immigration to the United States. Results indicated that 50% ($n = 20$) met criteria for PTSD. Three years later, Kinzie et al. (1989) re-examined 27 adolescents from the original sample. Of these, 48% ($n = 13$) met criteria for PTSD as measured by a DSM-III-R (APA, 1987a) diagnostic interview. Of note is that 61.5% of the participants who initially met criteria for PTSD continued to do so at the three-year follow-up. In a six-year follow-up, Sack et al. (1993) administered the DSM-III-R (APA, 1987a) version of the *Diagnostic Interview for Children and Adolescents (DICA)* (Welner, Reich, Herjanic, Jung, & Amando, 1987) to 19 of the 40 original Pol Pot survivors. Of the 19 participants who were examined across assessment dates, 52% had PTSD in 1984, 47% in 1987, and 32% in 1990.

Also with regard to Pol Pot, Sack et al. (1994) assessed 209 Cambodian adolescent refugees (104 males and 105 females) living in Portland, Oregon or Salt Lake City, Utah 13 years after they left Cambodia. The participants, aged 13 to 25 years, reported extensive exposure to starvation, familial separation, slave labor in work camps, and witnessing the executions of family members. With the assistance of a Cambodian translator, Sack et al. administered the PTSD section of the *DICA* (Welner, Reich, Herjanic, Jung, & Amando, 1987) and portions of the *Schedule of Affective Disorders and Schizophrenia for School-Age Children – Epidemiologic Version (K-SADS-E)* (Puig-Antich, Orvaschel, Tabrizi, & Chambers, 1983), which reflects the DSM-III-R (APA, 1987a) criteria for PTSD. Sack and his colleagues reported a current PTSD prevalence rate of 18.2% ($n = 38$) and a lifetime prevalence rate of 21.5% ($n = 45$).

In a related study, Hubbard, Realmuto, Northwood, and Masten (1995) interviewed 59 adolescent and young adult Cambodian refugees (29 males and 30 females) living in Minnesota. The participants, who ranged in age from 16 to 25 years, reported suffering similar traumatic experiences as the refugees in the Sack et al. (1993) study. Based on administrations of the *Structured Clinical Interview for the DSM-III-R Non-Patient*

Version (SCID-NP) (Spitzer & Williams, 1986), the authors observed a PTSD point prevalence of 24% and a lifetime PTSD prevalence rate of 59% among their sample.

In order to determine the prevalence of war-related PTSD among Cambodian refugees without the confounding effects of resettlement stress, Savin, Sack, Clarke, Meas, and Richart (1996) administered a Khmer version of the *DSM-III-R DICA* (Welner, Reich, Herjanic, Jung, & Amando, 1987) to 99 Khmer youth who had resided in the uncertain safety of a Thai refugee camp for 10 years. The authors reported that 26.3% of the participants met diagnostic criteria for Pol Pot-related PTSD, and 31.3% had a lifetime prevalence of the disorder. Participants who had experienced refugee camp trauma tended to evidence sub-threshold symptoms of PTSD.

African Studies. More recently, Schaal and Elbert (2006) examined the prevalence of PTSD a decade after the 1994 Rwandan genocide. Between April and July, 1994, over 800,000 Rwandans lost their lives during intense fighting between the Hutu and Tutsi ethnic groups (UNICEF, 2007). The authors noted that the UNICEF estimates indicated that 300,000 youth resided in child-headed households. Ten years after these events, Schaal and Elbert (2006) administered the *Event Scale* (Dyregrov, Gupta, Gjestad, & Mukanoheli, 2000) and the DSM-IV (APA, 1994) version of the *Composite International Diagnostic Interview (CIDI)* (World Health Organization, 1997) to 68 orphan youth and young adults aged 13 to 23 years who were living in either a child-headed household or an orphanage. The authors reported that all of the orphans had been exposed to extreme levels of violence and 41% has witnessed the murder of their own parent(s). The *CIDI* interviews revealed that all of the participants experienced at least one trauma-related reexperiencing symptom. Fifty-seven percent experienced at least three avoidance or numbing symptoms, and 62% reported two or more increased arousal symptoms. As a group, 44% of the participants met full criteria for PTSD. It was further reported that youth living in a child-headed household during the time of the study were more vulnerable to PTSD as compared to those living in an orphanage. Additionally, PTSD

vulnerability was higher in those aged 8 to 13 years during the genocide as compared to those aged 3 to 7 years at that time.

In a similar vein, Bayer, Klasen, and Adam (2007) examined child victims of the civil war within Africa's Great Lakes Region, in which there are an estimated 250,000 child soldiers. The authors assessed 169 former child soldiers who had been placed in rehabilitation centers in Uganda or the Democratic Republic of the Congo. The participating 141 boys and 28 girls ranged in age from 11 to 18 years (mean = 15.3 years old). The authors reported that the participants spent an average of 38.3 months as child soldiers and had been demobilized for approximately 2.3 months. The most commonly reported traumatic experiences were having witnessed a shooting (92.9%), seeing others being injured (89.9%), and having been seriously beaten (84%). In addition, 54.4% reported that they had killed others, and 27.8% reported having been forced to engage in sexual conduct. Administrations of the DSM-III-R (APA, 1987a) version of the *CPTSD-RI* (Pynoos et al., 1987) indicated a 34.9% prevalence rate of PTSD.

The aforementioned war-related studies reported PTSD prevalence rates ranging from 7.6% to 87%. Table 2.1 presents data regarding prevalence of PTSD among children and adolescents following exposure to war-related traumatic events.

Criminal Victimization Studies of Child-Adolescent PTSD

Researchers have also examined PTSD prevalence rates among child and adolescent victims of crimes, such as shootings, muggings, armed robbery, gang violence, murder, physical abuse, and sexual abuse. For example, Nader, Pynoos, Fairbanks, and Frederick (1990) assessed the prevalence of PTSD among 159 school-aged children, aged 5 to 13 years, approximately one month after a sniper opened fire on a Los Angeles elementary school playground killing one child and wounding thirteen others. Administrations of the author-developed *PTSD Reaction Index (CPTSD-RI)* (Frederick & Pynoos, 1988) indicated that 60.4% of the sample met DSM-III-R (APA, 1987a)

diagnostic criteria for PTSD. An assessment conducted 14 months after the shooting that included 100 children from the original sample indicated that 29% of the children had PTSD at follow-up. The authors observed that individuals who reported feelings of guilt and who had known the child who was killed exhibited a greater number of symptoms. Additionally, the authors reported that PTSD prevalence was positively associated with degree of exposure to the event, with participants who were directly exposed to the sniper attack evidencing significantly higher rates of PTSD (94.3%) as compared to children who were at home at the time of the shooting (44.2%).

Table 2.1

Child-adolescent PTSD Rates Following War-related Traumas

Study	Measure(s)	Gender	Age	Elapsed Time	PTSD Prevalence
<i>Middle East Conflicts</i>					
Saigh (1988a)	<i>DSM-III</i> Author-devised Interview	12 females	Mean Age: 18.2 years	37 and 316 days	63 days before: 0.00% 316 days after: 8.30%
Saigh (1988b)	<i>DSM-III</i> <i>Children's PTSD</i> <i>Inventory</i>	42 males 50 females	Mean Age: 13 years	Not Reported	29.30%
Saigh (1989a)	<i>DSM-III</i> <i>Children's PTSD</i> <i>Inventory</i>	403 males 437 females	Age Range: 9-12 years	1-2 years	32.50%
Saigh, Mroueh, & Bremner (1997)	<i>DSM-III</i> <i>Children's PTSD</i> <i>Inventory</i>	48 males 47 females	Mean Age: 17.5 years	M = 4.2 years	Stress Exposed = 46.70% Overall Sample = 14.70%

Table 2.1 (continued)

Study	Measure(s)	Gender	Age	Elapsed Time	PTSD Prevalence
Schwarzwald, Weisenberg, Waysman, Solomon, & Klingman (1993)	<i>CPTSDI-RI</i>	227 males 265 females	Grades 5, 7 and 10	Not Reported	Grade: males / females Gr. 5: 24.50% / 22.40% Gr. 7: 3.40% / 7.90% Gr. 10: 1.60% / 7.00%
Almqvist & Bromberg (1999)	<i>DSM-IV Based Clinical Interview</i>	29 males 10 females	Mean Age: 5.83 years	3.5 years	18.00%
Ahmad, Sofi, Sundelin-Wahlsten, & von Knorring (2000)	<i>HTQ PTSS-C</i>	24 males 21 females	Mean Age: 12.3 years Mean Age: 12.4 years	5 Years	87.00%
Khamis (2005)	<i>DSM-IV Based Clinical Interview</i>	523 males 477 females	Mean Age: 14.18 years	Not Reported	34.10%

Table 2.1 (continued)

Study	Measure(s)	Gender	Age	Elapsed Time	PTSD Prevalence
Lavi & Solomon (2005)	<i>CPTSD-RI</i>	358 males 371 females	Age Range: 11.5 - 15 years	Not Reported	Disputed Territories: 27.6% Jerusalem: 12.40% Gilo: 11.20%
Elbedour, Onwueghuzie, Ghannam, Whitcome, & Hein (2007)	<i>CPTSD-I</i>	121 males 108 females	Mean Age: 17.13 years	Not Reported	68.90%
Pat-Horenczyk, Ambrovitz, Peled, Brom, Daie, & Chemtob(2007)	<i>UCLA PTSD Reaction Index</i>	315 males 380 females	Mean Age: 14.77 years	22 months of recurrent attacks	Direct Exposure: 13.60% Near-Miss: 7.70% Overall Sample: 7.60%
<i>Southeast Asian Conflicts</i>					
Kinzie et al. (1986)	<i>DSM-III Diagnostic Interview</i>	25 males 15 females	Mean Age: 14 years	2.5 years	50.00%
Kinzie et al. (1989)	<i>DSM-III-R DIS</i>	16 males 11 females	Mean Age: 20 years	5.5 years	48.00%

Table 2.1 (continued)

Study	Measure(s)	Gender	Age	Elapsed Time	PTSD Prevalence
Sack et al., 1993	<i>DSM-III-R DICA</i>	<i>N = 19; gender not reported</i>	Mean Age: 23 years	12-18 years	12 Years: 52.00% 15 Years: 47.00% 18 Years: 32.00%
Sack, McSharry, Clarke, Kinney, Seeley, & Lewinshon (1994)	<i>K-SADS-E DICA</i>	104 males 105 females	Mean Age: 19.8 years	13 years	Current: 18.20% Lifetime: 21.50%
Hubbard, Realmuto, Northwood & Masten (1995)	<i>DSM-III-R Clinical Interview</i>	29 Males 30 Females	Mean Age: 19.5 years	15 years	Current: 24.00% Lifetime: 59.00%
Savin, Sack, Meas, & Richart (1996)	<i>DSM-III-R DICA</i>	89 males 10 females	Age Range: 18-25 years	10 years	Point Prevalence: 26.30 Lifetime Prevalence: 31.30%

Table 2.1 (continued)

Study	Measure(s)	Gender	Age	Elapsed Time	PTSD Prevalence
<i>African Conflicts</i>					
Schaal & Elbert (2006)	<i>CIDI Event Scale</i>	33 males 35 females	Mean Age: 17.72 years	~ 10 years	44.00%
Bayer, Klansen, & Adam (2007)	<i>CPTSD-RI</i>	141 males 28 females	Mean Age: 15.3 years	Demobilized: 2.3 months Time Spent as Child Soldiers: 38.3 months	34.90%

Similar events occurred in an upper-middle class suburban American elementary school in 1988 when a young woman with a history of psychiatric issues entered an Illinois school with several handguns, terrorizing and threatening many people before opening fire and killing two students (Schwarz & Kowalski, 1991). Between 6 and 14 months after the incident, Schwarz and Kowalski administered the DSM-III-R (APA, 1987a) version of the *Reaction Index* (Pynoos et al., 1987) to 64 children aged 5 to 14 years who were exposed to the shooting. In total, the prevalence of PTSD based on the DSM-III-R (APA, 1987a) criteria was estimated at 27% among the children 6 to 14 months subsequent to the event. Schwarz and Kowalski (1991) further reported that PTSD was associated more with emotional states recalled from the disaster than with geographic proximity and suggested that post-disaster intervention be offered on the basis of degree of emotional reaction as well as proximity.

Vila, Porche, and Mouren-Simeon (1999) reported that an armed man walked into a French school, took hostages, and threatened to blow himself up with hostages. Police intervened and no casualties were reported. The authors evaluated 26 hostages, between the ages of 6 and 9.5 years, using a standardized DSM-III (APA, 1980) based clinical interview (*K-SADS*) (Puig-Antich, Orvaschel, Tabrizi, & Chambers, 1980) and self-report questionnaires—*State and Trait Anxiety Inventory for Children (STAIC)* (Spielberger, 1973) and *Impact of Event Scale - Revised (IES-R)* (Horowitz et al., 1979)—immediately following the incident and at 2, 4, 7, and 18 months after the event. This sample was compared with 21 children from the same school who had not been threatened. Immediately following the incident, 96% of the children who were directly involved in the incident suffered from symptoms of acute stress disorder. Vila et al. (1999) found that after 2 months, 9 of the 47 children (19.2%) met DSM-III (APA, 1980) criteria for full PTSD as measured by the *K-SADS*, *STAIC*, and *IES*, including two students who were indirectly exposed to trauma. Prevalence rates for the disorder were lower at 4 (8.5%), 7 (7.7%), and 18 months (3.7%) following the initial event.

In a similar vein, Scrimin et al. (2006) described the symptoms of PTSD and measured attention and memory among a groups of Beslan's children ($n = 22$) and their primary caregivers ($n = 20$) three months after the children had been taken hostage in their school by a group of terrorists. In September, 2004, terrorists attacked a school in Beslan, Russia, where 1,300 children and adults were attending a party for the opening of the school year. The terrorists held the children and parents hostage for three days, where they were denied water, food, and medication. Other parents and relatives stood nearby the school, heard the shooting, and witnessed corpses being thrown out from the school building. The ordeal ended when the terrorists exploded widely dispersed mines, collapsing part of the school, and prompting the army to intervene. Of the 330 people killed, 186 were children. Children and their caretakers showed high levels of ongoing PTSD symptoms. Children additionally demonstrated difficulties in sustaining attention and in short-term memory. These outcomes support the need for appropriate interventions and ongoing monitoring of course of recovery. Although the aforementioned incidents and similar events, such as the shootings at Columbine High School in Littleton, Colorado (Larkin, 2007), can lead to PTSD, this form of trauma exposure has been infrequent.

In contrast, youth exposure to violence in urban communities is much more common (Fitzpatrick & Boldizar, 1993; Jaycox et al., 2002; Mazza & Reynolds, 1999; Ozer & McDonald, 2006; Shelly & Wright, 1995). For example, Fitzpatrick and Boldizar (1993) collected data from 221 low-income African-American youth, aged 7 to 18 years, living in urban housing projects in Alabama. Researchers administered modified questions from the *National Institute of Mental Health Screen Survey of Exposure to Community Violence* (Richters, 1990) and a revised version of the *Purdue Posttraumatic Stress Scale* (Figley, 1989) reflecting DSM-III-R (APA, 1987a) criteria for PTSD. Seventy percent of respondents indicated being directly exposed to a traumatic event, and 85% reported witnessing one or more violent acts. Fitzpatrick and Boldizar (1993)

concluded that being victimized and witnessing violence were both significantly related to reporting PTSD symptoms. Specifically, results of the evaluation indicated that 27% ($n = 54$) of the sample met diagnostic criteria for PTSD.

In an associated study, Berman et al. (1996) assessed the prevalence of PTSD among urban high school students who had been exposed to violent neighborhood crimes. The *Child PTSD Reaction Index (CPTSD-RI)* (Pynoos, Rodriguez, Steinberg, Stuber, & Frederick, 1998) was administered to 96 adolescents between the ages of 14 and 18 years in the Miami metropolitan area. These adolescents reported experiencing or witnessing a mugging, knife attack, shooting, suicide, or murder, or having seen a dead body. The authors indicated that 34.5% of the sample presented with DSM-III-R (APA, 1987a) PTSD. In a similar vein, Berton and Stabb (1996) administered the DSM-III (APA, 1980) based *Keane PTSD Scale* (Keane, Malloy, & Fairbank, 1984) and *Civilian Mississippi PTSD Scale (CM-PTSD)* (Berton & Stabb, 1995) to 103 high school juniors. Berton and Stabb (1996) concluded that 29% of the sample met criteria for PTSD.

With regard to correctional settings, Steiner, Garcia, and Mathews (1997) assessed PTSD prevalence among 85 incarcerated boys between the ages of 13 and 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 component of the *Psychiatric Diagnostic Interview – Revised (PDI-R)* (Othmer, Penick, Powell, Read, & Othmer, 1981), Steiner and colleagues determined that 31.7% of the juvenile delinquents met DSM-III-R (APA, 1987a) criteria for PTSD, as compared to 9.3% of the comparison group. The most commonly reported traumatizing stressors included intra-familial violence, such as abuse, murder, and serious 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 study evaluating PTSD and exposure to violence in urban immigrants, Jaycox et al. (2002) assessed PTSD by administering the *Child PTSD Symptom Scale* (Foa et al.,

2001) to 1,004 recent immigrant schoolchildren, aged 8 to 15 years, residing in Los Angeles. Participants included children whose native language was Spanish, Korean, Russian, and Western Armenian. Participants reported high levels of violence exposure, both personal victimization and witnessing violence. More specifically, results indicated that 49% of the participants were victims of community violence, and 80% of the sample had witnessed other forms of violence in the past year. Overall, the authors reported that 29.4% of the sample met DSM-IV (APA, 1994) criteria for PTSD.

Similarly, Foster, Kuperminc, and Price (2004) examined exposure to violence among 149 predominantly African American, lower income, inner-city, 11 to 16 year-old adolescent members of various local Boys and Girls Clubs. Participants completed the *Children's Exposure to Community Violence Checklist* (CECV) (Richters & Martinez, 1993) and the DSM-IV (APA, 1994) version of the *Trauma Symptom Checklist for Children* (TSCC) (Briere, 1996). All of the participants reported either witnessing or directly experiencing at least one act of violence. Self-report responses evidenced probable PTSD prevalence rates of 11.8% for girls and 11.5% for boys. Likewise, Horowitz, McKay, and Marshall (2005) interviewed 23 urban youth, aged 8 to 17 years, who reported encountering frequent gang and domestic violence. Based on responses to the *UCLA PTSD Index for DSM-IV Disorders* (UPID) (Pynoos et al., 1998), 50% met criteria for PTSD, and an additional 21% met criteria for partial PTSD.

With reference to community violence in Africa, Seedat, Nyamai, Njenga, Vythilingum, and Stein (2004) assessed 1,140 South African students and 901 Kenyan students living near Cape Town and Nairobi, respectively. Respondents completed a demographic questionnaire, a trauma checklist adapted from the DSM-IV (APA, 1994) version of the *Schedule for Affective Disorders and Schizophrenia for School-age Children – Present and Lifetime* version (*K-SADS-PL*) (Kaufman et al., 1996), and the author-derived *Child PTSD Checklist* (Newman & Amaya-Jackson, 1996). Kenyan youth, as compared to South African youth, had significantly higher rates of exposure to

witnessing violence (69% versus 58%), physical assault by a family member (27% versus 14%), and sexual assault (18% versus 14%). However, prevalence rates of PTSD and partial PTSD were significantly greater for South Africans (22% and 12%, respectively) than Kenyans (5% and 8%, respectively). The authors were unable to provide an explanation for this difference, suggesting that undiscovered cultural differences may have accounted for the varying rates.

With regard to stress-exposed urban youth, Lipschitz, Rasmusson, Anyan, Cromwell, and Southwick (2000) assessed 90 female adolescents between the ages of 12 and 21 years who received routine medical appointments at an inner-city primary care clinic. A majority of participants (92%) reported having experienced at least one trauma. The most common traumas endorsed were witnessing community violence (85.6%) and hearing about a homicide (65.8%). Administration of the *Child PTSD Checklist* (Newman & Amaya-Jackson, 1996) indicated that 13% of the overall sample met DSM-IV (APA, 1994) criteria for PTSD. Of the traumatized girls, 14.4% presented with symptoms warranting a diagnosis of PTSD. Furthermore, PTSD was significantly associated with depression, cigarette and marijuana use, poor school performance, and criminal arrest.

The aforementioned criminal victimization studies assessed child-adolescent victims of non-sexually based crimes. However, many community studies have demonstrated that rape and sexual assault are marked by higher rates of PTSD in youth relative to having been exposed to other types of traumas (Giaconia et al., 1995; Kessler et al., 1995; Norris, 1992; Resnick et al., 1993). Along these lines, McLeer, Deblinger, Atkins, Foa, and Ralphe (1988) recruited 31 sexually abused children (25 girls, 6 boys) through an outpatient university clinic. The children and their guardians participated in author-devised structured interviews and standardized instruments based on the DSM-III-R (APA, 1987a) criteria. Of the sexually abused children, 48.4% were diagnosed with PTSD. Furthermore, 25% of the cases that were abused by a trusted adult met PTSD criteria as compared to none of the children that were abused by an older child.

Similarly, Merry and Andrews (1994) assessed 95 children aged 4 to 16 years in New Zealand who had experienced extra- and/or intra-familial sexual abuse 12 months following disclosure of the abuse. Based on demographic data, a semi-structured interview with the children, and parent administrations of the *Diagnostic Interview Schedule for Children (DISC-2)* (Schaffer et al., 1989), Merry and Andrews concluded that 18.2% of the abused children met DSM-III-R (APA, 1987a) criteria for PTSD. In a related study, Wolfe, Sas, and Wekerle (1994) administered an author-devised DSM-III-R (APA, 1987a) PTSD checklist to 90 sexually abused children (21 males and 69 females) with a mean age of 12.4 years who had been referred to a child witness preparation program. Results indicated that 48.9% ($n = 44$) of the children had PTSD. Similarly, McLeer, Callaghan, Henry, and Wallen (1994) found that 42.3% of 26 sexually abused children (aged 6 to 16 years) met diagnostic criteria for PTSD based on their responses to the *Schedule for Affective Disorders and Schizophrenia for School-Age Children – Epidemiological Version (KSADS-E)* (Orvaschel, 1994).

With regard to sexual abuse among cases in correctional settings, Cauffman, Feldman, Waterman, and Steiner (1998) administered the PTSD component of the *Psychiatric Diagnostic Interview – Revised (PDI-R)* (Othmer et al., 1981) to 96 incarcerated female juvenile delinquents. A majority of the youth reported having been raped or in danger of being raped (76%), badly hurt or in danger of being hurt (74%), and having witnessed someone being severely injured or killed (60%). Cauffman and colleagues indicated a PTSD point prevalence of 48.9% and a lifetime prevalence of 65.3%.

In an effort to assess PTSD prevalence rates following sexual and physical abuse, Ackerman, Newton, McPherson, Jones, and Dykman (1998) administered the DSM-III (APA, 1980) version of the *Revised Diagnostic Interview for Children and Adolescents (DICA-R)* (Reich & Welner, 1988) to three cohorts of abused children aged 7 to 13 years and to their caregivers. Within their sample of 204 youth (73 males and 131 females),

62% ($n = 127$) of children reported being sexually abused, 21% ($n = 43$) of children reported being physically abused, and 17% ($n = 34$) of children reported experiencing both physical and sexual abuse. The authors reported an overall PTSD point prevalence rate of 34%. Additionally, the authors reported that children who had been both physically and sexually abused had a higher prevalence of PTSD (54.9%) relative to children who had been sexually abused (31.8%) or physically abused (25.4%). These findings suggest that children who experienced two types of abuse (e.g., sexual and physical) are more likely to develop PTSD than children who experienced one type of abuse.

In a related and more recent study, Ruggiero, McLeer, and Dixon (2000) administered the *KSAD-E* (Orvaschel, 1994) to 80 children between the ages of 6 and 16 years approximately 30 and 60 days following disclosure of sexual abuse. Ruggiero and colleagues (2000) reported that 36.6% of the overall sample developed DSM-III-R (APA, 1987a) PTSD. Similarly, Silva, Alpert, Munoz, Singh, Matzner, and Dummit (2000) compared PTSD prevalence rates following sexual or physical abuse, as well as the witnessing of domestic violence. Fifty-nine youth (39 males, 20 females) between the ages of 3 and 18 years were referred to the study via an inner-city outpatient clinic. The participants received administrations of the child version of the *Structured Clinical Interview for DSM-IV Disorders (Kid-SCID)* (Matzner, Silva, Silvan, Chowdhury, & Natasi, 1997). With reference to physical abuse, Silva et al. (2000) reported that 21% of the physically abused youth had PTSD and 17% of the youth that witnessed serious domestic violence met criteria for the disorder. It was also reported that 15% of sexually abused cases developed PTSD. In a similar vein, Linning and Kearney (2004) examined a sample of maltreated youth ages 8 to 17 years who were living in homeless shelter facilities in Nevada and Idaho and reported being physically and/or sexually abused within the past two years. Endorsements on the *Children's PTSD Inventory* (Saigh, 1997) indicated that 67.3% of the youth sample met DSM-IV (APA, 1994) criteria for PTSD.

With reference to PTSD prevalence rates following verbal, physical, and sexual assaults among lesbian, gay, and bisexual youth, D'Augelli, Grossman, and Starks (2006) assessed 528 youth aged 15 to 19 years during a two-year period. Assaults reportedly occurred as a result of sexual orientation. Participants completed the *Brief Symptoms Inventory (BSI)* (Derogatis, 1993) to measure symptomatic experiences during the previous week and the *Trauma Symptom Checklist (TSC)* (Brier, 1996) to measure trauma exposure. They also received administrations of the PTSD module from Version IV of the *NIMH Diagnostic Interview Schedule for Children (DISC)* (Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000). Among participants who experienced either physical or sexual assaults, 9% met criteria for a DSM-IV (APA, 1994) PTSD diagnosis.

Finally, Broman-Fulks and colleagues (2006) used results from the *National Survey of Adolescents (NSA)* to examine the prevalence of PTSD following sexual assault. Of the 4,023 adolescents who participated in the survey, 321 (8.2%) reported that they had experienced at least one sexual assault. A semi-structured interview that included the *National Women's Study PTSD Module* (Kilpatrick, Resnick, Saunders, & Best, 1989) assessed PTSD status using the DSM-IV (APA, 1994) criteria. Data were reported for non-disclosers (i.e., victims who did not disclose their assault history before the evaluation), short-delay disclosers (i.e., victims who disclose the assault within one month of the incident), and long-delay disclosers (i.e., victims who waited longer than one month before disclosing the assault). Results indicated that 24% of non-disclosers, 22% of short-delay disclosers, and 13% of long-delay disclosers developed PTSD.

More recently, Saigh, Yasik, Mitchell, and Abright (2011) examined the adjustment of two groups of New York City preschool children 8-10 months after September 11, 2001. One group was within 1 mile (1.61 km) of the World Trade Center and exposed to one or more traumatic events. The second group was 2 to 14 miles (3.28-22.54 km) away and not exposed to traumatic events. Parents evaluated their children by marking an author-devised and validated DSM-IV (APA, 1994) based PTSD

questionnaire and a standardized norm-referenced index of childhood adjustment. Parents also rated their personal adjustment by completing self-report measures of PTSD, anxiety, and depression. None of the trauma-exposed children warranted a current, probable PTSD diagnosis. Moreover, scores on the norm-referenced measure of childhood adjustment did not significantly vary between groups.

Examined collectively, the aforementioned studies reported PTSD prevalence rates following criminal victimization without sexual contact that ranged from 0.0% to 60.4%. Sexual assault incidents were associated with PTSD prevalence rates ranging from 9.0% to 63.5%. Table 2.2 presents a summary of the epidemiological studies regarding PTSD prevalence among children and adolescents following various forms of criminal victimization.

Disaster/Accident Studies of Child Adolescent PTSD

Disasters and accidents, (e.g., earthquakes, hurricanes, floods, and motor vehicle accidents) are often unanticipated and uncontrollable traumatic events that cause injury, death, and destruction. In a survey of U.S. residents, 13% of the sample reported a lifetime exposure to a natural or human-generated disaster (Burkle, 1996). The National Comorbidity Survey (Breslau et al., 1998) indicated that approximately 19% of men and 15% of women that were sampled were exposed to a natural disaster at least once in their lifetime. Given the potential for loss of livelihood and loved ones following disasters, survivors are at increased risk for experiencing a wide range of physical and psychological distress, including posttraumatic stress disorder (Norris, Friedman, & Watson, 2002; Ziaaddini, Nakhaee, & Behzadi, 2009). Many researchers have examined the posttraumatic stress reactions in youth following natural disasters and accidents (Jones-Alexander, Blanchard, & Hickling, 2005; Kolaitis et al., 2003; Laor, Wolmer, Kora, Yucel, Spirman, & Yazgan, 2002; McDermott, Lee, Judd, & Gibbon, 2005;

Pynoos, Goenjian, Tashjian, et al., 1993; Yule, Bolton, Udwin, Boyle, O’Ryan, & Nurrish, 2000).

Table 2.2

Child-adolescent PTSD Rates Following Criminal Victimization Traumas

Study	Measure(s)	Gender	Age	Elapsed Time	PTSD Prevalence
<i>School Shootings</i>					
Pynoos et al. (1987)	<i>CPTSD-RI</i>	80 males	Age Range:	1 month	60.40%
		79 females	5-13 years	14 months	29.00%
Schwarz & Kowalski (1991)	<i>Reaction Index</i>	32 males 32 females	Mean Age: 8.6 years	8-14 months	27.00%
Vila, Porche, & Mouren-Simeoni (1999)	<i>Kiddie-SADS-L</i>	14 males 12 females	Age Range: 6-9.5 years	1 month	11.50%
				2 months	15.40%
				4 months	3.80%
				7 months	7.70%
				18 months	3.80%
<i>Various Traumas</i>					
Fitzpatrick & Boldizar (1993)	<i>Perdue Posttraumatic Stress Scale</i>	102 males 119 females	Mean Age: 11.9 years	Not Reported	27.00%
Berman, Kurtines, Silverman, & Serafini (1996)	<i>PTSD-RI</i>	<i>N</i> = 96	Age Range: 14-18 years	Not Reported	34.50%

Table 2.2 (continued)

Study	Measure(s)	Gender	Age	Elapsed Time	PTSD Prevalence
Berton & Stabb (1996)	<i>CM-PTSD</i> <i>Keane PTSD Scale</i>	21 male 78 females	Mean Age: 17 years	Not Reported	29.00%
Jaycox et al. (2002)	<i>Child PTSD Symptom Scale</i>	1,004 recent immigrant youth	Age Range: 8-15 years	Not Reported	29.40%
Foster, Kuperminc, & Price (2004)	<i>TSCC</i>	84 males 62 females	Mean Age: 13.16 years	Not Reported	Males: 11.50% Females: 11.80%
Horowitz, McKay, & Marshall (2005)	<i>UPID</i>	23 urban youth	Age Range: 8-17 years	Not Reported	50.00%
Seedat, Nyami, Njenga, Vythilingum, & Stein (2004)	<i>K-SADS-PL</i>	872 males 1169 females	Mean Age: 15.8 years	Not Reported	Lifetime: 14.80%
Steiner et al. (1997)	<i>DSM-III-R PDI-R</i>	85 incarcerated males	Age Range: 13-20 years	Not Reported	31.70%
Lipschitz et al. (2000)	<i>DSM-IV Child PTSD Checklist</i>	90 females	Age Range: 12-21 years	Not Reported	Stress-Exposed: 14.40% Overall Sample: 13.00%

Table 2.2 (continued)

Study	Measure(s)	Gender	Age	Elapsed Time	PTSD Prevalence
<i>Physical and Sexual Assault</i>					
McLeer, Deblinger, Atkins, Foa, & Ralphe (1988)	<i>DSM-III-R structured interview</i>	6 males 25 females	Mean Age: 8.4 years	Not Reported	48.40%
Merry & Andrews (1994)	<i>DISC-2</i>	11 males 55 females	Mean Age: 8 years	12 months	63.50%
Wolfe, Sas, & Wekerle (1994)	<i>DSM-III-R checklist</i>	21 males 69 females	Mean Age: 12.4 years	Not Reported	48.90%
Cauffman et al. (1998)	<i>DSM-III-R PDI-R</i>	96 incarcerated females	Age Range: 13-22 years	Not Reported	48.90% Point Prevalence 65.30% Lifetime Prevalence
Ackerman, Newton, McPherson, Jones, & Dykman (1998)	<i>DICA-R</i>	73 males 131 females	Age Range: 7-13 years	At Least 4 Weeks	Overall Sample: 34.00% Sexual Abuse Alone: 31.80% Physical Abuse Alone: 25.40% Both: 51.90%

Table 2.2 (continued)

Study	Measure(s)	Gender	Age	Elapsed Time	PTSD Prevalence
Silva, Alpert, Munoz, Singh, Matzner, & Dummit (2000)	<i>Kid-SCID</i>	39 males 20 females	Mean Age: 9.9 years	Not Reported	Sexual Abuse: 15.00% Physical Abuse: 21.00% Witnessed Domestic Violence: 17.00%
Linning & Kearney (2004)	<i>C-PTSDI</i>	22 males 33 females	Mean Age: 12.7 years	2 years	67.30%
D'Augelli, Grossman, Starks (2006)	<i>DISC</i>	275 males 253 females	Mean Age: 17.05 years	Not Reported	Stress Exposed: 9.00%
Broman-Fulks, Roggerio, Hanson, Smith, Resnick, Kilpatrick, & Saunders (2007)	<i>National Women's Study PTSD Module</i>	70 males 251 females	Mean Age: 15.2 years	Not Reported	Non-Disclosers: 24.00% Short-Delay Disclosers: 22.00% Long-Delay Disclosers: 13.00%

Earthquakes. With reference to natural disasters, Pynoos et al. (1993) examined 231 children aged 8 to 16 years from three cities that were affected by the December 7, 1988 Armenian earthquake one and a half years after the disaster. This earthquake struck over 40% of the territory of Armenia, in the former USSR. The first tremor registered 6.9 on the Richter scale, and the second tremor had a magnitude of 5.8 (Pynoos et al., 1993). The earthquake impacted each of the three cities in the study to varying degrees. Specifically, Spitak, the city closest to the epicenter of the earthquake, experienced significant structural damage and loss of life. Gumri, located 20 miles from the epicenter, was relatively less damaged, and Yerevan, located 47 miles from the epicenter, was the least affected. The authors obtained demographic information, including loss of family members and destruction of the home due to the earthquake. Results of the *Child Posttraumatic Stress Disorder Reaction Index (CPTSD-RI)* (Pynoos et al., 1987) indicated that 70.3% of the entire sample met DSM-III-R (APA, 1987a) criteria for PTSD. The authors also reported a significant relationship between proximity of the city to the epicenter and prevalence of DSM-III-R (APA, 1987a) PTSD diagnoses, whereby Spitak (91.4%) and Gumri (90.9%) had significantly higher rates of PTSD as compared to Yerevan (37.2%).

In a follow-up study two-and-a-half years after the 1988 Armenian earthquake, Najarian, Goenjian, Pelcovitz, Mandel, and Najarian (1996) assessed lifetime rates of PTSD in Spitak, Gumri, and Yerevan. Administrations of the PTSD module of the *DICA-R* to 74 trauma-exposed children aged 11 to 13 years indicated that PTSD was most prevalent in youth who continuously resided in the city of Gumri (33%). Najarian and colleagues (1996) reported that DSM-III-R (APA, 1987a) PTSD rates were 28% among those who had relocated to the less damaged city of Yerevan and 4% among those who permanently resided in Yerevan.

Similarly, Hsu, Chong, Yang, and Yen (2002) examined adolescent PTSD prevalence rates six weeks after a 1999 earthquake in Taiwan. The earthquake reportedly

resulted in 2,415 deaths, 11,205 injuries, and destroyed more than 100,000 homes (Hsu et al., 2002). The authors administered the *Symptom Checklist 90-Revised (SCL-90-R)* (Derogatis, Lipman, & Covi, 1979) and the DSM-IV (APA, 1994) version of the *Children's Interview for Psychiatric Syndromes (ChIPS)* (Rooney et al., 1999) to 323 students (121 males, 182 females) aged 12 to 14 years who lived near the epicenter of the earthquake. Results indicated a PTSD prevalence rate of 21.7%.

In a related study, Laor and colleagues (2002) examined two groups of traumatized youth following the August 17 and November 12, 1999 earthquakes in East Marmara, Turkey. Participants were assigned to a high, medium, or low impact group based on the distance of their homes from the earthquake's epicenter. The high-exposure cohort consisted of 202 children who were displaced to a prefabricated village after the earthquake destroyed their homes. The low-exposure cohort consisted of 101 children who resided in a city located approximately 300 miles from the earthquake's center. Based on administrations of the *Child PTSD Reaction Index (CPTSD-RI)* (Pynoos et al., 1993), 20.8% of the 303 children reported severe to very severe DSM-III-R (APA, 1987a) PTSD symptoms.

Similarly, Kolaitis and colleagues (2003) examined 115 elementary school students living near the epicenter of the 1999 earthquake that occurred in the northwest suburbs of Athens, Greece. Forty-eight children not affected by the earthquake were used as controls. Endorsements on the DSM-III-R (APA, 1987a) based *Children's PTSD Reaction Index (CPTSD-RI)* (Pynoos et al., 1987) administered six months after the disaster indicated that, overall, there was a high rate (78%) of PTSD symptoms among the earthquake-exposed group. Children alone at the time of the earthquake and children who sustained injuries were most likely to be affected. Three to four months after the disaster, Roussos and colleagues (2005) reported that 4.5% of the 1,937 students aged 9 to 18 years who were evaluated met DSM-IV (APA, 1994) criteria for PTSD as measured by the *UCLA PTSD Reaction Index* (Pynoos et al., 1987).

In a similar vein, Yorbik, Akbiyik, Kirmizigul, and Sohmen (2004) examined PTSD rates among children and adolescents following the 1999 earthquakes in Turkey. At least 30 days after the second earthquake, Yorbik et al. (2004) examined 35 youth aged 2 to 16 years who were seeking help at a university clinic for symptoms such as fear of the dark and insomnia. Information regarding earthquake experience was gathered via child interviews and parental assistance. Each child also received an administration of an author-developed PTSD symptom checklist that reflected the DSM-IV (APA, 1994) criteria for PTSD. Data collection and analysis revealed a PTSD point prevalence of 40%.

In a more recent study, Ziaaddini, Nakhaee, and Behzadi (2009) examined 466 adolescents ($M = 15.9$ years) living in Bam, Iran ten months after a December 2003 earthquake struck the city. The earthquake measured at 6.3 on the Richter scale, injured 30,000 people, and killed 26,000 people. Endorsements on a structured PTSD questionnaire and the *Davidson Trauma Scale* (Davidson, Tharwani, & Connor, 2002) indicated that 66.7% of the sample met criteria for PTSD.

Hurricanes and Floods. In 1998, Hurricane Mitch, a category 5 storm, destroyed many homes and lives with heavy rains in Honduras, Guatemala, and Nicaragua. It resulted in over 11,000 deaths and 11,000 people missing, and was ranked as the second deadliest Atlantic hurricane in history (Hellin, Haigh, & Marks, 1999). In addition, the flooding resulted in 2.7 million people being left homeless and \$5 billion in damage (Williamson, Hertzfeld, Cordes, & Logsdon, 2002). Six months after the hurricane, Goenjian et al. (2001) studied 158 Nicaraguan adolescents from three different cities, each of which was affected to varying degrees. Consistent with their previous study, the authors assessed PTSD via the DSM-III-R (APA, 1987a) version of the *CPTSD-RI* (Pynoos et al., 1987). Results were consistent with the 1995 study in that there were differences in point prevalence rates for the most affected (90%), second most affected (55%), and least affected cities (14%).

Also with regard to natural disasters, Bokszczanin (2007) examined 553 children and adolescents between 11 and 21 years of age 28 months after a flood in southwestern Poland. Each participant completed a translated DSM-IV (APA, 1994) version of the *Revised Civilian Mississippi PTSD Scale* (Norris & Perilla, 1996) and an author-devised checklist assessing trauma experience. Bokszczanin (2007) reported that 17.7% of the students had scores evident of probable PTSD.

Motor Vehicle Accidents. In addition to natural disasters, many authors also assessed child-adolescent PTSD prevalence rates following motor vehicle accidents. Estimates predict that approximately 5% of youth are involved in a motor vehicle accident (MVA) in their lifetime, which can often lead to physical injury and the development of PTSD. Among the studies assessing child-adolescent PTSD prevalence rates following motor vehicle accidents, DiGallo, Barton, and Parry-Jones (1997) assessed 49 youth aged 5 through 18 years who were admitted to hospitals following motor vehicle accidents. Assessments were completed 12 to 15 weeks after the reported incidents through administrations of the DSM-III-R (APA, 1987a) version of the *CPTSD-RI* (Pynoos et al., 1987). The authors reported that 49% of the participants had scores that reflected full PTSD criteria.

Other researchers have reported more modest rates of PTSD following MVAs. Specifically, Keppel-Benson and colleagues (2002) analyzed children's experiences approximately nine months after a motor vehicle accident. Children ($n = 50$) and their parents ($n = 50$) completed interviews about their accidents, the DSM-IV (APA, 1994) based *Diagnostic Interview for Children and Adolescents-Revised-Child Version (DICA-R-C)* (Reich, Welner, & Herjanic, 1997), and post-traumatic stress questionnaires. Of the 50 children, 7 children (14%) met criteria for PTSD diagnosis, and an additional 5 children (10%) met criteria for specific phobia related to the automobile accident on the structured diagnostic interview. Degree of physical injury predicted more PTSD symptoms, and previous accident experiences predicted fewer symptoms, before and after

controlling for other variables. Holding degree of physical injury and age constant revealed that social support predicted fewer PTSD symptoms. Overall, these findings suggest the possible inoculating role of previous accidents and the importance of social support following MVA injury.

Modest rates of PTSD were also indicated in Zinc and McCain's (2003) examination of 143 youth injured in serious MVAs via administrations of the PTSD module of the *DICA* (Reich et al., 1992). Zinc and McCain (2003) reported DSM-III (APA, 1980) PTSD point prevalence rates of 18% and 10% at two and six months post-accident, respectively. Similarly, Meiser-Stedman, Yule, Smith, Glucksman, and Dalgeish (2005) examined 106 children aged 10 to 16 years who were admitted to a hospital emergency room following motor vehicle accidents. All of the participants were interviewed within four weeks of their accidents for Acute Stress Disorder and six months later for PTSD via administrations of the DSM-IV (APA, 1994) based child version of the *Anxiety Disorders Interview Schedule (ADIS)* (Silverman & Albano, 1996). The authors reported that 19.4% of the children met criteria for an Acute Stress Disorder diagnosis at time one and 12.5% met criteria for PTSD at time two.

With further reference to motor vehicle accidents, Landolt, Vollrath, Timm, Gnem, and Sennhauser (2005) examined 68 crash victims (37 males and 31 females) aged 6.5 to 14.5 years. The children were assessed using the DSM-III-R (APA, 1987a) version of the *CPTSD-RI* (Pynoos et al., 1987) four to six weeks following their accidents and then again at 12 months later. PTSD point prevalence estimates of 16.2% and 17.6% were reported for the initial assessment and at follow-up, respectively.

In a case-control study, Jones-Alexander, Blanchard, and Hickling (2005) compared 21 youth who had experienced a recent MVA to 14 controls that had never been in a MVA. According to endorsements on the *Children's PTSD Inventory* (Saigh, 1995) and the *DICA-R*, 23% ($n = 8$) of the total sample met DSM-IV (APA, 1994) criteria for PTSD. In a similar vein, Schäfer, Barkmann, Riedesser, and Schulte-Markwort (2006)

administered the DSM-IV (APA, 1994) based *Diagnostic Interview bie Psychischen Störungen (DIPS)* (Unnewehr, Schneider, & Margraf, 1995) to 72 German children aged 8 to 18 years who were involved in motor vehicle accidents. Assessments were completed both at one week and three months after the accidents. Following the first interview, 11% of the children met PTSD criteria except for Criterion E, which states the symptoms must be present for at least one month. The authors reported that 0% of the children met full criteria for PTSD at three months.

Transportation Accidents. Yule et al. (2000) examined emotional responses of teenage survivors of the 1988 Jupiter cruise ship sinking in Greece using the *Clinician-Administered PTSD Scale (CAPS)* (Nader et al., 1996). In this incident, two people died, 72 were injured, and 14 were missing when the 7,000 ton cruise liner Jupiter carrying 475 British students and teachers and 120 crew members sank after colliding with a freighter. Results indicated that 90% of youth met criteria for a diagnosis of PTSD six months after the disaster. Additionally, follow-up assessments revealed that 51.7% of the 217 participants assessed in the study presented with PTSD at some point during the period of 5 to 8 years after the incident.

Similarly, Mirzamani, Mohammadi, and Besharat (2006) used the DSM-III-R (APA, 1987a) based *Posttraumatic Stress Disorder Symptoms Scale (PSS)* (Foa et al., 1993) to assess PTSD prevalence in 19 child survivors of a May 4, 2002 boat sinking in Tehran City, Iran. Mirzamani and colleagues (2006) reported that 84.2% of the children evidenced PTSD 18 months after the accident. A comparable PTSD base rate of 89.5% was observed when investigators used a DSM-IV (APA, 1994) based psychiatric interview to derive the diagnosis.

Among the natural disasters and accidents studies that were reviewed above, PTSD prevalence rates ranged from 0% to 95%. Ultimately, these findings illustrate that a significant number of children involved in disasters and serious accidents may be severely psychologically affected by their trauma. Table 2.3 presents a summary of research

regarding the prevalence of PTSD following natural disasters and accident-related traumas.

Comorbidity of PTSD with Other Psychiatric Disorders

Numerous clinical and community studies have established that PTSD is associated with high rates of concurrent psychiatric disorders (Faustman & White, 1989; Kulka et al., 1990). Specifically, data from epidemiologic surveys indicate that the vast majority of individuals with PTSD meet criteria for at least one other psychiatric disorder, and a substantial percentage have three or more other psychiatric diagnoses (Brady, Killeen, Brewerton, & Lucerini, 2000). Comorbidity refers to the “co-occurrence of two or more psychiatric conditions in the same individual” (Saigh, Yasik, Sack, & Koplewicz, 1999, p. 31). Comorbidity impacts the conceptualization, assessment, and course of treatment of afflicted populations (Fairbank, Schlenger, Saigh, & Davidson, 1995).

A number of studies and surveys have examined the prevalence rates of depression, anxiety, and substance abuse in adult patients with PTSD (e.g., Amir, Kaplan, & Kotler, 1996; Jamil, Nassar-McMillan, & Lambert, 2004; Kessler et al., 1995). For example, in the National Comorbidity Survey, a lifetime history of at least one other psychiatric disorder was found in 88.3% of all men with lifetime PTSD (Kessler et al., 1995). The same was found to be true for 79% of women. This survey also concluded that 47.9% of men with a lifetime history of PTSD reported suffering from a major depressive episode as compared to only 11.7% of men without a history of PTSD. Men with a history of PTSD also reported higher historical levels of anxiety disorders as compared to men without a history of PTSD (e.g., GAD: 16.8% versus 3.3% and Panic Disorder: 7.3% versus 1.9%). Similar findings were reported for women, as 48.5% of women with a history of PTSD reported a history of a major depressive episode, whereas only 18.8% of women without PTSD did so. Women with a history of PTSD indicated higher historical

levels of anxiety disorders as compared to women without a history of PTSD (e.g., GAD:
15% versus

Table 2.3

Child-adolescent PTSD Rates Following Natural Disasters or Accidents

Study	Measure(s)	Gender	Age	Elapsed Time	PTSD Prevalence
<i>Earthquakes</i>					
Pynoos et al. (1993)	<i>DSM-III-R Clinical Interview</i>	Not Reported (N = 111)	Mean Age: 12.8 years	1.5 years	70.30%
Najarian et al. (1996)	<i>DICA-R</i>	37 males 37 females	Age Range: 11-13 years	2.5 years	High Exposure: 33.00% Relocated: 28.00% Low Exposure: 4.00%
Hsu et al. (2002)	<i>SCL-90-R ChIPS</i>	121 males 182 females	Mean Age: 13.3 years	6 weeks	21.70%
Laor et al. (2002)	<i>DSM-III-R Reaction Index</i>	135 males 168 females	Mean Age: 8.5 years	4-5 months	20.80%
Kolaitis et al. (2003)	<i>CPTSD-RI</i>	Not Reported (N = 115)	Grades 4, 5 and 6	6 months	78.00%
Roussos et al. (2005)	<i>UCLA PTSD-RI</i>	Not Reported (N = 1,937)	Age Range: 9-18 years	3-4 months	4.50%

Table 2.3 (continued)

Study	Measure(s)	Gender	Age	Elapsed Time	PTSD Prevalence
Yorbik, Akbiyik, Kirmizigul, & Sohmen (2004)	<i>DSM-IV Checklist</i>	17 males 18 females	Mean Age: 9.2 years	>30 days	Overall Sample: 40.00% Aged 2-6 Years: 0.00% Aged 7-11 years: 56.30% Aged 12-16 years: 50.00%
Bokszczanin (2007)	<i>Revised Civilian PTSD Scale</i>	213 males 320 females	Age Range: 11-21 years	28 months	17.70%
Ziaaddini, Nakhaee, and Behzadi (2009)	<i>Structured PTSD Questionnaire Davidson Trauma Scale</i>	466 high school students	Mean Age: 15.9 years	10 months	66.70%
<i>Hurricanes and Floods</i>					
Goenjian et al. (2001)	<i>CPTSD-RI</i>	81 males 77 females	Mean Age: 13 years	6 months	High-Impact: 90.00% Medium-Impact: 55.00% Low-Impact: 14.00%
Motor Vehicle Accidents DiGallo, Barton, & Parry-Jones (1997)	<i>CPTSD-RI</i>	38 males 19 females	Mean Age: 10.2 years	12-15 weeks	49.00%

Table 2.3 (continued)

Study	Measure(s)	Gender	Age	Elapsed Time	PTSD Prevalence
Zink & McCain (2003)	<i>DICA-R</i>	143 youth	Not Reported	2 and 6 months	2 months: 18.00% 6 months: 10.00%
Meiser-Stedman et al. (2005)	<i>ADIS</i>	60 males 33 females	Mean Age: 13.9 years	6 months	12.50%
Landolt et al. (2005)	<i>CPTSD-RI</i>	37 males 31 females	Age Range: 6.5-14.5 years	4-6 weeks 12 months	4-6 weeks: 16.20% 12 months: 17.60%
Jones-Alexander, Blanchard, & Hickling (2005)	<i>CPTSD-RI</i> <i>DICA-R</i>	11 males 10 females	Mean Age: 12.7 years	1 month	23.00%
Schäfer et al. (2006)	<i>DIPS</i>	42 males 30 females	Mean Age: 13.6 years	1 week 3 months	1 week: 0.00% 3 months: 0.00%
<i>Transportation Accidents</i>					
Yule et al. (2000)	<i>CAPS</i>	Not Reported	Not Reported	6 months 5-8 years	6 months: 90.00% 5-8 years: 51.70%
Mirzanani, Mohammadi, & Besharat (2006)	<i>PSS</i>	Not Reported	Not Reported	18 months	84.20%

5.9% and Panic Disorder: 12.6% versus 4.3%). Rates of substance abuse for men and women with a history of PTSD were also reported to be significantly higher than for those without a history of PTSD (e.g., Alcohol abuse/dependence in Men: 51.9% versus 34.4% and Alcohol abuse/dependence in Women: 27.9% versus 13.5%). Thus, it is evident that, in adults, PTSD often appears comorbid with other psychiatric disorders, such as major depression, anxiety disorders, and substance abuse disorders.

Considerably fewer studies have examined the prevalence rates of comorbid disorders in children and adolescents with PTSD. In their comprehensive review, Saigh et al. (1999) determined that only 17.6% of the 51 studies examined assessed for comorbid disorders via structured clinical interviews. Still, some clinical studies have reported important information on this topic. For example, Goenjian and his colleagues (1995, 2001) administered the DSM-III-R (APA, 1987a) *CPTSD-RI* (Pynoos et al., 1987), and the *Depression Self-Rating Scale* (Asarnow & Carlson, 1985) to 218 and 158 children, respectively, following natural disasters. In both cases, they reported that increased rates of PTSD corresponded with increased rates of depression. For example, 75% of children closest to the center of the 1988 Armenian earthquake experienced comorbid depression relative to 61% of those living 20 miles away and 13% of those living 47 miles from the epicenter. Similarly, 79% of the children who were closest to the center of a hurricane indicated comorbid PTSD and depression relative to 38% who lived in a relatively less devastated area.

Much of the earlier research in the area of comorbid disorders has been focused on examining PTSD and concurrent psychiatric diagnoses in Cambodian youth survivors or refugees of war-related traumas. For example, Kinzie and colleagues (1986) administered the *Schedule for Affective Disorders and Schizophrenia (SADS)* (Endicott & Spitzer, 1978) to a sample of Cambodian adolescents who were severely traumatized in the Pol Pot concentration camps as children. These authors reported that 85% of their sample met diagnoses for both PTSD and unspecified depressive disorders and 35% had unspecified

anxiety disorders. Additionally, 15% of the youth in this study presented with comorbid PTSD and panic disorder. In a follow-up assessment conducted three years later, Kinzie et al. (1989) also utilized the *SADS* and found that in 27 of the 40 original Khmer adolescents, 7.7% of those with PTSD continued to have comorbid panic disorder. Comorbid affective disorders were reported to occur in 76.9% of youth with PTSD or 37% of the overall sample.

In a six-year follow-up study, Sack and colleagues (1993) administered the *K-SADS-E* (Puig-Antich, Orvaschel, Tabrizi, & Chambers, 1980) to the original group of Khmer refugees assessed by Kinzie and colleagues (1986) and reported that none of the participants with PTSD met criteria for conduct disorder, substance-related disorders, or major psychoses. However, 60% of the participants met criteria for major depression, and 15% met criteria for unspecified anxiety disorders. In a related study, Sack et al. (1994) administered the PTSD section of the *Diagnostic Instrument for Children and Adolescents* (Welner et al., 1987) and sections from the DSM-III-R (APA, 1987a) *Schedule for Affective Disorders and Schizophrenia for School-Age Children – Epidemiological Version (DSM-III-R K-SADS-E)* (Puig-Antich, Orvaschel, Tabrizi, & Chambers 1983) to 110 Cambodian adolescent refugees living in Salt Lake City. The youth, aged 13 to 25 years, had experienced multiple traumatic incidents under the Pol Pot regime. Sack and his colleagues compared youths with a diagnosis of PTSD to those who had been traumatized but did not develop the disorder. Results indicated a point prevalence of 10.5% among Cambodian youth with PTSD and panic disorder. Furthermore, adolescents with current PTSD were 4.3 times more likely to experience comorbid depression and 3.5 times more likely to present with an unspecified comorbid anxiety disorder. The study found, however, that current PTSD was not associated with comorbid conduct disorder, substance use, or adjustment disorders among adolescents.

In a similar study, Hubbard, Realmuto, Northwood, and Masten (1995) used the DSM-III-R (APA, 1987a) *SCID* (Spitzer & Williams, 1986) and the *Traumatic Life*

Events Questionnaire (TLEQ) (Kubany et al., 2000) to assess PTSD symptoms, trauma exposure, gender, and diagnostic comorbidity in a sample of 59 Cambodian young adults (29 male and 30 female) who survived massive trauma as children. A significant number of those with PTSD (59%) had one or more additional *DSM-III-R* (APA, 1987a) Axis I disorders. Major depression and generalized anxiety disorder were the most common comorbid disorders. Somatoform pain disorder was also found to coexist with PTSD but only among females. Women were also found to have higher levels of current and lifetime PTSD symptoms. Further, trauma symptoms were related to exposure and exposure was related to age, but age was not related to symptoms. The findings suggest that the significant levels of comorbid diagnoses previously found to exist with PTSD in people traumatized as adults can be found among survivors of massive childhood trauma. Also, the rate of PTSD diagnoses found in this sample 15 years after the trauma of Pol Pot is comparable to findings previously reported in studies of Cambodian youths and shows that the effects of trauma experienced in childhood persist into early adulthood.

In a similar vein, Perkonig and colleagues (2000) administered the *Munich Composite International Diagnostic Interview (M-CIDI)* (Wittchen & Pfister, 1997) to a group of adolescents and young adults and found that, in total, 87.5% of all individuals with PTSD had at least one additional diagnosis, and 77.5% had two or more additional diagnoses. Specifically, in most comorbid PTSD cases, depressive disorders (68.5%), agoraphobia with or without panic disorder, as well as substance abuse or dependence (70.6%) were occurring simultaneously or were secondary.

Furthermore, as PTSD frequently presents with the classical features of attention-deficit hyperactivity disorder (ADHD; e.g., hyperactivity, impulsivity, restlessness, irritability, and distractibility), several studies have examined the co-occurrence of PTSD and ADHD in groups of traumatized children in addition to other psychiatric disorders. McLeer, Callaghan, Henry, and Wallen (1994) compared 26 children aged 6 to 16 years who had experienced sexual abuse with 23 children who had not been abused. The

K-SADS-E (Puig-Antich, Orvaschel, Tabrizi, & Chambers 1983) was administered to all of the children. Of the children who had been sexually abused, 42.3% presented with PTSD. McLeer and her coauthors (1994) reported that 23.1% of these cases presented with comorbid PTSD and attention-deficit hyperactivity disorder (ADHD). Moreover, 15.4% presented with comorbid PTSD and conduct disorder. Notably, the rates of ADHD were significantly higher than those found in the non-sexually abused children. Analogously, Famularo et al. (1996) indicated that 37% of severely maltreated children who received DSM-III-R (APA, 1987a) PTSD diagnoses via endorsements on the *DICA-C-R* also received an ADHD diagnosis. Additional findings demonstrated that 24% of the PTSD cases in this study also presented with comorbid CD or ODD. These authors further reported a prevalence rate of 39% of PTSD and comorbid anxiety disorders, and 32% of unspecified comorbid mood disorders.

In a more recent study, Saigh, Yasik, Oberfield, Halamandaris, and McHugh (2002) examined 103 youth aged 7 to 18 years. Each child received an administration of the *CPTSDI* (Saigh, 1998) and the *DICA-R* (Reich et al., 1994), a broad based structural interview that reflects DSM-IV (APA, 1994) criteria for a number of disorders. Of the 103 traumatized cases that were seen, 39 (38%) met criteria for PTSD and 64 received a PTSD negative diagnosis. Among the PTSD group, 8 youth met *DICA-R* criteria for major depression, and 1 youth met criteria for substance dependence; these cases were excluded from the study. Among the traumatized PTSD negative group, 2 youth met criteria for major depression, 2 had conduct disorder, and 1 had ADHD; these cases were excluded.

In sum, consistent with research findings regarding adults with PTSD, children and adolescents with PTSD may also evidence high rates of comorbid disorders. The most common comorbid diagnoses are depressive disorders, substance use disorders, and other anxiety disorders. Based on the literature reviewed in this chapter, rates of comorbid anxiety and PTSD ranged from 7.7% to 18.4% (panic disorder), 35.1% to 41.6%

(separation anxiety disorder), and 15% to 39% (unspecified anxiety disorders). Table 2.4 presents an overview of the epidemiological data involving comorbidity.

Table 2.4

Prevalence of Comorbid Psychiatric Diagnoses with Child and Adolescent PTSD

Study	Diagnostic Measure	Prevalence of Comorbid Disorder with PTSD
<i>War-Related Traumas</i>		
Kinzie et al. (1986)	<i>SADS</i>	Panic Disorder: 15.00% Unspecified Depressive Disorders: 85.00% Unspecified Anxiety Disorders: 35.00%
Kinzie et al. (1989)	<i>SADS</i>	Panic Disorder: 7.70% Unspecified Affective Disorders: 37.00%
Sack et al. (1993)	<i>K-SADS-E</i>	Conduct Disorder: 0.00% Unspecified Anxiety Disorders: 15.00% Major Depressive Disorder: 60.00%
Sack et al. (1994)	<i>K-SADS-E</i>	Conduct Disorder: 10.50% Panic Disorder: 10.50%
Hubbard et al. (1995)	<i>SCID</i>	Major Depressive Disorder: 21.00% Generalized Anxiety Disorder: 21.00% Social Anxiety Disorder: 21.00%
<i>Various Traumas</i>		
Perkonigg et al. (2000)	<i>M-CIDI</i>	Depressive Disorders: 68.50% Agoraphobia With or Without Panic Disorder As Well As Substance Use or Dependence: 70.60%

Table 2.4 (continued)

Study	Diagnostic Measure	Prevalence of Comorbid Disorder with PTSD
Saigh, Yasik, Oberfield, Halamandaris, & McHugh (2002)	<i>CPTSDI</i>	Internalizing Behavior Problems:
Physical/Sexual Assault		
McLeer et al. (1994)	<i>KSADS-E</i>	ADHD: 23.10% Panic Disorder: 18.40% ADHD and Conduct Disorder: 11.50%
Famularo et al. (1996)	<i>DICA-C-R</i>	Unspecified Anxiety Disorders: 39.00% ADHD: 37.00% Unspecified Mood Disorders: 32.00% ODD and Conduct Disorder: 24.00%

Risk Factors for PTSD

Numerous studies reviewed in this chapter additionally discussed risk factors for the development of child-adolescent PTSD. These risk factors include: (a) gender; (b) age; (c) race/ethnicity; (d) parental psychopathology; (e) child characteristics; (f) pre- and post-exposure to traumatic stress; (g) intensity of exposure to traumatic stress; (h) duration and frequency of exposure; (i) time between exposure and diagnostic evaluation; (j) type and mode of stressor; (k) relationship between victims and perpetrators; and (l) resettlement stress or relocation.

Gender. Results regarding the role of gender as a risk factor for PTSD in epidemiological studies have been inconsistent. Some studies have indicated a greater rate of PTSD in trauma-exposed females than in males. For example, Fitzpatrick and Boldizar (1993) reported that criminally victimized females reported more PTSD

symptoms with greater severity than males. Analogously, Perkonig et al. (2000) found the risk of experiencing traumatic events as well as PTSD to be significantly associated with being female. With reference to war-related traumas, Schaal and Elbert (2006) reported that females exposed to the horrors of the Rwandan genocide developed PTSD at greater rates than males (60% versus 27%, respectively), and Pat-Horenczyk et al. (2007) indicated that females were significantly more likely to present with probable PTSD than males (9.5% versus 5.4%, respectively) following the consistent threat of missile attacks. D'Augelli and colleagues (2006) reported that more female (15%) than male (4%) victims of sexual orientation victimization developed PTSD. Research by Ziaaddini et al. (2009) indicated that girls were up to three times more likely to suffer from PTSD than boys following a 2003 earthquake in Iran.

Conversely, Khamis (2005) reported that Palestinian male students who were exposed to consistent violence had a higher prevalence of PTSD (20%) relative to similarly exposed females (14.1%). Finally, it must be noted that many studies reported no significant gender differences with regard to the prevalence of child-adolescent PTSD (e.g., Ackerman et al., 1998; Ahmad et al., 2000; Broman-Fulks et al., 2007; Elbedour et al., 2007; Foster et al., 2004; Goenjian et al., 1995; Hubbard et al., 1995; Realmuto et al., 1992; Saigh, 1988; Saigh et al., 1995, 1997; Schwarzwald et al., 1994; Seedat et al., 2004; Silva et al., 2000; Yorbik et al., 2004).

Although it is not obvious that gender is a risk factor for PTSD, it is likely that gender plays some role in the development and expression of PTSD (Rojas & Pappagallo, 2004). Specifically, Shannon and colleagues (1994) found that females exposed to Hurricane Hugo had significantly more internalizing symptoms (related to emotional processing and reactions to the trauma) while boys tended to show more externalizing symptoms.

Age. The literature reviewed in this chapter revealed inconsistent findings relative to age as a risk factor for PTSD. Some research has implied that older children and

adolescents had higher prevalence rates of PTSD (Garrison et al., 1995; Schwartz & Kowalski, 1991), while others indicated that younger children are more susceptible to the development of the disorder (Bokszczanin, 2007; Schwarzwald et al., 1993). Research by Wolfe et al. (1994) indicated that sexually abused children above the age of 12 had a significantly higher prevalence of PTSD (56.5%) as compared to sexually abused children aged 12 and younger (32.1%). Consistent with this, Ahmad et al. (2000) reported that Kurdish children who developed PTSD after experiencing military occupation and violence had a higher mean age than those who did not develop PTSD. Following an earthquake in Turkey, Yorbik and colleagues (2004) reported that no children aged 6 and younger developed PTSD, whereas 56.3% of youth aged 7 to 11 years and 50% of youth aged 12 to 16 years developed the disorder.

On the other hand, Schwarzwald et al. (1993) indicated that fifth graders who experienced a Scud missile attack were more likely than seventh and tenth graders to develop PTSD (25.4%, 3.4%, and 1.6%, respectively). These results were maintained at a one-year follow-up when the children were in the sixth, eighth, and eleventh grades (Schwarzwald et al., 1993). Further, Bokszczanin (2007) noted that older boys were less likely to develop PTSD following a flood than younger boys. The authors suggested that because many of the older boys were involved in post-flood recovery, they might have experienced greater feelings of self-control than those who were not involved in recovery efforts. Finally, many studies reported no age differences relative to PTSD prevalence (Landolt et al., 2005; Lavi & Solomon, 2005; Schaal & Elbert, 2006).

Race/Ethnicity. Overall, research regarding the relationship between race/ethnicity and PTSD in children and adolescents has provided conflicting data. For example, whereas LaGreca et al. (1996) reported that Hispanic and African American youths had significantly higher levels of PTSD than Caucasian children following exposure to Hurricane Hugo, Garrison and colleagues (1993) and Shannon and colleagues (1998) demonstrated nonsignificant differences between these races. Further, March et al. (1997)

determined that African American children exposed to an industrial explosion had a higher prevalence of PTSD relative to Caucasian youth. Jones and colleagues (2002) found that being Mexican American predicted PTSD in youth following severe California wildfires. In addition, Galea and colleagues (2003) reported that Hispanics of Dominican or Puerto Rican origin (14.3% and 13.2%, respectively) were more likely than other Hispanics (6.1%) and non-Hispanics (5.2%) to report symptoms consistent with probable PTSD after the September 11, 2001 terrorist attacks.

Numerous studies have evidenced nonsignificant associations between ethnicity/race and the development of PTSD in youngsters. Crime-related PTSD studies failed to report race and ethnicity as significant predictors of PTSD (Abram, Teplin, Charles, Longworth, McClelland, & Dulcan, 2004; Famularo et al., 1996; Lawyer et al., 2006; Linning & Kearney, 2004; Lipschitz et al., 1999). Further, investigations assessing PTSD following natural disasters reported nonsignificant differences when race was examined as a factor (Garrison et al., 1993; Langley & Jones, 2005; Shannon et al., 1994; Shaw et al., 1995). Moreover, Zink and McCain (2003) as well as DeVries et al. (1999) observed that race and ethnicity were unrelated to the prevalence of PTSD in youth who underwent motor vehicle accidents. It appears as though the influence of race/ethnicity on the risk of PTSD is complex and difficult to study due to differing definitions of race, ethnicity, and culture across sources (Rojas & Pappagallo, 2004).

Parental Psychopathology. There is literature suggesting that the prevalence of PTSD among stress-exposed youth is related to parental psychopathology. For example, Sack et al. (1993) reported that Cambodian children who had parents with PTSD had significantly higher PTSD prevalence rates (22.3%) relative to children whose parents did not have the disorder (12.9%). The point prevalence of the disorder increased to 41.2% when both parents had PTSD. Ahmad et al. (2000) also reported a significant positive correlation between child and caregiver PTSD symptoms. Similarly, a study of individuals exposed to California wildfires by Jones et al. (2002) indicated that the

number of PTSD symptoms reported by parents was significantly associated with the prevalence of PTSD among the children. Linning and Kearney (2004) reported that parental psychopathology (e.g., drug and alcohol abuse) was significantly associated with PTSD prevalence rates among maltreated child victims. Finally, Khamis (2005) stated that children who reported high levels of anxiety in their homes following consistent exposure to war-related traumas were more likely to also exhibit PTSD symptoms.

Child Characteristics. Breslau, Lucia, and Alvarado (2006) indicated that child intelligence quotients (IQ) at the age of 6 were significantly related to PTSD development following a traumatic stressor later in life. Specifically, children with an IQ that was at least one standard deviation above the mean (e.g., IQ = 115 points) had a decreased risk for developing PTSD relative to children with an IQ below the mean (e.g., IQ \leq 100 points). Breslau et al. also reported that children who received teacher ratings that indicated heightened externalizing behavior problems in the first grade had an increased risk for developing PTSD if they were to be exposed to a traumatic event. In a similar vein, Saigh and colleagues (2006) compared the *Wechsler Intelligence Scale for Children-III (WISC-III)* (Wechsler, 1991) scores of traumatized youth with posttraumatic stress disorder (PTSD) to the scores of trauma-exposed and non-exposed comparison groups without PTSD. All groups were free of additional major childhood psychiatric disorders. The PTSD group scored significantly lower than the comparison groups on verbal subtests, but not on performance subtests. The scores of the trauma-exposed PTSD negatives and non-exposed controls were not significantly different. While this study clearly denotes that lower verbal IQ was associated with child PTSD, the authors cautioned that a cross-sectional design was employed and that estimates of pre-trauma intelligence were not available.

Pre- and Post-exposure to Traumatic Stress. Some research found that prior trauma, especially where PTSD developed, and the experience of post-trauma stressors increase an individual's susceptibility to repeated occurrences of PTSD. For example,

Garrison et al. (1993) assessed children who survived Hurricane Andrew and reported that having a pre-hurricane history of exposure to extreme stress (e.g., abuse or assault) was predictive of PTSD. Lipschitz et al. (2000) determined that an earlier history of child abuse and physical neglect was associated with significantly more PTSD among adolescent girls who had been exposed to various forms of community violence. In terms of post-trauma experiences, Saigh (1988) reported a strong association between secondary exposures to traumatic war-related events and PTSD. Sack et al. (1993) determined that Cambodian participants experienced significantly more resettlement stress than counterparts who did not develop the disorder. In contrast, Jones et al. (2002) indicated that neither pre- nor post-wildfire stress exposure was predictive of PTSD.

Intensity of Exposure to Traumatic Event. Research has indicated that the intensity of stress exposure is associated with PTSD prevalence rates. For example, Schwarzwald et al. (1994) reported that Israeli youth residing in areas hit by Scud missiles exhibited higher rates of PTSD (24.9%) relative to youth residing in areas that avoided bombardment (12.9%). Likewise, Goenjian et al. (1995, 2001) reported that children living in close physical proximity to the epicenter of an earthquake or eye of a hurricane, respectively, experienced higher rates of PTSD as compared to children residing farther away. Consistent findings were also reported by Pynoos et al. (1987) with regard to a school shooting. Children who were on the playground as shots were fired presented with a higher incidence of probable PTSD (94.3%) than children who were in the school building (88.9%), at home (44.2%), or on vacation (45.1%). Likewise, Pat-Horenczyk et al. (2007) reported that Israeli students who were directly exposed to a war-related terrorist attack had a prevalence rate of 13.6%, whereas those who experienced a near-miss had a lower rate of 7.7%. Hsu et al. (2002) stated that the incidence of PTSD was significantly higher among students who incurred physical injury (43.2%) following an earthquake relative to those who did not (12.9%). PTSD rates were also reported to be significantly higher for participants who lost family members living in their homes

(58.3%) relative to those who lost family members residing elsewhere (20.3%). Kolaitis and colleagues (2003) and Roussos and colleagues (2005) similarly reported that being injured and experiencing home damage were significant predictors of PTSD in youth following the 1999 earthquake near Athens, Greece. Finally, Schaal and Elbert (2006) reported that 61% of Rwandan children who witnessed a parent die from genocide developed PTSD as compared to 33% of the children who did not see their parents die.

Conversely, Koplewicz et al. (1994) reported that the level of stress exposure was not predictive of PTSD, as prevalence rates among youth who experience high and low life threat during the World Trade Center bombing were comparable (66% and 69%, respectively). Shaw et al. (1995) also indicated that there was no significant difference between the prevalence estimates of youth in high and low exposure areas to Hurricane Andrew. Also contrary to expectations, Saigh and his colleagues (2002) indicated that stressor severity did not predict PTSD prevalence, and Landolt et al. (2005) and DeVries et al. (1999) reported that physical injury status also did not predict PTSD. Likewise, Saigh et al. (2004) reported that preschool youth aged 3-5 years who were within 1 mile of the World Trade Center and exposed to one or more traumatic events did not have PTSD and did not significantly differ from preschool youth who were 2 to 14 miles away and not exposed to traumatic events with regard to probable PTSD diagnosis. Moreover, endorsements from the trauma-exposed group on the *Posttraumatic Stress Disorder Checklist (PCL)* (Weathers, Litz, Herman, Huska, & Keane, 1993), *Beck Depression Inventory-II (BDI-II)* (Beck, Steer, & Brown, 1996), and *Beck Anxiety Inventory (BAI)* (Beck, 1990) did not significantly differ from those made by children who were not exposed to traumatic events.

Duration and Frequency of Exposure. Research is inconsistent regarding the association between duration and frequency of exposure and PTSD incidence rates. Wolfe et al. (1994) reported that sexually abused children who were maltreated for more than one year had higher prevalence rates of PTSD relative to children who experienced

similar abuse for less than one year. In a similar vein, Berton and Stabb (1996) indicated that self-reports of ongoing exposure to domestic or community violence are directly related to prevalence rates of PTSD. Analogously, Ackerman and colleagues (1998) reported that children who reported having experienced both sexual and physical abuse had a higher incidence of PTSD (54.9%) than either sexual abuse (31.8%) or physical abuse (22.4%) alone. With regard to a sample of sexually abused youth, Ruggiero and colleagues (2000) reported that increased frequency and duration of sexual abuse significantly predicted PTSD. With reference to children and war traumas, Ahmad et al. (2000) reported that duration of captivity was positively correlated with PTSD. Further, Seedat et al. (2004) and Schaal and Elbert (2006) reported that children exposed to three or more war-related traumas were at greater risk for developing PTSD than children exposed to a single traumatic event. Conversely, Bayer et al. (2007) reported that PTSD was not predicted by the duration of time spent as child soldiers during the African civil wars.

Time Between Exposure and Diagnostic Evaluation. There was inconsistency across studies reviewed with regard to the time duration between trauma exposure and psychological assessment of youth. Pynoos et al. (1987) reported that while 60.4% of youth presented with PTSD at one month following a school-based shooting, the rate dropped to 29% of the sample 14 months later. In a similar vein, Saigh (1988) reported that 75% ($n = 9$) of war-exposed Lebanese youth developed PTSD by 37 days after experiencing the trauma, and 8.3% ($n = 1$) of these individuals continued to meet PTSD criteria at a follow-up 316 days post-trauma. Sack et al. (1993) reported that PTSD prevalence rates in Cambodian refugees decreased from 50% to 48% to 38%, respectively, at five, eight, and eleven years subsequent to the Pol Pot led genocide. Similarly, Vila and colleagues (1999) indicated that 15.4% of the youth hostages during a school-based shooting had PTSD two months following the incident, but reported that the rate dropped to 3.8% 18 months after the event. Finally, Bayer et al. (2007) reported that

those who had been liberated from duty as child soldiers for less than two months experienced higher PTSD prevalence rates as compared to those who had been liberated for more than two months. In contrast, Landolt et al. (2005) reported that while 16.2% of youth who experienced a motor vehicle accident had PTSD 4 to 6 weeks after the incident, 17.6% had PTSD at the 12-month follow-up. In sum, many of these studies suggest that PTSD rates are higher relative to the point in time when trauma was experienced.

Type and Mode of Stressor. Research has also demonstrated that the manner in which the traumatic event was experienced may present as a risk factor. Saigh (1991) reported that 25.2%, 55.6%, 5.6%, and 13.5% of the 230 stress-exposed Lebanese youth that met criteria for PTSD had been traumatized through direct experience (e.g., being shot), observation (e.g., witnessing the execution of a parent or sibling), information transmission (e.g., learning about the traumatic experiences of a parent or sibling), or combinations thereof. Lawyer et al. (2006) observed a greater rate of PTSD among sexually assaulted youth (20.3%) as compared to physically assaulted youth (15.1%). Furthermore, children who were sexually abused or exposed to serious domestic violence developed PTSD at a higher rate than children who had been physically maltreated or suffered parental neglect (Famularo, Fenton, & Kinscherff, 1993). In contrast, a study by McLeer et al. (1994) indicated that the prevalence of PTSD among sexually abused children (42.3%) was significantly greater than the prevalence of PTSD among non-sexually abused children meeting full criteria (8.7%).

Relationship Between Victims and Perpetrators. McLeer et al. (1988) reported that 75% of youth who were abused by their natural father developed PTSD. The authors (1993) also indicated that 25% of the participants abused by trusted adults and 10% of those abused by a stranger evidenced the disorder. In considerable contrast, none of the children who were abused by an older youth met diagnostic criteria for the disorder. Additionally, Lawyer and colleagues (2006) compared the prevalence of PTSD between

two cohorts of abused youth and indicated that PTSD estimates differed significantly as a function of the victim-perpetrator relationship. Among the first group of sexually abused children, 2.8% of youth experiencing assault by a stranger evidenced PTSD. In contrast, for participants whose perpetrators were recognized non-acquaintances, acquaintances, and family members, prevalence estimates were observed to be 27%, 25.9%, and 11.6%, respectively. Furthermore, PTSD was evident among 9.8% of acquaintance-assaulted adolescents within the second cohort of physically assaulted youth. Prevalence estimates were reported as 18.7%, 16.5%, and 17.8% among victims whose perpetrators were recognized non-acquaintances, acquaintances, and family members, respectively. Conversely, Ackerman et al. (1998) indicated that among young children who had not been sexually abused, the relationship between the child and perpetrator was not significantly related to a positive diagnosis of PTSD.

Resettlement Stress or Relocation. Three studies have indicated that the living environment of children subsequent to a traumatic event may influence PTSD prevalence rates. First, Khamis (2005) reported that Palestinian youth who resided in refugee camps following exposure to war-related traumas experienced higher rates of PTSD (50%) relative to youth exposed to similar traumatic events and who were not living in refugee camps (31.5%-33.2%). In a similar vein, Schaal and Elbert (2006) reported that 56% of children who survived the Rwandan genocide and were living in child-headed households developed PTSD, relative to 32% of Rwandan youth living in orphanages. Finally, Yorbik et al. (2004) reported that children who were living with their families following a Turkish earthquake presented with fewer PTSD symptoms than children who had been separated from their families.

In contrast, Najarian et al. (1996) reported that the prevalence of PTSD among exposed youth who remained in Gumri (the epicenter) following a major Armenian earthquake (32%) was comparable to that of youth who were similarly exposed but immediately relocated to Yerevan due to the destruction of their homes (28%). Further

investigations involving children and adolescents exposed to trauma are needed to more clearly delineate the relative risk of each factor.

Chapter Summary

The literature reviewed has demonstrated that although youth are frequently exposed to a variety of traumatic events, a majority of the individuals who were assessed did not develop PTSD. The research has also indicated that a myriad of stressors can induce PTSD in children and adolescents. Tables 2.1 through 2.3 present an overview of PTSD incidence rates by trauma type, specify prevalence rates ranging from 0% to 95%, and reveal marked differences within each category. Specifically, war-related traumas suggested prevalence rates ranging from 7.6% to 87%, criminal victimization studies included prevalence rates that ranged from 9.0% to 63.5%, and disaster and accident studies had rates from 0 to 90%.

The wide variation observed in reported prevalence rates in groups of youth may be accounted for by numerous factors, including diagnostic criteria, differences in assessment measures used, sample characteristics, severity and type of exposure, and time elapsed between assessment and trauma exposure. First, a variety of measures and methods reflecting three different sets of diagnostic criteria (e.g., DSM-III, DSM-III-R, and DSM-IV) was utilized. It is possible that the variations in criteria indicated in the different versions of the DSM may have been associated in part to the range in PTSD prevalence rates. Second, the measures used varied in form, including individually administered semi-structured interviews and/or structured clinical interviews, parental ratings, teacher ratings, group self-report measures, and PTSD symptom checklists. All in all, 40 tests were used to denote PTSD. The psychometric properties of these measures vary, and some instruments may not yield consistently valid and reliable results. Variance may be due to different psychometric properties in the measures that were used. For

example, the content validity of the *Reaction Index* (Frederick, Pynoos, & Nader, 1992) that was used in 14 studies that were reviewed has been questioned, as this test does not reflect all of the criteria for PTSD as denoted by the DSM-IV (APA, 1994). More specifically, it does not include items that measure functional impairment. This in effect may have increased the base rates for PTSD in the studies that relied on this test to measure PTSD. As such, psychometric variations may have significantly contributed to the observed variability. Additionally, a great deal of variability was evident with respect to the demographic characteristics of the participants that were sampled. Moreover, the extensive variability in the literature may also be explained in part by realizing the substantial differences relative to the type and intensity of the precipitating stressors. Finally, as studies have demonstrated that PTSD status may change over time (e.g., Sack et al., 1993; Vila et al., 1999), the varying PTSD prevalence rates across studies may also be related to the varying amounts of time the researchers allowed to elapse between trauma exposure and assessment.

Furthermore, studies examining psychiatric comorbidity suggest that anxiety, depression, and externalizing behavior disorders such as ADHD and conduct disorder can appear comorbid with PTSD in youth (Faustman & White, 1989; Goenjian et al., 1995, 2001; Kessler et al., 1995; Kilpatrick et al., 2003; Kinzie et al., 1986; Kulka et al., 1990; McLeer et al., 1994). As the presence of comorbid disorders may affect the treatment of PTSD (Hubbard et al., 1995; Saigh et al., 2002), more research examining disorders that may appear with child-adolescent PTSD and how these disorders affect the presentation and development of the disorder is necessary.

Studies investigating the influence of risk factors associated with child-adolescent PTSD have revealed both consistencies and inconsistencies in the literature. First, inconsistencies were noted relative to gender and age. Six studies indicated that females develop PTSD at higher rates than males (D'Augelli et al., 2006; Fitzpatrick & Boldizar, 1993; Pat-Horenczyk et al., 2007; Perkonigg et al., 2000; Schaal & Elbert, 2006;

Ziaaddini et al., 2009), and one (Khamis, 2005) indicated the opposite. Most interestingly, however, is that fifteen studies indicated no relationship between gender and PTSD (e.g., Ackerman et al., 1998; Ahmad et al., 2000; Broman-Fulks et al., 2007; Elbedour et al., 2007; Foster et al., 2004; Goenjian et al., 1995; Hubbard, 1995; Realmuto et al., 1992; Saigh, 1988; Saigh et al., 1995, 1997; Schwarzwald et al., 1994; Seedat et al., 2004; Silva et al., 2000; Yorbik et al., 2004). With regard to age, while six studies suggested that older children develop PTSD at greater rates than younger children (Ahmad et al., 2000; Garrison et al., 1993, 1995; Schwartz & Kowalski, 1991; Wolfe et al., 1994; Yorbik et al., 2004), two indicated the opposite (Bokszczanin, 2007; Schwarzwald et al., 1993) and three reported that there was no relationship between age and PTSD (Landolt et al., 2005; Lavi & Solomon, 2005; Schaal & Elbert, 2006). Second, all five of the studies examining the relationship between parental psychopathology and child PTSD (Ahmad et al., 2000; Jones et al., 2002; Khamis, 2005; Linning & Kearney, 2004; Sack et al., 1993) indicated that parental psychopathology was associated with PTSD in children. Next, nine studies examining the relationship between the intensity of exposure and PTSD indicated that greater intensity is predictive of the disorder (Goenjian et al., 1995, 2001; Hsu et al., 2002; Kolaitis et al., 2003; Pat-Horenczyk et al., 2007; Pynoos et al., 1987; Roussos et al., 2005; Schaal & Elbert, 2006; Schwarzwald et al., 1994). On the other hand, six studies indicated that there is no relationship between the intensity of exposure and incidence of PTSD (DeVries et al., 1999; Koplewicz et al., 1994; Landolt et al., 2005; Saigh et al., 2002, 2011; Shaw et al., 1995). Finally, with regard to the duration of traumatic experiences and the number of exposures, seven studies indicated that the longer or more often a child is exposed to traumatic events, the greater the likelihood of that child experiencing PTSD (Ackerman et al., 1998; Ahmad et al., 2000; Berton & Stabb, 1996; Ruggiero et al., 2000; Schaal & Elbert, 2006; Seedat et al., 2004; Wolfe et al., 1994). Only one study (Bayer et al., 2007) indicated that there is no relationship between duration and number of exposures with PTSD.

Overall, epidemiological research demonstrates that numerous youth experience exposure to one or more traumatic events in their lifetimes. Precisely estimating trends over time is an ongoing challenge, as evidenced by the inconsistencies in the literature (Finkelhor & Jones, 2004). As such, there is a need for prospective research that enhances understanding of correlates and expression of child-adolescent PTSD.

Chapter III

METHODOLOGY

Anxiety and PTSD

As previously reviewed in Chapter II, epidemiological literature demonstrates that PTSD has been documented in youth exposed to a wide range of violent and non-violent traumatic stressors (e.g., war, violent crime, abuse, natural disasters). According to the American Psychiatric Association's (APA) *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV, 1994), PTSD is indicated by exposure to exceptional stress and the presence of trauma-related thoughts and nightmares, avoidance, increased arousal, irritability, social estrangement, and functional impairments. These symptoms involve high levels of anxiety, repeated thoughts about the trauma, blunted affect, and a number of discrete responses, such as exaggerated startle responses, avoidance behavior, and memory impairment (Saigh, 1988).

Although the DSM-IV makes reference to the expression of PTSD in children and adolescents, it is important to note that the DSM-IV PTSD field trial did not involve subjects below the age of 15 years (Kilpatrick, Resnick, & Freedy, 1998; Saigh & Bremner, 1999). This chapter presents the rationale for an investigation that seeks to determine if the *Revised Children's Manifest Anxiety Scale (RCMAS)* (Reynolds & Richmond, 1978) ratings of traumatized youth with or without PTSD significantly differ from one another as well as from non-traumatized controls. This chapter further addresses the shortcomings in the literature by reviewing background information related to self-reported anxiety as a symptom of PTSD, and by presenting information regarding a

statement of the problem, the purpose and need for the study, hypotheses, methodology, and possible limitations of the study.

Background Information for the Investigation

Given the desire to understand how traumatic experiences may affect youth and the clinical need to identify measures that are sensitive to the expression of PTSD in children and adolescents, several studies investigated the anxiety ratings of traumatized youth. Wolfe, Sas, and Wekerle (1994) observed that the *CBCL* (Achenbach, 1991) Internalizing scores and Anxious/Depressed syndrome scale scores of sexually abused Canadian children with PTSD significantly exceeded the scores of sexually abused children without PTSD. Also within the realm of anxiety ratings, Sack et al. (1994) administered the *DSM-III-R Kiddie Schedule for Affective Disorders and Schizophrenia for School Age Children (K-SADS)* (Puig-Antich, Orvaschel, Tabrinzi, & Chambers, 1980) to a sample of traumatized Cambodian youth with and without PTSD. They concluded that youth with PTSD had a significantly greater prevalence of unspecified anxiety disorders (22% versus 6%). Also within the context of the Cambodian conflict, research by Hubbard et al. (1995) indicated that 21% of youth with PTSD evidenced some type of internalizing disorder, such as Generalized Anxiety Disorder.

Previous research has also specifically utilized the *Revised Children's Manifest Anxiety Scale (RCMAS)* (Reynolds & Richmond, 1978) ratings of traumatized children and adolescents. For example, Saigh (1989c) administered the *RCMAS* (Reynolds & Richmond, 1978) to a sample of 298 Lebanese children between the ages of 9 and 12 years who met criteria for either PTSD or simple phobia and a non-traumatized control group without phobia. Data analysis indicated that the *RCMAS* Total scores of the PTSD group were significantly greater than the scores of the phobia and control groups. Saigh also reported that the *RCMAS* scores of the phobia group significantly exceeded the

scores of the control group. Within this context, Saigh (1987a, 1987b, 1987c, 1989a) conducted four single-case studies to investigate the efficacy of prolonged imaginal exposure with youth who clearly met diagnostic criteria for PTSD and who were symptomatic for at least one year. At posttreatment, appreciably lower scores were evident on the *RCMAS*. Specifically, *RCMAS* scores, which may range from 0 to 39 points, decreased by an average of 8 points between the baseline probes and final treatment sessions and by an average of 9.7 points between baseline probes and 6-month follow-up.

In a related study, Saigh (1991) compared the *RCMAS* Total scores of Lebanese youth who developed PTSD following four different categories of traumatic events and a non-trauma exposed control group. The trauma categories included: (a) direct personal exposure to events that constituted threats to their own lives or their personal well-being (e.g., abduction, rape); (b) observing others who were exposed to life-threatening events or events that posed a threat to the well-being of others (e.g., witnessing an execution or torture); (c) being told about an incident that constituted a threat to the lives or well-being of others (e.g., being told in detail about the death of a relative whose body was mutilated); and (d) combinations involving direct exposure, observation, and or verbal mediation. Saigh reported that while the *RCMAS* Total scores of the four trauma groups with PTSD did not vary significantly from one another, the scores of the PTSD groups significantly exceeded the scores of the non-traumatized controls. Additionally, a number of treatment studies (Farrell, Hains, & Davies, 1998; Saigh, 1987a, 1987b) reported reductions in *RCMAS* scores after youth with PTSD had completed trauma-focused cognitive behavioral regimens.

In a similar vein, Farrell et al. (1998) drew on lower *RCMAS* scores to demonstrate the efficacy of cognitive behavioral therapy in working with children with PTSD. Farrell et al. found that skills learned through procedures such as self-talk, cognitive restructuring, stress inoculation, and emotive imagery may effectively decrease the

anxiety and depression levels in sexually abused children (aged 8-10) who exhibit PTSD symptoms. Similarly, Foa et al. (1999) demonstrated the efficacy of prolonged exposure treatment over stress inoculation training, prolonged exposure with stress inoculation training, and no treatment as supported by decreased posttreatment anxiety levels on the *State Trait Anxiety Inventory* (Spielberger, Edwards, Montuori, & Lushene, 1970) endorsements of 96 female sexual and nonsexual assault victims with chronic PTSD. Additionally, Chemtob, Nakashima, and Carlson (2002) stated that the children's "comments reflected reduced anxiety, better sleeping, more effective coping and fewer regressive behaviors" (p. 109) following cognitive behavioral treatment. Finally, research done by Dalgleish, Moradi, Taghavi, Doost, and Yule (2000) found that *RCMAS* Total scores of British children who developed PTSD following road traffic accidents significantly exceeded the scores of non-traumatized controls.

Statement of the Problem

While these investigations indicate that the *RCMAS* is sensitive to the expression of PTSD following a variety of traumatic experiences, numerous methodological and conceptual concerns are apparent. First, it is not clear if PTSD is specifically associated with higher *RCMAS* scores or if traumatic exposure in the absence of PTSD is associated with increased anxiety, as most of the investigations previously reviewed in this chapter compared youth with PTSD to a control group. This is a clinically significant omission as trauma exposure frequently does not lead to PTSD, as reported in Chapter II, and as it is theoretically possible that traumatized children without PTSD could evidence increased anxiety.

Second, reviews of the studies referenced above did not control for the potentially confounding effects of comorbid disorders. This omission is problematic, as children with PTSD frequently evidence Attention Deficit Hyperactivity Disorder (ADHD), Conduct

Disorder (CD), substance abuse or dependence, and/or Major Depressive Disorder (MDD) (Merry & Andrews, 1994; Sack et al., 1993; Saigh, Sack, Yasik, & Koplewicz, 1999). As these disorders have been associated with elevated *RCMAS* scores (Bernstein, Carroll, Thuras, Cosgrave, & Roth, 2002; Ollindick, Seligman, Butcher, & Div, 1999; Perrin & Last, 1992), it is not clear whether the reported variations in *RCMAS* (Reynolds & Richmond, 1978) scores may be attributed to PTSD, major comorbid disorders, or a combination of PTSD and comorbid disorders. Finally, it is important to acknowledge that the *RCMAS* is a multi-component test (Reynolds & Richmond, 1978) and the studies previously reviewed in this chapter did not offer information regarding *RCMAS* subscale variations. This omission is significant, as information about the *RCMAS* subscale scores of traumatized children could offer significant insights about the specific way distress manifests in traumatized youth.

Purpose of the Study

This study sought to compare the *RCMAS* Total and subscale scores of traumatized children and adolescents with and without PTSD to the scores of non-traumatized controls.

Need for the Study

Gathering empirical data regarding self-reported anxiety in traumatized youth with and without PTSD relative to a control group could appreciably enhance our understanding of the expression of the disorder and offer a number of theoretical and clinical contributions.

Theoretical Significance

Empirical information regarding self-reported anxiety ratings in traumatized youth with or without PTSD would help establish whether or not anxiety varies as a function of diagnostic status. In effect, this study would highlight whether anxiety is associated with PTSD or exposure to extreme stress. The anticipated outcomes would also lend empirical support for the placement of PTSD within the context of anxiety disorders in the *DSM-IV-TR* (APA, 2000). Additionally, these outcomes may be of interest to scientists, as the anticipated outcomes would provide a scientific basis to support the use of the *RCMAS* Total and subscale indices as treatment outcome measures.

In addition, since children with major comorbid disorders that are associated with anxiety were excluded, this study offers a unique perspective about self-reported anxiety of traumatized youth with or without PTSD. In contrast to the Saigh (1989a, 1991), Farrell et al. (1998), and Dalgleish et al. (2000) investigations, this study included youth with PTSD, traumatized PTSD negatives, and non-traumatized controls. Given that more than two-thirds of the general population may experience a significant traumatic event at some point during their lives (Breslau, Davis, Andreski, & Peterson, 1991; Breslau et al., 1998; Kessler et al., 1995; Norris, 1992; Resnick et al., 1993) and as approximately 8% of individuals in the United States have a lifetime prevalence of PTSD (*DSM-IV-TR*, APA, 2000), this study recognizes the importance of assessing the psychological well-being of individuals who are traumatized and do not develop PTSD. By employing a three-group case control design, this study provides an evaluation of the self-reported anxiety of traumatized PTSD negatives. Such an understanding could be of value in determining if traumatized youth without PTSD are at risk for experiencing high levels of anxiety. It should be noted in this context that case-control studies have a sound theoretical basis in epidemiological research (Armenian, 2009). Additionally, the case-control method has the capability to analyze etiologic relationships through multifaceted models, eliminate

the effect of multiple confounders, and test the interaction of a number of factors as we evolve toward understanding the complex relationships (Armenian, 2009).

Clinical Significance

Examined from a clinical perspective, this study offered a number of significant clinical benefits to participants. First, participants received free 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' parents/guardians. The provision of these reports, coupled with referrals for mental health services, may have served to offset the serious consequences associated with PTSD and a number of frequently occurring comorbid disorders. In addition, the anxiety ratings of traumatized children with PTSD and comorbid disorders provided empirically viable information that may be incorporated into planning and evaluating age-appropriate treatments. Finally, the anticipated outcomes would suggest that clinicians need to carefully assess anxiety-related thoughts and somatic problems among children with PTSD by going beyond the standard trauma-specific diagnostic symptom clusters.

Rationale and Hypotheses

Rationale for Hypotheses 1-8

Given previous research indicating that children and adolescents with PTSD evidenced significantly higher levels of anxiety (Saigh, Yasik, Oberfield, Halamandaris, & McHugh, 2002; Saigh, 1989a, 1991) relative to traumatized youth without PTSD and non-traumatized controls and given numerous treatment studies indicating significant reductions in *RCMAS* scores after youth with PTSD had completed trauma-focused

cognitive behavioral regimens (Farrell et al., 1998; Foa et al., 1999; Saigh, 1987a, 1987b, 1987c, 1988, 1989a), it was expected that, in the absence of major comorbid disorders, traumatized youth with PTSD would evidence significantly higher levels of anxiety as compared to traumatized youth without PTSD and to non-clinical controls as denoted by *RCMAS* scores. More specifically, the following hypotheses were tested:

Hypotheses 1-8.

H₀1: The *RCMAS* Total Anxiety scores of traumatized youth with PTSD will be significantly higher than the scores of traumatized youth without PTSD.

H₀2: The *RCMAS* Physiological Anxiety scores of traumatized youth with PTSD will be significantly higher than the scores of traumatized youth without PTSD.

H₀3: The *RCMAS* Worry/Oversensitivity scores of traumatized youth with PTSD will be significantly higher than the scores of traumatized youth without PTSD.

H₀4: The *RCMAS* Social Concerns/Concentration scores of traumatized youth with PTSD will be significantly higher than the scores of traumatized youth without PTSD.

H₀5: The *RCMAS* Total Anxiety scores of traumatized youth with PTSD will be significantly higher than the scores of non-clinical controls.

H₀6: The *RCMAS* Physiological Anxiety scores of traumatized youth with PTSD will be significantly higher than the scores of non-clinical controls.

H₀7: *RCMAS* Worry/Oversensitivity scores of traumatized youth with PTSD will be significantly higher than the scores of non-clinical controls.

H₀8: The *RCMAS* Social Concerns/Concentration scores of traumatized youth with PTSD will be significantly higher than the scores of non-clinical controls.

Rationale for Hypotheses 9-12

The literature comparing psychiatric morbidity of traumatized youth without PTSD to non-traumatized controls has failed to observe significant differences among these groups on measures of anxiety (Saigh, 1989a, 1991; Saigh et al., 2002). In view of this, it was anticipated that the anxiety ratings of traumatized children without PTSD, as denoted by *RCMAS* scores, would not significantly differ from the anxiety ratings of their non-traumatized counterparts. To address this point, the following hypotheses were examined:

Hypotheses 9-12.

H₀9: The *RCMAS* Total Anxiety scores of traumatized youth without PTSD and the non-traumatized controls will not significantly differ.

H₀10: The *RCMAS* Physiological Anxiety scores of traumatized youth without PTSD and the non-traumatized controls will not significantly differ.

H₀11: The *RCMAS* Worry/Oversensitivity scores of traumatized youth without PTSD and the non-traumatized controls will not significantly differ.

H₀12: The *RCMAS* Social Concerns/Concentration scores of traumatized youth without PTSD and the non-traumatized controls will not significantly differ.

In effect, it was anticipated that high anxiety ratings would be associated with PTSD and not with trauma exposure in the absence of PTSD. It was also expected that anxiety ratings among youth with PTSD would be evident across the different dimensions of the *RCMAS* (Reynolds & Richmond, 1978).

Methodology

Recruitment Process

Practitioners from Bellevue Hospital pediatric clinics referred youth who experienced, witnessed, or were confronted by a traumatic event as defined by the DSM-IV (APA, 1994) PTSD criterion A1. Non-traumatized participants were recruited from families with appointments in clinics that provide routine medical examinations to children. A multifaceted evaluation procedure was used to identify youth with PTSD, traumatized youth without PTSD, and non-traumatized controls. Multiple examiners and assessment methods were used to formulate PTSD diagnoses, as this approach decreases information variance that is associated with the formulation of psychiatric diagnoses (Spitzer, Endicott, & Robins, 1978). As such, all of the participants received two independent DSM-IV (APA, 1994) based clinical interviews for PTSD and two independent administrations of the *Children's PTSD Inventory* (Saigh, 2003).

PTSD Inclusion Criteria

To be included in the PTSD group, participants must have been between the ages of 7 and 18 years and received two independent PTSD clinical diagnoses from one of two board-certified child psychiatrists and a licensed psychologist, respectively, as well as two independent PTSD diagnoses as determined by administrations of the *Children's PTSD Inventory* (Saigh, 2003) by doctoral-level graduate psychology students.

Traumatized PTSD Negative Inclusion Criteria

In order to have been included in the study as a traumatized PTSD negative case, a participant must have been between 7 and 18 years old and 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, 2003) by

doctoral-level graduate psychology students. In addition, verbatim responses to the *Children's PTSD Inventory* (Saigh, 2003) trauma exposure questions must have reflected the DSM-IV Criterion A1 definition of trauma exposure,¹ as judged by two independent psychiatrists.

Control Group

In order to have been included in the study as a non-traumatized control case, a participant must have been between 7 and 18 years of age and 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, 2003) trauma exposure questions, the answers to which must not have reflected the DSM-IV Criterion A1 definition of trauma exposure,² as judged by two independent psychiatrists or psychologists.

Exclusion Criteria for All Subjects

Inasmuch as youth with a history of abuse or neglect may experience ongoing distress through court proceedings and/or foster care placements (McLeer, Callaghan, Henry, & Wallen, 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 (1970) were excluded from the study. This law specifies that it is a felony for a "parent or guardian or other persons legally responsible for a child's care to inflict or allow to be

¹DSM-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).

²DSM-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).

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). Importantly, youth that had been abused by a parent or guardian were excluded, but youth that had been sexually or physically assaulted by a person other than a parent or guardian were included. In addition, all youth engaged in ongoing court proceedings were excluded.

Participants with *WISC-III* (Wechsler, 1991) Full Scale IQs in the deficient range (69 or less) were excluded, as earlier research with the *Children’s PTSD Inventory* (Saigh, 1989b) determined that cases within this IQ range experienced difficulty in understanding test questions and verbalized inconsistent responses (Saigh, 2003). Youth that were not able to speak or understand English were also excluded from the study. Further, youth with MDD, ADHD, CD, substance dependence, or psychotic disorders as determined by *Diagnostic Interview for Children and Adolescents – Revised (DICA-R)* (Reich, Leacock, & Shanfeld, 1995) administrations were also excluded. Finally, youth with positive histories for significant head traumas, psychotic symptoms, and those receiving medication that could influence cognitive functioning were excluded as well.

Sample

Participants included youth aged 7 to 18 years drawn from the existing data set of a study approved by the Teachers College Institutional Review Board (IRB), Bellevue Hospital IRB, and the IRB of the Graduate School of the City University of New York. Bellevue Hospital practitioners from the hospital’s Adolescent Clinic, Pediatric Consultation-Liaison Psychiatry Clinic, Pediatric Emergency Room, and the Pediatric Crime Victim’s Program referred 228 cases to the investigators following traumatic experiences. Of this number, parental or guardian consent to participate and child assent were obtained for 157 (69%) of these cases. Of the consenting cases, 50 (32%) were

excluded for the following reasons: head injury ($n = 24$), limited English proficiency ($n = 8$), positive history of child abuse or neglect ($n = 2$), and *WISC-III* (Wechsler, 1991) Full Scale IQs in the deficient range ($n = 16$). One youth did not complete the entire research protocol and did not complete the *RCMAS* (Reynolds & Richmond, 1978) and was therefore excluded. Of the remaining 106 cases, 37 (35%) met criteria for PTSD and 69 (65%) did not. Among the PTSD group, eight cases were excluded because they also met *DICA-R* (Reich, Leacock, & Shanfeld, 1995) criteria for MDD, and one case was excluded due to meeting criteria for substance dependence. Among the traumatized PTSD negative group, two cases met criteria for MDD, two had CD, and one had ADHD. These cases were also excluded.

With reference to the control group, the parents/guardians of 280 potentially non-traumatized youth who presented at a Bellevue clinic that provides routine medical services to children were invited to enroll their children in the study. Parent or guardian consent to participate and child assent were provided by 78 (28%) of the cases. Five cases reported that they experienced traumatic incidents indicative of the DSM-IV PTSD Criterion A1 and were assigned to the traumatized participant pool. Thirty-two (41%) of the cases were excluded for the following reasons: head injury ($n = 2$), limited English proficiency ($n = 15$), current psychopharmacological treatment ($n = 8$), and *WISC-III* (Saigh, 1989b) Full Scale IQs in the deficient range ($n = 7$). None of the non-traumatized youth received a *DICA-R* (Reich, Leacock, & Shanfeld, 1995) diagnosis of MDD, CD, ADHD, substance dependence, or psychotic symptoms. None of the referred cases had a life-threatening illness.

The recruitment process led to the identification of 29 PTSD positives, 64 traumatized PTSD negatives, and 41 non-traumatized controls. All of the participants completed the *RCMAS* (Reynolds & Richmond, 1978). An exploratory analysis of the test scores identified two outliers (1 traumatized PTSD negative and 1 PTSD positive) who had extreme scores on two or more of the *RCMAS* scales and were therefore deemed to be

clinically unique to the sample. These two cases may have had undue influence on measures of central tendency and spread, and their effects may have been even more marked when included in the data analysis. In order to be conservative, these cases were excluded from the final data analysis. The rationale for exclusion is consistent with Hoyle et al.'s (2002) observations that "outliers can have a disproportionate and unfortunate effect on certain statistics that are computed on the data set as a whole" and that statistics may not be "robust in the presence of outliers" (pp. 439, 447). Accordingly, the final sample consisted of 28 PTSD positives, 63 traumatized PTSD negatives, and 41 controls. The age range for participants was 7.08 to 18.42 years ($M = 13.19$, $SD = 2.82$). Overall, 74 males and 58 females participated. The parents or guardians of the participants completed the Hollingshead (1975) *Four-Factor Index of Social Status* questionnaire wherein lower Hollingshead ratings indicate higher social status (e.g., higher income and/or education).

The demographic characteristics of the selected sample are reported in Table 4.1 in Chapter IV. Additionally, information regarding the type and frequency of traumatic events is reported in Table 4.2 in Chapter IV. More specifically, Table 4.2 lists the different types of PTSD Criterion A1 traumatic events that were reported by the PTSD and traumatized PTSD negative groups. With reference to the frequency of exposure to traumatic events, 42.9% of participants in the PTSD positive group reported exposure to a single traumatic event, 42.9% reported exposure to two traumatic events, and 14.2% reported exposure to more than two traumatic events. With reference to the traumatized PTSD negatives, 74.6% reported exposure to a single traumatic event, 19.0% reported exposure to two traumatic events, and 6.4% reported exposure to more than two traumatic events.

Diagnostic Measures

Children's PTSD Inventory (CPTSDI) (Saigh, 2003)

The *Children's PTSD Inventory* is a structured clinical interview for children and adolescents that reflects the DSM-IV criteria for PTSD. Saigh (2003) reported an internal consistency *alpha* of .95 at the diagnostic level. Diagnostic level inter-rater reliability was determined to be 98.0%. Further, the inter-rater intra-class correlation coefficient (ICC) and the inter-rater reliability *kappa* were reported to be .98 and .96, respectively, at the diagnostic level. In terms of test-retest reliability, 97.6% agreement was observed at the diagnostic level. A test-retest *kappa* of .91 and an ICC of .90 were also evident at the diagnostic level. The *CPTSDI* is also considered to be a valid measure when compared to clinician-derived diagnoses, as well as diagnoses obtained via administrations of the *Structured Clinical Interview for the DSM-IV (SCID)* (First, Gibbon, Williams, & Spitzer, 1996) and the *Diagnostic Interview for Children and Adolescents – Revised (DICA-R)* (Reich, Leacock, & Shanfeld, 1995) PTSD modules. Moderate to high levels of sensitivity (.84-.92), specificity (.93-.98), positive (.63-.93) and negative (.95-.99) predictive power, and diagnostic efficiency (.93-.95) were reported.

Diagnostic Interview for Children and Adolescents-Revised (DICA-R) (Reich, Leacock, & Shanfeld, 1995)

The *DICA-R* is a semi-structured interview that reflects the DSM-IV criteria for a variety of disorders. All participants received administrations of the MDD, ADHD, conduct disorder, substance dependence (e.g., alcohol, tobacco, glue sniffing, marijuana, and street drugs), and psychotic symptoms modules by a trained examiner. Test-retest *kappa* coefficients ranged from .55-.80 for the MDD module, .32-.59 for the ADHD module, and .66–1.00 for the substance dependence module (Reich et al., 2000). Coefficients of .76 and .92 were reported for the psychotic symptoms and conduct disorder modules, respectively (Reich et al., 2000). Reich et al. (personal communication

to Professor Philip A. Saigh, February 5, 2001) also reported sensitivity coefficients of .82, .85, .92, 1.00, and 1.00 for the MDD, ADHD, conduct disorder, substance dependence, and psychotic symptoms modules, respectively. Specificity coefficients of .72, .73, .71, .80, and .72 were reported for the respective DICA-R modules.

DSM-IV Clinical Interviews

Participants received two independent clinical interviews by one of two board-certified child psychiatrists and/or a licensed psychologist. The psychiatrists had 21 and 9 years of post-residency experience, and the psychologist had 23 years of postdoctoral experience. The examiners interviewed the participants and independently decided if participants had been exposed to traumatic incidents that were commensurate with the DSM-IV PTSD Criterion A1 definition and if their reported symptoms met criteria for PTSD. The examiners used the DSM-IV PTSD criteria to guide their decision process.

Diagnostic Agreement

With regard to diagnostic agreement for the unstructured PTSD clinical interviews, the clinicians agreed on the diagnostic status of 129 of the 132 cases ($kappa = .94$). Agreement between clinician-derived diagnoses and the diagnoses that were derived by administrations of the *Children's PTSD Inventory* (Saigh, 2003) was evident among 125 of the 132 cases ($kappa = .86$) examined. Regarding the seven cases wherein diagnostic discordance occurred, case conferences were held to discuss reported diagnostic symptoms, and final diagnostic decisions were reached through a consensual process. All seven cases were included.

Dependent Measures

Revised Children's Manifest Anxiety Scale (RCMAS) (Reynolds & Richmond, 1978)

This 37-item self-report inventory is intended to measure anxiety in children aged 6 to 19 years. The instrument has a 28-item Total anxiety or aggregate index and four subscales. The subscales include an 11-item Worry/Oversensitivity scale that measures general anxiety, a 10-item Physiological Anxiety scale that measures somatic concerns, a 7-item Social Concerns scale that measures fears related to social interactions and perceptions, and a 9-item Lie scale. Reynolds and Richmond (1978) reported internal consistency coefficients that ranged from .42 to .87 for the Total scale. They also reported internal consistency coefficients ranging from .70 to .80, .50 to .70, .60 to .70, and .70 to .90 for the Worry/Oversensitivity, Physiological Anxiety, Social Concerns, and the Lie scales, respectively. Reynolds (1980) further reported that the *RCMAS* (Reynolds & Richmond, 1978) Total index was significantly correlated ($r = .85, p < .001$) with the *State Trait Anxiety Inventory for Children (STAIC)* (Spielberger, 1973) Trait scale. With reference to construct validity, Lonigan, Shannon, Finch, Daugherty, and Taylor (1991) reported that children with high levels of exposure to Hurricane Hugo had significantly higher *RCMAS* Total and subscale scores relative to children with lesser exposure.

Assessment of Possible Intervening Variables

Severity of Psychosocial Stress Scale: Children and Adolescents (SPSS-CA) (APA, 1987b)

This 6-point Likert-type scale is intended to assess trauma severity. The scale provides specific examples to facilitate the rating process. For example, the “death of both parents” is described as a catastrophic stressor and accorded a rating of 6, while “breaking up with a boyfriend or girlfriend” is described as a mild stressor and accorded a rating of 2. The absence of a significant stressor is rated as 1 for “None.” A board-

certified child psychiatrist with 21 years of post-residency experience and a psychologist with 23 years of postdoctoral experience independently read all of the recorded responses to the *Children's PTSD Inventory* stress exposure items and rated the statements according to the *SPSS-CA* (APA, 1987b) criteria. A Pearson product moment correlation of .98 ($p < .001$) was observed between the independently derived stressor severity ratings. As stressor severity has been associated with increased psychiatric morbidity in children (Pynoos, Goenjian, Tashjian, Karakashian, Manjikian, & Manoukian, 1993), *SPSS-CA* (APA, 1987b) ratings were used to test for potential differences between traumatized youth with and without PTSD.

Hollingshead Four Factor Index of Social Adjustment (Hollingshead, 1975)

This instrument is a measure of socioeconomic status and presents questions involving parental education, occupation, and marital status. Participants were assigned to one of four social class strata, with the highest scores allocated to Class I and the lowest scores allocated to Class IV. Scores range from 11 to 77, and there is an inverse relationship between Total score and social position (e.g., low scores indicate high social positions). Cirino, Chin, Sevcik, Wolf, Lovett, and Morris (2002) reported moderate (.73) to high (.95) Hollingshead inter-rater reliability coefficients. The coefficients were highest for two wage earner families ($r = 0.95$) and families where the sole wage earner was male ($r = 0.95$). Reliability coefficients for families where the sole wage earner was female were slightly less ($r = 0.73$). Cirino et al. (2002) also compared the Hollingshead (1975) *Four Factor Index of Social Adjustment* to the *Socioeconomic Index of Occupations* (Nakao & Treas, 1992). Convergent validity coefficients were again moderate to high (e.g., total sample = 0.81; two wage earner families = 0.86; one male wage earner = 0.92; one female wage earner = 0.42). Finally, the authors compared the Hollingshead (1975) *Four Factor Index of Social Adjustment* to various IQ and achievement measures. Correlations with the IQ measures were moderate, ranging from

0.22 to 0.47. Correlations with achievement measures were moderate ($r = 0.00$) to low ($r = 0.50$). The highest and lowest coefficients pertained to families with two wage earners and families with one female wage earner, respectively.

Examiners

Doctoral-level school psychology students administered the *CPTSDI* (Saigh, 2003), *DICA-R* (Reich, Leacock, & Shanfeld, 1995), *RCMAS*, and the Hollingshead (1975) *Four Factor Index of Social Adjustment* according to a counterbalanced design in order to avoid an order effect.

Research Design

A three-group case-control design was utilized wherein designation to the traumatized youth with PTSD ($n = 28$), traumatized PTSD negative group ($n = 63$), and non-traumatized control group ($n = 41$) denoted the independent variable and scores on the *RCMAS* (Reynolds & Richmond, 1978) denoted the dependent variable. Armenian (2009) explains that a case-control design allows for “a comparison of a group of persons with a certain outcome or condition with another group of persons who do not have that outcome or condition” (p. 19). Examined in this context, a minimum of 21 participants was necessary for each of the three cohorts, as Cohen’s (1988) power analyses tables indicate that three-group case-control designs require a minimum of 21 cases per cell to denote a large effect. It is obvious that the current study had sufficient power to examine the hypotheses. Figure 3.1 presents a schematic representation of the research design. Information about the demographic makeup of the selected sample is reported in Table 4.1 in Chapter IV.

Figure 3.1

Schematic Representation of Research Design

<i>Revised Children's Manifest Anxiety Scale</i> (RCMAS, Reynolds & Richmond, 1978)	Traumatized Youth with PTSD (<i>n</i> = 28)	Traumatized Youth without PTSD (<i>n</i> = 63)	Non-Traumatized Control Group (<i>n</i> = 41)
Total RCMAS Score			
Physiological Anxiety			
Worry/Oversensitivity			
Social Concern/Concentration			
Lie			

Exploratory Analyses

It was imperative to evaluate the data graphically and assess the assumptions of the tests being conducted prior to completing formal analyses so that accurate conclusions could be formulated from the results. The F-statistic for an ANCOVA is reliable when the variances in each experimental condition are fairly similar, observations are independent, the dependent variable is measured on at least an interval scale, groups are normally distributed, the covariate and experimental effect are independent, and the relationship between the covariate and outcome variable is constant across different treatment levels (Field, 2009). The MANCOVA has similar assumptions to the ANCOVA, but extends to the multivariate case. Exploratory analyses, such as Box's Test and Shapiro-Wilks test for normality indicated that the assumptions of both the ANCOVA and MANCOVA were satisfied.

Analysis Procedures

Initially, Chi-square tests were conducted to test for possible significant differences between the groups with regard to gender. An ANOVA tested for significant *Hollingshead* SES group differences. ANOVAs were also used to test for significant age differences between groups at the time of trauma exposure and at the time of assessment. Possible differences in stressor severity as measured by the *SPSS-CA* and in the amount of time that has passed since trauma exposure were examined by performing an ANOVA.

In order to test for group differences with regard to the standardized *RCMAS* Total scores, a separate ANCOVA procedure was conducted controlling for possible group differences related to SES. As the *RCMAS* standard scores utilized in the analysis were standardized based on age and gender, these variables were not included as covariates. Bonferroni post-hoc comparisons were conducted to identify possible significant group comparisons. Analogously, a separate MANCOVA controlling for SES was conducted to examine for group differences across the five *RCMAS* subscale scores. Given a significant MANCOVA, univariate *F*-tests and Bonferroni post-hoc comparisons were conducted to identify significant group differences.

Limitations

Ideally, the rigorous methodology employed in this study would lead to meaningful results. However, it is important to note that certain limitations were present. First, external validity was limited to populations with similar demographic, developmental, and trauma histories as the youth involved in this study. Second, results should be tempered with the understanding that additional comorbid disorders were not excluded and the external validity of the study should be viewed accordingly. As a cross-sectional design was employed, it is not clear if PTSD induced higher levels of anxiety or if the observed anxiety levels existed before trauma exposure. The ex-post facto nature of case

control designs precluded randomization. Additionally, although self-report measures are valuable instruments for attaining information that is best known by the respondent, social desirability (Schaeffer, 2000) and erroneous perceptions (Kihlstrom, Eich, Sandbran, & Tobias, 2000) may limit reliability of these measures. Further, Kessler, Wittchen, Abelson, and Zhao (2000) suggest that both the respondent's ability to understand the questions and his/her motivation to do so can influence the assessment of psychiatric disorders, including PTSD. Finally, it is acknowledged that the *RCMAS* was recently revised (Reynolds & Richmond, 2008) and these outcomes may not apply to the revised index. It should also be realized that anxiety has been described as having three separate response systems (e.g., subjective reports of apprehension, psychophysiological arousal, and behavioral avoidance) (Rachman, 1990) and that this investigation did not consider the psychophysiological and behavioral manifestations of anxiety.

Chapter IV

RESULTS

This chapter includes demographic and dependent variable data analyses.

Descriptive Data

Table 4.1 presents a summary of the demographic background information of the selected sample.

Table 4.1

Demographic Variables

Variable	PTSD Positive	Traumatized PTSD Negative	Non-Traumatized Control
Age (years)			
<i>M</i>	14.24	13.22	12.43
<i>SD</i>	2.92	2.85	2.52
Gender	%	%	%
Male	53.6	66.7	41.5
Female	46.4	33.3	58.5
Hollingshead Social Class	%	%	%
Class I	0.0	4.8	9.8
Class II	19.5	23.8	19.5
Class III	10.7	44.4	36.6
Class IV	46.4	19.0	24.4
Class V	32.1	7.9	9.8

Table 4.1 (continued)

Demographic Variables

Variable	PTSD Positive	Traumatized PTSD Negative	Non-Traumatized Control
Race/Ethnicity	%	%	%
African-American	10.7	28.6	14.6
Asian	0.0	11.1	0.0
Caucasian	7.1	17.5	12.2
Hispanic	82.1	42.9	70.7
Other	0.0	0.0	2.4

A Chi-square test identified significant differences between the groups with regard to gender $\chi^2(2, N = 132) = 6.49, p < .05$. An ANOVA identified significant socioeconomic status (SES) between group differences, $F(2, 129) = 11.05, p < .001$. Post-hoc tests determined that the PTSD group had significantly lower Hollingshead SES ratings than the traumatized PTSD negatives, $t(91) = -4.51, p < .001$, and non-traumatized controls, $t(69) = -3.92, p < .01$. The Hollingshead ratings of the PTSD negatives and the non-traumatized controls were not significantly different. The ethnicity of participants is reported by comparison group. 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 (Field, 2009).

An ANOVA also identified significant differences for age, $F(2, 129) = 4.09, p < .05$. *Bonferroni* post-hoc analyses were employed to determine significant group differences. As such, each subsequent ANOVA was tested at an alpha level of .017. This level was achieved by dividing the original alpha ($\alpha = .05$) by the number of group comparisons (comparisons = 3). *Bonferroni* post-hoc tests established that the control group was

significantly younger than the PTSD group, $t(69) = -2.67, p < .05$. All other age comparisons were non-significant.

Descriptive Statistics for Traumatic Stressor Variables

Table 4.2 provides a list of the types of traumatic events reported by the PTSD and traumatized PTSD negative groups. Participants in the non-traumatized control group did not meet the DSM-IV Criterion A1³ definition of trauma exposure, as judged by two independent psychiatrists, and therefore were not included in the analysis. The mean number of traumas reported by the PTSD group ($M = 1.82, SD = .98$) was significantly greater than the mean number of traumas reported by the traumatized PTSD negatives ($M = 1.32, SD = 0.59$), $F(1, 89) = 9.18, p < .01$. Among the PTSD group, 42.9% reported exposure to a single traumatic event, 42.9% reported exposure to two traumatic events, and 14.2% reported exposure to more than two traumatic events. With reference to the traumatized PTSD negatives, 74.6% reported exposure to a single traumatic event, 19.0% reported exposure to two traumatic events, and 6.4% reported exposure to more than two traumatic events.

³DSM-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).

Table 4.2

Types of Traumas Reported by PTSD and Traumatized PTSD Negative Groups

Stressor	PTSD ^a		Traumatized PTSD Negative ^b	
	<i>N</i>	%	<i>n</i>	%
Sexual Assault	6	21.4	0	0.0
Physical Assault	7	25.0	13	20.6
Shot	5	17.9	5	7.9
Dog Attack	1	3.6	6	9.5
Motor Vehicle Accident	4	14.3	16	25.4
Hand Injury	1	3.6	13	20.6
Smoke Inhalation	2	7.1	2	3.2
Other	1	3.6	5	7.9
Witnessed Trauma	1	3.6	3	4.8

^a *n*=28. ^b *n*=63.

The mean stressor severity ratings as measured by the *SPSS-CA* (APA, 1987b) were 5.88 (*SD* = 0.28), 5.69 (*SD* = 0.42), and 0.00 (*SD* = 0.00) for the PTSD positives, traumatized PTSD negatives, and non-traumatized controls, respectively. An *ANOVA* comparing the stressor severity ratings for PTSD positives and PTSD negatives denoted a non-significant group difference, $F(1, 89) = 4.82, p < .05$. Similarly, a non-significant difference was observed relative to the stressor severity ratings for stress-exposed males and females, $F(1, 89) = .17, p = .68$. Males had a mean stressor severity rating of 5.74 (*SD* = 0.40) and females had a mean rating of 5.77 (*SD* = 0.39).

The amount of time that had passed since trauma exposure for the PTSD group ($M = 8.2$ months, *SD* = 10.9 months) did not significantly differ from the time interval for the traumatized PTSD negatives ($M = 5.4$ months, *SD* = 10.1 months), $F(1, 88) = 1.42, p > .05$. The mean age at the time of trauma exposure for the PTSD group was 13.56

years ($SD = 3.27$ years) and 12.67 years ($SD = 3.26$) for the traumatized PTSD negatives. The mean age at trauma exposure for the trauma exposed groups was not significantly different, $F(1, 89) = 1.47, p > .05$.

Multivariate and Univariate Analyses

In order to test for group differences with regard to the standardized *RCMAS* Total scores, an *ANCOVA* procedure was conducted controlling for group differences related to SES. As the *RCMAS* (Reynolds & Richmond, 1978) standard scores utilized in the analysis are standardized based on age and gender, these variables were not included as covariates. *Bonferroni* post-hoc comparisons were employed to identify significant group comparisons. This analysis was conducted using an alpha level of .017. This level was achieved by dividing the original alpha ($\alpha = .05$) by the number of group comparisons (comparisons = 3).

Analogously, a separate *MANCOVA* controlling for SES was conducted in order to examine for group differences across the four *RCMAS* scales. Given a significant *MANCOVA*, univariate *F*-tests and *Bonferroni* post-hoc comparisons were conducted to identify significant group differences. Essentially, *MANCOVA* is utilized in situations in which there are multiple outcome variables and allows the researcher to control for covariance. *Bonferroni* post-hoc comparisons were conducted using an alpha level of .004. This level was achieved by dividing the original alpha ($\alpha = .05$) by the number of group comparisons (comparisons = 12).

Table 4.3 presents the *RCMAS* Total and subscale scores (adjusted means and standard deviations) for the comparison groups as well as the univariate analyses. As may be seen in Table 4.4, *Bonferroni* post-hoc comparisons revealed that the adjusted mean *RCMAS* Total score of the PTSD group was significantly higher than the adjusted means of the traumatized PTSD negatives and controls. In contrast, the adjusted means of the

traumatized PTSD negatives and controls were not significantly different. A *MANCOVA* identified significant group differences at the subtest level, *Wilks lambda*, $F(8, 250) = 7.96, p < .001$. Basically, it was concluded that the adjusted mean vectors are not the same across the three groups. Given a significant *MANCOVA*, univariate *F*-tests and *Bonferroni* post-hoc comparisons were conducted to identify significant group differences. Univariate *F*-tests denoted significant group differences on the Total score, $F(2, 128) = 27.02, p < .001$, Physiological Anxiety scale, $F(2, 128) = 24.92, p < .001$, Worry/Oversensitivity scale, $F(2, 128) = 19.77, p < .001$, and Social Concern/Concentration scale, $F(2, 128) = 10.86, p < .001$. Non-significant differences were indicated on the Lie scale, $F(2, 128) = .27, p > .05$.

A *Bonferroni* post-hoc comparison was conducted. To compensate for the number of tests conducted, each test uses a strict criterion for significance. *Bonferroni* post-hoc comparisons determined that the mean Physiological Anxiety, Worry/Oversensitivity, and Social Concern subscale scores of the PTSD group were significantly higher than those of the traumatized PTSD negatives and the non-traumatized controls. The mean scores of the traumatized PTSD negatives and controls did not differ on any of the *RCMAS* subscales. Given this outcome, all of the hypotheses presented in Chapter III were supported. More specifically, Hypotheses 1-8 indicated that youth with PTSD would evidence significantly higher *RCMAS* scores relative to traumatized youth without PTSD and non-clinical controls. The observed outcomes supported these hypotheses across the *RCMAS* Total and scale scores. Likewise, Hypotheses 9-12 indicated that the *RCMAS* scores of traumatized children without PTSD would not significantly differ from the anxiety ratings of their non-traumatized counterparts. The observed outcomes support these hypotheses.

Table 4.3

Adjusted Means, Standard Deviations, and Univariate F-tests for RCMAS Total and Subscale Scores

Scale	PTSD ^a		Traumatized PTSD Negative ^b		Control ^c		Univariate Results	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>F</i> ^d	<i>p</i>
Total	58.82	10.29	41.70	8.12	43.78	10.09	29.96	.001
Physiological Anxiety	12.21	2.82	7.62	2.63	7.92	2.90	24.95	.001
Worry/Oversensitivity	12.18	3.10	7.68	2.29	8.34	3.33	23.77	.001
Social Concern/ Concentration	10.46	3.54	7.39	2.12	8.22	2.66	10.14	.001
Lie	10.82	2.07	10.38	2.56	10.27	2.65	34	.715

Note. ^a *n*=28. ^b *n*=63. ^c *n*=41. ^d *df* = (2, 128).

Table 4.4

Bonferroni Post-hoc Comparisons for RCMAS Total and Subscale Scores

Scale	PTSD vs. Traumatized PTSD Negative		PTSD vs. Control		Traumatized PTSD Negative vs. Control		Post-hoc Comparisons
	<i>t</i> (90)	<i>p</i>	<i>t</i> (69)	<i>p</i>	<i>t</i> (99)	<i>p</i>	
Total	7.59	.001	6.29	.001	-1.12	.794	1>2 ^{***} , 3 ^{***}
Physiological Anxiety	6.83	.001	5.99	.001	-0.56	1.00	1>2 ^{***} , 3 ^{***}
Worry/Oversensitivity	6.80	.001	5.49	.001	-1.18	.719	1>2 ^{***} , 3 ^{***}
Social Concern/Concentration	4.51	.001	3.06	.001	-1.53	.386	1>2 ^{**} , 3 ^{***}
Lie	.67	1.00	.80	1.00	.23	1.00	N.A.

Note: 1 = PTSD, 2 = Traumatized PTSD Negative, 3 = Control.

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

Chapter Summary

Data analyses indicated that, as hypothesized, the *RCMAS* scores of children and adolescents with PTSD significantly exceeded the *RCMAS* scores of traumatized PTSD negatives and non-traumatized controls. Also as hypothesized, the *RCMAS* scores of the traumatized PTSD negatives and controls were not significantly different. In effect, PTSD was consistently associated with increased anxiety across the scales of the *RCMAS*, and trauma exposure without PTSD was not.

Chapter V

CONCLUSIONS

This chapter offers insights regarding how the results of the study may be interpreted with respect to the current literature and future needs within the field of child psychopathology. First, the purpose and results of the study will be briefly reviewed. Next the theoretical and clinical significance of the findings will be discussed. Finally, the limitations of the study will be examined with regard to how this study may offer important implications for future research.

Summary of Findings

This investigation aimed to compare the anxiety ratings of a sample of hospital-referred traumatized youth with and without PTSD to non-clinical community controls. In a departure from previous research, this investigation systematically controlled for the potentially confounding effects of major comorbid disorders. In addition, this investigation controlled for SES and used a three-group case-control design wherein the multidimensional anxiety estimates of traumatized youth with or without PTSD were compared to the anxiety scores of non-traumatized controls. It was hypothesized that youth with PTSD would exhibit considerably higher anxiety scores, as rated on the *Revised Children's Manifest Anxiety Scale (RCMAS)* (Reynolds & Richmond, 1978), relative to traumatized children and adolescents without PTSD. It was also hypothesized that the anxiety scores of traumatized youth without PTSD and non-clinical controls would not significantly differ.

As predicted, the *RCMAS* Total Anxiety, Physiological Anxiety, Worry/Oversensitivity, and Social Concern/Concentration scores of children and adolescents with PTSD were significantly greater than the *RCMAS* scores of traumatized PTSD negatives and non-traumatized controls. Also as hypothesized, the *RCMAS* scores of the traumatized PTSD negatives and controls were not significantly different. Therefore, PTSD was consistently associated with increased anxiety across the scales of the *RCMAS*, and trauma exposure without PTSD was not.

Examined from an epidemiological perspective, the results involving the number of traumatized participants that did not have PTSD speak well for the resilience of children and adolescents in coping with adversity. More specifically, among all youth who reported experiencing a DSM-IV (APA, 1994) PTSD Criterion 1A traumatic event at evaluation, 71.1% did not develop full PTSD, and their scores on all of the *RCMAS* parameters did not significantly differ from the scores of the controls. These findings are concordant with the outcomes of studies indicating that the majority of traumatized youth do not meet criteria for PTSD (Giaconia et al., 1995; Kilpatrick et al., 2000; Saigh et al., 1999). The outcomes are also consistent with research indicating that traumatized youth without PTSD and non-traumatized controls did not differ on standardized measures of anxiety and depression (Saigh et al., 2002), anger (Saigh, Yasik, Oberfield, & Halamandaris, 2007), academic performance (Saigh, Mroueh, & Bremner, 1997), and cognitive ability (Saigh, Yasik, Oberfield, Halamandaris, & Bremner, 2006; Yasik, Saigh, Oberfield, & Halamandaris, 2007). The cumulative evidence suggests that trauma exposure in the absence of PTSD may not constitute a risk factor for childhood psychopathology.

Significance of the Study

Quay and Werry (1986) asserted that “a disorder is empirically validated by determining its relationship to other variables.... Of particular concern is differential validity; two putatively separate disorders ought not to be related in the same way to the same variable” (p. 37). The significant differences that were noted between the *RCMAS* 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, it is important to note that the *DSM-IV* PTSD field trial did not involve subjects below the age of 15 years (Kilpatrick, Resnick, & Freedy, 1998; Saigh & Bremner, 1999). While researchers have documented that the *RCMAS* is sensitive to the expression of PTSD following a variety of traumatic experiences (Dagleish, Moradi, Taghavi, Doost, & Yule, 2000; Farrell, Hains, & Davies, 1998; Saigh, 1987a, 1987b, 1987c, 1989a, 1989c, 1991), these studies are marked by methodological limitations. First, it is not clear if PTSD is specifically associated with higher *RCMAS* scores or if traumatic exposure in the absence of PTSD is associated with increased anxiety, as most of the investigations previously reviewed in this chapter compared youth with PTSD to a control group. This is a clinically significant omission, as trauma exposure frequently does not lead to PTSD as reported in Chapter II and as it is theoretically possible that traumatized children without PTSD could evidence increased anxiety. Second, the studies referenced above did not control for the potentially confounding effects of comorbid disorders. This omission is problematic, as children with PTSD frequently evidence Attention Deficit Hyperactivity Disorder (ADHD), Conduct Disorder (CD), substance abuse or dependence, and/or Major Depressive Disorder (MDD) (Merry & Andrews, 1994; Sack et al., 1993; Saigh, Sack, Yasik, & Koplewicz,

1999). As these disorders have been associated with elevated *RCMAS* scores (Bernstein, Carroll, Thuras, Cosgrave, & Roth, 2002; Ollindick, Seligman, Butcher, & Div, 1999; Perrin & Last, 1992), it is not clear whether the reported variations in *RCMAS* (Reynolds & Richmond, 1978) scores may be attributed to PTSD, major comorbid disorders, or a combination of PTSD and comorbid disorders. Finally, it is important to acknowledge that the *RCMAS* is a multi-component test (Reynolds & Richmond, 1978) and the studies previously reviewed in this chapter did not offer information regarding *RCMAS* subscale variations. This omission is significant, as information about the *RCMAS* subscale scores of traumatized children could offer significant insights about the specific way distress manifests in traumatized youth. In comparing the *RCMAS* scores of youth with PTSD, youth without PTSD, and nontraumatized controls, this study made the important determination that significantly higher levels of self-reported anxiety, as measured by the *RCMAS*, are associated with PTSD and not with exposure to trauma alone. The findings also suggest that exposure to trauma in the absence of PTSD is not associated with higher estimates of psychiatric morbidity.

The observed outcomes clearly provide evidence to support the differential validity of the classification as denoted by the Quay and Werry (1986) criteria. Viewed theoretically, these findings are consistent with the placement of PTSD within the context of anxiety disorders in the DSM-IV, as youth with PTSD evidenced higher scores on all scales of the *RCMAS* (Reynolds & Richmond, 1978) relative to traumatized PTSD negatives and controls. Although most of the *RCMAS* items do not directly reflect the diagnostic symptoms of PTSD, children with PTSD evidenced significantly higher scores on measures of general anxiety, somatic complaints, and social anxiety.

These findings are also consistent with earlier reports indicating that individuals with PTSD evidenced increased trait anxiety (Hensley & Verela, 2008), somatic problems (Solomon & Mikulincer, 1987), and social anxiety (Hoffman, Litz, & Weathers, 2002). Child PTSD investigators should also note that these findings provide a scientific basis to

support the use of the *RCMAS* (Reynolds & Richmond, 1978) total and subscale indices as treatment outcome measures.

Previous research examining anxiety in youth exposed to trauma has left the unanswered question of whether anxiety is induced by exposure to extreme stress or, rather, if it is uniquely associated with PTSD. Unlike most comparative PTSD studies (Blanchard et al., 2004; Jaycox et al., 2004; Linning, 2004; Maeser, 2008; McLeer et al., 1988; McNally, English, & Lipke, 1993), this investigation included traumatized children who did not develop PTSD as well as non-traumatized controls. The inclusion of distinct comparison groups is significant in that it allows researchers to determine whether PTSD is associated with specific emotional vulnerabilities and pathological behaviors or if traumatic exposure in the absence of PTSD is associated with significant impairments. In addition, previous research did not control for the potentially confounding effects of comorbid disorders. The present study systematically excluded individuals presenting with comorbid disorders, allowing for the assessment of relatively “pure cases.” This method was employed in order to more clearly gauge whether reported variations in *RCMAS* (Reynolds & Richmond, 1978) scores were a function of PTSD rather than a combination of PTSD and another psychiatric disorder (e.g., ADHD, MDD). Moreover, in contrast with studies that simply relied on the outcomes of self-report questionnaires to denote diagnostic status (Bayer et al., 2007; Goenjian et al., 2001; Linning, 2004; Pynoos, 1987; Schwarz & Kowalski, 1991), this study utilized a very conservative approach to case identification and employed rigorous diagnostic assessment methods in designating participants to groups. Specifically, each participant received two independent administrations of the *Children’s PTSD Inventory* (Saigh, 2003), an index with very high sensitivity and specificity, and two independent DSM-IV-based PTSD clinical interviews by a psychiatrist and a psychologist who were exceptionally experienced in the assessment of PTSD in youth.

Finally, it is important to acknowledge that the *RCMAS* is a multi-component test (Reynolds & Richmond, 1978) and the studies that were reviewed did not offer information regarding *RCMAS* subscale variations. Given the contextual gap in the literature, the present investigation presents empirical information about anxiety in traumatized children with or without PTSD relative to controls and extends our understanding of the association between trauma exposure and anxiety.

These outcomes indicate that the *RCMAS* was sensitive to the expression of PTSD in children and adolescents. Within a clinical context, the results of this study have significant implications. Taken collectively, these findings imply that clinicians need to carefully assess anxiety-related thoughts and somatic problems among children with PTSD by going beyond the standard trauma-specific diagnostic symptom clusters. Mental health clinicians may wish to utilize findings from the *RCMAS* (Reynolds & Richmond, 1978) to develop treatment program that are customized to meet the specific needs of youth with and without PTSD. In a similar vein, participants in the present study received psychiatric and psychological reports denoting findings from the comprehensive evaluation. Such information may have been particularly useful to individuals and families, as it highlighted areas of concern and specified the possible need for psychological treatment.

Limitations

As with any empirical investigation, these results should be tempered with the understanding that certain limitations are present in the research. First, children under the age of seven were not included in this investigation, which limits the generalizability of the results. The exclusion of very young children from the current study is supported by research indicating that self-report observations from youth under six years of age are often unreliable (Saigh, *in press*). According to Terr (1988), the verbal memory of

children aged five and under may stray from its origin through symbolic elaboration, cognitive reappraisal, and subtraction of content. Denham et al. (2003) also recognized that preschool-aged children often make their own emotional reflection and social information processing. Furthermore, interviewing traumatized children aged five or less, particularly those traumatized by physical and sexual abuse, is difficult not only because of children's recall deficiencies, but more often because standard interviewing formats can be ineffective with economically disadvantaged and culturally diverse children (Mordock, 2001).

Observations from this investigation must also be tempered with the understanding that youth with major comorbid disorders (e.g., major depressive disorder, conduct disorder, ADHD, substance dependence) were excluded, and results should be viewed accordingly (e.g., results may not generalize to populations with PTSD and multiple DSM-IV disorders). In a similar vein, additional comorbid disorders were not excluded, and the external validity of the study should be viewed accordingly. Furthermore, the current sample is highly representative of urban inner-city populations. Within this context, it should be noted that the PTSD group had significantly lower SES ratings on the Hollingshead index relative to traumatized PTSD negatives and controls. This finding is consistent with a large meta-analysis of data from 77 studies that examined risk factors for PTSD (Brewin, Andrews, & Valentine, 2000). Results of the meta-analysis identified a small but significant effect size for predicting PTSD given SES, wherein low SES was predictive of higher PTSD symptoms. The present findings are also consistent with prior research suggesting that socioeconomic status may be a risk factor for disaster-related PTSD (Norris et al., 2002) as well as PTSD following physical and/or sexual abuse (Romero, 2009). As such, the external validity of this study may be limited to youth with similar demographic, developmental, and psychiatric characteristics as well as trauma history backgrounds.

An additional limitation that should be considered involves social desirability, and erroneous perceptions may limit reliability of self-report measures. Further, Kessler and colleagues (2000) suggest that both the respondent's ability to understand the questions and his/her motivation can influence the assessment of psychiatric disorders, including PTSD. The outcomes should also be tempered with the realization that a cross-sectional design was employed. As such, it is not clear if PTSD induced higher levels of anxiety or if the observed anxiety existed before trauma exposure, as premorbid estimates of anxiety were not available. The ex-post facto nature of case control designs precludes randomization. Finally, it is acknowledged that the *RCMAS* was recently revised (Reynolds & Richmond, 2008) and these outcomes may not apply to the revised index. It should also be realized that anxiety has been described as having three separate response systems (e.g., subjective reports of apprehension, psychophysiological arousal, and behavioral avoidance) (Rachman, 1990), and this investigation did not consider directly observed psychophysiological and behavioral manifestations of anxiety.

Future Directions

Given the results of the study, a number of future research ideas should be considered. Given the significantly lower SES ratings of the PTSD group, future studies may wish to examine the relative contributions of demographic, familial, or environmental factors in predicting the incidence of PTSD in youth populations. With regard to developing cultural competency, prospective research may wish to compare youth from various cultural backgrounds with PTSD in order to offer data in treating diverse individuals. Similarly, an investigation with a younger sample may provide insights regarding the differential validity of the PTSD classification at an earlier developmental stage.

As epidemiological studies suggest that intentionally traumatized individuals evidence higher rates of PTSD relative to accident or disaster survivors (Breslau, Davis, Andreski, & Peterson, 1991; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Norris, 1990, 1992; Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993) and as the *Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition (DSM-IV)* (APA, 1994) indicates that PTSD “may be especially severe or long lasting when the stressor is of human design” (p. 4242), future research should also compare the self-reported anxiety of youth with PTSD who experienced intentional versus unintentional traumas.

As ADHD, CD, MDD, and substance dependence (Bernstein, Carroll, Thuras, Cosgrave, & Roth, 2002; Ollindick, Seligman, Butcher, & Div, 1999; Perrin & Last, 1992) have been associated with elevated *RCMAS* (Reynolds & Richmond, 1978) scores, future research could also compare children and adolescents with PTSD to youth with other psychiatric disorders. Comparative information involving anxiety of participants with PTSD, ADHD, CD, MDD, or substance dependence, and controls would further our understanding of impairments across diagnostic categories and increase the external validity of empirical findings. In addition, comparative studies that include comorbid cases may further our understanding of the expression of PTSD among populations with multiple disorders.

As anxiety has been described as having three separate response systems, including subjective reports of apprehension, psychophysiological arousal, and behavioral avoidance (Rachman, 1990), future investigations may wish to examine the psychophysiological and behavioral expression of anxiety among traumatized children with or without PTSD and non-traumatized controls. Finally, the association between PTSD, anxiety, and developmental moderators (e.g., parental psychopathology, quality of parent-child interaction) should be considered in prospective research.

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