

A Comparative Analysis of  
the *Junior Eysenck Personality Inventory*  
in Traumatized Urban Youth

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## ABSTRACT

### A Comparative Analysis of the *Junior Eysenck Personality Inventory*

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This study aimed to determine if *Junior Eysenck Personality Inventory (JEPI)* scores would differentiate between youth with and without PTSD. More specifically, the study compared *JEPI* Neuroticism and Extraversion scores across youth with PTSD, trauma exposed youth without PTSD, and non-traumatized youth using a three group case control design. The *Children's PTSD Inventory* and unstructured DSM-IV based diagnostic interviews were utilized to determine diagnostic status. Given that prior research has indicated a relationship between neuroticism and internalizing disorders, and as PTSD is primarily an internalizing disorder, it was expected that youth with PTSD would have higher *JEPI* Neuroticism scores relative to trauma exposed youth without PTSD or case controls. It was further expected that *JEPI* Neuroticism scores of trauma exposed youth without PTSD and control subjects would not significantly differ. Finally, it was expected that *JEPI* Extraversion scores would not significantly differ between groups. As expected, youth with PTSD had significantly higher Neuroticism scores relative to traumatized youth without PTSD and controls. The Neuroticism scores of trauma exposed youth without PTSD and controls did not significantly differ. There were no significant differences between groups in regard to Extraversion scores. Implications for research and practice were considered

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## Chapter I

### THE HISTORY OF POSTTRAUMATIC STRESS

#### Historical Background

Posttraumatic Stress Disorder (PTSD) was introduced in the third edition of the Diagnostic and Statistical Manual (DSM-III; American Psychiatric Association [APA], 1980). However, descriptions of posttraumatic psychological reactions have been documented as far back as the 21<sup>st</sup> century BC. Personal accounts of posttraumatic reactions have been documented since the 17<sup>th</sup> century AD. As noted in an article by Saigh, Green, and Korol (1996) “independent accounts have documented similar symptoms across time, settings, and stressors” (p. 112). The current chapter will chronicle the evolution of PTSD from the reactions described in historical accounts through current diagnostic criteria. Additionally, studies examining the construct validity of diagnostic criteria since the publication of the *DSM-III* will be reviewed.

This review of the literature was conducted using PsycInfo and Medline with multiple search terms and combinations. Terms included “Posttraumatic Stress Disorder” and “history” or “historical accounts,” “Gross Stress Reaction,” “Transient Situational Disturbance,” and “Rape Trauma Syndrome.” Result combinations (i.e., “Posttraumatic Stress Disorder” and “history” or “historical accounts”) and individual terms (e.g., “Gross Stress Reactions”) were included in the search. All results were reviewed for inclusion. Additionally, the reference list from an article (Saigh et al., 1996) and a chapter (Saigh, Yasik, Sack, & Koplewicz, 1999) by Saigh and colleagues were reviewed and relevant citations are described herein.

#### Historical Accounts of Trauma

Posttraumatic stress reactions have been documented across time and cultures. Historical reactions to trauma were compiled by Ben-Ezra (2010) in a review of historical literature.

Individual accounts of posttraumatic reactions can be found throughout the psychological and medical literature as far back as the 17<sup>th</sup> century. Clinical observations are also present in the psychological and medical literature.

**Literary References.** A literature review by Ben-Ezra (2010) looked outside of the fields of psychology and medicine by examining literary and religious texts. Within this context, he identified accounts of posttraumatic reactions in ancient Greece and Rome (e.g., descriptions of trauma from the *Iliad* and *Odyssey*), the “Middle Ages” (e.g., descriptions of nightmares and other sleep disturbances), and the Renaissance (e.g., reactions involving dissociation and intrusive thoughts). In addition, he noted reactions to rape and combat in Shakespearean plays. Similarly, Huber and te Wildt (2005) suggested that Charles Dickens described posttraumatic stress psychological symptoms in *A Tale of Two Cities*.

While these works mention historical references to posttraumatic symptoms prior to the 17<sup>th</sup> century, it is wise to note that the surveyed literature did not provide individual accounts of psychological problems after trauma exposure. Instead, works cited were posttraumatic narratives as they existed across cultures (e.g., the reactions of a group of individuals) and in works of art (e.g., fictional literature). The literary references made within the Ben-Ezra (2010) and Huber and te Wildt (2005) articles suggest that, while PTSD may be a relatively new diagnosis, cultures across time have recognized that certain physiological or psychological reactions may occur in response to traumatic events.

**Personal accounts.** Samuel Pepys’ diary of the 1666 Great Fire of London is cited as one of the earliest autobiographical accounts of a posttraumatic reaction (Daly, 1983). Pepys’ diary provides a detailed description of his own physiological and psychological reaction to the fire:

I did within these six days see smoke still remaining of the late fire in the City; and it is strange to think how to this very day I cannot sleep anight without great terrors of fire; and this very night could not sleep till almost 2 in the morning through thoughts of fire. (Pepys, 1667 as cited in Daly, 1983, p. 66)

A more recent autobiographical historical account was made by Charles Dickens (Forster, 1969 as cited in Trimble, 1981), who described his experiences during and following a railway accident. In one of his recollections, Dickens noted:

I am getting right, though still low in pulse and very nervous. Driving in Rochester yesterday I felt more shaken than I have since the accident. I cannot bear railway travelling yet. A perfect conviction, against the senses, that the carriage is down on one side (and generally that is the let, and not the side on which the carriage in the accident really went over), comes upon me with anything like speed, and is inexpressibly distressing. (Forster, 1969, in Trimble, 1981, p. 28)

Trimble (1981) believed that “nervous shock and hysteria were responsible for many of the symptoms of patients seen following railway accidents” (p. 42).

**The Medical Literature.** Emil Kraepelin created an early classification system for mental health disorders in the 19<sup>th</sup> century. Within this context, he used the term “schreckneurose” (i.e., fright neurosis) to describe symptoms he had observed in psychiatric patients:

...multiple nervous and psychic phenomena arising as a result of severe emotional upheaval or sudden fright which build up a great anxiety; it can therefore be observed after serious accidents and injuries, particularly fires, railway

derailments or collisions, etc. The clinical picture included, notably, agoraphobia as one of the possible symptoms, along with depressive mood, obsessive ideas, rumination, and hypochondriacal complaints. (Kraepelin, 1896, as translated by Jablensky, 1985, p. 737)

Also within this time frame, Page (1885) observed that while physical injury may be observed immediately following a trauma, psychological injury may appear at a later time (as cited in Trimble, 1981, p. 29). Da Costa (1871/1951), a physician treating soldiers during the American Civil War, wrote that soldiers who did not sufficiently recover from illness experienced cardiac symptoms after returning to duty. He noted that these soldiers otherwise appeared to be in good physical health. Within this context, he described a soldier who reportedly:

...noticed that he could not bear them [exertions] as formerly; he got out of breath, could not keep up with his comrades, was annoyed with dizziness and palpitation, and with pain in the chest; his accoutrements oppressed him, and all this though he appeared well and healthy. (Da Costa, 1871/1951, p. 560)

According to Da Costa (1871/1951), such symptoms were seen as a physiological reaction to combat. However, he went on to say that such symptoms occurred not only in soldiers who fought, but had also been observed in soldiers “kept under long drill” while training (p. 560). While Da Costa first described this set of symptoms as “irritable heart” (p. 559), it later became known as “Da Costa’s Syndrome” and has since been identified under many different labels (e.g., “soldier’s heart,” “aviator’s syndrome”) (Jablensky, 1985).

Similar descriptions can be found across several wars by multiple authors. Mott (1919) offered a verbatim description of the emotional distress that a British lieutenant experienced during World War I. More specifically, the officer reportedly indicated:

During the five days spent in the village of Roeux I was continually under our own shell fire and also continually liable to be discovered by the enemy, who was also occupying the village. Each night I attempted to get through his lines without being observed, but failed. On the fourth day my sergeant was killed at my side by a shell. On the fifth day I was rescued by our troops while I was unconscious. During this time I had had nothing to drink or eat, with the exception of about a pint of water. At the present time I am subject to dreams in which I hear these shells bursting and whistling through the air. I also continually see my sergeant, both alive and dead, and also my attempts to return are vividly pictured. I sometimes have in my dreams that feeling of intense hunger and thirst which I had in the village. When I awaken I feel as though all strength has left me and am in a cold sweat. For a time after awakening I fail to realize where I am, and the surroundings take on the form of the ruins in which I remained hidden for so long. Sometimes I do not think that I thoroughly awaken, as I seem to doze off, and there are conflicting ideas that I am in the hospital, and again that I am in France. During the day, if I sit doing nothing in particular and I find myself dozing, my mind seems to immediately begin to fly back to France. (Mott, 1919, pp. 126-127)

Mott further reported that these symptoms were not new mental disorders. He noted that the posttraumatic symptoms seen in soldiers did not differ from symptoms seen in civilians, with the exception that soldiers' experiences tended to be colored by their war experiences.

Weisenberg (1920) also wrote about the experiences of soldiers, describing difficult-to-treat patients in US Army barracks in New York during World War I. He indicated that patients suffering from hysteria attracted a great deal of attention.

According to Weisenberg (1920):

...there were present the usual types which have been so well and often described, such as aphonia, stuttering, amnesias, paralyses of both legs and more rarely of one upper or lower limb, less frequently a combination of mutism with deafness, a few cases of blindness, tremors, gaits of various sorts, and a large number of so-called epileptic or fainting cases. There is no need of describing the symptoms in these cases, for the patients presented the usual pictures which are present in all.

(Weisenburg, 1920, p. 596)

Like Page (1885), Kardiner (1941) also observed lasting psychological symptoms among World War I veterans at the Bronx VA Medical Center. He noted that physiological symptoms including "exhaustion, rapid pulse, easy fatigability, fainting spells, and epileptoid symptoms" (p. 72) continued to exist beyond the immediate traumatic event.

Studies of responses to traumatic events were also conducted during World War II. Grinker and Spiegel (1945) described several cases of US servicemen experiencing "combat neurosis" following life-threatening events. Neuroses included symptoms of "restlessness, aggression, depression, memory impairment, sympathetic overactivity, concentration

impairment, alcoholism, nightmares, phobias, and suspicion” (Saigh, 1992, p. 2). One such case described by Grinker and Spiegel (1945) was that of a 23-year-old fighter pilot who nearly died due to making a strategic error. Following the incident, he became gradually more anxious before and during missions. After 54 missions, he approached the flight surgeon and described sleep disturbances, physiological discomfort, and anxiety, stating:

Doc, I can't eat and I can't sleep, and I feel jittery all the time. I don't know what's the matter with me. I'm afraid I'm going to screw up some time. All I know is, I can't quit flying. I can't stop now and leave the fellows when I'm so close to the end. I couldn't do it. But I'm afraid that something's going to happen to me. I don't know. I can't figure it out. I know I'm not the only guy who's got butterflies in his stomach, but I don't know what to do. What should I do? (Grinker & Spiegel, 1945, p. 87)

Grinker and Spiegel (1945) also described a 24-year-old B-24 engineer gunner whose plane ran out of fuel over the English Channel. The gunner reportedly could not swim. Although he was rescued by his pilot, “As he watched the plane sink, he realized that all his friends, with the exception of the pilot, were in there going to their death” (p. 91). After returning to active duty, the airman reported sleep disturbances, intense psychological distress when recalling the event, physiological discomfort, irritability, and hypervigilance:

The night before his first scheduled mission he was very restless and had difficulty in falling asleep. In a terrifying nightmare he dreamed he was back in the plane with his crew, preparing to ditch. It was more frightening than the actual event. He saw himself in the plane, under water, trying to find a way out. The bombardier appeared and showed him a hole in the plane, motioning to him that he must get out. He awoke suddenly crying, with the realization that the

bombardier never got out. After that, he could not go back to sleep but lay quietly, smoking cigarettes, until it was time for the briefing. He could not eat breakfast and during the briefing felt strangely cold. His hands shook and he could not concentrate well on the details of the raid to come. He tried to shake off a growing feeling of dread and forced himself to get into the plane with an assumed nonchalance. On the way out to the target, everything worried him. He mistrusted the pilot, with whom he had never flown before, and worried about every unexpected bump and shudder of the plane. He had a feeling of imminent catastrophe which kept him rigidly tense, listening to any change in the pitch of the motors for signs of failure, constantly looking for an indication that his fears would be realized. When the plane passed over the sea on the way to the target, he fought off rising panic by crouching on the floor of the plane with his head clenched between his fists. Over the target, he felt more controlled and was able to stand by his guns and look for fighters, though his knees shook and his hands trembled. On the way back he continued to feel helpless, trapped, doomed, but still determined that he must not show how he felt to his crewmates. The mission was uneventful, but on his return he was weak and exhausted from the prolonged tension. He went immediately to his tent to lie down, hoping to get some relief from the iron grip of dread and fear. He had not eaten that day and wanted nothing except sleep and relief. But he slept only fitfully, each time being awakened by the dream of his bombardier showing him how to get out of the sinking plane. Instead of bringing peace, the night was as full of anxiety as the day's mission. (Grinker & Spiegel, 1945, p. 92)

During the same period, Lewis (1942) conducted a related study in England. In this study, psychological reactions were examined among a sample of civilians seeking treatment for war-related stressors. The author reported that about three quarters of patients seen for the first time for neurotic disturbances in a general practice facility in London had recently experienced air raids or other wartime stressors.

Various other clinicians and researchers also examined the effects of wartime experiences on civilians. At the 1961 *Joint Session of the American Orthopsychiatric Association and the World Federation for Mental Health* annual meeting, Eitinger (1962) used the phrase “Concentration Camp Syndrome” to refer to the psychological reactions of Norwegian concentration camp prisoners. Eitinger (1962) described survivors as having “increased fatigue, reduced power of concentration, increased irritability and emotional in-stability” (p. 372). He also noted sleep disturbances, nightmares, symptoms of anxiety, and recollections of those who had been killed (e.g., seeing a row of trees and visualizing rows of corpses hanging from the gallows).

Chodoff (1963) went on to describe patients who were seeking reparations from Germany for Nazi persecution. In this context, Chodoff (1963) made reference to the symptom presentations of 23 patients. He noted that the cases were very similar even though individual patients – being from multiple countries of origin (e.g., Germany, Poland, Czechoslovakia) – did not know one another. He suggested that the only explanation for their behavior was that they had all been subjected to similar experiences. Chodoff (1963) described these stereotyped behaviors, or “manifestations of direct anxiety” (p. 324), as:

...irritability, restlessness, apprehensiveness, and a tendency to respond with a kind of startled reaction to ordinary stimuli...by insomnia and nightmares...joint pains and

stiffness, recurrent headaches, cardiac palpitations, weakness, fatigue, and lack of energy...[and] symptoms...of anorexia, dysphagia, nausea, abdominal discomfort, and diarrhea. (Chodoff, 1963, pp. 324-325)

Like Mott (1919) who noted that the posttraumatic symptoms of World War I soldiers were colored by war-related thoughts, Chodoff (1963) described World War II patients as having recurrent thoughts about the events they had experienced. He also recognized that his patients had intrusive thoughts involving persecution and the loss of family members who had been killed. Chodoff (1963) further indicated that his patients were somewhat depressed, identifying that these patients had “a tendency toward seclusiveness, feelings of inadequacy, helplessness, apathy, and the wish to be taken care of...[and] feelings of envy, suspiciousness, hostility, and mistrust towards the world and other people” (p. 325). Patients also experienced “survival guilt” (p. 332). Importantly, Chodoff (1963) reported that symptoms persisted for years in some cases.

**Non-War-Related Accounts.** In a departure from studies involving war-related psychopathology, Adler (1943) described the reactions of hospitalized adults following the 1942 Coconut Grove fire in Boston. The author examined 46 adults exposed to the fire. Adler (1943) reported that 26 out of 46 hospitalized patients developed “post-traumatic mental complications” (p. 1101) during neuropsychiatric examinations. She indicated that male and female victims had similar psychological reactions. Similar to earlier studies, Adler (1943) found that some posttraumatic symptoms were persistent. Thirteen of her patients continued to suffer “from general nervousness and anxiety neuroses” (Adler, 1943, p. 1101) nine months following the incident. Patients were described as having intrusive thoughts (e.g., “recollections of being choked and trampled”), fears of dying, general irritability, sleep disturbance, and anxiety (p. 1099).

In another manuscript, Adler (1945) attempted to discover the “genesis of neuroses” (p. 75) by considering the various circumstances to which a person may respond with posttraumatic neurosis. Adler described both “fright” and “conflict” neuroses (p. 75). She noted that when people experience a particularly harrowing event (e.g., Coconut Grove fire) they might develop fright neurosis. Adler (1945) then described conflict neuroses, which were symptoms that followed slight injuries or the anticipation of being harmed. The anticipation of being placed in a harmful future event, she argued, could result in delayed symptoms following a trauma exposure (e.g., a firefighter having nightmares when asked to return to work). Adler (1945) further indicated that such cases might respond in ways that are similar to individuals who experienced more catastrophic events, even if they had no physical injury or only a minor injury.

**Trauma Experiences of Children.** While the majority of documentation for posttraumatic stress symptoms has been in regard to adult presentation, several studies have also examined the reactions of children to traumatic events. A study by Bender and Blau (1937) described 16 children (aged 5-12 years) who had been admitted to the children’s psychiatric ward at Bellevue Hospital for observation following reported sexual contact with adults. While the authors noted that not all of the children experienced negative outcomes, they established that for some children, the sexual encounters resulted in “immediate harmful effects on personality development” (p. 516). These children were described as experiencing anxiety, irritability, hyperactivity, restlessness, overactivity, inattention, and preoccupation, displaying avoidance behaviors, and displaying sexual re-enactment.

Mercier and Despert (1943) described several cases of French children who experienced acute anxiety following war traumas. These authors reported that an 11 year-old child told his mother in 1925, “When I am 26 I will have been killed at war a long time ago” (p. 267). A 9

year-old girl who fled her home with her mother, grandmother and 17 month-old sibling reportedly heard her caretakers verbalizing worries over the approaching German army. The child's mother reported that her daughter asked, "Do you certainly think they are going to kill all of us?" (p. 267). She was said to have somatic symptoms, including diarrhea and amnesia regarding daily tasks. A 4 year-old boy was described as shrieking, then becoming silent just prior to an air raid before attempting to hide in a gutter during the attack. He presented with a somatic reaction, which included rashes on his face, torso, feet, and hands.

Mercier and Despert (1943) described other lasting reactions of children after trauma. The authors described two children who crossed from a German occupied zone into a non-occupied zone, accompanied by a stranger who posed as their father. During an inspection by a German unit, the children remained quiet; however, after reaching the United States, the older child cautioned the younger child not to speak of the event, expressing fear that "they might still take us" (p. 269).

In a similar study, 8,000 British school children (age range: 5-14) were examined following air raids during World War II (Bodman, 1941). Results indicated that about 4% (n=300) of the children evidenced psychological problems (i.e., "general nervousness, trembling, crying, and aggressive behaviour") or psychosomatic complaints (i.e., "headaches, anorexia, indigestion, enuresis, soiling, pallor, and epistaxis") (Bodman, 1941, p. 486). Younger children (age range: 5-7) were found to have more psychological symptom expression and sleep difficulties than older children (age range: 11-14) in the study. Among a sample of 44 children exposed to a direct attack on a hospital where they were receiving care, 27 experienced acute symptoms (e.g., sweating, fright) and five of the youngest (age range: 1-5 1/2) experienced persistent symptoms following the incident. Within both groups, the youngest children exhibited

the most severe and/or longest lasting symptoms. Older children (age range: 7-11) showed “a tendency to accept the raid as an adventure” (Bodman, 1941, p. 487). Overall, Bodman represented that while many children experienced psychological symptoms in response to war stressors, young children appeared to be the most affected.

In a more formal study, Carey-Trefzer (1949) examined the “nervous symptoms” (p. 35) of children who were treated at a hospital in London following war. The study was based on a review of 1,203 records from 1942-1946 and followed by an in-person evaluation of 212 children exposed to war-related stressors. According to Carey-Trefzer (1949), these children exhibited aggression, inhibition, feelings of nervousness or fear, sleep disturbances, enuresis or encopresis, stammer, tics, psychosomatic symptoms (e.g., diarrhea, vomiting, asthma, fits or heart attacks), school delinquency, and difficulty in school. Of note, the author found that 30.6% of children exhibited difficulties in school while experiencing neurotic symptoms. Once the symptoms remitted, however, the children no longer experienced school difficulties.

Carey-Trefzer (1949) reported that the most persistent reactions of children in the study followed evacuation experiences. Similarly to the Bodman (1941) study, Carey-Trefzer (1949) indicated that, while some children fared better after evacuation, others, especially younger children, showed aggravated symptoms. Being sent away created “deep and persisting disturbances” (Carey-Trefzer, 1949, p. 542). Children described as nervous prior to the war reportedly “reacted far more to an experience than, for instance, his normal sibling” (p. 549). The “greatest number of disturbances” (e.g., anxiety, enuresis) followed air raids and changes in family life (e.g., father leaving or returning home) (Carey-Trefzer, 1949, p. 539). Symptoms in children who experienced air raids or changes in family life were more likely to end once the stressor was removed compared to symptoms following evacuation experiences. In fact, Carey-

Trefzer (1949) described several cases of children returning to normal functioning when they received emotional support from their mothers. However, the author also noted that children whose mothers exhibited nervous or neurotic behaviors continued to show symptoms of distress for several months after exposure. Distress in children in the presence of a parent tended to occur more often in younger children, who would look to their parent for guidance on how to respond to the event. In this context, it was observed that “If a child had a neurotic mother, we found that his chances of reacting neurotically to bombing incidents were increased, and that such disturbances showed a tendency to persist” (Carey-Trefzer, 1949, p. 547).

### **The American Psychological Association’s Diagnostic and Statistical Manuals**

In reaction to psychiatric morbidity following the wars (Saigh, 1992; Saigh et al., 1996), the American Psychiatric Association’s (APA) Committee on Nomenclature and Statistics included the diagnosis of “Gross Stress Reaction” in the first edition of the Diagnostic and Statistical Manual of Mental Disorders (*DSM-I*; APA, 1952). Since the publication of the first edition, the *DSM* has undergone several revisions. While the first iteration included vague references to potential symptoms, the *DSM* has included more refined diagnostic criteria and symptom clusters since the publication of the third version. Studies examining the validity of the diagnoses with both adults and children will be reviewed.

**The *DSM-I*: Gross Stress Reaction.** As described in the first iteration of the *DSM*, Gross Stress Reaction was experienced by individuals with “normal” functioning prior to experiencing “severe physical demands or extreme stress, such as in combat or civilian catastrophe (fire, earthquake, explosion, etc.)” (APA, 1952, p. 40). Like all diagnoses in the *DSM-I*, operational criteria for making a diagnosis of Gross Stress Reaction were not included.

***Gross Stress Reaction Studies of Adults.*** Studies of posttraumatic reactions resulting from war stressors continued to be explored following the publication of the *DSM-I*. Studies by Noble, Roudebush, and Price (1952) and Temperau (1956) examined fear reactions in men who served in the armed forces during the Korean war. Noble et al. (1952) examined 75 veterans on an orthopedic ward who had suffered war-related injuries. The authors reported that 42 veterans displayed psychiatric symptoms such as startle reactions and sleep disturbances ranging from mild to severe. A severe startle reaction, for example, was observed in one man who threw himself to the ground upon hearing a car backfire. The authors noted that the psychiatric symptoms experienced by men in the study did not appear to be related to the severity of their injury:

Approximately the same proportion of psychiatric symptoms was found in those moderately as in those seriously wounded...In other words, the psychiatric disturbance appeared to relate to factors other than the nature of the injury itself and can be considered as a reflection of the patient's personality, precombat, and combat experience. (Noble et al., 1952, p. 497)

Importantly, the Noble et al. (1952) observation regarding wounded Korean veterans is consistent with Adler's (1945) observations following the Cocoanut Grove fire that psychological symptoms are not necessarily related to an actual physical injury, but may be related to the fear of injury. Adler (1945) had previously noted that:

For a long time the opinion was held that post-traumatic neuroses were the result of the physical injury itself. However, since World War I accumulated evidence has shown that...the mere anticipation of an injury can bring about the same results as the injury itself. (Adler, 1945, p. 76)

The aforementioned study by Temperau (1956) examined reactions of 15 men on active military duty who reported a fear of flying. Their reactions included tension, panic, having a negative attitude towards others, headache, diarrhea, confusion, restlessness, and anxiety when faced with situations similar to those in which the trauma had been experienced. One pilot's experience was described as follows:

During a tactical intercept training mission in early 1953, it had been necessary to fly through a heavy thunderstorm relying completely on instruments. He first became slightly apprehensive at seeing "St. Elmo's fire" bouncing off the wings, then noticed that he was losing airspeed. The instrument panel began to swim before his eyes, he felt that the plane was tumbling (a forward, end-over-end motion) and out of control and his orientation in space was lost. He elected to bail out but the seat ejection apparatus failed and the canopy jammed. After a panic-stricken minute or two he was able to butt the canopy away with his head and crawl free of the plane. He parachuted to safety and was rescued a short time later, having sustained a few minor injuries during bail-out....He quickly found that whenever it became necessary to fly in "weather" he felt panicky, lost confidence in his instruments, and seemed to be obsessed with the idea that he would crash. The instrument panel seemed somehow strange and unfamiliar and the cross-checking of instruments necessary to determine his aircraft attitude became labored, no longer automatic. (Temperau, 1956, p. 221)

Similar to the reactions of the pilot previously described by Grinker and Spiegel (1945), Temperau (1956) noted that the pilots observed in his study typically developed a fear of flying following a "harrowing experience or the death of a close friend in an aircraft accident" (p. 220).

At the time of publication of the *DSM-I*, it was assumed that Gross Stress Reaction was acute and, once treated, people would quickly return to their previous level of functioning (Fletcher, 1996). Contrary to this assertion, Archibald, Long, Miller, and Tuddenham (1962) posited that Gross Stress Reaction may persist over time. They reported that while many prior studies examined Gross Stress Reaction as transient or as lasting for only a few years, no one “fully recognized that many veterans retain their original symptoms of startle reaction, recurrent nightmares, irritability, and headaches largely unchanged” (p. 317) for extended periods of time. Results of their study indicated that veterans diagnosed with Gross Stress Reaction continued to display symptoms “after a decade and a half” (p. 317).

***Gross Stress Reaction Studies of Children.*** Studies of children were also conducted within this timeframe. One study by Bloch, Silber, and Perry (1956) examined children who had experienced a tornado. Data were collected from parents and clinicians for 185 children. Results indicated that children displayed anxiety involving leaving their parent or home and startle reactions to noises, experienced enuresis, sleep disturbance (e.g., night terrors), and irritability, and avoided reminders of the trauma.

**The *DSM-II*: Transient Situational Disturbances.** The APA went on to publish the second edition of the *DSM* in 1968 (*DSM-II*; APA, 1968). In this second iteration, the term Transient Situational Disturbances replaced the former diagnosis Gross Stress Reaction. Transient Situational Disturbances were described as “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” (p. 48). The *DSM-II* criteria indicated that if “the symptoms persist after the stress is removed, the diagnosis of another mental disorder is indicated” (p. 48). While the *DSM-II*

provided examples of stressful events (e.g., “fear associated with military combat and manifested by trembling, running and hiding”) (p. 49), the diagnosis was not operationally defined. In addition to adult presentation of the diagnosis being somewhat more clearly described, a child presentation was also described in the *DSM-II* (e.g., “irritability and depression associated with school failure and manifested by temper outbursts, brooding and discouragement”) (p. 49).

Following the publication of the *DSM-II*, studies continued to be published examining trauma reactions in adults, including men who fought in war, women who were raped, and children exposed to various traumatic stressors.

***Transient Situational Disturbances Studies of Adults.*** Horowitz and Solomon (1975) wrote a significant article describing the way in which they predicted Vietnam Veterans might present with physiological and psychological symptoms months or years following military service. The authors described the experiences of soldiers during the Vietnam War, the lack of interpersonal relationships between service members, and varying attitudes towards the war. The authors suggested that many veterans would experience a period of relief immediately following the war, but would present with stress responses after a latency period. The authors referred to this as a delayed stress response and stated that individuals who experienced a stressful event may respond in one of two ways (i.e., with intrusive-repetitive or denial-numbing tendencies). They further predicted that symptoms might consist of nightmares, flashbacks, “painful moods,” re-enactments, “impaired social relationships,” “aggressive and/or self-destructive behavior,” and fearing the loss of control when having hostile impulses (Horowitz & Solomon, 1975, p. 72).

A related study by Figley (1978) examined the interpersonal adjustment of Vietnam veterans upon returning to civilian life using a self-report questionnaire. One hundred and one returnees (combatants and non-combatants) attending college under the GI Bill were enrolled in

the study. Results indicated that veterans who did not face combat reported better interpersonal adjustment than those who did. Findings also showed that the interpersonal adjustment of combatants during military service was worse than their interpersonal adjustment prior to or following service. However, overall interpersonal adjustment appeared to improve for subjects over time.

While a specific reference to rape was not included in the Transient Situational Disturbances criteria of the *DSM-II*, reactions to rape were studied following its publication. In a study of 146 adult women who reported having been raped, Burgess and Holmstrom (1974) described "Rape Trauma Syndrome" (p. 982). They wrote about the acute (i.e., anxiety, anger and fear, muscle tension, nausea) and lasting (i.e., sleep disturbance, including nightmares; fears, including around sex; and avoidance behaviors) physical and psychological effects of rape. The authors asserted that "it is not surprising that the victim experiences a syndrome with specific symptomatology as a result of the attack made upon her," given that the act of rape is an act of violence (p. 982). The posttraumatic responses to rape were similar to reactions to other stressors such as war and natural disasters.

***Transient Situational Disturbances Studies of Children.*** Studies of children were also conducted within this period. For example, a study by Lacey (1972) examined 56 children and family members who had witnessed, or who had known others who had been killed by a landslide. A mining tip complex had collapsed after a long, heavy rain, causing the landslide. Children in the study were found to have experienced nightmares, anxiety, lack of socialization with peers (several children lost all of their friends in the slide), unstable mood, enuresis, and lack of progress in school. More specifically, the authors noted that children modeled the fears expressed by their parents of the remaining tips. For example, the children experienced feelings

of “aggression” (Lacey, 1972, p. 259) toward the local government for refusing to move the tip that caused the deaths. They also experienced fear of inclement weather such as the heavy rains that reminded them of those that had accompanied the landslide. The author noted having observed some children playing “burying” (p. 259). Yet similar to the studies of adults, most children in the study showed improvement over time.

**The *DSM-III* and the *DSM-III-R*: Posttraumatic Stress Disorder.** Diagnostic symptoms in the *DSM-I* and *DSM-II* were not operationally defined and had poor reliability across clinicians making the same diagnoses (Morey, Skinner, & Blashfield, 1986). According to Saigh, Green, and Korol (1996, p. 110) and Saigh and Bremner (1999), the multiple descriptions and terms describing posttraumatic psychological problems led to the conclusion that the criteria for making diagnoses needed to be refined and clarified.

As defined by Morey et al. (1986), the purpose of classifying psychiatric disorders is to offer “a basis for communication” (p. 47). Standard terminology should be used to facilitate communication, behaviors should be described in similar ways, and organization of the information should allow for easy retrieval of the information. The authors further indicated that having clear, well-defined, and organized criteria should allow for predictions regarding etiology and prognosis to be made, and for theories about diagnosis to be formulated.

A task force to update the *DSM* for the third time was appointed by the APA and led by Robert Spitzer (Saigh & Bremner, 1999). Under Spitzer’s oversight, operational criteria were defined and “a multi-axial approach to diagnosis” was created (Morey et al., 1986, p. 61). The Reactive Disorders committee relied upon clinical experience and reviews of the literature to define a set of diagnostic criteria for what would be called Posttraumatic Stress Disorder (PTSD; Saigh & Bremner, 1999; Saigh et al., 1996).

The 1980 publication of the *DSM-III* described PTSD as 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 stressful event would “evoke significant symptoms of distress in most people and [would be] generally outside the range of such common experiences as simple bereavement, chronic illness, business losses or marital conflict” (APA, 1980, p. 236). Saigh and Bremner (1999) described the new definition as integrating theory with practice since it included multiple types of stressors that could result in similar posttraumatic symptoms (e.g., earthquakes, torture, vehicular accidents, sexual assault). The *DSM-III* detailed an expanded set of diagnostic criteria that included exposure to extreme stress, re-experiencing symptoms (intrusive recollections), numbing/avoidance symptoms (diminished interest in previously enjoyed activities), and other symptoms that might occur following the trauma, such as sleep disturbance or memory impairment (Saigh & Bremner, 1999; Saigh et al., 1996).

Criteria for symptoms in children were included in the *DSM-III*, with “functional impairment (e.g., academic problems) recognized as a diagnostic indicator of the disorder” (Saigh et al., 1996, p. 112). Finally, the *DSM-III* included that reactions to stress could be acute (i.e., occurs within six months of the stressor), chronic (i.e., occurs for more than six months following the stressor), or delayed (i.e., does not occur for at least six months following the stressor). This was in contrast to prior versions, which had required that the reaction be acute. The *DSM-III* also introduced premorbid and comorbid diagnoses for the first time (Brett, Spitzer, & Williams, 1988).

In 1983, the *DSM-III* began to undergo a revision. At this point, the diagnostic criteria were updated and the Diagnostic and Statistical Manual of Mental Disorders-Revised (*DSM-III-*

R) was published in 1987 (Saigh, 1992). Symptoms were organized “into reexperiencing, numbing/avoidance, and psychophysiological reactivity symptom clusters” (Saigh et al., 1996, p. 111). Of these, the reexperiencing symptoms cluster was expanded: a diagnosis required only one of the symptoms in this cluster, as opposed to two required in the previous version. The numbing symptoms cluster was also expanded such that more numbing symptoms were required to make a diagnosis. Finally, the newly experienced symptoms cluster was revised to focus on increased arousal and excluded “feelings of guilt” (Saigh & Bremner, 1999, p. 6). Overall, symptoms, were more detailed and more clearly organized, including those for children (Brett et al., 1988).

Following the inclusion of PTSD in the *DSM-III*, several studies examined the validity of the PTSD classification. Studies included those focused on veterans’ experiences (Zimering, Caddell, Fairbank, & Keane, 1993) and those of adults targeted by violence (Kinzie & Goetz, 1996), as well as on the PTSD diagnosis in adolescents and children (Saigh, 1988, 1989c; Saigh, 1991).

*DSM-III Posttraumatic Stress Disorder Studies of Adults.* Zimering et al. (1993) examined the construct validity of the *DSM-III* PTSD diagnosis using a sample of Vietnam veterans. Thirty-two adult males, 16 of whom were diagnosed with PTSD but had not yet received treatment, and 16 of whom were not diagnosed with PTSD, were enrolled in the study. For this study, the researchers operationally defined six PTSD symptom criteria from across all symptoms categories, creating tasks that could be completed in a laboratory setting. Subjects with PTSD were administered the Jackson PTSD Structured Interview (Keane, Fairbank, Caddell, Zimering, & Bender, 1985) and an MMPI-PTSD subscale that had been validated for veterans with PTSD (Fairbank, Keane, & Malloy, 1983; Keane, Malloy, & Fairbank, 1984). If

participants met criteria on these measures, a “laboratory-based psychophysiological assessment procedure” (Zimering et al., 1993, p. 330) that previously had been shown to effectively discriminate between veterans with and without PTSD (Malloy, Fairbank, & Keane, 1983) was used to verify the results and confirm diagnosis. For control participants (without PTSD), doctoral-level clinicians administered clinical interviews, the PTSD Checklist, and the MMPI-PTSD subscale to confirm that these participants did not qualify for a PTSD diagnosis “or any other DSM-III affective or schizophrenic disorder” (Zimering et al., 1993, p. 330). Intrusive thoughts, physiological arousal, perception of affect (to measure emotional numbing), ability to concentrate, memory ability, and autonomic arousal during exposure to combat and non-combat sounds were examined. Results indicated that all tasks, with the exception of the memory impairment task, differentiated participants with and without PTSD. The authors concluded that their findings supported the validity of the *DSM-III* PTSD classification.

Another study examined Cambodian adult refugees who had been imprisoned in concentration camps for two to four years to measure the validity of PTSD in a non-western population (Kinzie, Fredrickson, Ben, Fleck, & Karls, 1984). Diagnostic interviews were conducted with all participants. The Diagnostic Interview Schedule PTSD module (Robbins, Helzer, & Craughan, 1982) was used to assess for PTSD symptoms. Symptoms expressed by refugees included avoidance of activities that might remind them of their experiences in Cambodia (e.g., violent movies) as well as anxiety-inducing thoughts of their concentration camp experiences, panic or anxiety, sleep disturbance (including nightmares), startle response, irritability, aggression, poor interpersonal relations with close family members, and memory and concentration impairment. The authors concluded, based on their results, that Cambodian

participants experienced similar psychological responses to traumatic events relative to traumatized Western populations.

***DSM-III Posttraumatic Stress Disorder Studies of Children.*** The validity of *DSM-III* criteria for PTSD in adolescents and children was also examined (Saigh, 1988, 1989c). Saigh (1988) studied 72 adolescents who met criteria for PTSD (n=24), simple phobia (n=24) and no disorder (controls; n=24). Youth were assessed using the Children's Posttraumatic Stress Disorder Inventory (Children's PTSD Inventory; Saigh, 1987), the Reynold's Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond 1978), the Test Anxiety Inventory (TAI; Spielberger, 1980) and the Children's Depression Inventory (CDI; Kovacs 1981). Results indicated that adolescents diagnosed with PTSD reported higher levels of anxiety, depression, and behavioral issues than adolescents diagnosed with simple phobia and control subjects. In a related investigation, Saigh (1989c) examined children who met criteria for PTSD (n=231), simple phobia (n=32), or no disorder (controls; n=35). Youth were examined using the RCMAS (Reynolds & Richmond 1978), the CDI (Kovacs 1981), and the Conners' Teacher Rating Scale (CTRS; Conners, 1969). These results also indicated that children with PTSD had higher levels of anxiety, depression, and misconduct relative to children with simple phobias and control subjects. The outcomes of these studies indicated that PTSD in the *DSM-III* was a valid classification for adolescents and children.

In a related study that sought to determine how different sorts of traumatic experiences influence youth, Saigh (1991) examined a sample of Lebanese children (age range: 9-12) exposed to one of four types of trauma: direct experience, observation, verbal mediation, or some combination of the three. Of the 840 originally referred participants, 230 cases of PTSD were identified based on administration of the Children's PTSD Inventory (Saigh, 1989b). Forty-

seven youth were originally considered for the control group. After administration of the Children's PTSD Inventory, 35 subjects did not meet criteria for PTSD and were included as control participants. All participants completed the RCMAS and CDI and were rated by their teachers using the CTRS. Results indicated that anxiety, depression, or misconduct scores did not vary across PTSD groups. All of the participants with PTSD had significantly higher RCMAS, CDI, and CTRS scores relative to the nontraumatized controls. These results served to further validate the diagnosis of PTSD in youth, including those who experienced only verbal mediation of a traumatic event in non-Western populations.

**The *DSM-IV* and the *DSM-IV-TR*: Posttraumatic Stress Disorder.** The *DSM* underwent another revision beginning in 1988, resulting in the publication of the fourth edition in 1994 (*DSM-IV*; APA, 1994; Saigh & Bremner, 1999). The update was based primarily on literature reviews (Davidson & Foa, 1993) that addressed “clinical phenomenology (course, subtypes, and symptomatic manifestations), epidemiology (prevalence, features, and risk factors), and relation to other disorders (e.g., phobias and dissociative disorders)” (Saigh & Bremner, 1999, p. 6). It also included findings from field trials (Kilpatrick, Resnick, & Freedy, 1993) that examined various stressors and symptoms, as well as variations in onset and duration of symptoms.

With regard to trauma, the fourth version of the *DSM* no longer required that a traumatic experience be “outside the range of normal human experience” (APA, 1994, p. 428). Criterion A (Exposure to a traumatic event) was amended in the *DSM-IV* to indicate that a person must have:

- “experienced, witnessed, or [be] confronted with an event or events that involve actual or threatened death or serious injury, or a threat to the physical integrity to self or others” or

- “the person’s response involved intense fear, helplessness, or horror” that could be expressed as “disorganized or agitated behavior” in children (APA, 1994 p. 428).

Based on research indicating that witnessing a traumatic event could lead to posttraumatic stress disorder (Saigh, 1991; Smith & Holford, 1993), the observation of a traumatic event (“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 part”) was added as part of the operational definition (APA, 1994, p. 424). For children and adolescents, “sexually traumatic events [could] include developmentally inappropriate sexual experiences without threatened or actual violence” (p. 428). Finally, criteria were added to allow for verbally mediated trauma (e.g., learning of a serious accident).

Symptom clusters were also revised. Physiological reactivity was moved to Cluster B (reexperiencing) and criteria were revised so that only one reexperiencing symptom (e.g., intrusive thoughts about the traumatic experience) needed to be present. New criteria (Criteria E and F) were added to specify duration and severity, indicating that symptoms must be present for at least one month (Criteria E) and must cause “clinically significant distress or impairment in social, occupational, or other important areas of functioning” (Criteria F; APA, 1994). Acute reactions to trauma were included as the separate, but related, diagnosis of Acute Stress Disorder (Andreasen, 2004).

The *DSM-IV* text, but not the diagnostic or symptom criteria, was updated again in 2000 with the publication of the *DSM-IV-TR* (APA, 2000). After the publication of the fourth edition of the *DSM*, several new studies examined the validity of the diagnosis in adults and children.

***DSM-IV Posttraumatic Stress Disorder Studies of Adults.*** Jamil, Nassar-McMillan, and Lambert (2004) examined Iraqi Gulf War refugees who were also veterans of the Iraqi Gulf War

with (n=19) and without (n=13) PTSD. Participants were administered an interview questionnaire, the PTSD Checklist-Military Version (PCL-M; Weathers, Litz, Herman, Huska, & Keane, 1993), to determine diagnostic status. The researchers assessed for depression using a measure created from items taken from or based on the Primary Care Evaluation of Mental Disorders (PRIME-MD; Spitzer et al., 1996). They also assessed panic and anxiety using a measure based on items from the PRIME-MD (Weathers et al., 1993). Participants were administered items from the Marlowe-Crowne Social Desirability Scale (MCSDS; Strahan & Gerbasi, 1972) to assess their tendency to provide answers that were deemed to be socially desirable. Results indicated that participants with PTSD had higher levels of depression and panic, but not anxiety, relative to refugees without PTSD.

A related study by Golier et al. (2002) assessed memory ability in adult Holocaust survivors with (n=31) and without (n=16) PTSD, and control cases (n=35). Diagnoses of PTSD were confirmed using the Clinician-Administered PTSD Scale (CA-PTSD; Blake et al., 1995) and the Structured Clinical Interview for *DSM-IV* (SCID; First, Spitzer, Gibbon, & Williams, 1997). Explicit memory was assessed using a paired-associate recall task where participants were asked to remember pairs of related or unrelated words; implicit memory was assessed with a word stem completion task where participants were asked to complete three-letter word stems (Lussier, Peretz, Belleville, & Fontaine, 1989). Two subtests from the Wechsler Adult Intelligence Scale, Revised (WAIS-R; Wechsler, 1981), were used to measure approximate overall intelligence. Results indicated that participants with PTSD had lower scores on both high- and low-recall explicit memory tasks and on IQ tasks as compared to participants without PTSD and control subjects. There were no differences in the implicit memory task across

groups. Traumatized participants without PTSD and control subjects did not differ on the outcome measures.

*DSM-IV Posttraumatic Stress Disorder Studies of Children.* A study by Yasik, Saigh, Oberfield, and Halamandaris (2007) assessed memory ability in youth exposed to a traumatic event with (n=29) and without (n=62) PTSD, and nontraumatized control subjects (n=40). The Children's PTSD Inventory (Saigh, 2003b) and separate clinical interviews by a psychologist and psychiatrist were used to confirm diagnosis of PTSD or absence of diagnosis in all participants. The Diagnostic Interview for Children and Adolescents, Revised (DICA-R; Reich, Leacock, & Shanfeld, 1995) was used to assess for comorbid diagnoses of Attention-Deficit/Hyperactivity Disorder, Conduct Disorder, Major Depressive Disorder, substance dependence, and psychotic symptoms. To measure the severity of the stressor experienced by the child, The Severity of Psychosocial Stress Scale: Children and Adolescents (SPSS-CA; APA, 1987) from the *DSM-III* was used. Participants were administered the Wide-Range Assessment of Memory and Learning (WRAML; Sheslow & Adams, 1990) to evaluate verbal and visual memory and learning. Results indicated that subjects with PTSD had lower general memory and learning scores relative to the control group. The PTSD group also had lower verbal memory scores than trauma-exposed youth without PTSD and control subjects. There were no differences between groups on visual memory scores. There were no significant differences found between traumatized PTSD negatives' and control subjects' learning and memory task scores. Results indicated that PTSD, but not trauma without PTSD, accounted for the learning and memory differences found in this study.

Intellectual ability in youth with and without PTSD has also been investigated. A study by Saigh, Yasik, Oberfield, Halamandaris, and Bremner (2006) examined youth exposed to a

traumatic event with PTSD (n=26), traumatized youth without PTSD (n=57), and nontraumatized controls (n=37). The diagnostic and stressor severity measures used are the same as those described in the Yasik et al. (2007) study. The Wechsler Intelligence Scale for Children, Third Edition (WISC-III; Wechsler, 1991) was used as the dependent measure. Results indicated that participants with PTSD had significantly lower Full Scale and Verbal IQ scores compared to traumatized youth without PTSD and nontraumatized controls. Saigh and colleagues also reported that the WISC-III test scores of traumatized youth without PTSD and nontraumatized controls were consistently not significantly different on all outcome measures.

In terms of subtest scores, youth with PTSD had significantly lower Vocabulary Arithmetic, Similarities, and Comprehension scores than traumatized youth without PTSD and nontraumatized control subjects. Nonsignificant differences were reported across groups on all of the performance measures. The authors concluded that PTSD and not trauma exposure without PTSD was associated with significantly lower scores on measures of verbal ability.

**The *DSM-5*: The Most Recent PTSD Criteria.** With the update of the *DSM* to the fifth iteration (*DSM-5*; APA, 2013a), many researchers have provided commentary on the validity of the diagnosis of PTSD as well as the criteria needed to meet diagnostic criteria.

While PTSD was classified as an anxiety disorder in the *DSM-IV*, it was placed in the Trauma- and Stressor-Related Disorders category of the *DSM-5* (APA, 2013a). Several changes to the diagnostic criteria were also made. The *DSM-IV* Criterion A1 was expanded to specifically include learning about a trauma (Criterion A3 in the *DSM-5*) and repeated exposure to the details of a trauma (Criterion A4 in the *DSM-5*). Criterion A2 in the *DSM-IV*, which indicated that response to the trauma had to involve “intense fear, helplessness, or horror” (APA, 2000, p. 468) was removed as a diagnostic criterion in the *DSM-5*. Results of a study conducted

by O'Donnell, Creamer, McFarlane, Silove, and Bryant (2010) support the removal of this criterion, as nearly one quarter of their sample did not meet A2 criteria.

The B cluster (reexperiencing) was edited to indicate that criteria are examples of “intrusion symptoms” (APA, 2013a, p. 271) rather than persistent reexperiences of a traumatic event. The C criteria cluster (numbing/avoidance) was edited to remove “numbing of general responsiveness” as part of “persistent avoidance” (APA, 2000, p. 468). The C cluster was also reduced to only two criteria:

- “Avoidance of or efforts to avoid distressing memories, thoughts, or feelings about or closely associated with the traumatic event(s)” and
- “Avoidance of or efforts to avoid external reminders (people, places, conversations, activities, objects, situations) that arouse distressing memories, thoughts or feelings about or closely associated with the traumatic event(s)” (APA, 2013a, p. 271).

A new cluster (D cluster) was added for “negative alterations in cognitions and mood associated with the traumatic event(s), beginning or worsening after the traumatic event(s) occurred,” (APA, 2013a, p. 271). The *DSM-IV* criteria for “increased arousal” (DSM-IV D cluster) (APA, 2000, p. 468) was changed to “Marked alterations in arousal and reactivity” (DSM-5 E cluster) (APA, 2013a, p. 272). The criterion for irritability and anger outbursts was expanded to include examples (e.g., verbal aggression) and a new criterion (i.e., “reckless or self-destructive behavior”) was added (APA, 2013a, p. 272). A new criteria (F) was also added to indicate that the disturbance must not be “attributable to the physiological effects of a substance...or another medical condition” (APA, 2013a, p. 272). Finally, specifiers for dissociative symptoms (depersonalization and derealization) were added. In addition, the *DSM-IV* specifiers for acute

or chronic subtypes were removed. The *DSM-IV* specifier for delayed expression was altered from indicating that symptoms onset “is at least 6 months after the stressor” (American Psychiatric Association, 2000, p. 468) to “full diagnostic criteria are not met until at least 6 months after the event (although the onset and expression of some symptoms may be immediate)” (American Psychiatric Association, 2013a, p. 272).

In addition to updated criteria as noted above, the *DSM-5* also includes symptom criteria specifically for children aged 6 years or under. For this age group, Cluster A (Exposure) includes only direct experience or witnessing a trauma. Clusters C and D were combined to create a new cluster C and negative alterations include only four criteria. Alterations of arousal (cluster D) criteria do not include “Reckless or self-destructive behavior” (APA, 2013a, p. 272). All other symptoms are the same as those for adults.

Disagreements about the utility of the changes have been presented in the literature. For example, Zoellner, Rothbaum, and Feeny (2011) argued that the rationale for moving PTSD out of the anxiety disorders category and into the trauma- and stressor-related disorders category “is unclear, under-developed, and unsupported” and “negates the critical role of fear and anxiety in PTSD” (pp. 853-854). Those opposing the changes to the criteria have cited lack of evidence in supporting literature to indicate that changes are valid or necessary (Zoellner, Bedard-Gilligan, Jun, Marks, & Garcia, 2013).

### **Diagnostic Refinement Across the Diagnostic and Statistical Manuals**

The criteria for what is now referred to as PTSD has been refined across five revisions of the *DSM*. Beginning as a general description, Gross Stress Reaction in the *DSM* (American Psychiatric Association, 1952) was further refined into the diagnosis Transient Situational Disturbances in the *DSM-II* (American Psychiatric Association, 1968). This, in turn, evolved

into PTSD in the *DSM-III* (American Psychiatric Association, 1980). PTSD was defined using operational criteria and symptoms organized into clusters. Criteria were further refined in the *DSM-III-R* (American Psychiatric Association, 1987) and *DSM-IV* (American Psychiatric Association, 1994). Multiple studies have supported the validity of PTSD in adults and children in the third and fourth versions of the *DSM*. Finally, several changes have been made to the diagnosis in the *DSM-5* (American Psychiatric Association, 2013a). However, some have criticized the changes made to the *DSM-5*. Those opposing changes have cited the lack of research evidence to support changes in the diagnostic criteria or its move to the new category Trauma- and Stressor-Related Disorders. For now, it is difficult to understand the utility of the *DSM-5* PTSD classification in research and practice since the criteria have changed significantly from the *DSM-IV* (American Psychiatric Association, 2013b) criteria and as there is a dearth of information regarding the validity of the *DSM-5*.

At this point in time it is important to remember that Quay and Werry (1986) advised 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). Quay and Werry’s (1986) comments are particularly noteworthy, since the process for development of the *DSM-5* has been seriously questioned (British Psychological Association, 2011; Frances, 2013; Lane, 2013) and it is critically important for diagnoses to be based on a valid nosology.

## **Chapter Summary**

Throughout history, the existence of traumatic reactions for individuals from diverse cultures have been reported. Since the seventeenth century, clusters of posttraumatic symptoms that we now refer to as Posttraumatic Stress Disorder have been documented among individuals

and more formally in medical and psychological studies. These symptoms have been described using a number of different terms in historical records. The use of different appellations impeded research on the diagnosis, which “was not established until the late 20<sup>th</sup> century” (Saigh et al., 1996, p. 112). Beginning in 1952, with the first publication of the Diagnostic and Statistical Manual (APA, 1952), the term Gross Stress Reaction was established. The criteria were expanded and the term Transient Situational Disturbance was written in the *DSM-II* (APA, 1968). With the third publication of the Diagnostic and Statistical Manual (APA, 1980), the term Posttraumatic Stress Disorder (PTSD) was introduced. The *DSM-III* also included the first set of operationalized criteria for PTSD by clearly defining symptom presentation. With subsequent publications of the Diagnostic and Statistical Manual, the diagnostic criteria for PTSD were further refined.

As shown in Table 1.1, many of the symptoms cited in literature prior to the publication of the *DSM-I* can be fit to the posttraumatic stress categories delineated by the *DSM-5*. However, it is important to note that while PTSD was moved out of the Anxiety Disorders category in the *DSM-5*, countless clinicians, researchers, and other observers have documented psychological (e.g., fear) and somatic (e.g., racing heart) symptoms of anxiety as part of the clinical presentation of PTSD across time. Table 1.1 includes symptoms that could be labeled anxious symptoms, and those often found in anxious patients (e.g., rapid pulse, headache, gastrointestinal issues). Future studies should continue to explore the role of anxiety in PTSD to better understand its function as part of this disorder.

As the diagnosis has been most recently redefined (*DSM-5*; APA, 2013a), additional research will need to examine the current validity of the disorder, and to help researchers and clinicians more effectively identify, study, and treat PTSD.

**Table 1.1**

*Posttraumatic symptoms as described throughout the literature prior to DSM-I (APA, 1952) publication. Organized by DSM-5 Diagnostic Criteria for Posttraumatic Stress Disorder (APA, 2013a, pp. 271-274)*

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**B cluster (Intrusive recollections))**

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Criterion B.1 (upsetting memories; “repetitive play”) (APA, 2013a, p. 271)

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<u>Author</u>	<u>Subjects</u>	<u>Finding</u>
Kraepelin, 1896, as translated by Jablensky (1985, p. 737)	Psychiatric patients	obsessive ideas
Kraepelin, 1896, as translated by Jablensky (1985, p. 737)	Psychiatric patients	rumination
34 Chodoff (1963, p. 325)	Patients formerly persecuted by Nazis	“obsessive ruminative state in which the patient was more or less constantly preoccupied with recollections of, and ruminations about, his experiences during the persecution, and about those members of his family who had died or had been killed”
Adler (1943, p. 1099)	Adult victims of a fire	“recollections of being choked and trampled on... which usually were associated with fear of imminent death”

Criterion B.2 (upsetting dreams)

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<u>Author</u>	<u>Subjects</u>	<u>Finding</u>
Pepys, 1667, in Daly (1983, p. 66)	Autobiographical account of someone who witnessed a great fire	“to this very day I cannot sleep anight without great terrors of fire”
Mott (1919, pp. 126-127)	Autobiographical account of a soldier	“dreams in which I hear these shells bursting and whistling through the air...[and have] that feeling of intense hunger and thirst which I had in the village”
Grinker and Spiegel (1945, p. 85)	American soldiers during WWI	“nightmares of combat”
Chodoff (1963)	Patients formerly persecuted by Nazis	Nightmares

35

Criterion B.3 (reexperiencing; reenacting)

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<u>Author</u>	<u>Subjects</u>	<u>Finding</u>
Bender and Blau (1937, p. 512)	Sexually assaulted children	“infantile sex practices”
Bender and Blau (1937, p. 506)	10 year-old girl sexually assaulted by her father	“precocious sex interests”

Criterion B.4 (distress following trauma cues)

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<u>Author</u>	<u>Subjects</u>	<u>Finding</u>
Eitinger (1962, p. 372)	Norwegian concentration camp prisoners	“painful associations” (e.g., seeing a row of trees and visualizing rows of corpses hanging from the gallows)
Adler (1945, p. 76)	n/a	“the mere anticipation of an injury can bring about the same results as the injury itself”
Mercier and Despert (1943, p. 269)	Two children in the US after fleeing Nazi Germany	Older child cautioned a younger child to refuse to discuss their journey out of Germany due to fear that the Nazis would “take” them

Criterion B.5 (“physiological reactions” to trauma cues (APA, 2013a, p. 271))

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36

<u>Author</u>	<u>Subjects</u>	<u>Finding</u>
Grinker and Spiegel (1945, p. 84)	American soldiers during WWI	“feel constantly jittery and apprehensive or display severe tension and fear over the target area”
Chodoff (1963)	Patients formerly persecuted by Nazis	Apprehensiveness

**C cluster (“persistent avoidance” (APA, 2013a, p. 271))**

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<u>Author</u>	<u>Subjects</u>	<u>Finding</u>
Grinker and Spiegel (1945, p. 85)	American soldiers during WWI	“others...refusing to think about either the past or the future, live only for the moment”

Criterion C.1 (avoidance of internal reminders of the trauma event)

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No references found

Criterion C.2 (avoidance of external reminders of trauma event)

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No references found

**D cluster (cognitive and mood changes)**

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37 Criterion D.1 (memory impairment)

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<u>Author</u>	<u>Subjects</u>	<u>Finding</u>
Weisenburg (1920, p. 596)	American soldiers during WWI	amnesias

Criterion D.2 (negativity)

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<u>Author</u>	<u>Subjects</u>	<u>Finding</u>
Chodoff (1963, p. 325)	Patients formerly persecuted by Nazis	“feelings of envy, suspiciousness, hostility, and mistrust towards the world and other people”
Chodoff (1963, p. 325)	Patients formerly persecuted by Nazis	“feelings of inadequacy, helplessness,”

Criterion D.3 (distorted thoughts)

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<u>Author</u>	<u>Subjects</u>	<u>Finding</u>
Grinker and Spiegel (1945, p. 84)	American soldiers during WWII	“confusion in regard to the environment”
∞ Bender and Blau (1937, p. 502)	Male child sexually assaulted by his father	“preoccupied and bewildered”

Criterion D.4 (negative feelings)

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<u>Author</u>	<u>Subjects</u>	<u>Finding</u>
Kraepelin, 1896, as translated by Jablensky (1985, p. 737)	Psychiatric patients	depressive mood
Grinker and Spiegel (1945)	American soldiers during WWI	severe depression
Eitinger (1962, p. 372)	Norwegian concentration camp prisoners	““moody," "his mood changes without cause,"”
Chodoff (1963, p. 325)	Patients formerly persecuted by Nazis	depressive manifestations

Criterion D.5 (loss of interest)

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<u>Author</u>	<u>Subjects</u>	<u>Finding</u>
Eitinger (1962, p. 372)	Norwegian concentration camp prisoners	“he is sad, moping, without interest for conversation and entertainment, not sociable enough.”
Chodoff (1963)	Patients formerly persecuted by Nazis	seclusiveness

Criterion D.6 (interpersonal detachment)

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<u>Author</u>	<u>Subjects</u>	<u>Finding</u>
Grinker and Spiegel (1945)	American soldiers during WWI	withdrawal

Criterion D.7 (lack of positive feelings)

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39

<u>Author</u>	<u>Subjects</u>	<u>Finding</u>
Chodoff (1963)	Patients formerly persecuted by Nazis	apathy

**E cluster (“Marked alterations in arousal and reactivity” (APA, 2013a, p. 272))**

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<u>Author</u>	<u>Subjects</u>	<u>Finding</u>
Kardiner (1941)	WWI veterans	Easy fatigability or exhaustion
Eitinger (1962)	Norwegian concentration camp prisoners	Increased fatigue
Chodoff (1963, p. 325)	Patients formerly persecuted by Nazis	“fatigue, and lack of energy”
Adler (1943, p. 1099)	Adult victims of a fire	Fatigue
Chodoff (1963)	Patients formerly persecuted by Nazis	Restlessness

Bender and Blau (1937)	9 year-old female child who had sexual contact with one man; 10 year-old girl sexually assaulted by her father	Restlessness
Bender and Blau (1937)	10 year-old girl sexually assaulted by her father	Overactivity
Bender and Blau (1937)	Sexually assaulted children	Hyperactivity

Criterion E.1 (irritability)

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<u>Author</u>	<u>Subjects</u>	<u>Finding</u>
Chodoff (1963)	Patients formerly persecuted by Nazis	Irritability
Adler (1943, p. 1099)	Adult victims of a fire	“general irritability”
40 Grinker and Spiegel (1945)	American soldiers during WWI	Increased irritability
Eitinger (1962)	Norwegian concentration camp prisoners	Increased irritability
Eitinger (1962)	Norwegian concentration camp prisoners	Emotional in-stability
Bender and Blau (1937, p. 505)	9 year-old female child who had sexual contact with one man	“Unruly behavior”
Bender and Blau (1937)	Sexually assaulted children	“rebellious, disobedient and disrespectful”
Bodman (1941, p. 486)	British school children (age range: 5-14)	“Aggressive behavior”
Carey-Trefzer (1949)	Children following WWII	Aggressive

Criterion E.2 (recklessness)

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No references found

Criterion E.3 (“Hypervigilance” (APA, 2013a, p. 272))

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<u>Author</u>	<u>Subjects</u>	<u>Finding</u>
Kraepelin, 1896, as translated by Jablensky (1985, p. 737)	Psychiatric patients	hypochondriacal complaints

Criterion E.4 (easily startled)

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<u>Author</u>	<u>Subjects</u>	<u>Finding</u>
Chodoff (1963, p. 324)	Patients formerly persecuted by Nazis	“a tendency to respond with a kind of startled reaction to ordinary stimuli”

41

Criterion E.5 (difficulty concentrating)

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<u>Author</u>	<u>Subjects</u>	<u>Finding</u>
Eitinger (1962)	Norwegian concentration camp prisoners	“reduced power of concentration”

Criterion E.6 (disturbed sleep)

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<u>Author</u>	<u>Subjects</u>	<u>Finding</u>
Pepys, 1667, in Daly (1983, p. 66)	Autobiographical account of an adult who witnessed a great fire	“this very night could not sleep till almost 2 in the morning through thoughts of fire”
Grinker and Spiegel (1945, p. 85)	American soldiers during WWI	“wakefulness and tension”
Eitinger (1962, p. 372)	Norwegian concentration camp prisoners	“disturbed sleep, with nightmares and other anxiety phenomena”

Carey-Trefzer (1949)	Children following WWII	Sleep disturbances
Chodoff (1963)	Patients formerly persecuted by Nazis	insomnia
Adler (1943)	Adult victims of a fire	insomnia

**Symptoms not included in *DSM-5* PTSD criteria**

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Anxiety

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<u>Author</u>	<u>Subjects</u>	<u>Finding</u>
Forster, 1969, in Trimble (1981, p. 28)	Autobiographical account (Charles Dickens)	“low in pulse and very nervous”
Adler (1943, p. 1101)	Adult victims of a fire	“general nervousness and anxiety neuroses”
<sup>42</sup> Adler (1943, p. 1099)	Adult victims of a fire	“Patients with symptoms of "anxiety neurosis" complained mainly of fears and anxiety which they were unable to control”
Bodman (1941, p. 486)	British school children (age range: 5-14)	“general nervousness, trembling, [and] crying”
Bender and Blau (1937, p. 502)	Male child sexually assaulted by his father	“considerable anxiety”
Grinker and Spiegel (1945)	American soldiers during WWI	Anxieties; severe anxiety
Trimble (1981, p. 42)	Patients who experienced railway accidents	“nervous shock and hysteria”
Carey-Trefzer (1949)	Children following WWII	feelings of nervousness or fear
Grinker and Spiegel (1945)	American soldiers during WWI	Phobic reactions

Kraepelin, 1896, as translated by Jablensky (1985, p. 737)	Psychiatric patients	Agoraphobia
Da Costa (1951, p. 560)	soldiers of the American Civil War	“out of breath”

Cardiac

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<u>Author</u>	<u>Subjects</u>	<u>Finding</u>
Kardiner (1941)	WWI veterans	Rapid pulse
Da Costa (1951, p. 560)	Soldiers of the American Civil War	Cardiac symptoms including dizziness, palpitations, chest pain
Chodoff (1963, p. 325)	Patients formerly persecuted by Nazis	Cardiac palpitations
Carey-Trefzer (1949)	Children following WWII	Fits or heart attacks

43

Headache

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<u>Author</u>	<u>Subjects</u>	<u>Finding</u>
Chodoff (1963, p. 325)	Patients formerly persecuted by Nazis	Recurrent headaches
Bodman (1941, p. 486)	British school children (age range: 5-14)	Headaches

Loss of consciousness

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<u>Author</u>	<u>Subjects</u>	<u>Finding</u>
Weisenburg (1920, p. 596)	American soldiers during WWI	“epileptic or fainting cases”
Kardiner (1941)	WWI veterans	epileptoid symptoms; “fainting spells”

Gastrointestinal

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<u>Author</u>	<u>Subjects</u>	<u>Finding</u>
Chodoff (1963, p. 325)	Patients formerly persecuted by Nazis	“symptoms...of anorexia, dysphagia, nausea, abdominal discomfort, and diarrhea”
Bodman (1941, p. 486)	British school children (age range: 5-14)	Anorexia and indigestion
44 Grinker and Spiegel (1945, p. 85)	American soldiers during WWI	“constant tension numbs their appetites, and as a consequence they lose weight”
Carey-Trefzer (1949)	Children following WWII	Vomiting
Mercier and Despert (1943, p. 267)	9 year-old girl during WWII	Diarrhea
Carey-Trefzer (1949)	Children following WWII	Diarrhea

Gait

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<u>Author</u>	<u>Subjects</u>	<u>Finding</u>
Weisenburg (1920, p. 596)	American soldiers during WWI	“paralyses of both legs and more rarely of one upper or lower limb”
Weisenburg (1920, p. 596)	American soldiers during WWI	“gaits of various sorts”

Chodoff (1963, p. 325)                      Patients formerly persecuted by Nazis                      “joint pains and stiffness”

Enuresis and Encopresis

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Author

Subjects

Finding

Bodman (1941, p. 486)

British school children (age range: 5-14)

Enuresis; “soiling”

Carey-Trefzer (1949)

Children following WWII

Enuresis; encopresis

Expressive Language

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Author

Subjects

Finding

Weisenburg (1920)

American soldiers during WWI

Aphonia

Grinker and Spiegel (1945)

American soldiers during WWII

Mutism

45 Weisenburg (1920, p. 596)

American soldiers during WWI

“A combination of mutism with deafness”

Weisenburg (1920)

American soldiers during WWI

stuttering

Carey-Trefzer (1949)

Children following WWII

Stammer

School difficulties

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Author

Subjects

Finding

Bender and Blau (1937, p. 502)

5 year-old female child sexually assaulted by her father

“retardation in her intellectual and emotional development”

Bender and Blau (1937, p. 505)	9 year-old female child who had sexual contact with one man	“Her scholastic achievements became so backward that she was placed in an ungraded class for children of defective intelligence”
Bender and Blau (1937)	10 year-old girl sexually assaulted by her father	School retardation
Carey-Trefzer (1949)	Children following WWII	School delinquency; difficulty in school while experiencing symptoms

Other

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<u>Author</u>	<u>Subjects</u>	<u>Finding</u>
Mercier and Despert (1943)	4 year-old boy during WWII	rashes on the face, torso, feet, and hands upon
46 Bodman (1941)	British school children (age range: 5-14)	Pallor
Bodman (1941)	British school children (age range: 5-14)	Epistaxis
Carey-Trefzer (1949)	Children following WWII	Tics
Weisenburg (1920)	American soldiers during WWI	Tremors
Grinker and Spiegel (1945)	American soldiers during WWII	Tremor
Carey-Trefzer (1949)	Children following WWII	Asthma
Weisenburg (1920)	American soldiers during WWI	blindness
Mercier and Despert (1943)	9 year-old girl during WWII	Amnesia regarding daily tasks

Mercier and Despert (1943, p. 267)	11 year-old child after WWII	[foreshortened future:] “When I am 26 I will have been killed at war a long time ago”
Grinker and Spiegel (1945)	American soldiers during WWII	Stupor
Grinker and Spiegel (1945, p. 84)	American soldiers during WWII	“psychosomatic reactions”
Eitinger (1962, p. 372)	Norwegian concentration camp prisoners	“reduction of their male potency or female libido”
Bender and Blau (1937)	10 year-old girl sexually assaulted by her father	Irresponsibility
Carey-Trefzer (1949)	Children following WWII	Inhibition
Bender and Blau (1937)	5 year-old female child sexually assaulted by her father; a 7 year-old female child sexually assaulted by a man	Infantile behavior
Chodoff (1963, p. 325)	Patients formerly persecuted by Nazis	“the wish to be taken care of”
Chodoff (1963)	Patients formerly persecuted by Nazis	Weakness

## **Chapter II**

### **THE EPIDEMIOLOGY OF CHILD AND ADOLESCENT PTSD**

Epidemiology assesses the “prevalence and distribution of health and illness in the population” (Norris & Slone, 2013, p. 1) to help us better understand the “nature and scope” of a disorder (Saigh et al., 1996, p. 112). In the current chapter, prevalence of trauma exposure and rates of PTSD diagnoses in adult populations will be briefly reviewed. The primary focus of this chapter will be the epidemiology of PTSD in diverse populations of children and adolescents. Beyond studies of general populations, literature showing rates of PTSD following specific types of stressors (e.g., war, criminal victimization) will be examined. Finally, comorbidities between PTSD and other common disorders, as well as risk factors in diagnosis will be discussed.

Studies presented in the current review of the literature were obtained via searches conducted on PsycInfo and Medline. Descriptors used to generate results included “PTSD” or “posttraumatic Stress disorder,” and “child” or “adolescent” or “youth.” To focus the search on the epidemiology of childhood PTSD following specific stressor types, the following descriptors were also included: “epidemiology,” “war,” “natural disaster,” “hurricane,” “tornado,” “cyclone,” “earthquake,” “tsunami,” “flood,” “fire,” “assault,” “sex,” “criminal victimization,” “serious injury,” “accident,” and “motor vehicle.” Results were limited to English-language articles. Articles listed on governmental websites (National Center for PTSD, U.S. Department of Veterans Affairs; National Institute of Mental Health), obtained from book chapters by Saigh (1992) and Saigh et al. (1999), and cited in a relevant article by Saigh et al. (1996) were also considered.

## **Trauma Exposure and PTSD in the General Population**

The literature indicates that exposure to potentially traumatic events is common (Breslau, Davis, Andreski, & Peterson, 1991; Breslau et al., 1998; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). Epidemiology studies based on DSM-III-R criteria indicated that around 70% of individuals are exposed to a traumatic event during their lifetime (Saigh et al., 1996). Estimates of lifetime prevalence have remained generally consistent “since the advent of the DSM-III-R (Norris & Slone, 2013, p. 2). Knowledge about the rates of exposure and prevalence of PTSD in the general population contributes to a better understanding of the disorder (Saigh et al., 1996); thus, PTSD epidemiological studies are considered herein.

### **Community-based surveys of trauma exposure and PTSD**

**U.S. Populations.** A review of the literature on the prevalence of exposure to traumatic events based on DSM-III-R or DSM-IV criteria indicated that most people will experience a traumatic event by age 45, with about 25% of the population experiencing such an event by young adulthood (Norris & Slone, 2013). Norris (1992) indicated that 21% of 1,000 adults in her study experienced a traumatic event (e.g., motor vehicle accident, physical or sexual assault) within the past year, and 69% within their lifetime. As based on administrations of the *Traumatic Stress Schedule* (Norris, 1990) and the *Brief Symptom Inventory* (Derogatis & Spencer, 1982), 6.2% of the sample met criteria for probable current PTSD. A study by Resnick, Kilpatrick, Dansky, Saunders, and Best (1993) examined over 4,000 women who had experienced various traumas (e.g., physical or sexual assault, disaster, accident) and found that 69% of their sample were exposed to a traumatic event during their lives. Resnick et al. (1993) reported lifetime PTSD prevalence of 12.3% and six month prevalence of 4.6% as based on administrations of the National Women’s Study PTSD Module (Kilpatrick, Resnick, Saunders, &

Best, 1989). In related work, Breslau et al. (1998) indicated that 89.6% of 2,181 American adults were exposed to a lifetime traumatic event (e.g., physical assault, sexual assault, motor vehicle accident). As based on administrations of the *Diagnostic Interview Schedule, Version IV (DIS-IV)*; Robins, Cottler, Bucholz, & Compton, 1995) and the *World Health Composite International Diagnostic Interview, Version 2.1 (CIDI)*; World Health Organization [WHO], 1997), 9.2% met criteria for a lifetime PTSD diagnosis (Breslau et al., 1998). Rates of prevalence reported in the literature of U.S. adults are consistent with those listed in the *DSM-5* where lifetime risk is estimated to be 8.7%, with past-year prevalence estimated to be 3.5% (APA, 2013a).

**Non-U.S. populations.** Rates of trauma exposure and PTSD have also been considered in non-US populations and varying rates of the disorder have been observed across settings and populations. Data collected by the World Health Organization (WHO) estimated lifetime prevalence of PTSD in 27 countries to range from 0.3% (China) to 6.1% (New Zealand) (Kessler, 2008). An explanation as to why rates of PTSD may vary by culture has been given in a presentation by Whealin (2008) who indicated that while certain neurobiological reactions to traumatic events are universal, ways of responding to trauma exposure and interpretation of the trauma event may vary across culture (Friedman & Marsella, 1996 as cited in Whealin, 2008).

de Jong et al. (2001) examined lifetime exposure to traumatic events during conflict in 4 low-income populations (i.e., Cambodia, Algeria, Ethiopia, Gaza) using an “adapted version of the *Life Events and Social History Questionnaire*” (Mollica, Wyshak, & Lavelle, 1987). Lifetime PTSD diagnosis was assessed using the *CIDI, Version 2.1* (WHO, 1997). Similarly to the WHO report, results of the de Jong et al. (2001) study indicated that trauma exposure rates and PTSD diagnosis varied by country. For example, rates of reported torture ranged from 8.4%

(Algeria) to 25.5% (Ethiopia); rates of being separated from a family member, including due to that family member's death, ranged from 4.6% (Gaza) to 17.5% (Cambodia). Overall, PTSD prevalence ranged from 15.8% (Ethiopia) to 37.4% (Algeria; de Jong et al., 2001). In a related study, Creamer, Burgess, and McFarlane (2001) examined 10,641 adults in Australia using a modified version of the *CIDI* (Andrews & Peters, 1998). Results of the study indicated that 64.5% of men and 49.5% of women reported experiencing at least one traumatic event. The authors reported a past year PTSD prevalence of 1.33% (Creamer et al., 2001).

**Gender differences.** In examining the rates of trauma exposure and PTSD diagnosis in various western and non-western populations, several studies reported significant differences involving the type and amounts of trauma exposures that were experienced by men and women. A national survey of adults in the U.S. indicated that women (9.7% prevalence) were more likely than men (3.6% prevalence) to qualify for a lifetime diagnosis of PTSD (National Comorbidity Survey [NCS], 2007). Whereas general population prevalence in the U.S. has been found to be 6.8% (Kessler et al., 2005), a study of adults in the Detroit area found that women evidenced lifetime prevalence rates of 13.0%, while men were indicated to have a lifetime prevalence of only 6.2% (Breslau et al., 1998). Similar estimates were found by Resnick et al. (1993), who indicated a lifetime prevalence of PTSD in women to be 12.3%, with a 6-month prevalence of 4.6%. The aforementioned study by de Jong et al. (2001) of Cambodia, Algeria, Ethiopia, and Gaza adolescents and adults indicated that female participants endorsed significantly more PTSD symptoms than men in two (i.e., Algeria and Cambodia) of the four populations examined; men endorsed significantly more PTSD symptoms in one population examined (i.e., Gaza).

## Trauma Exposure and PTSD in Children and Adolescents

Worldwide, violence against youth has also been shown to be high. The World Health Organization's 2002 *World report on violence and health: Summary* report indicated that the death of individuals 10 to 29 years old as a result of violence was 9.2 per 100,000 in the year 2000. Rates were highest in the U.S. and developing countries, or those "caught up in the turmoil of social and economic change" (World Health Organization, 2002, p. 13). The report further indicated high rates of physical injury, where "for every young person killed, 20 to 40 receive[d] injuries that require[d] hospital treatment" (World Health Organization, 2002, p. 14).

U.S. government statistics show that children and adolescents are disproportionately affected by crime. In regard to youth in the U.S., the U.S. Department of Justice 1997 *Bureau of Justice Statistics Special Report* concluded that while youth 12 to 24 years of age accounted for 22% of the U.S. population, they "comprised...35% of murder victims, and 49% of serious crime victims" (e.g., robbery, aggravated assault) (Perkins, 1997, p. 1). Women under age 25 accounted for more than half of all victims of rape or sexual assault (Perkins, 1997). A report by White and Lauritsen (2012) for the U.S. Department of Justice indicated that both simple assaults and violent crimes perpetrated against youth, including those involving weapons or causing injury, declined between 1994 and 2010. However, the Truman, Langton, and Planty (2013) report for the U.S. Department of Justice indicated that individuals 12 to 24 years of age continue to be disproportionately victimized when compared to individuals over 35 years of age.

Costello, Erkanli, Fairbank, and Angold (2002) examined exposure to traumatic events in 1,420 American youth as part of the *Great Smoky Mountains Study*. The study was longitudinal in design, examining participants from childhood into early adulthood. The *Life Events Interview*, which is part of the *Child and Adolescent Psychiatric Assessment* (Angold & Fisher,

1999; Angold et al., 1995b), was used to assess trauma exposure for lifetime prevalence of “high” (e.g., serious accident, war, rape) and 3 month prevalence of “low” (e.g., parental separation or divorce) magnitude events (Costello et al., 2002, p. 102). Results indicated that 25% of all of the children who were sampled had been exposed to at least one high magnitude stressor in their lifetime. The authors further reported that having experienced low magnitude stressors increased participants’ risk of experiencing a high magnitude event (Costello et al., 2002).

### **Studies of Youth Trauma Exposure and PTSD**

The prevalence of exposure and diagnosis in children and adolescents has been considered across the literature and will be the focus of the current chapter. Rates of PTSD in children and adolescents, like in adults, appear dependent on various factors. A review of the literature by Wang, Chan, and Ho (2013) showed rates of PTSD in children and adolescents exposed to “community-wide disasters” based on DSM-IV criteria ranging from 1% to 60%. Several studies have considered trauma exposure and rates of PTSD among youth.

#### **Western-Nation General Population Studies of Youth Trauma Exposure and PTSD.**

A study by Elklit (2002) examined a national sample of 390 Danish children (age range: 13-15). An author-devised interview was used to assess for exposure to traumatic events. The *Harvard Trauma Questionnaire, Part IV (HTQ)*; Mollica et al., 1992), was used to estimate PTSD diagnosis. Results indicated that 88% of children had a lifetime exposure to one or more traumatic event. Of youth who experienced one or more traumas and completed the *HTQ* (n=289), 9% were estimated to meet criteria for a diagnosis of PTSD.

A similar study by Landolt, Schnyder, Maier, Schoenbucher, and Mohler-Kuo (2013) examined exposure to trauma and PTSD diagnosis in 6,787 Swiss students in the 9<sup>th</sup> grade.

Assessment of trauma exposure and PTSD diagnosis were made using the Adolescent Version of the *University of California Los Angeles PTSD Reaction Index (UCLA-PTSD-RI*; Steinberg, 2004). PTSD diagnosis was assumed if all DSM-IV-TR criteria were endorsed “some” to “most of the time” (Landolt et al., 2013, p. 211). Results indicated that 56% of students reported exposure to at least one traumatic event (e.g., disaster, witnessing assault) with 4.2% of participants meeting criteria for a possible PTSD diagnosis at the time of the assessment.

A study of a community sample of 3,021 German youth (age range:14-24 years) was conducted by Perkonigg, Kessler, Storz, and Wittchen (2000) as part of the *Early Developmental Stages of Psychopathology study* (Wittchen, Wittchen, Nelson, & Lachner, 1998b). The authors used the *Munich CIDI (M-CIDI*; Lachner et al., 1998; Wittchen, Lachner, Wunderlich, & Pfister, 1998a) to assess for PTSD and other mental health issues. As opposed to the previously reported studies (Elklit, 2002; Landolt et al., 2013), results of the Perkonigg et al. (2000) study indicated that, while large portions of the sample reported having experienced a traumatic event (25.5% males; 17.7% females), few subjects met criteria for a PTSD diagnosis (<1% males, 2.2% females). Lifetime prevalence in the sample was reported to be 1.3%; past year prevalence was reported to be 0.7%. The authors noted that, while rates of PTSD in this German sample were lower than in U.S. samples, “the conditional probability for PTSD after experiencing traumas, risk factors and comorbidity patterns [were] quite similar” (Perkonigg et al., 2000, p. 46) to those found in studies of American youth. The authors argued that the occurrence of few natural disasters, along with restrictive weapons laws and low crime rates in Munich likely influenced the outcomes of this study (Perkonigg et al., 2000).

**Non-western Populations of Youth Trauma Exposure and PTSD.** Some studies have examined general population rates of trauma exposure and PTSD in non-western populations.

One such study by Khamis (2005) examined trauma exposure and rates of PTSD in 1,000 Palestinian children (age range: 12-16 years). A structured clinical interview based on DSM-IV criteria was used to assess for PTSD. Results indicated that 54.7% of children in the study had a lifetime exposure to “at least one high-magnitude traumatic event” (e.g., family member killed or injured, physical assault, vehicle accident) (Khamis, 2005, p. 87); 62.3% of the sample reporting trauma exposure (34.1% of the full study sample) met criteria for a current PTSD diagnosis.

Peltzer (1999) conducted a study of 148 South African children (age range: 6-16 years) to assess the prevalence of trauma exposure and PTSD. The *Children’s Posttraumatic Stress Disorder Inventory* (Saigh, 1989b) using DSM-III (APA, 1980) criteria was used to assess both trauma exposure and PTSD diagnosis. Results indicated that 67% of participants experienced a “very bad” trauma (e.g., witnessed a death or serious injury, involved in a serious accident); 8.4% met criteria for a diagnosis of PTSD (Peltzer, 1999, pp. 648-649). A study by Abbo et al. (2013) examined rates of trauma exposure and PTSD diagnosis among 1,587 Ugandan children (age range: 3-16 years). The *MINI International Neuropsychiatric Interview for Children and Adolescents (MINI Kid)*; Sheehan et al., 2010) was used to assess trauma exposure and establish PTSD. Results indicated that 35.5% of participants were exposed to at least one trauma; 6.6% of participants met criteria for PTSD.

**Special Populations: Youth Trauma Exposure and PTSD in Clinical Samples.** As opposed to examining rates of trauma exposure and PTSD prevalence in the general population, some studies have considered epidemiology in more specific populations. For example, Fehon, Grilo, and Lipschitz (2001) conducted a study of 89 youth (age range: 12-18 years) on a hospital’s adolescent inpatient unit. Exposure to violence was assessed using the *Child’s Exposure to Violence Checklist* (Amaya-Jackson, 1998) and the *Childhood Trauma*

*Questionnaire* (CTQ; Bernstein & Fink, 1998). PTSD symptoms were assessed using the *Child Posttraumatic Checklist* (Amaya-Jackson, McCarthy, Newman, & Cherney, 1995). Results indicated that half of the participants experienced “serious violence” at least once (Fehon et al., 2001). Experiences of violence endorsed included community violence (51.7%), family violence (52.8%), physical assault (60.7%), and sexual assault (39.3%). The authors additionally reported that, of the youth in their study, 43.8% had physically assaulted someone else and 7.9% had sexually assaulted someone else. Further, the authors noted that youth exposed to community violence endorsed more PTSD symptoms than participants who were not exposed to community violence. A related study examining an inner city sample of youth (n=100; age range: 3-18) from a mental health clinic, using the Structured Clinical Interview for DSM-IV, Childhood Diagnoses (Kid-SCID; Matzner, 1994; Matzner, Silva, Silvan, Chowdhury, & Nastasi, 1997), showed that 59% of youth had been exposed to trauma (e.g., physical or sexual abuse, witnessing domestic violence) and 22% qualified for current PTSD (Silva et al., 2000). A study examining the rate of PTSD in adolescents (n= 6483; age range: 13-17 years) as part of the *NCS Replication* (Kessler & Merikangas, 2004) using a modified *CIDI* (Merikangas, Avenevoli, Costello, Koretz, & Kessler, 2009) indicated a lifetime PTSD prevalence of 4.7% (Kessler et al., 2012).

#### **Special Populations: Youth Trauma Exposure and PTSD in Juvenile Offenders.**

Studies have also been conducted with samples of juvenile offenders. Teplin, Welty, Abram, Dulcan, and Washburn (2012) examined the prevalence of psychiatric disorders among 1,829 incarcerated American youth (age range: 10-18 years at baseline) as part of a longitudinal study. The *Diagnostic Interview Schedule for Children 2.3* (*DISC 2.3*; Fisher et al., 1993; Shaffer et al., 1996) and *DISC-IV* (Shaffer, Fisher, & Lucas, 2003; Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000) were used to assess for past year psychiatric disorders. PTSD was first assessed 13

months after baseline, when the DISC-IV was released. The *DIS-IV* (Compton & Cottler, 2004; Robins et al., 1995) was used to assess for past year substance use disorders. Results indicated rates of PTSD diagnosis at 7.9% (baseline), 7.6% (first follow-up), and 5.4% (second follow-up) for males and 14.6% (baseline), 7.9% (first follow-up), and 5.8% (second follow-up) for females. The authors noted that the observed decrease across time was not statistically significant. Comorbidities, including with substance abuse, were not reported

A study by Moore, Gaskin, and Indig (2013) examined history of abuse and neglect among 291 Australian juvenile offenders in custody (age range: 13-21 years) as part of the *New South Wales Young People in Custody Health Survey* (Indig et al., 2011). Trauma exposure was assessed using the *Childhood Trauma Questionnaire* (Bernstein et al., 2005). The *Kiddie Schedule for Affective Disorders for Children – Present and Lifetime Version (K-SADS-PL;* Axelson, Birmaher, Zelazny, Kaufman, & Gill, 2009) was used to diagnose PTSD based on DSM-IV (APA, 2000) criteria. The authors indicated that 60% of the participants reported exposure to childhood neglect or abuse; 20% met criteria for PTSD. Psychiatric disorders beyond PTSD and substance use were assessed using the *K-SADS-PL*. Finally, juvenile offenses and antisocial behavior were assessed using data obtained from the Juvenile Justice database. Overall, results indicated that youth at highest risk for PTSD were those who had experienced multiple traumatic events, had a parent with a substance use history or used substances themselves, had two or more mental health disorders in addition to PTSD, reported current psychological distress, had a “history of attempted suicide or self-harm,” or were re-incarcerated during the follow-up period (Moore et al., 2013, p. 867).

## **Rates of Posttraumatic Stress Disorder by Stressor Type**

While the studies described above include information regarding rates of trauma exposure and PTSD in the general or other populations, several studies have considered the rate of PTSD in children exposed to specific types of traumas. Specific traumas examined included war-related stressors (e.g., seeing mutilated bodies), criminal victimization (e.g., physical or sexual assault), natural disasters (e.g., being in a tsunami), and being in a serious accident (e.g., motor vehicle accident). This section will outline studies that have examined rates of PTSD by stressor type. Comorbidities and rates of PTSD symptoms or diagnosis by various factors (e.g., age, gender) will be reported in the *Comorbidity and Risk Factors for PTSD* sections, respectively. Data showing participant, measure, and outcome data will be included within each section (see Tables 2.1-2.5).

### **Stressor Types**

**War-Related Studies.** Several studies have examined the response of youth to war and war-related events. It is important to consider the response of youth to war-related stressors, as war related events are prevalent in various regions of the world, have the ability to affect great numbers of individuals, and often last for extended periods of time.

To examine the impact of on-going war related events on Lebanese youth, Saigh, Mroueh, and Bremner (1997) examined 95 Lebanese children and adolescents. Study participants were randomly selected from one of six private schools where courses were taught primarily in English. PTSD was diagnosed using the *Children's PTSD Inventory* (Saigh, 1989b). As per Saigh et al. (1997), youth-reported stressful exposures included, among other events, witnessing others being killed and being inside of a building when it was destroyed. Results

indicated that 14 students (14.7%) qualified for a diagnosis of PTSD. Sixteen additional participants had been exposed to an extreme stressor but did not meet criteria for PTSD.

A study by Schiff et al. (2012) examined posttraumatic symptoms in adolescents in high school (age range: 13-17 years) one year following the second Lebanon war. The authors assessed exposure to war and other traumas (e.g., physical abuse) among 2,351 Arab and 1,800 Jewish students using the *Traumatic Events Screening Inventory for Children (TESI)* (Degenhardt et al., 2008; Ghosh-Ippen et al., 2002; Ribbe, 1996). Overall, 4.0% of the youth reported experiencing physical abuse, while 65.1% reported experiencing at least one other trauma. The largest number of trauma exposures included hearing sirens near where missiles fell (84.2%), and hearing (76.7%) or feeling (71.5%) a missile's shock wave (Schiff et al., 2012). PTSD symptom data were collected using the self-report *UCLA-PTSD RI* (Rodriguez, Steinberg, & Pynoos, 1999). Probable PTSD was diagnosed when a child reported meeting all DSM-IV PTSD criteria as reflected by the *UCLA-PTSD RI*. Nearly 7% of the overall sample met criteria for probable PTSD one year following the event. Beyond traumatic events, the study examined substance use and abuse via questions based off of the *WHO survey* (Harel-Fisch et al., 2010; Harel, Alenboygen-Frankowitz, Molcho, Abu-Asaba, & Haviv, 2002) and school violence via questions based off of a "larger valid scale" (Schiff et al., 2012, p. 1324). Results indicated that exposure to physical abuse, but not exposure to war-related traumas, was associated with substance use. Exposure to either physical abuse or war-related traumas was associated with higher scores on the *UCLA-PTSD RI* as well as involvement in school violence.

To examine the rates of posttraumatic reactions in children exposed to war-related stressors, Thabet and Vostanis (1999) examined 981 Palestinian children (age range: 6-11 years) living in the Gaza Strip. Participants were initially assessed using the *Rutter Scale B2 Teacher*

*Screen* (Rutter, 1967) to determine the general likelihood of emotional or behavioral issues. Twenty-five percent of the original sample ( $n = 239$ ), including children with a probable or unlikely mental health disorder, were randomly selected from the original sample for administration of the *Rutter Scale A2 Parent Screen* (Rutter, Tizard, & Whitmore, 1970). To assess for exposure to traumatic events and posttraumatic reactions, the same youth were given the *Gaza Traumatic Event Checklist* (Abu Hein, Qouta, Thabet, & El Sarraj, 1993) and the *UCLA-PTSD RI* (Pynoos et al., 1987) based on DSM-III (APA, 1980) criteria. Results indicated that children experienced high rates of exposure to tear gas (56.1%) and witnessing daytime (49.0%) and nighttime (41.8%) raids (Thabet & Vostanis, 1999). Other exposures included, but were not limited to, witnessing a friend or relative being beaten, shot, or put in detention. The authors reported that, 5.4% of children in the study had probable PTSD (Thabet & Vostanis, 1999).

In a related study of older participants, Thabet, Abed, and Vostanis (2004) examined 403 Palestinian refugee children (age range: 9-15 years) during a time of conflict. The authors used the *Gaza Traumatic Event Checklist* (Thabet & Vostanis, 1999) to assess trauma exposure. Similarly to the Thabet and Vostanis (1999) study, results of the Thabet et al. (2004) study indicated that youth were exposed to various war traumas, including, but not limited to, seeing wounded people or mutilated bodies on television (92.1%), witnessing aerial attacks (71.2%), seeing a close relative get shot (31.5%), and inhaling tear gas (27.8%). The authors further reported that, on average, youth in the study were exposed to 4 traumas (Thabet et al., 2004). To assess likely PTSD and affective disorder symptoms, the authors utilized the *UCLA-PTSD RI* (Pynoos et al., 1987) and the *Short Mood and Feelings Questionnaire* (MFQ; Angold, Costello, Messer, & Pickles, 1995a), respectively. Results indicated that 52.6% of youth in the study had

“moderate” posttraumatic stress symptoms, while 23.9% had “severe” to “very severe” reactions (Thabet et al., 2004, p. 537).

In a similar study involving a sample of 229 Palestinian adolescents, Elbedour, Onwuegbuzie, Ghannam, Whitcome, and Hein (2007) assessed for PTSD, depression, anxiety, and methods of coping. PTSD diagnosis was made based on the *Posttraumatic Stress Disorder Interview (PTSD-I; Watson, Juba, Manifold, Kucala, & Anderson, 1991)*. Self-rated depression was assessed using the *Beck Depression Inventory-II (BDI-II; Beck, 1996)*, self-rated anxiety using the *Beck Anxiety Inventory (BAI; Beck & Steer, 1990)*, and self-rated coping using the *Coping Responses Inventory Youth Form (CRI; Moos, 1993)*. Many youth in the study reported witnessing the death of a friend (48.5%) or family member (15.7%), having his or her home destroyed (7.9%), and witnessing missiles being fired (7.9%; Elbedour et al., 2007, p. 724). Overall, 68.9% of the sample met criteria for a diagnosis of PTSD. Additionally, based on self-report measures, 40% endorsed depression in the moderate to severe range, 94.9% endorsed anxiety in the severe range, and 69.9% had “undesirable coping responses” (Elbedour et al., 2007, p. 719).

Allwood, Bell-Dolan, and Husain (2002) examined the impact of violent (e.g., “witnessing killings”) and nonviolent (e.g., exposure to inclement weather, lack of food) traumas on 791 Bosnian children (age range: 6-16 years) during the 1994 Sarajevo siege. Like the Thabet et al. (2004) study, Allwood et al. (2002) examined youth during the crisis event. Subjects were administered the *War Experiences Questionnaire (WEQ; Husain and Holcomb, unpublished, 1994, in Allwood et al., 2002)*, the *Impact of Event Scale (IES; Horowitz, Wilner, & Alvarez, 1979)*, and the *UCLA-PTSD RI (Pynoos et al., 1987)* to gather information about exposure to war-related stressors and posttraumatic reactions. The authors indicated that the

highest rates of reported traumatic stressors involved family members being wounded (73.4%), friends or family members killed (79.4%), and being exposed to shooting nearby (72.8%; Allwood et al., 2002). Results showed that 41% of children in the sample experienced posttraumatic symptoms in the clinically significant range (i.e., with scores falling in the mild, moderate, or severe range of the *UCLA-PTSD RI*). Other emotional and behavioral reactions to war stressors were examined using the *Child Behavior Checklist, Teacher Report Form (CBCL-TRF*; Achenbach, 1991) and the *Children's Depression Inventory (CDI*; Kovacs, 1992). The authors described various war experiences as related to teacher ratings on the *CBCL-TRF*. For example, being personally threatened or seeing others killed or wounded were related to *CBCL-TRF* ratings of anxiety/depression and delinquency (Allwood et al., 2002, p. 453).

Elbert et al. (2009) examined 420 Tamil children in Sri Lanka (age range: 10-14 years) exposed to “two decades of civil war and unrest” (p. 238). Trauma exposure was examined using a modified event list (Karunakara et al., 2004; Neuner et al., 2004). The *UCLA-PTSD RI, Child and Parent versions* (Steinberg, 2004), were translated and used to screen for potential PTSD. Expert clinicians conducted clinical interviews following the structure of the K-Section of the *CIDI* (World Health Organization, 1997) with modified questions based on the *MINI-Kid* (Sheehan et al., 1998) to validate the diagnosis. Most of the children in the study (92%) reported experiencing at least one traumatic event, such as being around combat (79%), bombing (58%), or shelling (40%), witnessing a death (40%), or having his or her home attacked (30%). Based on scores from the child version of the *UCLA-PTSD RI*, 23% of youth met criteria for PTSD. Results of the adult version of the *UCLA-PTSD RI* indicated that 24% of youth met criteria for PTSD. The reported correspondence between the parent and child *UCLA-PTSD RI* scores was 79%. The authors further indicated that expert clinical interviewers assessed a subset of 53

youth. Of those assessed, 26% of the children met criteria for current PTSD and 36% met criteria for a lifetime diagnosis.

In a study of PTSD symptoms in Kenyan youth, Harder, Mutiso, Khasakhala, Burke, and Ndeti (2012) examined 552 children and adolescents (age range: 6-18 years) 6 months after post-election violence. PTSD symptoms were assessed using a translated version of the *UCLA-PTSD RI* (Steinberg, 2004). The authors calculated rates of probable PTSD from respondents who rated items for PTSD criteria B through D as “much” or “most of the time” and had “serious PTSD symptoms” (Harder et al., 2012). Diagnoses were verified through unstructured clinical interviews with Master-level clinicians using portions of the *Clinician Administered PTSD Scale (CAPS)*; Blake et al., 1995). Trauma exposures included “seeing someone beaten or shot, seeing a dead body, and being in a place where a war was going on” (Harder et al., 2012, p. 67). Results indicated that 18% of study participants met criteria for PTSD.

***Ethnic Cleansing and Refugees.*** In addition to exposure to war violence, many individuals exposed to war choose to flee. These individuals often have been exposed to multiple stressors, including war-related events, as well as traumas related to the experience of fleeing their home or living in refugee camps. Targeted youth, including accompanied and unaccompanied child, adolescent and young adult refugees, are considered here.

Schaal and Elbert (2006) examined the expression of PTSD following the war experiences in 68 adolescent orphans of the Rwandan genocide. All study participants lived in orphanages or child-headed households. The *Event Scale*, adapted from a measure by Dyregrov, Gupta, Gjestad, and Mukanoheli (2000) and the *CIDI* (World Health Organization, 1997) were used to assess trauma exposure and PTSD, respectively. The majority of reported trauma exposures included seeing mutilated or dead bodies (97%). The authors reported that large

numbers of children had also been attacked or had been victims of looting (88%), had seen someone “being brutally killed (77%)” (p. 99), or had witnessed their own parents’ murder (41%) (Schaal & Elbert, 2006). Overall, 44% of children in the study met criteria for PTSD (Schaal & Elbert, 2006).

Becker, Weine, Vojvoda, and McGlashan (1999) examined rates of PTSD in a small study of 10 Bosnian adolescent refugees who fled their homes due to ethnic cleansing. Based on evaluation using the *Communal Traumatic Experiences Inventory (CTEI)*; Weine et al., 1995) and the *PTSD Symptoms Scale (PTSD-SS)*; Foa, Riggs, Dancu, & Rorhbaum, 1993) based on the DSM-III-R (APA, 1987), 3 participants met criteria for likely PTSD within one year of fleeing. While PTSD remitted in all three participants, one additional participant met criteria for delayed onset PTSD during the 1-year follow-up assessment. Based on these results, the authors suggested that youth in their study generally showed resiliency (Becker et al., 1999).

Young Cambodian refugees were examined as part of the *Khmer Adolescent project* (Sack et al., 1994). The study looked at 209 refugee adolescents and young adults (age range: 13-25 years). PTSD criteria were examined using the *Diagnostic Interview for Children and Adolescents PTSD module (DICA)*; Welner, Reich, Herjanic, Jung, & Amado, 1987) based on DSM-III-R (APA, 1980) criteria. Results indicated that 18.2% of participants met diagnosis for PTSD at the time of the study, while 21.5% met lifetime diagnosis. Selected sections of the *Kiddie-SADS-E* (Puig-Antich, 1983; Puig-Antich, Orvaschel, Tabrinzi, & Chambers, 1981) were administered to evaluate mental health issues beyond PTSD.

In a smaller, but similar study, Savin, Sack, Clarke, Meas, and Richart (1996) examined 99 Cambodian youth (age range: 18–25 years) living in a Thai-Cambodian border refugee camp. The *DICA* (Welner et al., 1987) was used to assess PTSD. The *BDI* (Beck, Ward, Mendelson,

Mock, & Erbaugh, 1961) and *Kiddie-SADS* depression module (Puig-Antich, 1983; Puig-Antich et al., 1981) were used to assess for depressive symptoms and diagnose depression. Results of the study indicated that 31.3% of the sample qualified for a diagnosis of PTSD at the time of the study, while 37.3% qualified for a lifetime diagnosis. Of note, 3% (current) to 4% (lifetime) of participants who qualified for a diagnosis of PTSD reported only refugee camp stressors. While high rates of depression (68.7% current; 34.6% past), as assessed using the *BDI*, were reported, comorbidity between PTSD and depression was not indicated.

Several studies examined diverse refugee populations with participants coming from multiple countries and having experienced diverse traumatic stressors. In a study by Kinzie, Cheng, Tsai, and Riley (2006), 131 diverse refugee children, adolescents, and young adults (age: < 21 years) were examined for PTSD via clinical interviews by a psychiatrist. Participants came from countries including, but not limited to, Mexico, Somalia, Vietnam, and Afghanistan. Youth in the study reported exposure to domestic violence, war, and vicarious trauma while living in refugee camps. Results of the study indicated that 63% of youth exposed to war traumas and 25% exposed to domestic violence qualified for a PTSD diagnosis. Of note, the authors discussed concerns regarding a high portion of participants in their study who met criteria for “mental retardation or cognitive disorders” (Kinzie et al., 2006, p. 536), but attributed those findings to personal circumstances including limited access to education, poor nutrition, and emotional depravity.

A study by Morgos, Worden, and Gupta (2008) examined 331 children in Southern Darfur living in an Internally Displaced Persons camp and attending camp-affiliated schools. Children in the study had been exposed to several types of war stressors, including, but not limited to, having one’s home invaded (94.6%) or seeing a home burned down (94%), having to

abandon one's home (98.8%), and witnessing torture (75.5%). The authors described study participants as having "chronic exposure to war experiences" (Morgos et al., 2008, p. 245). Trauma symptoms were assessed using the *UCLA-PTSD RI* (Pynoos et al., 1987). Results indicated that 74.9% of youth met "clinical" levels of trauma (i.e., having scores in the "severe" to "very severe" range) as based on *UCLA-PTSD RI* scores (Morgos et al., 2008, p. 237), with 7.3% of youth having scores in the very severe range. Beyond PTSD, grief symptoms, including traumatic grief, were assessed using the *Expanded Grief Inventory (EGI)* (Layne, 2001). Results indicated that 16% of the participants had scores in the high range on the *Traumatic Grief subscale* of the *EGI*. Finally, depressive symptoms were assessed using the *CDI* (Kovacs, 1992). Results indicated that 38% of participants met criteria for depression based on *CDI* T-scores over 60 (Morgos et al., 2008, p. 239).

In a study by Huemer et al. (2011), the authors examined the prevalence of PTSD among 41 unaccompanied adolescent refugees of war (age range: 15-18 years). Study participants originated from multiple countries in Africa, including, but not limited to, Gambia, Somalia, and Nigeria. The *UCLA-PTSD RI* (Steinberg, 2004) and the *MINI-Kid* (Sheehan et al., 1998) were used to assess trauma exposure and posttraumatic symptoms and to diagnose PTSD. The authors did not describe the traumatic stressors that the participants experienced. Results indicated that 19.5% of participants met criteria for a PTSD diagnosis based on evaluation by the *MINI-Kid*. Demographic information and information about other mental health symptoms and life satisfaction were assessed using the *Youth Self-Report* (Achenbach & Rescorla, 2001) and *Facts About You* questionnaire (Steiner, Araujo, & Koopman, 2001). Unaccompanied refugee minors in the study reported lower life satisfaction in the areas of happiness, school, and recreation than

the normed population. While 15% of the sample reported more than one diagnosis, the rates of comorbidity with PTSD, specifically, were not reported.

Table 2.1 presents an overview of the PTSD rates that were reported in the 15 war-related studies that were reviewed. It may be seen in this context that PTSD point prevalence rates ranged from 5.4% (Thabet & Vostanis, 1999) to 74.9% (Morgos et al., 2008).

**Table 2.1**

*PTSD rates in youth following events related to war*

**War-related studies**

<u>Study</u>	<u>Gender</u>	<u>Age</u>	<u>Measure(s)</u>	<u>Time Since Trauma</u>	<u>PTSD Prevalence</u>
Saigh et al. (1997) *Lebanese youth	N=95  *gender not reported for full sample	Age range: not reported  Mean age (PTSD positive): 17.64 years  Mean age (PTSD negative): 17.21 years  Mean age (controls): 17.74 years	<i>Children's Posttraumatic Stress Disorder Inventory</i>	4.2 years, on average	14.7% (full sample)  46.7% (trauma exposed)
Schiff et al. (2012) *Arab and Jewish youth	N= 4151  *Many participants did not report gender	13-17 years  Mean age: not reported	<i>TESI</i>  <i>UCLA-PTSD RI</i>	About 1 year	Probable PTSD: 6.9%

Thabet and Vostanis (1999) *Palestinian youth	129 males 110 females	6-11 years Mean age: 8.9 years	<i>Gaza Traumatic Event Checklist</i> <i>UCLA-PTSD RI</i>	Not reported	Mild: 31.8% Moderate: 35.6% Severe: 5.4% Very Severe: none reported
Thabet et al. (2004) *Palestinian youth	190 males 213 females	9-15 years Mean age: 12 years	<i>Gaza Traumatic Event Checklist</i> <i>UCLA-PTSD RI</i>	Not reported	Mild: 21.1% Moderate: 52.6% Severe: 22.9% Very Severe: 1%
Elbedour et al. (2007) *Palestinian youth	121 males 108 females	15-19 years Mean age: 17.13 years	<i>PTSD-I</i>	Not reported	68.9%
Allwood et al. (2002) * Bosnian youth	389 males 402 females	6-16 years Mean age: 10.9 years	<i>WEQ</i> <i>IES</i> <i>UCLA-PTSD RI</i>	Not reported	Clinically significant range: 41%

Elbert et al. (2009) *Tamil youth in Sri Lanka	202 males 218 females	10-14 years Mean age: 10.5 years	Modified event list Modified <i>CIDI K-section</i>  <i>UCLA-PTSD RI</i> (Parent and Child versions)  Clinical interview	Not reported	<i>UCLA-PTSD RI</i> (child version): 23%  <i>UCLA-PTSD RI</i> (parent version): 24%  Expert clinical interview (subset of N=53 subjects)  Lifetime: 36%  Current: 26%
Harder et al. (2012) *Kenyan youth	265 males 287 females	6-18 years Mean age: 11 years	<i>UCLA-PTSD RI</i> <i>CAPS</i>	6 months	18%

### Ethnic Cleansing and genocide

<u>Study</u>	<u>Gender</u>	<u>Age</u>	<u>Measure(s)</u>	<u>Time Since Trauma</u>	<u>PTSD Prevalence</u>
Schaal and Elbert (2006) *Rwandan youth	33 males 35 females	13-23 years Mean age: 17.72	<i>Event-Scale</i>  <i>CIDI</i>	About 10 years	44%

Becker et al. (1999) *Bosnian youth	7 males 3 females	13-19 years  Mean age: 16.1 years	<i>CTEI</i>  <i>PTSD SS</i>  *using DSM-III-R criteria	Baseline: within 1 year of resettlement  Follow-up: 1 year after baseline	Baseline: 30%  1 year: 10%
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**Refugees**

<u>Study</u>	<u>Gender</u>	<u>Age</u>	<u>Measure(s)</u>	<u>Time Since Trauma</u>	<u>PTSD Prevalence</u>
Sack et al. (1994) *Khmer youth	104 males 105 females	13-25 years  Mean age: 19.8 years	<i>DICA</i>  <i>Kiddie-SADS-E</i>  *using DSM-III-R criteria	About 13 years	Lifetime: 21.5%  Current: 18.2%
Savin et al. (1996) *Khmer youth	89 males 10 females	18-25 years  Mean age: 22.27 years	<i>DICA</i>  *using DSM-III criteria	Not reported	Lifetime: 37.3%  Current:31.3%

Kinzie et al. (2006) *ethnically diverse youth	69 males 62 females	< 21 years Mean age: 11.3 years	DSM-IV based clinical interview	Not reported	War trauma: 63% Domestic violence: 25%
Morgos et al. (2008) *Southern Darfur youth	187 males 144 females	6-17 years Mean age: 12 years	<i>UCLA-PTSD RI</i>	Not reported	Severe: 67.7 Very Severe: 7.3 Clinically significant range: 74.9
Huemer et al. (2011) *ethnically diverse youth	35 males 6 females	15-18 years Mean age: 16.95 years	<i>UCLA-PTSD RI</i> <i>MINI-Kid</i>	Not reported	19.5% (Mini-Kid) 20% (PTSD RI)

**Criminal Victimization: Physical and Sexual Assault.** Outside of the context of war, researchers have examined individuals who have experienced trauma through physical and/or sexual assault.

**Physical Threat or Assault.** A study by Famularo, Fenton, Kinscherff, and Augustyn (1996) examined rates of comorbid diagnoses among 117 U.S. youth (age range: 6-12 years) who had been removed from their homes after exposure to “significant child abuse and/or trauma” (p. 956). The *DICA, Revised (DICA-R)*; Kaplan & Reich, 1991) and a clinical interview used to assess for PTSD and other diagnoses indicated that 35% of youth met criteria for PTSD.

Silva et al. (2000) enrolled 59 youth who had been referred to a psychiatric outpatient clinic trauma study. The researchers confirmed trauma exposure, PTSD diagnosis, and other mental health disorders using the *Kid-SCID* (Matzner, 1994; Matzner et al., 1997). Traumas experienced included, but were not limited to, physical or sexual abuse and “witnessing serious domestic violence” (Silva et al., 2000, p. 1230). Results indicated that 22% of the sample met criteria for PTSD. The authors noted that witnessing domestic violence and experiencing physical abuse were associated with PTSD severity. The authors concluded that higher rates of intelligence appeared to be a protective factor against developing PTSD (Silva et al., 2000).

Rheingold, Zinzow, Hawkins, Saunders, and Kilpatrick (2012) examined data from 3,614 homicide survivors (age range: 12-17 years) who participated in the *2005 NSA Replication Study* (Kessler & Merikangas, 2004). Questions similar to those in the *Trauma Assessment for Adults* (Resnick, Falsetti, Kilpatrick, & Freedy, 1996) were used to assess for a history of interpersonal violence, including physical or sexual assault (Kilpatrick, 2000; Kilpatrick et al., 2003). Youth in the study reported knowing about the homicide of one or more friends or family members (18%), or being a survivor of attempted homicide (9%), vehicular homicide (7%), or both (2%).

The *National Women's Study* PTSD module (NWS; Kilpatrick et al., 1989; Resnick et al., 1996) was used to assess for a diagnosis of PTSD. Of youth who reported surviving an attempted homicide, “approximately 6% of reported criminal survivors, 7% of vehicular survivors, and 9% of survivors endorsing both forms of homicide reported current PTSD” (Rheingold et al., 2012, p. 691). While the authors further indicated that rates of PTSD in attempted homicide survivors were significantly higher than the rates among non-victims, they noted that this difference was not apparent after controlling for other factors such as demographic factors and violence history. The NWS depression module (Kilpatrick et al., 2003) was used to assess for a Major Depressive episode. Substance use was examined using an approach described in a prior publication (Kilpatrick, 2000; Kilpatrick et al., 2003). The authors noted that all participants reported similar levels of drug use. Comorbidities were not reported for PTSD with major depression or substance use.

Vila, Porche, and Mouren-Simeoni (1999) examined 26 French youth (age range: 6-9.5 years) held captive and threatened by a mentally ill man who came into their classroom. A sample of 21 students from the same school who had not been held captive was used for comparison. French translations of interviews were used to assess PTSD symptoms and anxiety. PTSD was diagnosed via the *Kiddie-Schedule for Affective Disorders and Schizophrenia for School Age Children, Lifetime Version (Kiddie-SADS-L; Klein et al., New York State Psychiatric Institute, unpublished, as cited in Vila et al., 1999)*, an interview adapted from the *Kiddie-SADS* (Chambers et al., 1985; Kaufman et al., 1997). The authors used the *IES* (Hansenne, 1993; Horowitz et al., 1979) to assess for intrusive memories or avoidance behaviors in regard to the traumatic event. Finally, the *State Trait Anxiety Inventory for Children (STAIC; Spielberger, 1973)* was used to examine each child for “pathological anxiety” (p. 747). Subjects were

interviewed at four time points across 1.5 years. The authors noted that anecdotal information from teachers, parents, and classmates provided additional information. Results indicated that 27% of study youth met criteria for a diagnosis of PTSD during at least one of the four time points. They further indicated that 24% to 38% of youth met criteria for “subclinical PTSD” at various time points, with subclinical PTSD defined as youth exposed to trauma who met criteria for clinical symptom cluster B, C, or D, and experienced symptoms for at least one month beginning at least one month after the trauma event. The authors reported finding no significant differences in rates of PTSD between children directly exposed to the trauma and those who were indirectly exposed at the 4-month, 7-month, or 18-month follow-up interviews (Vila et al., 1999).

Holbrook et al. (2005c) examined the prevalence of PTSD among American adolescents over a two-year period following discharge from a hospital trauma center. Results were calculated using complete data from 381 participants (age range: 12-19 years). During the assessment, participants were asked if they feared for their life and if they had control over the event happening or happening again. The *IES-R* (Chaffin & Schultz, 2001) was used to assess for Acute Stress Disorder and PTSD using a cutoff score of 24 to determine clinical significance. Results indicated that participants experienced multiple types of traumas including, but not limited to, being in a motor vehicle accident (22.2%), being intentionally injured (e.g., being shot; 13.0%), and being injured during recreational events such as skateboarding (16%). Holbrook et al. (2005c) indicated that 27% of all participants met criteria for a PTSD diagnosis based on the cutoff score of 24 during at least one assessment period. Beyond PTSD, behavioral issues, including alcohol or drug abuse or missing school, were assessed at 6 months following discharge. The *Quality of Well-Being* scale (*QWB*; Anderson, Bush, & Berry, 1986, 1988;

Kaplan & Bush, 1982; Kaplan, Bush, & Berry, 1978) was used to assess quality of life. The authors noted that the presence of PTSD, based on *IES-R* scores over 24, had “strong positive associations with...alcohol and drug abuse, difficulty staying in school, problems with authority, social relationship problems, thoughts of suicide, depression, and loss of interest in usual activities” (Holbrook et al., 2005c, p. 767).

Broberg, Dyregrov, and Lilled (2005) examined 275 youth (age range: 13-24 years) who were exposed to an intentionally started fire at a discotheque in Sweden. Results were reported for data collected from 222 of those participants. The authors noted that youth included in the study were from various countries, with many non-Swedish youth who “had war-related experiences” (Broberg et al., 2005, p. 1284). The *IES* (Weiss & Marmar, 1997) was used to assess for posttraumatic distress. A translated version (Frank, 1999) of the adult version of the *Clinician Administered Posttraumatic Stress Scale (CAPS)* (Blake et al., 1995) was administered to diagnose PTSD. Results indicated that 25% of youth met criteria for PTSD. Beyond diagnosis, the authors reported that nearly one quarter (23%) of the participants in the study reported school difficulties resulting from exposure to the fire. Similarly to the Elbert et al. (2009) study of youth exposed to violence and war-related traumas in Sri Lanka, many of the youth exposed to the discotheque fire evidenced lower school grades. Several youth also dropped out of school following the event, with the authors estimating that up to 1/3 of the non-responders had dropped out of school (Broberg et al., 2005).

An article by Seedat, Nyamai, Njenga, Vythilingum, and Stein (2004) examined general PTSD prevalence in youth (age range: 14-22 years) in schools in South Africa and Kenya. The *Trauma Checklist*, adapted from the *Kiddie-SADS-PL* (Kaufman et al., 1997), was used to assess lifetime trauma exposures. Results of the study indicated that 80% of all participants endorsed at

least one lifetime trauma exposure. Traumas included, but were not limited to, “witnessing community violence (63%), being robbed or mugged (35%), and witnessing a family member being hurt or killed (33%)” (p. 170). The *Child PTSD Checklist* (Amaya-Jackson et al., 1995) was used to diagnose likely PTSD. The measure was administered as a self-completed checklist, with items counting towards diagnosis if the participant endorsed them as occurring “Most” or “all of the time” (Seedat et al., 2004, p. 170). The number of negative life events did not appear to impact rates of PTSD diagnosis. Life events beyond trauma were assessed using the *Life Events Questionnaire, Adolescent Version (LEQ-A; Masten, Neemann, & Andenas, 1994)*. Depressive symptoms were assessed using the *BDI* (Beck & Steer, 1987). Overall, 14.5% of youth in the study met criteria for likely PTSD; 10% met criteria for “partial-symptom PTSD” (Seedat et al., 2004, p. 171).

A similar study by Suliman et al. (2009) examined trauma exposure, rates of PTSD and symptoms of related disorders (e.g., depressive symptoms), and the effect of multiple traumas on 922 youth (age range: 14-18 years) living in Cape Town, South Africa. Stressful events were assessed using the *LEQ-A* (Masten et al., 1994), history of abuse and neglect was assessed using the *CTQ* (Bernstein et al., 1994), and trauma events were assessed using the *Trauma Checklist*, a measure adapted from the *Kiddie-SADS-PL* (Kaufman et al., 1997). Finally, PTSD diagnosis was made using the *Child PTSD Checklist* (Amaya-Jackson et al., 1995). The *BDI* (Beck & Steer, 1987) was used to assess depressive symptoms, while the *Multidimensional Anxiety Scale for Children (MASC; March, Amaya-Jackson, Terry, & Costanzo, 1997)* was used to assess self-rated anxiety. Results indicated that 23.6% of youth had likely PTSD. Further, experiencing stressful life events, abuse, or neglect was associated with PTSD and depressive symptoms. Past

year stressful life events “and childhood abuse and neglect were both significantly positively correlated to anxiety, depression, and PTSD symptoms” (Suliman et al., 2009, p. 124).

**Sexual Assault.** Rates of sexual assault and resulting PTSD have been examined in both male and female populations. For example, Broman-Fulks et al. (2007) examined 321 male and female American adolescents (age range: 12-17 years) from the *1995 NSA* who reported having been sexually assaulted. More specifically, the authors examined whether disclosure of sexual assaults within one month would reduce the risk for various mental health issues. The authors noted that only two-thirds of the participants had disclosed assaults prior to being interviewed for the study. Of the 321 youth assessed, 319 provided full disclosure data and were included in the analysis. Several measures were used to assess for psychopathology and behavioral issues including a modified version of the *NWS PTSD* module (Kilpatrick et al., 1989) to diagnose PTSD. Results indicated that 65.8% of youth in the study reported one sexual assault, with the remaining youth reporting multiple assaults. The six-month prevalence of PTSD did not significantly differ between youth who disclosed sexual assault within one month (22%), after one month (13%), or not at all (24%). In regard to disclosure, there were significantly different rates of PTSD, substance abuse or dependence, and delinquency in youth who first disclosed to their mother ( $n=75$ ) versus youth who first disclosed to someone else ( $n=143$ ) or did not disclose to anyone at all ( $n=101$ ). The authors noted that when adolescents disclosed the assault to their mothers, the risk of PTSD was reduced five-fold. Six-month prevalence of PTSD after disclosure to the youth’s mother, someone else, or no one at all were 7%, 25%, and 23%, respectively. Youth injured during the sexual assault had a nearly four-fold increase in PTSD diagnosis. The *NWS depression* module (Kilpatrick et al., 2003) was used to diagnose a Major Depressive episode. Substance use and dependence was assessed using DSM-IV criteria

(Kilpatrick, 2000). Finally, delinquency was assessed using a modified version of a scale that had been used by Elliott, Huizinga, and Ageton (1985) in the National Youth Study (Broman-Fulks et al., 2007). The authors reported that disclosure was not significantly related to differences in substance abuse, substance dependence, or rates of depression. Further, they reported that non-disclosers were more likely to report having “committed a delinquent offense in the past year” (Broman-Fulks et al., 2007, p. 265). No results were reported regarding diagnostic comorbidities.

Wolitzky-Taylor et al. (2008) examined multiple forms of dating violence in a representative sample of 3,614 American male and female adolescents (age range: 12-17 years) from the 2005 NSA. Potentially traumatic events – including questions regarding drug or alcohol facilitated rape (DAFR) collected from female participants only – were assessed using questions about physical or sexual assault from a partner or another individual. Of note, verbal threats and aggression were not considered. Participants were also questioned about other potentially traumatic events (e.g., motor vehicle accidents, natural disasters). The PTSD module of the NSA survey was used to assess lifetime PTSD (Kilpatrick et al., 1989). Beyond PTSD, the NSA survey depression module was used to assess lifetime diagnosis of an MDE. Results showed that 1.6% of the sample (girls=2.7%; boys=0.6%) reported “serious dating violence” (p. 758), with sexual assault occurring in .9% of the sample and physical violence from a partner occurring in .8% of the sample. While the authors did not report rates of PTSD, they noted that participants who were exposed to partner violence were almost four times as likely as those who were not to receive a diagnosis of PTSD. Participants exposed to stressful life events beyond dating violence were about twice as likely, and those exposed to other forms of trauma were about three times as likely, as those who were not to meet criteria for a diagnosis of PTSD.

McCauley et al. (2009) examined 1,763 adolescent girls (age range: 12-17 years) for lifetime sexual assault and past year rates of PTSD. Similarly to the Wolitzky-Taylor et al. (2008) study, the authors included “incapacitated/drug-alcohol facilitated sexual assault (IS/DAFS)” as one form of sexual assault (p. 295). The McCauley et al. (2009) study examined sexual assault in two ways: using a sexual assault module with questions similar to items from the 1995 NSA (Kilpatrick, 2000) and using follow-up questions regarding IS/DAFS. The PTSD module of the NSA survey (Kilpatrick et al., 1989; Resnick et al., 1993) was used to diagnose PTSD. Results indicated that 11.8% of girls in the study had experienced lifetime sexual assault, with 2.1% of these girls experiencing IS/DAFS sexual assault. Non-sexual assault trauma exposures were not reported. Rates of PTSD were approximately 22% among girls who had experienced IS/DAFS sexual assault, approximately 23% in girls who had experienced other sexual assault, and approximately 6% in girls who did not experience either form of sexual assault. The authors indicated that past year rates of PTSD were comparable in girls who experienced lifetime IS/DAFS or other sexual assault, and that both groups were significantly more likely than girls who did not report any history of sexual assault to be diagnosed with PTSD within in the past year. Beyond PTSD, the depression module of the NSA survey was used to diagnose a major depressive episode. Other questions were used to assess substance use (Kilpatrick, Acierno, Resnick, Saunders, & Best, 1997; Kilpatrick, 2000). Similarly to PTSD diagnosis, the authors indicated that rates of past year MDE were comparable in girls who reported IS-DAFS sexual assault or non-IS/DAFS sexual assault. Girls who reported lifetime IS/DFS sexual assault were most likely to endorse alcohol abuse or drug use within the prior year.

Table 2.2 presents an overview of the PTSD rates that were reported in the 11 criminal victimization studies that were reviewed. As may be noted, PTSD point prevalence rates ranged from 3.8% (Vila et al., 1999) to 35% (Famularo et al., 1996).

**Table 2.2**

*PTSD rates in youth following criminal victimization*

<b>Physical Assault</b>					
<u>Study</u>	<u>Gender</u>	<u>Age</u>	<u>Measure(s)</u>	<u>Time Since Trauma</u>	<u>PTSD Prevalence</u>
Famularo et al. (1996) *American youth	48 males 69 females	6-12 years Mean age: not reported	<i>DICA-C-R</i> Clinical Interview	Not reported	35%
Silva et al. (2000) *American youth	39 males 20 females	3-18 years Mean age: 9.9 years	<i>Kid SCID</i>	Not reported	22%
∞ Rheingold et al. (2012) *American youth	1,851 males 1,763 females	12-17 years Mean age: 14.6 years	<i>NWS PTSD module</i>	PTSD in past 6 mos based on lifetime exposure	Criminal homicide: 9%  Vehicular homicide: 7% Both: 2%
Vila, Porche, & Mouren-Simeoni (1999) *French children	14 males 12 females Comparison group: 11 males 11 females	7.5-9.5 years (n=22) 6-6.5 years (n=4)  7.5-9.5 years (n=22 controls)	<i>Kiddie-SADS-L</i> <i>IES</i> <i>STAIC</i>	2-18 months post incident	1 month: 11.5% 2 months: 15.4% 4 months: 3.8% 7 months: 7.7% 18 months: 3.8%

Holbrook et al. (2005a) *American youth	284 males 117 females	12-19 years Mean age:15 years	<i>IES-R</i>	3, 6, 18 and 24 months	Across time: 27%
Broberg et al. (2005) *Swedish youth	110 males 112 females	13-24 years Mean age (females): 17.35 Mean age (males): 18.09	<i>IES</i> <i>CAPS</i>	18 months	25%
Seedat et al. (2004) *South African and Kenyan youth	883 males 1158 females	14-22 years Mean age: 15.8	<i>Trauma Checklist</i> <i>Child PTSD Checklist</i>	Lifetime	14.5%
83 Suliman et al. (2009) *South African youth	380 males 542 females	14-18 years Mean age: 15.73 years	<i>Trauma Checklist</i> <i>Child PTSD Checklist</i>	Lifetime	23.6%

## Sexual Assault

<u>Study</u>	<u>Gender</u>	<u>Age</u>	<u>Measure(s)</u>	<u>Time Since Trauma</u>	<u>PTSD Prevalence</u>
Broman-Fulks et al. (2007) *American youth	70 males 251 females	12-17 years Mean age: 15.2 years	NWS PTSD module (modified version)	PTSD in past 6 months based on lifetime exposure	Disclosed within one month: 22%  Disclosed after 1 month: 13%  Nondisclosers: 24%
84 Wolitzky-Taylor et al. (2008) *American youth	N = 3,614 *breakdown by gender not reported	12-17 years Mean age: not reported	Questions regarding stressful or traumatic life events  NSA PTSD module	Not reported	Exposure to dating violence compared to no exposure to dating violence (OR=3.58)
McCauley et al. (2009) *American youth	1,763 females	12-17 years Mean age: not reported	Sexual Assault module  Questions regarding IS/DAFS  NSA PTSD module	Not reported	IS/DAFS: ~22%  Other sexual assault: ~23%  No sexual assault: ~6%

**Accident and Natural Disaster Studies.** With relatively high rates of occurrence, many individuals have been involved in accidents or exposed to natural disasters. In the Breslau et al. (1998) study previously reviewed, the authors noted that 28.0% of their sample of 2,181 U.S. adults had been in a serious motor vehicle accident and 16.6% had been exposed to a natural disaster. A review of the international literature suggests that 12% to 46% of youth qualify for a diagnosis of PTSD within 4 months following a motor vehicle accident and 13% to 25% between 4 and 12 months following a motor vehicle accident (Mehta & Ameratunga, 2012). In a study of adult women in the U.S., Resnick et al. (1993) observed that 33.31% of their sample had been exposed to a disaster. In a study involving Swiss youth, Landolt et al. (2013) reported that 13.13% of their study participants had been involved in a severe accident, 1.77% had been in an earthquake, and 14.37% had been exposed to another disaster. Given the high rates of individuals involved in accidents or exposed to natural disasters, studies have been conducted to examine the psychological effects of these incidents on individuals. The next sections will focus on rates of PTSD in youth involved in accidents or exposed to disasters.

**Accident Studies.** A study by Daviss et al. (2000) examined the prevalence of PTSD among 48 American children (age range: 7-17 years) who had been hospitalized following various injuries (e.g., automobile accidents, gunshots, and burns). Children and their parents were interviewed using the *TESI* for Children (*TESI-C*) or for Parents (*TESI-P*; Ford & Rogers, 1997), respectively, to assess traumatic event exposure. Injury severity was examined by a pediatric surgeon using the *Injury Severity Score (ISS)*; Baker, O'Neill, Haddon, & Long, 1974), acute distress using the *Child Stress Reaction Checklist (CSRC-P)*; Saxe, November, 1997), and prior psychopathology using the *CBCL* (Achenbach, 1991). Parental acute distress was measured using the *Stanford Acute Stress Reaction Questionnaire (SASRQ-R)*; Classen, Koopman, Hales, &

Spiegel, 1998). Thirty to 256 days following discharge, participants received administrations of the *CAPS, Child and Adolescent version (CAPS-CA; Nader et al., 1996)* to diagnose PTSD. Additionally, parents completed the *PTSD Checklist (Ford & Rogers, 1997)*. Results of the study indicated that 12.5% of children met criteria for PTSD. The authors noted that having prior psychopathology, a history of sexual abuse, or a parent who endorsed high levels of acute distress were associated with youth meeting criteria for PTSD. Prior psychopathology, having a parent who endorsed high levels of acute distress, and, to some extent, the child having a high level of acute distress, were related to posttraumatic stress symptoms.

Landolt, Buehlmann, Maag, and Schiestl (2009) assessed 43 Swiss child and adolescent (age range: 7-16 years) burn victims to determine the relationship between PTSD and health-related quality of life. PTSD was assessed using a German translation of the *CAPS-CA (Nader et al., 1996; Steil & Fuchsel, 2006)*. Quality of life was assessed using the *TNO-AZL Child Quality of Life Questionnaire (TACQOL; Vogels, 2000)*. Results indicated that 18.6% of burn victims met full diagnostic criteria for PTSD. Results further indicated that participants with PTSD were more likely than participants without PTSD to have significantly lower social functioning as rated by the *TACQOL*. This finding was especially true for youth who reported a greater number of PTSD symptoms. The authors expressed surprise that participants without PTSD reported more physical complaints. Of note, the authors also reported that children whose mothers were present during the time when they were burned had fewer PTSD symptoms and higher quality of life scores.

Maeda, Kato, and Maruoka (2009) examined survivors of a ship that sank after being hit by a submarine. Thirty-five individuals had been aboard, including 13 students in training at a fisheries high school (age: 17 years), 2 teachers, and 20 crewmembers. Five adults and four

students were believed to have drowned. All nine surviving youth participated in the study. Students were assessed at five time points occurring between two and 38 months following the accident. PTSD symptoms were assessed using the *IES-R, Japanese version (IESR)*; Asukai, Kato, Kawamura, & Kim, 2002). Diagnoses were made based on administrations of the *CAPS* (Asukai, Hirohata, Kato, & Konishi, 2003; Blake et al., 1995) and the *MINI-Kid* (Otsubo et al., 2005; Sheehan et al., 1998). Additionally, adolescents' general health was assessed using the *General Health Questionnaire (GHQ)*; Zung, 1965). Depressive symptoms were assessed using the *Self-Rating Depression Scale (SDS)*; Fukuda & Kobayashi, 1973). Results indicated that seven of the nine students met criteria for PTSD and six of the nine met criteria for Major Depressive Disorder (MDD) at a 2-month follow-up. While seven students still met criteria for PTSD and four met criteria for MDD at the 14-month follow-up, the authors noted that self-reported PTSD and MDD symptoms improved over time. No participants met criteria for PTSD or MDD by 38 months. Youth with high CAPS scores endorsed high numbers of general health problems on the *GHQ*, high impact on the *IES*, and had high self-rated depression on the *SDS* at the 2-month follow-up. All self-rating scale scores decreased across the follow-up intervals.

**Motor Vehicle Accidents.** Three articles located during the current review of the literature, which were also included in the Mehta and Ameratunga (2012) literature review, are described herein. A study by Gillies, Barton, and Di Gallo (2003) examined 31 participants (age range: 6-20 years), following motor vehicle accidents. PTSD symptoms were assessed using the *IES-R* (Dyregrov, Kuterovac, & Barath, 1996; Horowitz et al., 1979) and the *UCLA-PTSD RI* (Pynoos et al., 1987). Parents completed the *CBCL* (Achenbach, 1991) and participated in a semi-structured interview. The authors indicated that during a previous study participants were administered the *IES-R* and *UCLA-PTSD RI* at 2-16 days and 12-15 weeks following accidents

(Di Gallo, Barton, & Parry-Jones, 1997, in Gillies et al., 2003). Results of the initial study indicated that symptom severity decreased between the first and second assessment, with 14% of youth falling in the Moderate to Severe level of PTSD at the second assessment. The Gillies et al. (2003) study examined these same participants for a third time between 67 and 96 weeks after the motor vehicle accident. Results of the Gillies et al. (2003) study indicated that 32% of participants had high scores on the *IES-R*, noting that this finding was not significantly different from that found at time two. At time three, 29% of participants had PTSD symptoms in the moderate to severe level, as measured by the *UCLA-PTSD RI*. They further specified that symptom severity increased in 71% of participants between the second and third interviews, with several participants exhibiting delayed onset posttraumatic stress symptoms. Additionally, parent measures and interviews at the third time point indicated that participants continued to be “upset about the accident” and had “changed behaviour in school”; they also endorsed generally high scores on the *CBCL* (Gillies et al., 2003, p. 525). The authors hypothesized that avoidance may have skewed results if participants could not answer or avoided answering items related to the trauma at early interview time points (Gillies et al., 2003).

Stallard, Velleman, and Baldwin (1998), examined 119 British children (age range: 5-18) who had been in motor vehicle accidents and an additional 66 children who had sports injuries. PTSD was diagnosed during a semi-structured interview that included the *CAPS for Children* (*CAPS-C*; Nader, Kriegler, Blake, & Pynoos, 1994). Results indicated that 34.5% of children involved in a motor vehicle accident met diagnostic criteria for PTSD while only 3% of children who sustained sports injuries met diagnostic criteria for PTSD.

In a similar study, Zink and McCain (2003) examined 143 American children (age range: 7-15 years) who had been involved in motor vehicle accidents. While the Stallard et al. (1998)

study assessed children at only one point in time, Zink and McCain (2003) assessed children at two time points. PTSD was diagnosed based on the *DICA-R* PTSD module (Werner et al., 1987) at two and six months post-accident. Data regarding each child's behavior were collected from parents via the *CBCL* (Achenbach, 1991). Results indicated that 18% of youth in the study met diagnostic criteria for PTSD 2 months after being in an automobile accident. Ten percent of children, including six with delayed onset, met diagnostic criteria for PTSD six months after their accident. Combined, 22% of all subjects met diagnostic criteria for PTSD at two or six months. Similar to those found in the Gillies et al. (2003) study, results of the *CBCL* ratings collected for the Zink and McCain (2003) study indicated that children with PTSD had increased behavioral issues following injury.

Table 2.3 presents an overview of the PTSD rates that were reported in the six accident studies that were reviewed. As may be noted, PTSD point prevalence rates ranged from 0% (Maeda et al., 2009) to 88.9% (Maeda et al., 2009).

**Table 2.3**

*PTSD rates in youth following accidents*

**Accidental Injury**

<u>Study</u>	<u>Gender</u>	<u>Age</u>	<u>Measure(s)</u>	<u>Time Since Trauma</u>	<u>PTSD Prevalence</u>
Daviss et al. (2000) *American youth	31 males	7-17 years	<i>TESI</i> (Parent and child versions)  <i>CAPS-CA</i>  <i>PTSD Checklist</i> (parent)	30 to 256 days	12.5%
	17 females	Mean age: 13.5 years		Mean time = 95 days	
Landolt et al. (2009) * German-speaking Swiss youth	28 males	7-16 years	<i>CAPS-CA</i>	4.4 years on average	18.6%
	15 females	Mean: 10.4 years			
Maeda et al. (2009) *Japanese youth	9 males	17 years (at 2 month evaluation)	<i>IES-Revised</i>	2 - 38 months	2 mos: 77.8%
		Mean age: not reported	<i>CAPS</i>		8 mos: 88.9%
			<i>MINI-Kid</i>		14 mos: 77.8%
					26 mos: 11.1%
					38 mos: 0%

## Motor Vehicle Accidents

<u>Study</u>	<u>Gender</u>	<u>Age</u>	<u>Measure(s)</u>	<u>Time Since Trauma</u>	<u>PTSD Prevalence</u>
Gillies et al. (2003) *American youth	19 males 12 females	6-20 years Mean age: 11.7 years	<i>IES-R</i> <i>UCLA-PTSD RI</i>	67-96 weeks (mean: 78 weeks)	29% with moderate-severe symptoms  44% mild symptoms
Stallard et al. (1998) *British youth	105 males 80 females	5-18 years Mean age: 13.97 years	<i>CAPS-C</i> as part of a semistructured interview	road traffic accidents: 22-79 days (mean: 40.3 days)  Sports injuries: 21-82 days (mean: 43.5 days)  *3 youth in road traffic accidents and 2 sustaining sports injuries were assessed prior to 1 month; 0 met remaining PTSD diagnostic criteria	Motor vehicle accident: 34.5%  Sports injury: 3%

**Motor Vehicle Accidents (continued)**

<u>Study</u>	<u>Gender</u>	<u>Age</u>	<u>Measure(s)</u>	<u>Time Since Trauma</u>	<u>PTSD Prevalence</u>
Zink and McCain (2003) *American youth	85 males 58 females	7-15 years Mean age: 10.8 years	<i>DICA-R</i> PTSD module	2 months, 6 months	2 months: 18% 6 months: 10% Overall: 22%

**Water-Related Natural Disasters (i.e., cyclones, tsunamis, hurricanes, and typhoons).** Kar and Bastia (2006) examined youth 14 months after a super cyclone in India. The authors diagnosed PTSD, Generalized Anxiety Disorder, and MDD using the *MINI-Kid* (Sheehan et al., 1998). Trauma exposures included seeing mutilated bodies, seeing damaged or destroyed homes, and experiencing starvation. Results of the study indicated that 37.9% of youth (Mean age (males): 14.25 years; Mean age (females): 14.3 years) met criteria for at least one diagnosis; 26.9% met criteria for PTSD, 12.0% for GAD, and 17.6% for MDD.

In a study conducted by McDermott, Cobham, Berry, and Stallman (2010), 441 Australian children (age range: 8-15 years) were examined three months following exposure to a cyclone. Screening questions were used to assess the children's experience during and after the event (McDermott, Lee, Judd, & Gibbon, 2005). Assessment included subjective perception of threat to oneself or a threat to family member's life. PTSD symptoms were assessed using the *UCLA-PTSD RI* (Steinberg, 2004). Other mental health issues were assessed via parent report using the *Strengths and Difficulties Questionnaire, parent report version, emotional subscale (SDQ)*; Goodman, 1997; Goodman, 2001). Finally, family resilience was assessed via parent reports on the *Family Resilience Measure (FRM)*; Zubrick et al., 2005). Results indicated that 11.3% of children in the study had PTSD symptoms in the severe to very severe range on the *UCLA-PTSD RI*.

Agustini, Asniar, and Matsuo (2011) examined 482 Indonesian children (age range: 11-19 years) to determine the prevalence of PTSD in youth exposed to a tsunami. The *Traumatic Exposure Severity Scale (TESS)*; Elal, 2005) was used to assess for the impact of the tsunami and participants' level of distress in response to the tsunami. The *UCLA-PTSD RI* (Pynoos et al., 1987) was used to assess for posttraumatic stress symptoms. The authors noted that all of the

children in the study reported witnessing a family member's death, seeing a mutilated body, or hearing agonizing screams from others as a result of exposure to the tsunami (Agustini et al., 2011). Nearly one-quarter of the sample lost one or both parents. Results indicated that 22.4% of study participants had severe to very severe scores on the *UCLA-PTSD RI*. Similar to the results of the McDermott et al. (2010) study indicating that perceived threat was associated with higher *UCLA-PTSD RI* scores, Agustini et al. (2011) noted that *TESS* scores were positively associated with *UCLA-PTSD RI* scores.

Goenjian et al. (2001) examined posttraumatic reactions in 158 adolescents across various regions of Nicaragua following a hurricane. Youth from Posoltega ("the most devastated region" (p. 789)), Chinandega, and Leon ("the least devastated city" (p. 789)) were included. Many participants in the study lost their homes (63%) or a family member (31%), or were seriously injured (27%; Goenjian et al., 2001, p. 790). The authors administered the *UCLA-PTSD RI* (Pynoos et al., 1987) to assess for posttraumatic symptoms and the *Depression Self-Rating Scale (DSRS)* (Asarnow & Carlson, 1985) to assess for depressive symptoms. Results indicated that 90% of youth recruited from Posoltega, 55% from Chinandega, and 14% from Leon had severe to very severe posttraumatic stress symptoms. Comorbid PTSD and depression diagnoses, as based on "empirically derived cutoff scores" (Goenjian et al., 2001, p. 791), were reported as being 79% in Posoltega, 38% in Chenandega, and 29% in Leon.

Rates of PTSD and depressive symptoms among 271 Taiwanese adolescents (age range: 12-15 years) who had been displaced due to a typhoon were examined by Yang et al. (2011). To assess trauma exposure and impact of that exposure, the Chinese version of the *IES-R* (Weiss & Marmar, 1997; Wu & Chan, 2003) was administered. Participants were also asked to complete the *Inventory of Exposure Experience to Typhoon Morokot*, which was adapted from a prior

inventory for earthquake exposed adolescents (Hsu, Chong, Yang, & Yen, 2002). The *MINI-Kid* (Sheehan et al., 1998) was used to diagnose PTSD. Overall, results indicated that 25.8% of participants met criteria for a diagnosis of PTSD. Beyond PTSD, depressive symptoms were assessed using the *Center for Epidemiological Studies Depression Scale (CES-D)*; Chien & Chung, 1985; Radloff, 1977) and perception of familial support using the *Family APGAR Index* (Yang et al., 2011). Finally, teachers were asked to complete *Achenbach's Teacher Report Form (C-TRF)*; Achenbach & Rescorla, 2007) regarding the child's behavioral and emotional presentation. Participants who had more trauma event exposures, had PTSD based on prior trauma exposures, or were personally injured or had a family member injured or die were more likely to meet criteria for PTSD. Perceived family support was not related to PTSD. Participants with PTSD had higher self-rated depression and *IES-R* scores. Finally, youth with PTSD as a result of the Typhoon had "more severe teacher-rating symptoms on Social Problems, Thought Problems, and Rule Breaking Behavior and total *C-TRF*" scores (p. 365).

**Earthquakes.** Najarian, Goenjian, Pelcovitz, Mandel, and Najarian (1996) examined rates of earthquake-related PTSD among 49 Armenian youth (age range: 11-13 years) without a prior history of psychiatric problems. The authors examined youth in multiple categories: those who stayed in their homes, those who relocated, and those who lived in a nearby city with minimal exposure to the earthquake. PTSD diagnosis was made using the *DICA* PTSD module (Kaplan & Reich, 1991). The *DSRS* (Asarnow & Carlson, 1985) was used to assess for depressive symptoms. Behavioral issues were assessed using the *CBCL Parent* (Achenbach & Edelbrock, 1983) and *Teacher* (Achenbach & Edelbrock, 1986) reports. The results of the study indicated that children exposed to the earthquake had higher rates of PTSD than the control group, with 32% of youth who did not relocate and 28% of exposed youth who did relocate

meeting criteria for PTSD, compared to only 4% of the control group. Youth with high levels of exposure to the earthquake also had higher depression scores than the control group. As in the case of the Gillies et al. (2003) and Zink and McCain (2003) studies, mothers of youth with high levels of exposure to the earthquake reported that they felt that their children had more behavioral issues on the *CBCL* relative to the mothers of the control group. The only significant result of teacher reports involved girls who were exposed to the earthquake as those cases had higher rates of internalizing issues relative to girls in the control group.

In a study by Eksi et al. (2007), 160 youth (age range: 9-18 years) were examined six to 20 weeks following a 7.4 magnitude earthquake in Turkey. A psychiatric interview was used to assess trauma exposure and psychiatric symptoms. All participants had multiple trauma exposures. These included, but were not limited to, having their houses collapse, having to relocate, being injured, and having a family member injured or killed. Participants completed a self-report questionnaire that included questions about their demographics and location during the earthquake. The questionnaire included items regarding potential trauma experiences (e.g., experiencing “serious danger,” witnessing death or witnessing “extreme suffering” (p. 192)). To assess state and trait anxiety, the researchers administered the *STAI* (Spielberger, 1983). PTSD was assessed using the *CAPS* (Blake, Weathers, & Nagy, 1990) as part of a clinical interview by a psychiatrist. The authors noted that the adult version of the *CAPS* was used in the study since “the Child *CAPS* was not standardized at the time” that the study began (p. 192). Finally, parental reactions and feelings of guilt were examined during the clinical interview. Results indicated that 60% of participants met criteria for PTSD and 31% met criteria for major depression. While there were no gender differences for PTSD diagnoses, the authors reported that boys were more likely than girls to meet criteria for a diagnosis of depression.

**Fire.** A study by Yelland et al. (2010) examined 155 youth (age range: 8-18 years) exposed to bushfires in Australia. The *UCLA-PTSD RI-Revised* (UCLA-PTSD RI-R; Steinberg, 2004) was used to assess Posttraumatic Stress symptoms. A disaster-related traumatic experiences measure “adapted from the *Hurricane-Related Traumatic Experiences-Revised* (La Greca, Silverman, Vernberg, & Prinstein, 1996) scale” was used to assess for exposure to traumatic stressors, such as perceived or actual threat to life, or immediate or ongoing loss or disruption (Yelland et al., 2010, p. 275). Results indicated that 27% of youth in the study had scores on the *UCLA-PTSD RI -R* falling in the moderate to very severe range.

Table 2.4 presents an overview of the PTSD rates that were reported in the eight disaster studies that were reviewed. As may be noted, PTSD point prevalence rates ranged from 10.0% (Yelland et al., 2010) to 90% (Goenjian et al., 2001).

**Table 2.4**

*PTSD rates in youth following natural or manmade disasters*

**Cyclones, tsunamis, hurricanes, typhoons**

<u>Study</u>	<u>Gender</u>	<u>Age</u>	<u>Measure(s)</u>	<u>Time Since Trauma</u>	<u>PTSD Prevalence</u>
Kar and Bastia (2006) *Indian youth	48 males 60 females	*age range not reported  Mean (males): 14.25 years  Mean (females): 14.3 years	<i>MINI-Kid</i>	14 months	26.9%
86					
McDermott et al. (2010) *Australian youth	198 males 243 females	8-15 years  Mean age: 10.2 years	<i>UCLA-PTSD RI</i>	3 months	Severe to very severe range: 11.3%
Agustini et al. (2011) *Indonesian youth	246 females 236 males	11-19 years  Mean age: 14.4 years	<i>UCLA-PTSD RI</i>  <i>TESS</i>	4.5 years	Mild: 25.7%  Moderate: 40.7%  Severe: 21.4%  Very severe: 1%

Cyclones, tsunamis, hurricanes, typhoons (continued)

<u>Study</u>	<u>Gender</u>	<u>Age</u>	<u>Measure(s)</u>	<u>Time Since Trauma</u>	<u>PTSD Prevalence</u>
Goenjian et al. (2001) *Nicaraguan youth	81 males 77 females	'adolescents' Mean age: 13 years	<i>UCLA-PTSD RI</i>	6 months	Posoltega: 90% Chinendega: 55% Leon: 14%  * severe to very severe posttraumatic stress symptoms
<sup>66</sup> Yang et al. (2011) *Taiwanese youth	124 males 147 females	12-15 years Mean age: 13.4 years	<i>Inventory of Exposure Experience to Typhoon Morokot</i>  <i>IES-R</i>  <i>MINI-Kid</i>	3 months	25.8%

## Earthquakes

<u>Study</u>	<u>Gender</u>	<u>Age</u>	<u>Measure(s)</u>	<u>Time Since Trauma</u>	<u>PTSD Prevalence</u>
Najarian et al. (1996) *Armenian youth	37 males 37 females *includes n=49 youth exposed to earthquake and n=14 control subjects	11-13 years *Mean age not reported	<i>DICA</i> PTSD module	2 ½ years	Earthquake: 32% Relocated: 28% Comparison: 4%
Eksi et al. (2007) *Turkish youth	58 males 102 females	9-18 years Mean age: 14.43 years	Clinical Interview <i>CAPS</i>	6-20 weeks	60%

## 100 Fires

<u>Study</u>	<u>Gender</u>	<u>Age</u>	<u>Measure(s)</u>	<u>Time Since Trauma</u>	<u>PTSD Prevalence</u>
Yelland et al. (2010) *Australian youth	67 males 88 females	8-18 years Mean age: 12.8 years	<i>UCLA-PTSD RI-R</i> Disaster-related traumatic experiences measure	11-15 months	Severe to Very Severe Range: 10% Moderate range: 17%

## **Comorbidity**

Several of the studies described previously examined PTSD and various other diagnoses, but did not report comorbidities (Allwood et al., 2002; Huemer et al., 2011; Morgos et al., 2008; Najarian et al., 1996; Savin et al., 1996). Other studies have considered the relationship between posttraumatic stress symptoms and symptoms of other diagnoses. For example, in their study of hurricane exposed youth, Goenjian et al. (2001) reported strong associations between posttraumatic stress symptoms (PTSS) and depressive symptoms. However, the authors were only able to report relationships between the disorders based on test cutoff scores. Using these cutoff scores, the authors noted that comorbidities between likely PTSD and depression were highest in youth from the hardest hit area. Yang et al. (2011) noted that displaced Taiwanese youth following a hurricane who qualified for a diagnosis of PTSD reported more psychological distress and more depressive symptoms than those who did not qualify for a diagnosis of PTSD. Maeda et al. (2009) reported that PTSD symptom severity was associated with depressive symptoms. In their study of youth in South African and Kenyan schools, Seedat et al. (2004) similarly observed a significant trend between PTSD symptoms and *BDI* scores, where youth who endorsed more PTSD symptoms had higher scores on the depression measure. The authors further reported that substance use was not significantly associated with PTSD symptoms.

Other studies have reported odds ratios or shown a path analysis to describe comorbid relationships. For example, Sack et al. (1994) reported odds ratios to describe the relationship between youth with or without PTSD and comorbid disorders. The authors indicated that Khmer refugee youth with PTSD were about three to four times more likely than those without PTSD to have comorbid anxiety or depressive disorders.

While many studies described thus far have not reported rates of comorbid diagnoses, several studies have. In the aforementioned study by Famularo et al. (1996), the authors examined rates of comorbid diagnoses in U.S. youth exposed to child abuse and/or trauma using the *DICA-C-R*. Results indicated that youth exposed to trauma with PTSD were more likely than youth exposed to trauma without PTSD to also be diagnosed with another anxiety disorder, attention-deficit hyperactivity disorder (ADHD), or a psychotic disorder. Further, the authors noted that these youth were also more likely to express “at least a transient desire to kill themselves” (p. 958). Famularo et al. (1996) also reported that youth with PTSD may have “a tendency toward mood disorders” (Famularo et al., 1996, p. 959), but that, ultimately, there was no significance between groups on mood disorders. Additionally, the authors reported no significant differences between group rates of, Oppositional Defiant Disorder (ODD) or Conduct Disorder (CD), enuresis, or encopresis.

The Kilpatrick et al. (2003) examination of youth from the *NSA* provided information involving multiple comorbid conditions in US populations. The PTSD and MDE modules from a modified version of the *NWS* (Kilpatrick et al., 1989) were used to assess PTSD and MDE, respectively, using a 6-month cutoff for current versus lifetime diagnosis. Interview questions based on DSM-IV criteria were used to assess substance abuse or dependence using a 12-month cutoff. Of the 6.3% of girls and 3.7% of boys who met criteria for a diagnosis of PTSD, nearly three-quarters met criteria for at least one other disorder. Sixty-two percent of youth with diagnosed PTSD also met criteria for a MDE. The authors did not report overall rates for comorbid PTSD and Substance Abuse/Dependence (SA/D), but did report rates by gender, with 29.7% of boys and 24.2% of girls with PTSD also meeting criteria for SA/D.

In their study of a community sample of German youth using the *M-CIDI* (Lachner et al., 1998; Wittchen et al., 1998a), Perkonig et al. (2000) reported comorbidity rates involving PTSD, substance use and multiple other disorders. Overall, the authors noted that, of youth who met criteria for a diagnosis of PTSD, 87.5% also met criteria for one other diagnosis; 77.5% met criteria for two or more other diagnoses. The prevalence of youth who met criteria for other diagnoses prior to PTSD (Primary), following PTSD (Secondary), or within the same year that they developed PTSD (Concurrent) was reported. Results indicate that mood (Primary: 31.6%; Secondary: 52.6%; Concurrent: 15.8%) and substance abuse or dependence (Primary: 29.4%; Secondary: 61.8%; Concurrent: 8.8%) disorders tended to occur more often after participants qualified for a diagnosis of PTSD. Somatoform (Primary: 66.7%; Secondary: 33.3%; Concurrent: 0.0%), anxiety (Primary: 54.2%; Secondary: 33.3%; Concurrent: 12.5%), and eating disorders (Primary: 80.0%; Secondary: 20.0%; Concurrent: 0.0%) tended to occur first. In regard to other disorders occurring simultaneously or sequentially to PTSD, the authors noted that “in most comorbid PTSD cases, depressive disorders (68.5%), agoraphobia with or without panic disorder...[and] substance abuse or dependence (70.6%)... [occur] simultaneously or are secondary” to PTSD (Perkonig et al., 2000, p. 53).

The Kar and Bastia (2006) study of Indian youth exposed to a super-cyclone described earlier examined comorbidities in youth who met criteria for PTSD, GAD, or MDD based on results of the *MINI-Kid* (Sheehan et al., 1998). The authors reported that, of the 37.9% of youth in the study who met criteria for at least one disorder, 39% met criteria for more than one diagnosis (two diagnoses: 11.1%; three diagnoses: 3.7%). Results indicated that PTSD was highly comorbid with both MDD (63.2%) and GAD (76.9%). Unlike Thabet et al. (2004), who concluded that comorbidity in their study may have been the result of posttraumatic stress and

depressive symptoms overlapping, Kar and Bastia (2006) reported that symptom overlap alone did not account for the high comorbidities.

The previously discussed study by Eksi et al. (2007) that involved youth exposed to an earthquake in Turkey indicated that, based on results of the *CAPS* (Blake et al., 1990) and a clinical interview, about half (45 of 96) of all participants diagnosed with PTSD also met criteria for depression. The previously discussed Elbert et al. (2009) study of youth exposed to civil war, using multiple diagnostic measures, also reported comorbidity between PTSD and internalizing disorders or related symptoms. Psychiatrists conducting clinical interviews reported that 8% of the sample who did not qualify for PTSD qualified for another anxiety disorder (separation anxiety, social phobia, or agoraphobia), whereas 12% of youth who did meet criteria for PTSD had a comorbid anxiety disorder. Similarly, 4% of youth without PTSD met criteria for an affective disorder (current major depression, dysthymia), whereas 41% of youth with PTSD met criteria for an affective disorder. Suicide risk at the time of the assessment was also higher in youth with PTSD (26% vs 7% in those without). Finally, youth with PTSD were more likely to report somatic symptoms (e.g., headaches) than youth without PTSD. Similarly, in their study of Palestinian youth, Elbedour et al. (2007, p. 726) reported that “adolescents diagnosed with PTSD tended to be those who reported the highest levels of depression, anxiety, and positive reappraisal coping and the lowest levels of seeking guidance and support coping” (p. 726).

Table 2.5 presents an overview of the five studies that provided information regarding comorbidities between PTSD and various other diagnoses. As may be noted, comorbidity rates ranged from 12% with another anxiety disorder (Elbert et al., 2009) to 76.9% with generalized anxiety disorder (Kar & Bastia, 2006).

**Table 2.5**

*Comorbidities*

<u>Study</u>	<u>Measure(s)</u>	<u>PTSD Comorbidities</u>
Famularo et al. (1996)	<i>DICA-C-R</i> Clinical Interview	Other anxiety disorders: 39% Mood disorders: 32% Suicidal ideation: 15% Psychotic Disorders: 15% ADHD: 37% ODD or CD: 24% Enuresis/Encopresis: 20%
Kilpatrick et al. (2003)	Modified <i>NWS</i> PTSD and MDE modules; DSM-IV-based questions regarding substance abuse and dependence	MDE: 62% Males: 47.3% Females: 70.6% SA/D: not reported Males: 29.7% Females: 24.2%

<b><u>Study</u></b>	<b><u>Measure(s)</u></b>	<b><u>PTSD Comorbidities</u></b>
Perkonigg et al. (2000)	<i>M-CIDI</i>	Mood disorder: Primary: 31.6% Secondary: 52.6% Concurrent: 15.8% Substance Abuse or Dependence disorders: Primary: 29.4% Secondary: 61.8% Concurrent: 8.8% Somatoform disorder: Primary: 66.7% Secondary: 33.3% Concurrent: 0.0% Other anxiety disorder: Primary: 54.2% Secondary: 33.3% Concurrent: 12.5%

<u>Study</u>	<u>Measure(s)</u>	<u>PTSD Comorbidities</u>
		Eating disorder: Primary: 80.0% Secondary: 20.0% Concurrent: 0.0%  *met criteria for other diagnoses prior to PTSD (Primary), following PTSD (Secondary), or within the same year that they developed PTSD (Concurrent)
Kar and Bastia (2006)	<i>MINI-Kid</i>	MDD: 63.2%  GAD: 76.9%
107 Eksi et al. (2007)	CAPS  Clinical Interview	Major Depressive Disorder 46.9%
Elbert et al. (2009)	Modified event list  Modified <i>CIDI</i> K-section  <i>MINI-Kid</i> (version 2.0)  <i>UCLA-PTSD RI</i> (Revision 1) (Parent and Child versions)  Clinical interview	Other Anxiety Disorder 12%  Affective Disorder 41%  Current suicide Risk 26%

## **Risk Factors for PTSD**

Several risk factors are apparent in the rate of PTSD diagnosis across populations as reported in this chapter. These include gender, age, race/ethnicity, type of trauma exposure, duration or dose of trauma exposure, and time elapsed since trauma exposure.

**Gender Differences.** Differing rates of PTSD diagnosis by gender in children and adolescents have been demonstrated across many articles in this review of the literature. Results of 18 (Agustini et al., 2011; Allwood et al., 2002; Elklit, 2002; Holbrook et al., 2005c; Huemer et al., 2011; Kilpatrick et al., 2003; Landolt et al., 2013; McDermott et al., 2010; Moore et al., 2013; Morgos et al., 2008; Perkonigg et al., 2000; Schaal & Elbert, 2006; Schiff et al., 2012; Stallard et al., 1998; Suliman et al., 2009; Teplin et al., 2012; Wolitzky-Taylor et al., 2008; Yang et al., 2011) of the 40 studies reviewed indicated that female participants were diagnosed at significantly higher rates than male participants. Additionally, in four (Broberg et al., 2005; Daviss et al., 2000; Kar & Bastia, 2006; Vila et al., 1999) studies that did not report significant difference, there appeared to be a trend for female participants to have an apparent higher rate of PTSD. These results are consistent with the adult literature reviewed previously (Breslau et al., 1998; de Jong et al., 2001; NCS, 2007; Tolin & Foa, 2006). Finally, 11 (Abbo et al., 2013; Eksi et al., 2007; Elbedour et al., 2007; Harder et al., 2012; Kilpatrick et al., 2003; Sack et al., 1994; Silva et al., 2000; Thabet et al., 2004; Thabet & Vostanis, 1999; Yelland et al., 2010; Zink & McCain, 2003) of the 40 studies reviewed indicated a lack of significant differences by gender.

Results from 18 (Agustini et al., 2011; Allwood et al., 2002; Elklit, 2002; Holbrook et al., 2005c; Huemer et al., 2011; Kilpatrick et al., 2003; Landolt et al., 2013; McDermott et al., 2010; Moore et al., 2013; Morgos et al., 2008; Perkonigg et al., 2000; Schaal & Elbert, 2006; Schiff et al., 2012; Stallard et al., 1998; Suliman et al., 2009; Teplin et al., 2012; Wolitzky-Taylor et al.,

2008; Yang et al., 2011) of the 40 studies that involved youth who experienced specific types of stressors (i.e., war, accidents, natural disasters) indicated that female participants were frequently more likely to qualify for a PTSD diagnosis or have more PTSD symptoms. For example, the Kilpatrick et al. (2003) study of more than 4,000 American youth indicated that girls (6.3%) were diagnosed with PTSD at nearly twice the rate of boys (3.7%) when the authors examined the 6-month prevalence of the disorder. Similar results were seen in the Holbrook et al. (2005c) study of American youth admitted to a hospital trauma center following injuries (female: 40%; male: 22%) and the Schaal and Elbert (2006) study of youth following the Rwandan genocide (female: 60%; male: 27%). Elklit (2002) similarly reported gender differences in rates of PTSD diagnosis in his national study of Danish children (females: 12.3%; males: 5.6%), as did Landolt et al. (2013) in their study of Swiss students (females: 6.2%; males: 2.4%), Perkonig et al. (2000) in their study of German youth (females: 12.5%, males: 1.6%), Stallard et al. (1998) in their study of British youth (females: 55%; males: 19%), and Wolitzky-Taylor et al. (2008) in their study of American youth. In a similar vein, Suliman et al. (2009) reported that female participants in their South African sample reported more symptoms of PTSD, anxiety, and depression than their male counterparts. The Teplin et al. (2012) study of incarcerated American youth (girls: 14.6%; boys: 7.9%) and the Moore et al. (2013) study of Australian juvenile offenders (girls: 40%; boys: 17%) found higher rates of PTSD in female participants than male participants. Several other studies have also noted gender differences, with female youth being more likely than male youth to meet criteria for a diagnosis of PTSD (Allwood et al., 2002; Huemer et al., 2011; McDermott et al., 2010; Schiff et al., 2012; Yang et al., 2011). The results of a study by Agustini et al. (2011) of Indonesian youth exposed to a tsunami showed that female gender was associated with more posttraumatic symptoms. Likewise, Morgos et al. (2008)

noted, in examining internally displaced persons in Darfur, that female participants reported “more severe levels of traumatic reactions” (p. 245) than male participants.

Four of 40 studies reported nonsignificant gender related differences (Broberg et al., 2005; Daviss et al., 2000; Kar & Bastia, 2006; Vila et al., 1999). In their study of youth who experienced accidental injuries, Daviss et al. (2000) noted a non-significant trend for girls to meet criteria for PTSD more often than boys. In the Broberg et al. (2005) study of youth exposed to a discotheque fire in Sweden, the authors noted that girls reported higher levels of stress than boys. However, the rates of PTSD did not significantly differ (Broberg et al., 2005). Similarly, a study of French youth who were taken hostage in their school (Vila et al., 1999) also showed nonsignificant gender differences. In contrast to the Broberg et al. (2005) study, results of the Vila et al. (1999) study indicated that boys met criteria for PTSD somewhat more often than girls (boys: 64%; girls: 42%). The study of youth exposed to a super cyclone in India showed similar results (Kar & Bastia, 2006).

Some authors have suggested the difference in diagnostic rates may be due to boys and girls having experienced different types or numbers of traumas. However, the findings relative to trauma type and severity by gender are inconsistent. For example, Costello et al. (2002) noted that while there were no differences in the number of “high magnitude” stressors experienced by male and female participants in their study, female participants were more likely to report sexual assault, coercion or abuse and male participants were more likely to report “causing death or severe harm to someone else” (p. 107). Some studies have reported that multiple or more severe traumas are experienced by girls. Moore et al. (2013) reported that female juvenile offenders experienced more trauma exposures (physical, emotional, or sexual), as well as more severe trauma exposures, than male juvenile offenders in their study. Conversely, other studies have

reported that male participants experience more or more severe traumas. For example, in their study of youth in the German general population, Perkonigg et al. (2000) noted that boys were more likely than girls to endorse having experienced traumatic events. Similarly, Thabet et al. (2004) reported that boys in their study experienced significantly more traumas than girls. In an earlier but related study, Thabet and Vostanis (1999) reported that boys exposed to war traumas were more likely than girls to witness physical harm to a close friend (e.g., a friend's limb being broken) or see his home destroyed. In their U.S. Department of Justice report, Truman et al. (2013) indicated that, in 2010, males were more likely to become the victim of a serious violent crime. However, a separate report for the U.S. Department of Justice indicated that, across time, rates of exposure to violent crime did not differ by gender (White & Lauritsen, 2012).

Three of 40 studies showed that even when one gender experienced more severe trauma exposures, rates of PTSD diagnosis did not differ (Khamis, 2005; Seedat et al., 2004; Silva et al., 2000). For example, Silva et al. (2000) noted that while female participants had a greater likelihood of being physically abused than males, they were no more likely than males to qualify for a PTSD diagnosis. Seedat et al. (2004) reported that boys in their study had more trauma exposures and “were more likely...to have witnessed community violence” (p. 171), but were no more likely than girls to meet criteria for a PTSD diagnosis. Khamis (2005) noted, in his study of Palestinian children, that males were more likely to be exposed to trauma events, but that there were ultimately no significant gender differences in rates of PTSD.

Finally, 11 of 40 studies reported a lack of significant differences with reference to diagnosis by gender (Abbo et al., 2013; Eksi et al., 2007; Elbedour et al., 2007; Harder et al., 2012; Kilpatrick et al., 2003; Sack et al., 1994; Silva et al., 2000; Thabet et al., 2004; Thabet & Vostanis, 1999; Yelland et al., 2010; Zink & McCain, 2003).

**Age.** Age-based differences in rates of diagnosis varied across studies in the current review. While two (Perkonigg et al., 2000; Yelland et al., 2010) of the 40 studies that were considered herein indicated that young children may be more psychologically affected by trauma exposure than older children, seven (Abbo et al., 2013; Holbrook et al., 2005c; Khamis, 2005; Kilpatrick et al., 2003; Sack et al., 1994; Savin et al., 1996; Wolitzky-Taylor et al., 2008) indicated that older children were more affected. Three (Daviss et al., 2000; Thabet et al., 2004; Thabet & Vostanis, 1999) studies reported no significant differences between older and younger youth.

In their study of youth exposed to bushfires in Australia, Yelland et al. (2010) reported that younger participants endorsed a greater number of PTSD symptoms than older participants. Similarly, Perkonigg et al. (2000) reported that younger youth in their study were more likely than older youth to qualify for a diagnosis of PTSD. A possible reason for younger youth qualifying for a PTSD diagnosis at a higher rate than older youth may be related to participants' reactions to anxious or post-traumatic reactions expressed by their caregivers. As briefly discussed in Chapter 1, young children may model their caregiver's reaction to trauma events. For example in the description by Carey-Trefzer (1949) in Chapter 1, children whose mothers displayed nervous or neurotic behaviors tended to experience anxious symptoms for several months following exposure to war-stressors. In a more recent study of Palestinian youth, Khamis (2005, p. 91) noted that "children with PTSD were more likely to report higher levels of anxiety in [their] home environment than children with non-PTSD" (p. 91). Similarly, Eksi et al. (2007) reported non-age specific results in their study of children exposed to a high-magnitude earthquake. The authors noted that children whose caregivers displayed "extreme reactions" (e.g., wailing; Eksi et al., 2007, p. 196) were more likely to meet criteria for a diagnosis of

PTSD. Likewise, Daviss et al. (2000) reported rates of PTSD as being higher in children whose parent endorsed high levels of acute distress. While not age-specific, loss of a child's caregiver may also relate to a child endorsing PTSD symptoms. For example, Agustini et al. (2011) reported that children in their study who lost their parents had more severe levels of PTSD symptoms. Similarly, in their study of child burn injury cases, Landolt et al. (2009) reported that children had fewer PTSD symptoms when their mother was present during the trauma. However, the authors did not describe the mother's reaction to the trauma event, so it is unclear if the mother presented with distress during the event.

While two studies indicated that younger children might be diagnosed with PTSD at higher rates than older youth, seven (Abbo et al., 2013; Holbrook et al., 2005c; Khamis, 2005; Kilpatrick et al., 2003; Sack et al., 1994; Savin et al., 1996; Wolitzky-Taylor et al., 2008) of 40 studies in this review of the literature indicated the opposite. For example, in the Holbrook et al. (2005c) study of injured adolescents in the United States, adolescents aged 16 to 19 years were more likely to meet criteria for PTSD diagnosis than youth aged 12 to 15 years. The Kilpatrick et al. (2003) of U.S. youth in the general population showed similar findings, as did the Abbo et al. (2013) study of youth in Rural Uganda and the Khamis (2005) study of Palestinian youth. The Savin et al. (1996) study of Khmer youth aged 18 to 25 years reported higher rates of PTSD than the similar Sack et al. (1994) study of Khmer youth that also included younger youth (age range: 13-25). The Wolitzky-Taylor et al. (2008) study of dating violence showed that older youth were more likely to experience dating violence and be diagnosed with PTSD than younger youth. Finally, while adults were not primarily considered in the current chapter, it is noteworthy that Maeda et al. (2009) reported that adolescents in their study of survivors of a

shipwreck had significantly higher rates of PTSD than adults who were tested two months following the incident.

Three of 40 studies indicated non-significant age differences for PTSD diagnosis, or described only differences in posttraumatic stress symptom scores (Daviss et al., 2000; Thabet et al., 2004; Thabet & Vostanis, 1999). For example, in a study of youth hospitalized for physical injury, Daviss et al. (2000) reported that older adolescents appeared to qualify for a PTSD diagnosis at somewhat higher rates than younger children, but that the difference was nonsignificant. In regard to posttraumatic stress symptoms, in their study of Palestinian refugee youth, Thabet et al. (2004) reported that older youth had higher *UCLA-PTSD RI* scores than younger youth. Similarly, higher *UCLA-PTSD RI* scores were found in the Thabet et al. (2004) study of Palestinian youth ages 9 to 15 years than in the related Thabet and Vostanis (1999) study of Palestinian youth ages 6 to 11 years.

Older youth meeting criteria for PTSD at a higher rate than younger youth may be due, in part, to the number of trauma exposures older youth experience in comparison to younger youth. For example in their study of youth following the Rwandan genocide, Schaal and Elbert (2006) reported that older youth experienced both more traumas and endorsed more symptoms than younger youth in their study. Thabet and Vostanis (1999) similarly reported that older youth in their study experienced more traumas than younger youth. The authors further indicated that the “number of experienced traumas was the best predictor of [the] presence and severity of PTSD” (Thabet & Vostanis, 1999, p. 385). Similar differences for the number of exposures experienced were also reported by Morgos et al. (2008) in their study of displaced persons in Darfur and Rheingold et al. (2012) in their study of adolescent attempted homicide survivors in the U.S.

Finally, seven of the 40 reviewed studies reported no significant differences based on age (Agustini et al., 2011; Eksi et al., 2007; Harder et al., 2012; Schaal & Elbert, 2006; Silva et al., 2000; Yang et al., 2011; Zink & McCain, 2003).

**Race/Ethnicity.** Six of the 40 studies reviewed indicated significant racial or ethnic differences in rates of PTSD or PTSD symptoms (Broberg et al., 2005; Kilpatrick et al., 2003; Rheingold et al., 2012; Schiff et al., 2012; Seedat et al., 2004; Teplin et al., 2012). In their study of homicide survivors in the United States, Rheingold et al. (2012) noted that Hispanic and African-American participants were over-represented in the attempted homicide survivor group compared to the group of non-victims. Similar results were found in the Kilpatrick et al. (2003) study of youth in the general U.S. population, with Hispanic and African American youth being more likely than other youth in the study to meet criteria for a PTSD diagnosis. The Teplin et al. (2012) study of American youth in juvenile detention reported that Hispanic participants had significantly greater rates of PTSD than non-Hispanic white or African American participants, while African American participants had greater rates of PTSD than non-Hispanic white participants.

Non-U.S. studies also showed significant differences in the rate of diagnoses between races or ethnic groups. In a study of youth exposed to a discotheque fire in Sweden, results indicated that immigrant youth had higher rates of PTSD than Swedish youth (Broberg et al., 2005). However, the authors also noted that many of the immigrant youth in their study had been exposed war and that their prior experiences, rather than their race or ethnicity, were likely related to their meeting criteria for receiving a PTSD diagnosis. When specifically examining war-related and other traumas in Arab and Jewish students in Israel, Schiff et al. (2012) indicated that Arab students reported more posttraumatic stress symptoms than Jewish students. Seedat et

al. (2004) reported that South African students (22%) had higher rates of PTSD than Kenyan students (5%). While the authors were unclear as to why there was a difference between groups, they suggested several hypotheses (e.g., cultural differences in the concept of trauma; Seedat et al., 2004).

Four of 40 studies reported no significant differences in rates of diagnosis based on race or ethnicity (Moore et al., 2013; Silva et al., 2000; Suliman et al., 2009; Zink & McCain, 2003).

**Socioeconomic Status.** Only four (Elbert et al., 2009; Holbrook et al., 2005c; Rheingold et al., 2012; Suliman et al., 2009) of 40 studies in the current review reported rates of PTSD diagnosis based on socioeconomic status (SES). Findings of two of these studies (Holbrook et al., 2005c; Rheingold et al., 2012) indicated that youth from lower SES households were diagnosed at higher rates than youth from higher SES households. For example, in their study of criminal homicide survivors, Rheingold et al. (2012) noted that “criminal homicide survivors were more likely to report a lower income...than non-victims” (Rheingold et al., 2012, p. 690). The Holbrook et al. (2005c) study indicated that the SES of a participant’s family was “strongly and significantly associated with long-term PTSD” (p. 767).

Results of the remaining two (Elbert et al., 2009; Suliman et al., 2009) studies indicated no significant difference in rates of diagnosis based on SES. For example, results of the Suliman et al. (2009) study of youth exposed to multiple traumas showed no difference in rates of diagnosis between youth “from lower and higher socioeconomic school settings” (p. 124). In their study of Tamil children in Sri Lanka, Elbert et al. (2009) noted that there were no significant differences in the rate of PTSD in children based on family income or specific types of family possessions denoting status (e.g., bikes, livestock). However, they did report that children with PTSD were significantly more likely to eat fewer meals per week, possess fewer

personal items (e.g., clothes, books, notebooks, toys), and have parents who possessed fewer articles of clothing, than those without PTSD (Elbert et al., 2009).

**Dose of Trauma Exposure.** Twelve (Eksi et al., 2007; Ford, Elhai, Connor, & Frueh, 2010; Goenjian et al., 2001; Moore et al., 2013; Perkonigg et al., 2000; Schaal & Elbert, 2006; Seedat et al., 2004; Suliman et al., 2009; Thabet et al., 2004; Thabet & Vostanis, 1999; Yang et al., 2011; Yelland et al., 2010) of the 40 studies reviewed indicated that the number of trauma exposures was related to the likelihood of having a PTSD diagnosis, with more exposures resulting in the greater likelihood of being diagnosed. For example, the Ford et al. (2010) study that examined polyvictimization indicated that, compared to youth who experienced only one trauma, youth who experienced more than one trauma had a three times greater likelihood of meeting criteria for PTSD. As reported previously, in their study of Australian juvenile offenders, Moore et al. (2013) reported that youth who had experienced multiple traumatic events were at highest risk for meeting criteria for a PTSD diagnosis. Similar results were seen in the Suliman et al. (2009) and Seedat et al. (2004) studies of African youth. In both studies, youth with multiple trauma exposures had a greater likelihood of meeting criteria for PTSD than youth with fewer exposures. Additionally, the Seedat et al. (2004) study results indicated that the type of trauma exposure was also relevant, where youth with a history of “sexual assault...physical assault by a family member...[or] serious accidents” (p. 172) were more likely than youth who experienced other forms of trauma to be diagnosed with PTSD. A study of a German general population (Perkonigg et al., 2000) indicated that youth with PTSD reported having experienced more trauma events than those who did not meet diagnostic criteria.

In regard to war-related events, children exposed to more war traumas evidenced higher rates of PTSD (Schaal & Elbert, 2006) or more posttraumatic stress symptoms (Thabet et al.,

2004). Thabet and Vostanis (1999) reported that the number of trauma exposures was related to PTSD diagnosis and severity of the disorder in their study of Palestinian children's reactions to war. Dose effects can similarly be seen following natural disasters, with studies showing higher rates of PTSD (Yang et al., 2011) or more or more severe posttraumatic stress symptoms (Goenjian et al., 2001). For example, in examining youth exposed to a bushfire, Yelland et al. (2010) reported that those who continued to face "disaster-related loss and life disruption" (p. 276) were most likely to qualify for a PTSD diagnosis. Finally, one study (Eksi et al., 2007) indicated that youth exposed to an earthquake who witnessed the suffering or death of others were more likely to develop PTSD.

One study did not show a dose-exposure effect. In their sample of Australian youth exposed to a tsunami, Agustini et al. (2011) reported that the number of traumatic exposures was not related to severity of PTSD symptoms reported.

**Time Since Exposure.** Studies of adults with PTSD have shown that as time since exposure passes, rates of diagnosis decrease. According to the DSM-5 (APA, 2013a), about one half of adults who qualify for a diagnosis of PTSD will make a full recovery within about 3 months. Child studies of PTSD included in the current review of the literature appear to be generally consistent with adult findings. Two (Maeda et al., 2009; Vila et al., 1999) of the 40 studies reviewed indicated a rate of decline in PTSD across time. For example, the Vila et al. (1999) study of French school children showed rates of diagnosis declining across time. At 1 month following the trauma event, 11.5% of participants in the study met criteria for a diagnosis of PTSD; however, by 18 months, only 3.8% of participants qualified for a diagnosis. More strikingly, in the Maeda et al. (2009) study of youth in an accident at sea, results indicated that 77.8% of study participants met criteria for a diagnosis of PTSD at 2 months, while no

participants qualified for diagnosis by 38 months. While many studies in the current review examined diagnosis at only one time point, other studies compared rates of diagnosis at the time of the study to lifetime prevalence of PTSD. Results of three (Becker et al., 1999; Sack et al., 1994; Savin et al., 1996) of the 40 studies reviewed showed current rates as being lower than lifetime prevalence, supporting the concept that PTSD is not a lasting diagnosis.

### **Summary**

In reviewing the epidemiology of PTSD in trauma exposed youth, the literature indicates that youth are often exposed to traumatic events, including war (e.g., exposure to combat), victimization (e.g., sexual assault), accidents (e.g., motor vehicle accident), and natural disasters (e.g., hurricane). However, of those exposed, not all went on to meet criteria for PTSD. The studies included in the current review evidenced considerable variance with reference to prevalence. Diagnosis ranged from 5.4% (Thabet & Vostanis, 1999) to 74.9% (Morgos et al., 2008) in youth exposed to war-related events, 3.8% (Vila et al., 1999) to 35% (Famularo et al., 1996) in criminally victimized youth, 0% (Maeda et al., 2009) to 88.9% (Maeda et al., 2009) in youth who experienced an accident, and 10.0% (Yelland et al., 2010) to 90% (Goenjian et al., 2001) in youth exposed to a natural disaster.

Several factors may account for the variation in rates of diagnoses, including the DSM criteria used, the measure used to assess diagnostic criteria, the amount of time between the trauma exposure and diagnostic assessment, and other factors such as gender, age, race or ethnicity, or socioeconomic status of the study participants, and the dose or severity of trauma experienced. Studies included in the current review included those using DSM-III, DSM-III-R, and DSM-IV diagnostic criteria. The changes in diagnostic criteria across time may have resulted in differing rates of diagnosis. Additionally, 19 different measures were used in the

current study to assess PTSD or PTSD symptoms, each with varying rates of validity and reliability. For example, the *Children's PTSD Inventory* (Saigh, 1989b) has high content validity with the DSM-IV, high test-retest reliability (97.6%; Saigh et al., 2000), excellent total scale inter-rater reliability (98.1%; Ohan, Myers, & Collett, 2002; Saigh et al., 2000), and very high sensitivity (.84-.92) and specificity (.93-.98; Saigh, 2003a). On the other hand, the *UCLA-PTSD RI* (Pynoos et al., 1987; Steinberg, 2004) can be only be used to assess for likely PTSD diagnosis. Items on the *UCLA-PTSD RI* do not overlap with all DSM-IV criteria and some items vary from DSM-IV criteria (e.g., items assessing a decrease in subjective rather than objective experiences; Ohan et al., 2002). Finally, the time between trauma exposure and assessment ranged from 30 days (Daviss et al., 2000) to about 13 years (Sack et al., 1994) across studies in the current review. However, 13 (Allwood et al., 2002; Elbedour et al., 2007; Elbert et al., 2009; Famularo et al., 1996; Huemer et al., 2011; Kinzie et al., 2006; McCauley et al., 2009; Morgos et al., 2008; Savin et al., 1996; Silva et al., 2000; Thabet et al., 2004; Thabet & Vostanis, 1999; Wolitzky-Taylor et al., 2008) of 40 studies did not show the amount of time that elapsed between trauma exposure and assessment. Research (Maeda et al., 2009; Vila et al., 1999) appears to indicate that rates of PTSD diagnosis are likely to decrease across time with or without intervention, so the amount of time between trauma exposure and assessment would likely affect the diagnostic rate.

In terms of personal factors, research shows somewhat mixed results for variations in diagnosis based on gender and age. In regards to gender differences, 18 (Agustini et al., 2011; Allwood et al., 2002; Elklit, 2002; Holbrook et al., 2005c; Huemer et al., 2011; Kilpatrick et al., 2003; Landolt et al., 2013; McDermott et al., 2010; Moore et al., 2013; Morgos et al., 2008; Perkonigg et al., 2000; Schaal & Elbert, 2006; Schiff et al., 2012; Stallard et al., 1998; Suliman

et al., 2009; Teplin et al., 2012; Wolitzky-Taylor et al., 2008; Yang et al., 2011) of the 40 studies included in the current review, like those found in the adult literature, showed that girls tended to be diagnosed with PTSD at higher rates than boys. Some authors hypothesized that girls and boys may experience different types or numbers of traumas. Four (Broberg et al., 2005; Daviss et al., 2000; Kar & Bastia, 2006; Vila et al., 1999) studies showed non-significant differences by gender, not always with girls having seemingly higher rates of PTSD. Further, 11 of 40 studies reported a lack of significant gender differences (Abbo et al., 2013; Eksi et al., 2007; Elbedour et al., 2007; Harder et al., 2012; Kilpatrick et al., 2003; Sack et al., 1994; Silva et al., 2000; Thabet et al., 2004; Thabet & Vostanis, 1999; Yelland et al., 2010; Zink & McCain, 2003).

In regard to differences in diagnosis by age, seven (Abbo et al., 2013; Holbrook et al., 2005c; Khamis, 2005; Kilpatrick et al., 2003; Sack et al., 1994; Savin et al., 1996; Wolitzky-Taylor et al., 2008) of the 40 reviewed studies indicated that older youth were more likely to be diagnosed with PTSD than younger youth. Similarly to differences by gender, however, results regarding differences by age were inconsistent across studies. While seven studies indicated that older youth were more likely to meet criteria for PTSD, two studies (Perkonigg et al., 2000; Yelland et al., 2010) reported that younger children were more likely than older youth to qualify for diagnosis. Three studies (Daviss et al., 2000; Thabet et al., 2004; Thabet & Vostanis, 1999) indicated a lack of significant differences in rates of diagnosis between older and younger youth. In contrast to analyses on gender comparisons, the age comparison outcomes are somewhat more difficult to interpret, as different age ranges and cutoffs were used across studies. Similarly, interpretations of the differences in diagnosis based on race and ethnicity are difficult to interpret. Six studies (Broberg et al., 2005; Kilpatrick et al., 2003; Rheingold et al., 2012; Schiff et al., 2012; Seedat et al., 2004; Teplin et al., 2012) showed differences in diagnostic rates based

on race and ethnicity. It is difficult, however, to make group comparisons, as some studies examined race (e.g., White, Asian) and ethnicity (e.g., Hispanic, Jewish), while others examined groups by nationality (e.g., Kenyan). Four of 40 studies reported no significant differences in rates of diagnosis based on race or ethnicity (Moore et al., 2013; Silva et al., 2000; Suliman et al., 2009; Zink & McCain, 2003). Finally, in regard to socioeconomic status (SES), two (Holbrook et al., 2005c; Rheingold et al., 2012) of the 40 reviewed studies indicated that youth from lower SES households were diagnosed at higher rates than youth from higher SES households while two others (Elbert et al., 2009; Suliman et al., 2009) reported no significant difference by SES.

Results for dose of exposure appear somewhat more consistent. Of the 13 studies where dose of exposure was considered, twelve (Eksi et al., 2007; Ford et al., 2010; Goenjian et al., 2001; Moore et al., 2013; Perkonigg et al., 2000; Schaal & Elbert, 2006; Seedat et al., 2004; Suliman et al., 2009; Thabet et al., 2004; Thabet & Vostanis, 1999; Yang et al., 2011; Yelland et al., 2010) indicated that youth who experience more traumas or more severe traumas were diagnosed at higher rates than youth who experience only one trauma event or less severe traumas. One study (Agustini et al., 2011) failed to find a difference in diagnostic rate based on number of exposures, but did report a difference based on severity of trauma.

Overall, the literature indicates that youth are exposed to various forms of trauma. While it is difficult to identify how many youth will be diagnosed with PTSD following exposure to one or more traumas of varying types, it is clear that only a portion of trauma exposed youth will qualify for a diagnosis of PTSD. Further research is needed to better understand the relationship between trauma exposure, PTSD, and other various factors, including variations in rate or

intensity of trauma exposure and time since exposure, as well as sex, gender, race or ethnicity, and socioeconomic status of the exposed individual.

## Chapter III

### BACKGROUND AND METHODOLOGY

As described in the American Psychiatric Association's (APA) Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 1994), PTSD is characterized by high levels of anxiety following exposure to a traumatic event, with symptoms of intrusive thoughts or nightmares, avoidance, increased arousal, and significant impairment to daily functioning. While the DSM-IV (APA, 1994) references PTSD in children and adolescents, the DSM-IV PTSD field trials did not include participants under 15 years of age (Kilpatrick et al., 1993; Saigh & Bremner, 1999).

The current chapter will present a review of the literature that seeks to examine the relationship between personality traits and PTSD in children and adolescents. This chapter will further address limitations of prior studies and present a statement of the problem, the purpose and need for the study, hypotheses, methodology, and potential limitations of the proposed study.

#### **Background: Personality and PTSD**

The literature indicates that there is a relationship between personality traits, including neuroticism and extraversion, and internalizing disorders or conditions. For example, Eysenck and Eysenck (1964) reported that adults with high scores on the *Eysenck Personality Inventory* (*EPI*; Eysenck & Eysenck, 1964) Neuroticism scale “tend to be emotionally overresponsive and to have difficulties in returning to a normal state after emotional experiences...complain of vague somatic upsets...and also report many worries, anxieties, and other disagreeable emotional feelings (p. 6).

Within the context of cross-sectional studies, Chung, Berger, and Rudd (2007) administered the *NEO-Five Factor Inventory* (*NEO-FFI*; Costa & McCrae, 1990) and the

*Posttraumatic Stress Diagnostic Scale (PSTD; Foa, 1995)* to adults who experienced myocardial infarctions in an effort to examine the relationship between PTSD and personality. The authors indicated that *NEO-FFI* Neuroticism scores were significantly higher among participants who developed PTSD than among participants who developed partial PTSD or those without PTSD symptoms. The relationship between *NEO-FFI* Neuroticism scores among traumatized adults with partial PTSD and those without PTSD symptoms was not reported. Further, the *NEO-FFI* Extraversion scores did not significantly differ between groups (Chung et al., 2007).

In regard to general population studies, Cox, MacPherson, Enns, and McWilliams (2004) examined a nationally representative sample of American adults ( $n = 3,238$ ) exposed to at least one traumatic event. The authors assessed neuroticism by using items drawn from *Goldberg's Big-Five* factor structure (Goldberg, 1992) and PTSD by administering a modified version of the revised *Diagnostic Interview Schedule (DIS-R; Breslau et al., 1991; Kessler et al., 1995)*. The authors subsequently reported that individuals with high levels of neuroticism were at an increased risk of PTSD relative to participants with low levels of neuroticism. In a similar study, Perrin et al. (2014) administered the *Schedule for Affective Disorders and Schizophrenia—Lifetime and Anxiety Disorder Version* (Endicott & Spitzer, 1978) PTSD module and the *Eysenck Personality Questionnaire (EPQ; Eysenck & Eysenck, 1975a)* to 3,691 Swiss adults. Their results indicated that individuals with high levels of neuroticism, as measured by the *EPQ*, were more likely to meet criteria for a lifetime diagnosis of PTSD relative to individuals with low levels of neuroticism.

Engelhard, Hout, and Lommen (2009) conducted a prospective study involving 214 American military troops. They assessed neuroticism prior to deployment using the short version of the *Eysenck Personality Questionnaire (EPQ; Eysenck & Eysenck, 1975a)* and

posttraumatic stress severity following deployment using the *Posttraumatic Stress Disorder Symptoms Scale (PSS)*; Engelhard, Arntz, & van den Hout, 2007; Foa et al., 1993). The authors reported that individuals with high *EPQ* Neuroticism scores had significantly more PTSD symptoms relative to individuals with low *EPQ* Neuroticism scores.

Breslau et al. (1991) and Breslau and Schultz (2013) conducted a longitudinal study examining the relationship between PTSD and personality factors in 1,007 American adults. Data were collected at three time points across 10 years. PTSD was assessed using the *Diagnostic Interview Schedule for DSM-III-R* (Robins, Helzer, Cottler, & Golding, 1989) and neuroticism was assessed using the short form of the revised *Eysenck Personality Questionnaire (EPQ-R)*; Eysenck, Eysenck, & Barrett, 1985). The authors indicated that *EPQ-R* Extraversion scores did not increase the risk of PTSD following trauma exposure (Breslau et al., 1991). However, *EPQ-R* Neuroticism scores increased the risk of lifetime PTSD when examined retrospectively (Breslau et al., 1991) and prospectively (Breslau & Schultz, 2013). Of note, Breslau and Schultz (2013) reported that the relationship between *EPQ* Neuroticism and increased PTSD risk only applied for participants without a history of major depression.

In a similar investigation, Mulder, Fergusson, and Horwood (2013) conducted a 30-year longitudinal study that involved adults from Australia and New Zealand. Of 1,265 original study participants recruited at birth, 987 participated at the 30-year follow-up. Neuroticism was assessed at 14 years using the short form of the *Eysenck Personality Inventory (EPI)*; Eysenck & Eysenck, 1964). Lifetime PTSD was diagnosed at 30 years using the *Diagnostic Interview Schedule for DSM-IV*. On the basis of this methodology, Mulder et al. (2013) indicated that high *EPI* Neuroticism scores significantly predicted lifetime PTSD diagnoses.

While several studies examined the relationship between personality traits and PTSD in adult samples, fewer have examined this relationship in child and adolescent samples. Within the context of child and adolescent studies, Wu, Yin, Xu, and Zhao (2011) examined 968 Chinese youth (mean age: 18.56 years) who were exposed to a devastating storm. Posttraumatic stress symptoms were assessed using a Chinese version of the *Impact of Events Scale (IES-R)*; Weiss & Marmar, 1997; Wu & Chan, 2003) and personality traits were examined using the Chinese version of the *Eysenck Personality Questionnaire (EPQ)*; Gong, 1984). Results indicated that Neuroticism scores on the Chinese version of the *EPQ* were positively correlated with the number of posttraumatic stress symptoms as measured by the *IES-R*. The authors also reported a non-significant relation between *EPQ* Extraversion scores and *IES-R* PTSD symptom scores (Wu et al., 2011).

In related work, two studies were conducted that examined the relationship between personality traits and PTSD in youth following a 7.9 magnitude earthquake in China. Initially, Zhang, Liu, Zhu, Shi, and Cheng (2010) examined 312 Chinese orphans (age range: 8-18 years) 6-months following the earthquake. The authors used the *Children's Revised Impact of Event Scale (CRIES)*; Smith, Perrin, Dyregrov, & Yule, 2003) to assess PTSD symptoms and a Chinese version of the *EPQ for Children (EPQ)*; Gong, 1984) to examine personality traits. The authors went on to report that *EPQ* Neuroticism scores predicted PTSD symptom severity, as measured by the *CRIES*. In the related study, An, Fu, Wu, Lin, and Zhang (2013) examined 636 youth (age range: 13-16 years) who were exposed to the earthquake. The authors collected data 1, 1.5, and 2 years following the earthquake. The *Child PTSD Symptom Scale (CPSS)*; Foa, Johnson, Feeny, & Treadwell, 2001) was used to assess posttraumatic symptoms. A personality scale adapted from Costa and McCrae's five-factor model of personality (Zhou, Niu, & Zou, 2000)

was used to measure personality traits. Given this framework, the authors reported that high neuroticism scores, as measured by the scale adapted from Costa and McCrae's five-factor model of personality, were significantly and bi-directionally associated with PTSD symptom severity as measured by the *CPSS* at 1 and 1.5 years. More specifically, based on structural equation modeling, the authors reported that higher posttraumatic symptom severity scores at 1 year predicted higher neuroticism scores at 1.5 years and that higher neuroticism scores at 1 year predicted posttraumatic symptom severity at 1.5 years. Neither posttraumatic symptom severity nor neuroticism scores predicted the other at 2 years.

Overall, all 10 studies reviewed in the current chapter indicated significant relationships between neuroticism scores and PTSD or PTSD symptoms (An et al., 2013; Breslau et al., 1991; Breslau & Schultz, 2013; Chung et al., 2007; Cox et al., 2004; Engelhard et al., 2009; Mulder et al., 2013; Perrin et al., 2014; Wu et al., 2011; Zhang et al., 2010). Three of 10 studies reported that the relationship between extraversion and PTSD or PTSD symptoms was non-significant (Breslau et al., 1991; Chung et al., 2007; Wu et al., 2011). The remaining seven studies did not offer comparative information about extraversion (An et al., 2013; Breslau & Schultz, 2013; Cox et al., 2004; Engelhard et al., 2009; Mulder et al., 2013; Perrin et al., 2014; Zhang et al., 2010).

### **Statement of the Problem**

While several studies of both adults and youth showed significant associations between personality traits and PTSD or PTSD symptoms, several concerns are apparent. Longitudinal studies evaluating the prevalence of PTSD in the general population failed to include children or adolescents (Breslau et al., 1991; Breslau & Schultz, 2013), or considered lifetime trauma exposure several years after participants reached adulthood (Mulder et al., 2013). Thus, the relationship between personality traits and PTSD in children and adolescents cannot be inferred

from these studies. Additionally, the majority of studies (An et al., 2013; Chung et al., 2007; Engelhard et al., 2009; Perrin et al., 2014; Wu et al., 2011; Zhang et al., 2010), only compared trauma exposed individuals with PTSD to trauma exposed individuals without PTSD.

Comparative information involving the personality traits of individuals with PTSD, traumatized individuals without PTSD, and non-traumatized control cases was not reported. Therefore, the relationship between personality traits and trauma exposure in individuals who did not develop PTSD could not be evaluated. Moreover, several of the studies in the current chapter (An et al., 2013; Engelhard et al., 2009; Wu et al., 2011; Zhang et al., 2010), did not use reliable and valid DSM-based individually administered interviews. Finally, the majority of studies in this chapter did not rule out major co-morbid diagnoses (An et al., 2013; Breslau et al., 1991; Breslau & Schultz, 2013; Cox et al., 2004; Engelhard et al., 2009; Perrin et al., 2014; Wu et al., 2011; Zhang et al., 2010). This is problematic because youth with PTSD often have co-morbid mood disorders, anxiety disorders, conduct disorder, attention-deficit hyperactivity disorder, and substance dependence (Famularo et al., 1996; Sack et al., 1994; Saigh et al., 1999). Further, these disorders have been associated with increased levels of neuroticism and extraversion (Cheng & Furnham, 2003; Gabrys et al., 1988; Grekin, Sher, & Wood, 2006; Miller, Miller, Newcorn, & Halperin, 2008; Richman, Sallee, & Folley, 1996).

### **Purpose of the Study**

The proposed study seeks to: a) identify traumatized youth with and without PTSD and a non-traumatized control group, b) exclude cases with major co-morbid disorders (i.e., attention deficit-hyperactivity disorder, conduct disorder, major depressive disorder, substance dependence, psychotic symptoms, deficient IQ), and 3) compare the *Junior Eysenck Personality (Eysenck, 1965)* Index scores of the three groups.

## **Theoretical Significance**

Information regarding the relationship between personality traits and trauma exposure in children and adolescents with and without PTSD and non-traumatized control subjects would provide meaningful information regarding the presentation of this disorder in children and adolescents. As reported in chapter 2, exposure to traumatic events in the United States is very common. On the other hand, only a small proportion of children and adolescents exposed to traumatic events reportedly developed PTSD (Broman-Fulks et al., 2007; Huemer et al., 2011; Saigh, 1992; Silva et al., 2000; Vila et al., 1999; Zink & McCain, 2003). Given these points, the use of a non-traumatized comparison group will allow the investigator to establish if trauma exposure without PTSD is associated with increased neuroticism and extroversion as measured by the *Junior Eysenck Personality Inventory (JEPI; Eysenck, 1965)*. This information could offer an important contribution to our understanding of the adjustment of a large segment of the child population who were traumatized and did not develop PTSD. It is important to note in this regard that attention-deficit hyperactivity disorder (ADHD), conduct disorder (CD), major depressive disorder (MDD), and substance dependence have been associated with elevated levels of neuroticism and extroversion on the *JEPI* (Cheng & Furnham, 2003; Gabrys et al., 1988; Gudjonsson, Sigurdsson, Young, Newton, & Peersen, 2009; Rosenberg, 1969). Accordingly, the exclusion of youth with ADHD, CD, MDD, and substance dependence will serve to more closely focus on the expression of personality constructs among the comparison groups.

## **Clinical Significance**

This study had immediate clinically relevant impact for study participants. Each participant received a free psychiatric and psychological evaluation. Following the assessment, the child's parents received a free comprehensive psychological report that included the presence

or absence of psychiatric morbidity, information regarding the child's cognitive, affective, and behavioral functioning, and referrals to appropriate psychiatric services as needed.

Beyond the immediate clinical significance, findings of the current study may provide empirically significant information regarding the relationship between personality traits and PTSD. This information could be used in clinical settings to help identify individuals who may be at greater risk of developing PTSD following trauma exposure. Additionally, it may serve as an indicator to providers to consider personality factors when evaluating and treating trauma-exposed youth.

## **Rationale and Hypotheses**

### **Rationale for Hypotheses 1 and 2**

Eysenck and Eysenck reported that anxious adults tend to score higher than average on Neuroticism as measured using the *Eysenck Personality Inventory* (Eysenck & Eysenck, 1964). As reviewed above, all 10 studies showed a positive relationship between neuroticism and PTSD or PTSD symptoms (An et al., 2013; Breslau et al., 1991; Breslau & Schultz, 2013; Chung et al., 2007; Cox et al., 2004; Engelhard et al., 2009; Mulder et al., 2013; Perrin et al., 2014; Wu et al., 2011; Zhang et al., 2010). In view of these points and as PTSD is primarily an internalizing disorder (Saigh, 1989c; Saigh, Yasik, Oberfield, Halamandaris, & McHugh, 2002), it was predicted that children and adolescents with PTSD would have elevated scores on the *Junior Eysenck Personality Inventory (JEPI; Eysenck, 1965)* Neuroticism Index relative to traumatized youth without PTSD and non-traumatized controls. More specifically, the following hypotheses will be tested:

Hypothesis 1: Youth with PTSD will have significantly higher *JEPI* Neuroticism Index scores relative to traumatized youth without PTSD.

Hypothesis 2: Youth with PTSD will have significantly higher *JEPI* Neuroticism Index scores relative to non-traumatized controls.

### **Rationale for Hypothesis 3**

It was also expected that the *JEPI* Neuroticism Index scores of traumatized children without PTSD would not significantly differ from the scores of the nontraumatized controls as previous studies reported that similar groups did not differ on self-reported measures of anxiety and depression (Saigh, 1989a; Saigh, 1989c; Yasik, Saigh, Oberfield, Halamandaris, & Wasserstrum, 2012). Further support for this expectation is provided by research involving the parental ratings of traumatized youth without PTSD and non-traumatized youth as these ratings indicated that traumatized PTSD negatives and controls did not significantly differ on measures of anxiety, depression and withdrawn behavior (Saigh et al., 2002). Accordingly, the following hypothesis will be tested:

Hypothesis 3: The *JEPI* Neuroticism Index scores of traumatized youth without PTSD and non-traumatized controls will not significantly differ.

### **Rationale for Hypotheses 4-6**

Three of the 10 studies reviewed in this chapter reported that extraversion was not significantly related to PTSD or PTSD symptoms (Breslau et al., 1991; Chung et al., 2007; Wu et al., 2011). Results for extraversion scores were not reported for the remaining 7 studies (An et al., 2013; Breslau & Schultz, 2013; Cox et al., 2004; Engelhard et al., 2009; Mulder et al., 2013; Perrin et al., 2014; Zhang et al., 2010).

Research involving the parental ratings of traumatized youth without PTSD and non-traumatized youth indicated that traumatized PTSD negatives and controls did not significantly differ on measures of externalizing behaviors (Saigh, Yasik, Halamandaris, Bremner, &

Oberfield, 2014; Saigh et al., 2002). Further, both studies indicated non-significant differences between youth with PTSD and traumatized youth without PTSD on parent rated externalizing behaviors (Saigh et al., 2014; Saigh et al., 2002). Based on these findings, it is predicted that the *JEPI* Extraversion Index scores will not appreciably differ between groups. More specifically, the following hypotheses will be tested:

Hypothesis 4: The *JEPI* Extraversion Index scores of youth with PTSD will not significantly differ from the scores of traumatized youth without PTSD.

Hypothesis 5: The *JEPI* Extraversion Index scores of youth with PTSD will not significantly differ from the scores of the non-traumatized controls.

Hypothesis 6: The *JEPI* Extraversion Index scores of traumatized youth without PTSD will not significantly differ from the scores of the non-traumatized controls.

## **Study Design and Methodology**

### **Recruitment and Study Procedures**

The participants were drawn from an existing set of data approved by the Bellevue Hospital Institutional Review Board (IRB), New York Medical school IRB, the Graduate School of the City University of New York IRB, and the Teachers College IRB. This study employed the same procedures and assessed some of the participants that were described in a series of case-control studies that used different dependent variables to test the differential validity of the *DSM-IV* PTSD classification (Saigh, Yasik, Oberfield, & Halamandaris, 2007; Saigh et al., 2014; Saigh, Yasik, Oberfield, & Halamandaris, 2008; Saigh et al., 2006; Saigh et al., 2002; Yasik et al., 2007; Yasik et al., 2012). Providers were given information regarding the purpose of the study and were asked to refer youth who met *DSM-IV* PTSD A1 criteria.

After agreeing to participate in the study via phone conversation with Professor Philip A. Saigh, each participant was asked to meet the research team at the hospital. The child and his/her parent were provided with information regarding the study, including benefits and potential risks of participation, and informed that they could withdraw from the study at any time. If the parent and child agreed to enroll in the study, they were asked to provide formal consent and assent, respectively. After consent and assent were obtained, the parent was asked to complete a set of parent measures while the child met separately with a licensed clinical psychologist, a board-certified psychiatrist, and two advanced level graduate student research assistants to establish or confirm diagnosis.

The psychologist and psychiatrist independently conducted clinical diagnostic interviews to determine if participants met criteria for trauma exposure and PTSD diagnosis as defined in the *DSM-IV* PTSD A1 criteria. Each graduate student then individually administered the *Children's PTSD Inventory* (Saigh, 2003b). In youth referred following trauma exposure, the examiners established or confirmed exposure to a trauma event, as defined by *DSM-IV* PTSD A1 criteria, and PTSD diagnosis, as defined by the *DSM-IV*. The examiners confirmed absence of exposure to a trauma event and PTSD diagnosis in youth referred as non-clinical control subjects. Following confirmation of diagnosis or absence of diagnosis, the child met individually with a research assistant who administered modules from the *Diagnostic Interview for Children and Adolescents, Revised* (Reich et al., 1995) to confirm the absence of attention deficit hyperactivity disorder (ADHD), conduct disorder (CD), major depressive disorder (MDD), substance dependence, and psychotic symptoms. The research assistant administered the *Wechsler Intelligence Scale for Children, Third Edition (WISC-III)*; Wechsler, 1991) to assess level of intelligence. Remaining study measures were administered using a counter-balanced

design after confirmation of 1) PTSD diagnosis or absence of diagnosis 2) absence of comorbid or other psychiatric diagnoses, and 3) intelligence above the deficient range (i.e., >69).

### **Inclusion Criteria**

*Traumatized PTSD cases.* Youth aged 7 to 18 years were included in the study if they reported an intentional or unintentional trauma history and met criteria for a PTSD diagnosis as based on two independent unstructured DSM-IV-based diagnostic interviews and two independent administrations of the *Children's PTSD Inventory* (Saigh, 2003b).

*Traumatized PTSD negative cases.* Youth aged 7 to 18 years were included in the study if they reported an intentional or unintentional trauma history and did not meet criteria for a PTSD diagnosis as based on two independent unstructured DSM-IV-based diagnostic interviews and two independent administrations of the *Children's PTSD Inventory* (Saigh, 2003b).

*Non-traumatized control cases.* Youth aged 7 to 18 years were included if they did not report a trauma exposure history as based on two independent unstructured DSM-IV-based diagnostic interviews and two independent administrations of the *Children's PTSD Inventory* (Saigh, 2003b).

### **Exclusion Criteria**

Youth were excluded from the study if they had difficulty understanding English or did not speak English fluently, as all measures were administered in English. Youth were also excluded if they met criteria for diagnosis of ADHD, CD, or MDD, or who reported substance dependence or psychotic symptoms, as based on an assessment using the *DICA-R* (Reich et al., 1995). The inclusion of co-morbid diagnoses would have made it difficult to accurately report the relationship between personality traits and PTSD specifically. Youth with an IQ falling in the deficient range (i.e., < 70) were excluded because prior research showed that they had

difficulty understanding the questions used to formulate a PTSD diagnosis (Saigh, 2003a). Youth who were taking medication at the time of the study that may have influenced their cognitive functioning were also excluded. Finally, youth with a history of neglect or physical or sexual abuse by a parent or guardian, as defined by the New York State Family Court Act, were excluded because these youth often experience continuing psychological distress during court proceedings and placement into the foster care system (Kendall-Tackett, Williams, & Finkelhor, 1993; McLeer, McLeer, Deblinger, Henry, & Orvaschel, 1992; Merry & Andrews, 1994; Zona & Milan, 2011).

### **Participants**

Providers at Bellevue Hospital's Pediatric Emergency Room, Pediatric Crime Victim's Program, Adolescent Clinic, and Pediatric Consultation-Liaison Psychiatry Clinic referred 228 trauma-exposed patients. Of those referred, parent/guardian consent and child assent was obtained for 157 cases. Following consent, 50 subjects were excluded from the study due to a history of head injury ( $n = 24$ ), limited English proficiency ( $n = 8$ ), a history of child abuse or neglect ( $n = 2$ ), and *WISC-III* (Wechsler, 1991) Full Scale IQs in the deficient range ( $n = 16$ ). Of the remaining 107 cases, 10 were excluded due to having comorbid diagnosis as based on results of the *DICA-R* (Reich et al., 1995). Nineteen additional cases were excluded for not having completed a full battery, including the *Junior Eysenck Personality Inventory (JEPI)* (Eysenck, 1965).

Providers at a Bellevue clinic that provide routine medical services to children referred control group participants. Providers referred 280 control subjects; 78 parents provided consent to allow their child to participate in the study. Five of these cases later reported experiencing a traumatic event and were transferred into the traumatized participant group. Of the remaining 73

participants, 32 were excluded due to head injury ( $n = 2$ ), limited English proficiency ( $n = 15$ ), current psychopharmacological treatment ( $n = 8$ ), and *WISC-III* (Wechsler, 1991) Full Scale IQs in the deficient range ( $n = 7$ ). Two participants were excluded for not having completed a full battery, including the *JEPI* (Eysenck, 1965). No case control subject qualified for a diagnosis of MDD, CD, ADHD, substance dependence, or psychotic symptoms as measured by the *DICA-R* (Reich et al., 1995). Additionally, none had a life-threatening illness.

A total of 25 traumatized youth with PTSD, 58 traumatized youth without PTSD, and 39 non-clinical control subjects were included in the final analyses. The age range for participants included in the analysis is 7.08-18.42 years (mean = 13.08; SD = 2.86). There were 70 males and 52 females.

## Measures

### Diagnostic Measures

***DSM-IV Unstructured Clinical Interviews.*** Two DSM-IV-based clinical interviews were independently conducted by a New York State licensed psychologist and one of two board-certified psychiatrists. The examiners independently assessed for trauma exposure consistent with *DSM-IV* PTSD Criteria A1. They further determined if each participant also met criteria for PTSD diagnosis based on full *DSM-IV* PTSD criteria. When clinicians did not agree upon a diagnosis, a case conference was held and full agreement regarding the diagnosis was established. For control subjects, each examiner independently conducted a clinical interview to confirm that the participant did not meet *DSM-IV* PTSD A1 trauma exposure criteria.

***Children's PTSD Inventory (CPTSDI).*** The *CPTSDI* (Saigh, 2003b) is a structured clinical interview used to diagnose PTSD. The measure includes questions regarding PTSD symptoms in children and adolescents based on DSM-IV diagnostic criteria. The *CPTSDI* was

used to assess for trauma exposure and confirm PTSD diagnosis, and to confirm absence of trauma exposure in non-clinical control subjects. Saigh et al. (2000) reported an internal consistency Cronbach's alpha of .95 at the diagnostic level. Saigh et al. (2000) further reported inter-rater reliability calculated from two independent administrations to be 98.1%. Inter-rater intra-class correlation coefficients (ICC) of .98 and an inter-rater reliability kappa of .96 were noted at the diagnostic level. A 97.6% test-retest reliability, .91 test-retest kappa, and .90 ICC were observed at the diagnostic level. Moderate to high levels of sensitivity (.84-.92) and specificity (.93-.98) were indicated. Furthermore, moderate to high levels of positive (.63-.93) and negative (.95-.99) predictive power and diagnostic efficiency (.93-.95) were reported (Saigh, 2003a).

***Diagnostic Interview for Children and Adolescents–Revised (DICA–R).*** The *DICA–R* (Reich et al., 1995) is a semi-structured clinical interview for children and adolescents based on both DSM-III-R and DSM-IV diagnostic criteria. Each participant was administered the ADHD, CD, MDD, psychotic symptoms, and substance dependence modules. Reich (2000) noted adolescent test-retest reliability kappas ranging from .32-.59 for the ADHD module and .55-.80 for the MDD module. Coefficients of .92 were reported for the CD module and .76 for the psychotic symptoms module (Reich, 2000; Reich, personal communication to Professor Philip A. Saigh, April 6, 2000 as cited in Saigh et al., 2008). Reich et al., (Reich, personal communication to Professor Philip A. Saigh, February 5, 2001 as cited in Saigh et al., 2008) reported sensitivity coefficients of .82 (MDD), .85 (ADHD), .92 (CD), 1.00 (substance dependence), and 1.00 (psychotic symptoms), and specificity coefficients of .72 (MDD), .71 (ADHD), .73 (CD), .80 (substance dependence), and .72 (psychotic symptoms) for the modules examined in the current study. Reich (2000) reported that studies examining the validity of the DICA have shown that

the “DICA differentiate[s] between children with differing levels of psychopathology” (p. 65) in the expected direction.

### **Demographic Measure**

***Hollingshead Four-Factor Index of Social Status.*** The *Hollingshead Four Factor Index of Social Status* (Hollingshead, 1975) is a self-report measure examining parent socioeconomic status (*SES*). Factors include parental marital status, level of education, and occupational status and prestige. Scores are based on level of education and occupation. Higher education and occupations with higher salaries are given higher scores. Final scores range from 8 to 66. Based on their answers given, participants are assigned to one of five social strata (I-V), with higher SES assigned to the first social strata (i.e., Class I). If only one parent is gainfully employed, SES is based on the level of education and occupation of that parent. If both are employed, SES is based on the average of education and occupation of each. Cirino et al. (2002) reported inter-rater reliability coefficients in the moderate (one-female-wage-earner families:  $r = .73$ ) to high (one-male-wage-earner families and two-wage-earner families:  $r = .95$ ) range. Cirino et al. (2002) further reported modest (One-female-wage-earner families:  $r = .42$ ) to high (One-male-wage-earner families:  $r = .92$ ) convergent validity with the *Socioeconomic Status of Occupations* (Nakao & Treas, 1992) and moderate (One-female-wage-earner families:  $r = .68$ ) to high (One-male-wage-earner families:  $r = .91$ ) convergent validity with the *Socioeconomic Index for Occupations in Canada* (Blishen, Carroll, & Moore, 1987).

### **Stressor Severity Measure**

***Severity of Psychosocial Stress Scale: Children and Adolescents (SPSS-CA).*** The *SPSS-CA* (American Psychiatric Association, 1987) is a 6-point Likert-type scale developed by the APA to assist in the assessment of trauma severity. Ratings of 1 indicate no known exposure

to a stressor, whereas ratings of 6 indicate exposure to a catastrophic stressor. Trauma severity was independently rated by a licensed clinical psychologist and board certified child psychiatrist using *SPSS-CA* criteria after reading participant responses to the *CPTSDI*. Because exposure to severe stressors has been shown to be related to psychiatric morbidity (Pynoos et al., 1993), level of stressor severity was used to examine potential differences between traumatized youth with and without PTSD.

### **Dependent Measure**

*Junior Eysenck Personality Inventory (JEPI)*. The *JEPI* (Eysenck, 1965) is a self-report 60 item measure assessing Neuroticism (e.g., moody, restless) and Extraversion (e.g., sociable) personality features. A Lie scale is included to detect faking. Twenty-four items make up the Neuroticism scale, 24 items make up the Extraversion scale, and 12 items make up the Lie scale. Scores range from 0-24 for Neuroticism and Extraversion and 0-12 for the Lie scale. All scores are standardized based on age and gender.

Eysenck (1965) reported test-retest reliability coefficients on the *JEPI* ranging across indices from .51 to .92 (Extraversion Index), from .53 to .88 (Neuroticism Index), and from .41 to .89 (Lie scale). Harbinson (1970) reported correlation coefficients of .83 (Extraversion Index), .85 (Neuroticism Index), and .43 (Lie Scale) when comparing the *JEPI* to corresponding indices of the *New Junior Maudsley Inventory* (Furneau & Gibson, 1966). Similarly, Pearson and Francis (1984) reported correlation coefficients of .83 (Extraversion), .89 (Neuroticism), and .73 (Lie) when comparing the *JEPI* to corresponding indices of the *Junior Eysenck Personality Questionnaire* (Eysenck & Eysenck, 1975b).

In regard to construct validity, the *JEPI* was developed based on the theory underlying the Eysenck Personality Inventory (EPI). This theory states that “dysthymic neurotics” (i.e.,

individuals with internalizing disorders), “hysterics,” and “psychopaths” will score higher than the general population on neuroticism (Eysenck & Eysenck, 1964, p. 16). Further, those with internalizing disorders will score low on extraversion compared to the general population, whereas “hysterics and psychopaths” will score significantly higher on extraversion as compared to “dysthymic neurotics” (Eysenck & Eysenck, 1964, p. 16). This was demonstrated in the *EPI* reference group norms. Additionally, the *JEPI* scales were developed using principal components analysis, where two principles, readily identified as neuroticism and extraversion, contributed most of the variance. The authors further reported low factor correlations between the Extraversion and Neuroticism scales (Eysenck, 1965).

### **Study Design**

This study will utilize a 3-group case control design, which 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” (Armenian, 2009, pp. 19-20). The independent variable will consist of three groups: PTSD ( $n = 25$ ), trauma-exposed PTSD negatives ( $n = 58$ ), and non-traumatized controls ( $n = 39$ ). The *JEPI* Neuroticism, Extraversion, and Lie Scale scores will be used as the dependent variable. Cohen’s (1988) power analyses tables indicate that a minimum of 21 cases per group is required to reflect a large effect. As all cells have more than 21 cases, this study has sufficient power to identify significant effects. A schematic representation of the research design is presented in Figure 3.1.

Figure 3.1

*Schematic Representation of Research Design*

<b>Dependent Variable</b>	<b>Experimental Groups</b>		
<i>Junior Eysenck Personality Inventory</i> (Eysenck, 1965)	PTSD  (n=25)	Traumatized youth  without PTSD  (n= 58)	Non-clinical cases  (n= 39)
Neuroticism Index			
Extraversion Index			
Lie Scale			

## Chapter IV

### RESULTS

This chapter includes results of the data analysis, including demographic variables, potential confounding variables, and the dependent variable.

#### Demographic Data Analyses

Demographic information regarding the included participants is reported in Table 4.1

Table 4.1

#### *Demographics*

	PTSD <sup>a</sup>	Traumatized PTSD negative <sup>b</sup>	Control Cases <sup>c</sup>
<u>Gender</u>			
Male	15	39	16
Female	10	19	23
<u>Age</u>			
Mean Age (SD)	14.08 (3.03)	13.11 (2.89)	12.39 (2.58)
<u>Race/Ethnicity</u>			
African American	2	17	5
Asian	1	7	0
Caucasian	2	9	5
Hispanic	20	25	0
Other	0	0	1

Table 4.1 (continued)

*Demographics*

	PTSD <sup>a</sup>	Traumatized PTSD negative <sup>b</sup>	Control Cases <sup>c</sup>
<u>Socioeconomic Status</u>			
Class I	1	2	4
Class II	1	13	8
Class III	3	27	14
Class IV	12	11	9
Class V	8	5	4

<sup>a</sup>n=25 <sup>b</sup>n=58 <sup>c</sup>n=39

Chi-square analysis identified significant differences between groups by gender,  $\chi^2(2, N=122)=6.64, p=.036$ . There were more male participants than expected in the trauma exposed PTSD negative group and more female participants than would be expected in the case control group. A univariate ANOVA indicated a significant difference between groups on SES,  $F(2,119)=8.55, p<.001$ . Bonferroni post-hoc comparisons indicated that participants with PTSD had significantly higher *Hollingshead Four Factor Index of Social Status* (Hollingshead; Hollingshead, 1975) social strata scores (i.e., lower SES) than traumatized youth without PTSD ( $t(81)=-.93, p=.001$ ) and non-traumatized controls,  $t(62)=-.97, p=.001$ . Traumatized participants without PTSD and non-traumatized controls did not significantly differ according to *Hollingshead* SES ratings,  $t(95)=-.04, p>.05$ . A univariate ANOVA indicated no significant differences between groups by age,  $F(2, 119)=2.76, p>.05$ . Assumptions of chi-square analyses indicated that there should be a minimum of five participants per cell (Field, 2009). Chi-square

analyses of race/ethnicity by group violate these assumptions, thus the results of the analysis could not be interpreted.

### **Stressor Severity Analyses**

The types of traumatic events endorsed by the participants are reported in Table 4.2. With reference to trauma exposure, 30.1% of youth exposed to at least one trauma in the current study who reported *DSM-IV* (American Psychiatric Association, 2000) PTSD Criterion A1 traumatic experiences also met full criteria for the disorder. In regard to youth with PTSD, 11 reported a history of exposure to one trauma event, 11 to two trauma events, and three to three or more trauma events. Of traumatized youth without PTSD, 44 reported a history of exposure to one trauma event, 10 to two events, and four to three events. Univariate ANOVA identified significant differences across groups, with youth with PTSD ( $M=1.76$ ;  $SD=.93$ ) reporting a greater number of traumas than trauma exposed youth without PTSD ( $M=1.31$ ;  $SD=.60$ ),  $F(1, 81)=6.98$ ,  $p=.01$ . As non-traumatized control participants did not meet DSM-IV criteria A.1 trauma exposure, they were not included in the analysis.

Table 4.2

*Reported traumas by group*

<u>Trauma</u>	PTSD <sup>a</sup>		Traumatized PTSD negative <sup>b</sup>	
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>
Sexual Assault	4	16.0	0	0.0
Physical Assault	7	28.0	13	22.4
Shot	4	16.0	5	8.6
Dog attack	1	4.0	4	6.9
Motor vehicle accident	4	16.0	14	24.1
Hand injury	1	4.0	12	20.7
Smoke inhalation	2	8.0	2	3.4
Other	1	4.0	5	8.6
Witnessed trauma	1	4.0	3	5.2

<sup>a</sup>n=25 <sup>b</sup>n=58

Mean stressor severity ratings, as measured by the *SPSS-CA* (American Psychiatric Association, 1987), were assessed by group and gender. Results of a univariate ANOVA denoted non-significant differences in *SPSS-CA* stressor severity scores between trauma exposed youth with ( $M=5.85$ ;  $SD=.31$ ) or without ( $M=5.67$ ;  $SD=.43$ ) PTSD,  $F(1, 81)=3.43$ ,  $p=.07$ . A separate univariate ANOVA similarly indicated non-significant differences in *SPSS-CA* stressor severity scores between male ( $M=5.71$ ;  $SD=.41$ ) and female ( $M=5.75$ ;  $SD=.41$ ) participants,  $F(1, 81)=.16$ ,  $p=.70$ .

Further, the mean age at trauma exposure and amount of time that elapsed between trauma exposure and assessment were assessed via separate univariate ANOVAs. Univariate analyses indicate that mean age at time of trauma exposure did not significantly differ between

youth with PTSD (M=13.39 years; SD 3.39 years) and trauma exposed youth without PTSD (M=12.64 years; SD=3.22 years),  $F(1,80)=.92, p=.34$ . Similarly, univariate analyses indicate that the average amount of time that elapsed between trauma exposure and assessment did not vary between youth with PTSD (M=.69 years; SD=.96 years) and trauma exposed youth without PTSD (M=.47 years; SD=.88 years),  $F(1,80)=1.02, p=.32$ .

### **Multivariate Analyses**

A MANOVA with SES as the independent variable and the *Junior Eysenck Personality Inventory (JEPI; Eysenck, 1965)* Index scores as the dependent variable was conducted to examine possible effects of *Hollingshead (Hollingshead, 1975)* SES social strata scores on the *JEPI* scores regardless of group. The omnibus test showed significance for *Hollingshead* SES scores on *JEPI* scores, *Wilks' Lambda*  $F(12, 305)=2.19, p=.01$ . Results of univariate F-tests indicated that SES was significantly associated with *JEPI* Extraversion scores,  $F(4, 117)=3.50, p=.01$ , but not *JEPI* Neuroticism,  $F(4, 117)=1.36, p=.25$ , or Lie,  $F(4, 117)=1.31, p=.27$ , index scores. Bonferroni post-hoc tests indicated that *JEPI* Extraversion scores were significantly higher for participants in the second Hollingshead social strata as compared to the third,  $t(62)=6.92, p=.04$ , or fourth,  $t(52)=8.87, p=.01$ , social strata. No other group differences were significant. Because diagnostic groups differed significantly by SES, and because SES explained part of the effect of *JEPI* Index score results, SES was included in the final multivariate analysis as a covariate.

MANCOVA was utilized to examine diagnostic group differences across *JEPI* standardized scores without inflating alpha levels, while controlling for group differences related to Hollingshead SES scores. Omnibus test results were followed by univariate F-tests and

Bonferroni post-hoc comparisons to clarify differences between groups. Age and gender were not controlled for, as the *JEPI* is standardized on both.

Omnibus results of the MANCOVA indicated at least one significant difference between groups for at least one of the *JEPI* Index scores, *Wilks' Lambda*,  $F(6, 232)=3.35$ ,  $p=.003$ .

Univariate F-tests and Bonferroni post-hoc comparisons were examined to identify differences between groups. Univariate tests indicated a significant difference in *JEPI* Neuroticism Index scores by group,  $F(2,118)=8.25$ ,  $p<.001$ . No significant differences were detected between groups on the *JEPI* Extraversion,  $F(2,118)=.32$ ,  $p=.73$ , or Lie,  $F(2, 118)=.63$ ,  $p=.53$ , indices.

There were no significant differences detected between SES and any *JEPI* Index score. Results of multivariate and univariate analyses are presented in Table 4.3.

Table 4.3

*Multivariate and Univariate Analyses for JEPI Index scores*

<u>Scale</u>	PTSD <sup>a</sup>		Traumatized PTSD Negative <sup>b</sup>		Control Cases <sup>c</sup>		Univariate Analyses	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>F(2, 118)</u>	<u>p</u>
<i>JEPI</i> Neuroticism Index	53.47	11.39	43.64	9.57	42.49	8.92	8.25	<.001*
<i>JEPI</i> Extraversion Index	49.08	7.31	51.45	11.18	52.36	7.74	.32	.73
<i>JEPI</i> Lie Index	54.80	9.24	51.42	10.46	53.43	8.54	.63	.53

Note: <sup>a</sup> $n=25$ , <sup>b</sup> $n=58$ , <sup>c</sup> $n=39$

Note: \*denotes significance at the  $p=.001$  level

Bonferroni post-hoc comparisons were calculated using an alpha level of .006, calculated by dividing the alpha level of .05 by the number of group comparisons (i.e., 9). Bonferroni post-hoc comparisons indicated that participants with a diagnosis of PTSD scored significantly higher

on the *JEPI* Neuroticism Index than traumatized participants without PTSD,  $t(81)=8.88, p=.001$ , and non-traumatized control subjects,  $t(62)=10.04, p=.001$ . *JEPI* Neuroticism Index scores did not significantly differ between traumatized participants without a diagnosis of PTSD and non-traumatized control subjects,  $t(95)=1.16, p>.05$ . Results of Bonferroni post-hoc analyses are presented in Table 4.4.

Table 4.4

*Bonferroni post-hoc comparisons*

<u>Scale</u>	PTSD vs. Traumatized PTSD Negative		PTSD vs. Control		Traumatized PTSD Negative vs. Control		Post-hoc comparisons
	<u>t(81)</u>	<u>p</u>	<u>t(62)</u>	<u>p</u>	<u>t(95)</u>	<u>p</u>	
<i>JEPI</i> Neuroticism Index	8.88	.001	10.04	.001	1.16	1.00	1>2*, 1>3*
<i>JEPI</i> Extraversion Index	-1.06	1.00	-1.99	1.00	-.93	1.00	N.A.
<i>JEPI</i> Lie Index	1.92	1.00	-.08	1.00	-2.00	.94	N.A.

Note: 1=PTSD, 2=Traumatized PTSD negative, 3=Control  
 \*denotes significance at the  $p=.001$  level

The observed outcomes supported the hypotheses presented in Chapter 3. More specifically, Hypotheses 1-2 indicated that youth with PTSD would have significantly higher *JEPI* Neuroticism Index scores relative to traumatized youth without PTSD and non-traumatized control subjects. The observed outcomes clearly supported these expectations. Hypothesis 3 indicated that *JEPI* Neuroticism Index scores of traumatized youth without PTSD and non-traumatized controls would not significantly differ. The observed outcomes supported this hypothesis. Hypotheses 4-6 indicated that *JEPI* Extraversion Index scores would not significantly differ across groups. The observed outcomes also supported these hypotheses.

## Chapter Summary

Data analyses indicated, as hypothesized, that *JEPI* Neuroticism scores for youth with PTSD significantly exceeded *JEPI* Neuroticism scores of traumatized youth without PTSD and control subjects. Further, *JEPI* Neuroticism scores for trauma exposed youth without PTSD and control subjects did not differ. Finally, as hypothesized, *JEPI* Extraversion scores did not differ across groups. In summary, PTSD was associated with increased neuroticism, whereas trauma exposure without PTSD was not. Additionally, neither diagnosis nor trauma exposure were related to extraversion.

## Chapter V

### DISCUSSION

This chapter will offer an interpretation of the study results. The purpose of the study and the study results will be reviewed briefly. Next, the theoretical and clinical significance of the results will be discussed. Finally, limitations of the study and future directions will be presented.

#### Summary of Findings

The present study aimed to compare personality traits of traumatized youth with and without Posttraumatic Stress Disorder (PTSD) and a non-traumatized control group via *Junior Eysenck Personality Inventory (Eysenck, 1965)* Index scores utilizing a three-group case control design. More specifically, this study compared the personality trait scores of the *JEPI* Neuroticism Index and the *JEPI* Extraversion Index of trauma exposed youth with and without PTSD and non-traumatized control subjects.

The current study expands upon existing research examining the relationship between PTSD and personality traits (An et al., 2013; Breslau & Schultz, 2013; Zhang et al., 2010). As reviewed in Chapter 3, few studies conducted to date have examined the relationship between PTSD and personality traits. Of the studies reviewed, only three included children or adolescents (An et al., 2013; Wu et al., 2011; Zhang et al., 2010). Of those, none used reliable and valid, individually administered interviews based on the *Diagnostic and Statistical Manual of Mental Disorders (DSM)*. As such, the studies could only make conclusions based on probable diagnosis. Other limitations were also present including the lack of a control group (An et al., 2013; Chung et al., 2007; Engelhard et al., 2009; Perrin et al., 2014; Wu et al., 2011; Zhang et al., 2010); thus, trauma exposure in individuals who did not develop PTSD could not be

evaluated. Additionally, several studies failed to exclude comorbid cases (An et al., 2013; Breslau et al., 1991; Breslau & Schultz, 2013; Cox et al., 2004; Engelhard et al., 2009; Perrin et al., 2014; Wu et al., 2011; Zhang et al., 2010), which is problematic because research has shown that youth with PTSD often have co-morbid diagnoses (Famularo et al., 1996; Sack et al., 1994; Saigh et al., 1999). This prevents drawing conclusions regarding PTSD specifically. The current study attempted to address limitations of prior research by using rigorous methodology to determine diagnosis based on *DSM-IV* (American Psychiatric Association, 2000) criteria, including a control group, and controlling for other potential confounders including major co-morbid diagnoses.

As reviewed in chapter 4, 30.1% of youth in the current study exposed to at least one trauma met full criteria for PTSD. This is consistent with prior studies that suggested resiliency in youth, where only a portion of youth met criteria for PTSD following trauma exposure (Huemer et al., 2011; Saigh, 1992; Silva et al., 2000). Of youth exposed to at least one trauma in the current study, those with PTSD reported exposure to a significantly greater number of traumas than those without PTSD. These results are consistent with the prior literature indicating that the number of traumas is related to likelihood of diagnosis (Moore et al., 2013; Yelland et al., 2010). There were no differences in severity of trauma by group or gender for youth who reported exposure to at least one traumatic event. Further, there was no significant difference in age at time of trauma exposure or in the amount of time that elapsed between trauma exposure and assessment.

In regard to demographic variables, there were more male participants than expected in the trauma exposed, PTSD negative group. This is consistent with prior studies indicating that female gender may be a risk factor for diagnosis (Agustini et al., 2011; Landolt et al., 2013;

Schiff et al., 2012). Additionally, there were more female participants in the case control group than would have been expected. With regard to socioeconomic status (SES), youth with PTSD had significantly lower SES ratings as measured by the *Hollingshead Four Factor Index of Social Status* (Hollingshead, 1975) than traumatized youth without PTSD and non-traumatized control cases, which did not differ from one another. This finding is concordant with findings by Holbrook et al. (2005b) and Rheingold et al. (2012) indicating that individuals from lower SES households are diagnosed with PTSD at higher rates than individuals from higher SES households following trauma exposure. There were no significant differences by age. As reported in Chapter 2, findings by age in the prior literature are inconsistent across studies. Differences by race and ethnicity could not be evaluated given an insufficient number of cases per group.

In regard to analysis of the relationship between PTSD and personality traits, it was hypothesized that youth with PTSD would have significantly higher *JEPI* Neuroticism Index scores relative to traumatized youth without PTSD and non-traumatized control subjects. It was further hypothesized that *JEPI* Neuroticism Index scores of traumatized youth without PTSD and non-traumatized controls would not significantly differ. Finally, it was hypothesized that *JEPI* Extraversion Index scores would not significantly differ across groups. Results supported these hypotheses. Youth with PTSD had significantly higher *JEPI* Neuroticism scores than trauma exposed youth without PTSD or case controls. Additionally, *JEPI* Neuroticism scores of trauma exposed youth without PTSD and control cases did not significantly differ. Thus, PTSD was associated with high levels of neuroticism, whereas trauma exposure in the absence of PTSD was not. No significant differences were found for *JEPI* Extraversion scores across groups.

## Significance of Study

Results of the current study were in the expected direction and are consistent with the prior literature. The elevated neuroticism scores in youth with PTSD relative to traumatized youth without PTSD and case controls is consistent with prior studies indicating that youth and adults with PTSD or likely PTSD endorsed higher levels of neuroticism than individuals without PTSD (Breslau et al., 1991; Chung et al., 2007; Wu et al., 2011). This outcome is also consistent with the *Eysenck Personality Inventory* manual (Eysenck & Eysenck, 1964) which indicates that individuals with high anxiety report higher than typical levels of neuroticism. As PTSD is characterized as an anxiety disorder in the *DSM-IV* (American Psychiatric Association, 2000), it was expected that participants with PTSD would self-report higher than typical levels of neuroticism. Clearly, the outcomes of this investigation support this rationale.

The finding that traumatized youth without PTSD and control subjects did not differ on self-reported levels of neuroticism is congruent with the outcomes of prior studies indicating that traumatized youth without PTSD did not differ on self-reported measures of anxiety and depression (Saigh, 1989a; Saigh, 1989c; Yasik et al., 2012) or parent ratings of anxiety, depression and withdrawn behavior (Saigh et al., 2002) relative to controls. Results indicating that *JEPI* Extraversion scores did not significantly differ across groups are also consistent with research indicating insignificant differences between similar groups on extraversion measures (Breslau et al., 1991; Chung et al., 2007; Wu et al., 2011).

The findings from the current study provide empirical support for the differential validity of the PTSD classification in children and adolescents. This is important because, while *DSM-IV* criteria indicate that children and adolescents can be diagnosed with PTSD, *DSM-IV* field trials of PTSD failed to include youth under 15 years of age (Kilpatrick et al., 1993; Saigh & Bremner,

1999). As presented in Chapter 1, the need to substantiate the differential validity of a psychiatric disorder was noted by Quay and Werry (1986), who indicated that “a disorder is empirically validated by determining its relationship to other variables...[where] two putatively separate disorders ought not to be related in the same way to the same variable” (p. 37). Results of the current study provide empirical support for the differential validity of *DSM-IV* (American Psychiatric Association, 2000) PTSD in children and adolescents. More specifically, differential validity is supported by the *JEPI* Neuroticism outcomes, where *JEPI* Neuroticism was associated with PTSD and not with trauma exposure without PTSD. As such, the findings suggest that clinicians may be able to utilize the *JEPI* for early assessment of trauma-exposed youth to identify examinees who may be at increased at risk for developing PTSD. With early identification, clinicians could begin to develop treatment programs for these youth. As part of the current study, psychological evaluations containing diagnostic status and results of *JEPI* outcomes, along with outcomes of other measures, were provided to each participant, along with recommendations for treatment, as appropriate.

The rigorous methods of the current study helped to control for several methodological limitations found in prior studies. First, rigorous diagnostic procedures (i.e., utilizing both structured and unstructured clinical interviews and employing multiple examiners) were used in a very conservative approach to diagnosis. Comorbid diagnoses (identified through administrations of the *Diagnostic Interview for Children and Adolescents* (Reich et al., 1995)) were excluded to allow for a more accurate analysis and reporting of the relationship between personality traits and PTSD. Additionally, youth with deficient intellect, those taking medication that may have influenced cognitive functioning, and those with ongoing psychological distress were also excluded. Further, the inclusion of a control group allowed for a better understanding

of the functioning of trauma-exposed youth without PTSD. This is important, because a majority of prior studies examined only trauma-exposed youth with or without PTSD.

### **Limitations**

While this study employed rigorous methods, several limitations remain. The external validity of the study is limited to developmentally and demographically similar children and adolescents without comorbid disorders. The age constraints of the current study limit the understanding of psychological functioning of trauma-exposed youth under the age of 7. Additionally, participants were drawn from an urban setting, potentially limiting reliability of the results to youth from similar settings. Further, youth with PTSD were shown to have lower SES ratings on the *Hollingshead Four Factor Index of Social Status* (Hollingshead, 1975). As such, findings may only apply to youth with a similar socioeconomic status. Results are also limited to youth with similar psychiatric and trauma histories as those of the study participants. Relatedly, while multiple major co-morbid disorders were excluded from the study (i.e., ADHD, CD, MDD, substance abuse, psychotic symptoms), a complete exclusion of potential comorbid illnesses was not possible. The presence of other, non-identified, comorbid disorders may have confounded study results. Finally, it is not possible to control for all potential confounders.

Other limitations include various factors that may have influenced participant answers to the *JEPI* self-report items. The use of self-report measures is a valuable way of obtaining information from individuals; however, participants may vary in their ability to understand or their motivation to honestly and accurately answer questions on these measures (Kessler, Wittchen, Abelson, & Zhao, 2000). Further, the reliability of these measures may have been affected by social desirability (Schaeffer, 2000) and erroneous perceptions (Kihlstrom, Eich, Sandbrand, & Tobias, 2000) of respondents. Finally, the external validity of the current findings

relative to the *DSM 5* PTSD classification (American Psychiatric Association, 2013a) is an open question as the new diagnostic criteria significantly differ from the *DSM IV* PTSD criteria (American Psychiatric Association, 2013a, 2013b).

### **Future Directions**

Future studies should seek to replicate findings of differential validity of PTSD in children and adolescents using *DSM 5* (American Psychiatric Association, 2013a) criteria, as the criteria have changed from those presented in the *DSM-IV* (American Psychiatric Association, 2000). Relatedly, future studies should consider including youth under 7 years of age, as the *DSM 5* (American Psychiatric Association, 2013a) now includes specific symptom criteria for youth ages 6 and under. More specifically, studies should separately examine *DSM 5* (American Psychiatric Association, 2013a) criteria listed for individuals seven and over, as well as for children younger than 7.

As the current study included a relatively small sample size, future studies should consider including a larger group of youth with PTSD. By examining a larger sample size, where more diversity in psychiatric and trauma histories is likely, limitations based on psychiatric and trauma histories would be reduced. Future studies examining youth with and without PTSD and youth with and without co-morbid conditions would also further our understanding of the expression of PTSD.

Finally, the current study examined youth who reported an intentional or unintentional trauma history as a single group. No study in the current review of the literature examined the similarities or differences in psychological functioning of youth who had been exposed to intentional stressors (e.g., rape) as compared to youth exposed to unintentional stressors (e.g.,

motor vehicle accidents). Thus, future studies should include an exploration of the functioning of intentionally versus unintentionally traumatized youth.

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