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Identifying Maltreated Youths at Heightened Risk for Posttraumatic Symptoms

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IDENTIFYING MALTREATED YOUTHS AT HEIGHTENED RISK FOR POSTTRAUMATIC SYMPTOMS

By

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ABSTRACT

Identifying Maltreated Youths at Heightened Risk for Posttraumatic Symptoms

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Childhood maltreatment is associated with increased risk for lifetime and current PTSD (Davis & Siegel, 2000; Widom, 1999). This study examined a model of PTSD in which dissociation, depression, and posttraumatic cognitions related to heightened PTSD symptoms for maltreated youths. This study then evaluated the model's fit across variations in intelligence, gender, age, ethnicity, and maltreatment type. Participants (n=360) included youths from Department of Family Services-related sites in Las Vegas. The first hypothesis was that the model would display goodness-of-fit across various indices. The second hypothesis was that the model would better fit youths with below average intelligence (FSIQ = 55-84) than youths with average intelligence (FSIQ = 85-114). The third and fourth hypotheses were that the model would better fit females than males and younger youths (aged 9-13 years) than older youths (aged 14-18 years). The fifth and sixth hypotheses were that the model would better fit multiracial, Hispanic, and African American youths than Caucasian youths, as well as victims of sexual maltreatment than victims of neglect, physical maltreatment, or multiple maltreatment types. Hypotheses were tested via structural equation modeling using EQS. Hypothesis one was supported. Hypotheses two, three, and four were not supported. Hypotheses five and six were partially supported. Findings and clinical implications are discussed.

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CHAPTER 1:

CHILD MALTREATMENT

Definitions of Child Maltreatment

The Federal Child Abuse Prevention and Treatment Act, amended in 2010, defines child maltreatment as "any recent act or failure to act on the part of a parent or caregiver which results in death, serious physical or emotional harm, sexual abuse or exploitation; or an act, or failure to act, which presents an imminent risk of serious harm" (U.S. Department of Health and Human Services [USDHHS], 2011). The Centers for Disease Control and Prevention (CDC) consider child maltreatment to be "any act or series of acts of commission or omission by a parent or other caregiver that results in harm, potential for harm, or threat of harm to a child" (CDC, 2012).

Four types of maltreatment have been identified: physical maltreatment, sexual maltreatment, emotional maltreatment, and neglect. Physical maltreatment refers to non-accidental bodily injury inflicted on a child from acts such as striking, burning, or kicking (Cahill, Kaminer, & Johnson, 1999; Trickett, Negriff, Ji, & Peckins, 2011). Sexual maltreatment refers to the involvement of a child in sexual activity to provide erotic gratification or financial gain to the perpetrator (Trickett et al., 2011). Examples include molestation, statutory rape, prostitution, and incest. Emotional maltreatment refers to the continuous and extreme thwarting of a child's basic emotional needs, often causing the child to experience chronic anxiety, depression, or fear that his safety is threatened (Barnett, Manly & Cicchetti, 1993; Cahill et al., 1999). Neglect refers to the omission of health care, education, supervision, protection from environmental hazards, and emotional support (Dubowitz & Bennett, 2007). Neglect can also involve a failure to

meet a child's physical needs (e.g., providing clothing and food). The definition of child maltreatment often varies by culture and personal opinion because differentiating unpopular parenting behaviors from abusive actions can be subjective (Barnett et al., 1993; Cicchetti & Toth, 2005; Kinard, 2004).

Prevalence

Child Protection Services (CPS) agencies in the United States received 3.3 million referrals involving the alleged maltreatment of 6 million children in 2009. Of those reports, 61.9% were investigated and more than one-third were substantiated (USDHHS, 2009). In 2010, 436,321 children were victims of maltreatment (USHHS, 2010). In 2011, 6.2 million children were referred to CPS agencies for alleged maltreatment and 681,000 were found to be victims of maltreatment (USDHHS, 2011). This indicates that approximately 9/1000 children in the population are maltreated. More than one-third of reports were not investigated each year, so the incidence of child maltreatment is likely much higher.

Fatalities. Many (3130) children died in 2010-2011 because of maltreatment (USDHHS, 2010; USDHHS, 2011). Approximately one-third of all fatalities in 2010 were attributed exclusively to neglect (USDHHS, 2010). Over 80% of child fatalities in 2011 occurred among youth younger than age 4 years, with infant boys having the highest death rate (2.47/100,000 in the population) (USDHHS, 2011).

Prevalence by maltreatment type. Maltreated children were victims of neglect (78.3%), physical maltreatment (17.8%), sexual maltreatment (9.5%), psychological maltreatment (7.6%), and other types of maltreatment such as abandonment, threats, or congenital drug addiction (9.6%) in 2009 (USDHHS, 2009). Approximately 79% of

maltreated youth suffered neglect, 17.6% suffered physical maltreatment, and 9.1% suffered sexual maltreatment in 2011 (USDHHS, 2011).

Prevalence by gender. Slightly more females (9.6/10000) than males (8.7/10000) were maltreated in 2011 (USDHHS, 2011). Coleman and Stewart (2010) examined 398 incarcerated youth and found that girls were 3 times more likely to report sexual maltreatment than boys, whereas boys were 1.5 times more likely to report physical maltreatment than girls. Brosky and Lally (2004) observed that 75% of incarcerated females but only 51% of incarcerated males had experienced a traumatic event such as maltreatment. Females are more likely to be victims of sexual maltreatment than males, but researchers report mixed findings about incidence rates of neglect, physical maltreatment, and emotional maltreatment across genders (Abram et al., 2004; Breslau, Davis, Andreski & Peterson, 1991; Davis & Siegel, 2000; Koenen & Widom, 2009).

Prevalence by age. Children younger than age 1 year had the highest victimization rate in 2011 (21.2/10000) (USDHHS, 2011). Approximately 27% of victims were younger than age 3 years (182,742 children), 20% were aged 3-5 years, 16% were aged 6-8 years, and 10% were aged 15-17 years (USDHHS, 2011). Nearly 65% of maltreated youth younger than age 2 years were victims of neglect compared to only 20% of youth aged 15-17 years. Youth older than age 12 years comprised nearly 50% of all cases of sexual maltreatment. Physical maltreatment and psychological maltreatment were most prevalent among youth aged 3-5 years (16.3% and 19.3%, respectively) (USDHHS, 2011).

Prevalence by ethnicity. Nearly 90% of maltreatment victims in 2011 were African American (21.5%), Hispanic (22.1%), or White (43.9%) (USDHHS, 2011).

Victims of African-American, American Indian, and multiple racial descents had the highest rates of victimization in the population (14.3/1000, 11.4/1000, and 10.1/1000, respectively) (USDHHS, 2011).

Effects of Maltreatment

Maltreated youth may experience poor social outcomes, cognitive delays, and psychopathology. The effects of maltreatment are variable and often influenced by factors such as a child's age at onset, chronicity, and severity of the maltreatment (Cicchetti & Toth, 2005; Cook et al., 2005). The biological, interpersonal and intrapersonal, behavioral, cognitive, and psychological effects of maltreatment are discussed next.

Biological effects. Childhood maltreatment adversely affects numerous brain structures including the hippocampus, amygdala, cerebral cortex, corpus callosum, and cerebellum (De Bellis & Kuchibhatla, 2006; McCroy, De Brito, & Viding, 2010; Teicher et al., 2002; Teicher et al., 2004). Functional consequences of these structural changes include dysregulation of the catecholaminergic and serotonergic neurotransmitter systems as well as the hypothalamic-pituitary-adrenal (HPA) axis (Kaufman & Charney, 2001; McCrory et al., 2010; Watts-English, 2006).

Much literature has examined the relationship between the HPA axis and cortisol levels among maltreated youth. The HPA axis produces and initiates the release of a sequence of hormones in response to stress. Initially, the hypothalamus releases corticotrophin-releasing hormone (CRH), which triggers the pituitary gland to release adrenocotropic hormone (ACTH), which ultimately initiates the release of cortisol by the adrenal cortex. Cortisol, the principle glucocorticoid, is essential for maintaining

homeostasis and, in regulated amounts, enables an adaptive response to stress (Alink et al., 2012; Shea et al., 2004). However, chronic activation of the HPA axis results in overproduction of cortisol. Some detrimental consequences of excess cortisol include adverse structural changes in the brain, suppressed neurogenesis, and synaptic and dendritic remodeling (Rogosch, Dackis, & Cicchetti, 2011).

The production of cortisol typically follows a circadian rhythm, such that levels of cortisol are highest in the morning and decline throughout the day (Alink et al., 2012; Tarullo & Gunnar, 2006). However, the extant literature yields mixed findings about the relationship between cortisol levels and childhood maltreatment. Some researchers have found higher morning cortisol levels, others have found lower morning cortisol levels, and yet others have found no difference in cortisol levels among maltreated and non-maltreated youth (Bruce, Fisher, Pears & Levine, 2009; Cicchetti, Rogosch, Gunnar & Toth, 2010; Sullivan, Bennett, & Lewis, 2013). Cicchetti and Rogosch (2001) posited that these seemingly discrepant findings may be attributable to different types of precipitating stressors. Bruce and colleagues (2009) examined the morning cortisol levels of 117 maltreated youth and found that children with low morning cortisol levels experienced severe physical neglect, whereas children with high morning cortisol levels experienced severe emotional maltreatment. Therefore, cortisol levels may vary depending on the type of maltreatment experienced.

Interpersonal and intrapersonal effects. Childhood maltreatment can negatively affect the development and maintenance of peer relationships, which can lead to less competence in future social interactions (Alink et al., 2012; Trickett et al., 2011; Cicchetti & Toth, 2005). Maltreated youth are more likely to be rejected by their peers,

be disliked, and be less prosocial than youth with no history of maltreatment (Anthonysamy & Zimmer-Gembeck, 2007; Bolger, & Patterson, 2001; Chappelle, Tyler, & Bersani, 2005; Graham et al., 2010).

Victims of maltreatment often experience negative intrapersonal consequences such as lower self-worth, less self-esteem, heightened egocentrism, and delayed social perspective-taking (Burack et al., 2006; Feiring, Rosenthal, & Taska, 2000; Kinard, 2004; Teicher et al., 2002). Kaufman and Cicchetti (1989) found that camp counselors rated maltreated children lower than comparison children on self-esteem and prosocial behaviors and higher on withdrawn behaviors. The authors hypothesized that maltreated youth are more likely to have negative expectations about potential social experiences because they have low self-esteem when engaging with peers. In turn, these expectations increase the likelihood of an unsuccessful social interaction occurring, which further diminishes a child's self-esteem and strengthens his expectations that future social encounters will be futile. Maltreated youth, especially victims of physical maltreatment, are also more likely than non-maltreated youth to be aggressive in relationships and exhibit a hostile attribution bias (Anthonysamy & Zimmer-Gembeck, 2007; Graham et al., 2010; Kaufman & Cicchetti, 1898; Price & Glad, 2003).

Behavioral effects. Childhood maltreatment is associated with behavioral problems and a higher incidence of risk-taking behaviors (Cicchetti & Toth, 2005). Specifically, maltreated youth are more likely than their non-maltreated peers to exhibit externalizing behavior problems, such as acting out and explosive anger, and engage in delinquency and violent acts during adolescence (Arata, Langhinrichsen-Rohling, Bowers, & O'Brien, 2007; Chapelle, Tyler, & Bersani, 2005; Cicchetti & Rogosch, 2001;

Kaplow & Widom, 2007; Petrenko et al., 2012; Stouthamer-Loeber, Weigh, Homish, & Loeber, 2002).

Adolescents with a history of maltreatment are also more likely than their non-maltreated peers to engage in promiscuity, alcohol and other drug use, non-suicidal self-injurious behaviors, suicidal ideation, and suicide attempts (Arata et al., 2007, Maniglio, 2011). Noll, Shenk, and Putnam (2009) found that victims of childhood sexual maltreatment were 2 times more likely to become pregnant during adolescence than teenagers who had not been sexually maltreated. Similarly, Hahm, Ozonoff, and Wert (2010) observed that adolescent and young adult women with multiple maltreatment experiences were associated with the highest sexual risks (e.g., STD diagnoses, prostitution), delinquency (e.g., selling drugs, gang affiliation), and suicidality.

Cognitive effects. Maltreatment may detrimentally affect a child's school performance, attention, executive functioning, and intelligence (Cook et al., 2005; Perez & Widom, 1994; Shonk & Cicchetti). A meta-analysis by Veltman and Browne (2001) revealed that childhood maltreatment is related to delayed cognitive development/intelligence, delayed expressive and receptive language development, and poor academic performance. Additionally, childhood maltreatment has been associated with lower grades, poorer scores on standardized tests, and lower achievement scores (Coohey et al., 2011; Kinard, 2001; Shonk & Cicchetti, 2001).

Victims of maltreatment may also exhibit diminished auditory attention, deficits in problem solving, and weakened executive functioning abilities relative to non-maltreated peers (Cook et al., 2005; DePrince, Weinzierkl, & Combs, 2009; Nolin & Ethier, 2007). Lower intelligence, operationalized in most research by an individual's

intelligence quotient (IQ) score, has also been associated with childhood maltreatment (Carrey, Butter, Persinger & Bialik, 1995; De Bellis, Hooper, Spratt, & Woolley, 2009; Perez & Widom, 1994). Jaffee and Maikovich-Fong (2011) found that children who had been maltreated across multiple developmental periods (chronic maltreatment) had lower IQ scores than children maltreated in only one developmental period.

Psychological effects. Childhood maltreatment has been linked to the development of anxiety, depression, posttraumatic stress disorder (PTSD), dissociation, attention-deficit/ hyperactivity disorder, personality disorders, and substance abuse (Blecker-Blease & Freyd, 2008; Cicchetti & Toth, 2005; Gibb, Chelminski, & Zimmerman, 2007; Kaplow & Widom, 2007; MacMilan et al., 2001; Springer, Sheridan, Kuo, & Carnes, 2007). Dissociation and depression will be discussed in detail because they occur frequently among victims of maltreatment and may prove important for identifying unique risk factors associated with comorbid PTSD.

Depression is an internalizing disorder that often manifests following exposure to a traumatic or emotionally disturbing event. Researchers have consistently demonstrated a robust relationship between childhood maltreatment and depression (Arata et al., 2007; Arnow et al., 2011; Cicchetti & Toth, 2005; Kaplow & Widom, 2007). A meta-analysis conducted by Nanni, Uher, and Danese (2012) revealed that individuals maltreated during childhood are twice as likely as individuals with no history of maltreatment to develop recurrent and persistent depressive episodes. Moreover, depressed individuals with a history of maltreatment benefitted less from treatment (Nanni, Uher, & Danese, 2012).

Widom and others (2007) found that 25% of youth who were victims of maltreatment prior to age 11 years met criteria for lifetime Major Depressive Disorder (MDD) and 15% met criteria for current MDD. Children with a history of physical maltreatment or multiple types of maltreatment were at increased risk of lifetime MDD, whereas youth with a history of neglect were at increased risk of current MDD. Additionally, the authors observed that more than 95% of participants with a history of maltreatment and a lifetime diagnosis of MDD met criteria for at least one other lifetime diagnosis, including PTSD, dysthymia, drug abuse and/or dependence, and antisocial personality disorder (Widom, Dumont & Czaja, 2007).

Dissociation is a coping mechanism often employed by youth following maltreatment. Dissociation occurs when the usually integrated functions of consciousness, memory, identity, and environmental perceptiveness are disrupted and prevented from assimilating (Putnam, 1997). Three salient dissociative patterns tend to be exhibited by maltreated youth: automatization of behavior (e.g., deficits in judgment and planning), compartmentalization of painful memories and feelings, and detachment from awareness of emotions and self (Cook et al., 2005; Putman, 1997). Victims of maltreatment with dissociative symptoms may implement actions without self-awareness or planning, and often report feeling that their thoughts are disconnected from their emotions (Cook et al., 2005).

Maltreated youth are at increased risk of manifesting dissociative symptoms relative to non-maltreated youth, and often continue to experience symptoms months or years after the maltreatment ends (Huelette, Freyd, & Fisher, 2011; Kaplow et al., 2008; Putnam, 1997). Macfie and others (2001) examined the prevalence and characteristics of

dissociative symptoms among 198 maltreated and non-maltreated preschoolers. They found that children with a history of maltreatment demonstrated significantly more dissociation than non-maltreated youth, and that 17% of the maltreated children scored in the range of dissociation typically associated with a dissociative disorder. Both chronicity and severity of maltreatment were positively associated with dissociative symptoms, and dissociation strongly correlated with the presence of internalizing and externalizing symptoms (Macfie, Cicchetti & Toth, 2001). Dissociative symptoms have also been found to place a child at risk for learning difficulties, impaired affect regulation, poor behavioral management skills, and a blunted self-concept (Cook et al., 2005; Kaplow et al., 2008).

Limitations of research on effects of maltreatment. Many studies assessing the effects of childhood maltreatment are affected by research design limitations such as small samples sizes and convenience samples. Additionally, much of the extant research was conducted using retrospective self-reports completed by adults about the maltreatment experiences they endured as a child. Participants may have inadvertently exhibited recollection bias or memory loss about aspects of their experiences. Retrospective self-reports also make establishing an empirically supported relationship between childhood maltreatment and later-onset psychopathology particularly challenging (Cicchetti & Toth, 2005; Oswald, Heil, & Goldbeck, 2010).

The existing literature has predominantly examined child maltreatment as a singular construct. However, the effects of different maltreatment types should be analyzed separately for several reasons. First, identifying consistent findings within the maltreatment research is difficult given the numerous, and often discrepant, definitions of

what constitutes maltreatment. Secondly, more recent research suggests that different types of maltreatment present varying and unique effects for youth. Therefore, some of the conflicting findings in the child maltreatment literature may be the result of operationalizing maltreatment as a unitary construct (McCroy, De Brito, & Viding, 2010).

Few researchers have examined the effects of childhood maltreatment using a large, diverse sample. Studies that do include youth of different ages and ethnic groups, for example, often fail to differentiate them. Lastly, little research has examined the influence of protective factors on preventing the development of psychological disorders, such as PTSD, following maltreatment. The following sections will focus on PTSD given its prevalence among maltreated youth.

Posttraumatic Stress Disorder

PTSD Criteria. PTSD is classified as a trauma- and stressor-related disorder and is characterized by specific symptoms following exposure to a traumatic event (American Psychological Association [APA], 2013). Examples of traumatic events include exposure to war, rape, natural disasters, terrorist attacks, and vehicular accidents. The symptom presentation of PTSD is often influenced by an individual's developmental level, such that the most recent edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) provides separate diagnostic criteria for children younger than age 6 years. For individuals older than age 6 years, a diagnosis of PTSD may be warranted when a trauma involves:

- direct exposure to actual or threatened death, serious injury, or sexual violence

- directly witnessing an event that involved actual or threatened death, serious injury, or sexual violence of another person
- learning that a violent or accidental traumatic event occurred to a close family member or close friend
- experiencing repeated or extreme exposure to aversive details of a traumatic event

An individual may experience recurrent, involuntary, and distressing re-experiencing episodes regarding the event via memories, dreams, dissociative reactions (e.g., flashbacks), or physiological reactions to stimuli that symbolize aspects of the trauma. Youth may experience memories of the event through themes of repetitive play and may express dissociative reactions through trauma-specific reenactments in play. Also, individuals frequently avoid stimuli associated with the event as well as external reminders of the event that arouse distressing emotional reactions. Negative changes in thoughts and feelings that begin or worsen after the event may be present and often include an inability to remember aspects of the trauma, a diminished interest in previously enjoyed activities, and distorted cognitions about the event that lead to self-blame or guilt. Lastly, an individual may experience a change in arousal and reactivity subsequent to the traumatic event, such as engaging in reckless or self-destructive behaviors, having newfound difficulties concentrating, or experiencing problems with sleep. Symptoms must be present for longer than one month and cause significant distress. A diagnosis of PTSD with delayed expression is appropriate when symptoms do not manifest until more than 6 months after the event (APA, 2013).

PTSD and Children

Symptoms of PTSD often manifest differently in children than in adults. Young children are more likely to express re-experiencing symptoms through play or storytelling (APA, 2013; Davis & Siegel, 2000). Youth also tend to exhibit more mood fluctuations, aggression, and destructiveness than adults (APA, 2013; Dyregrov & Yule, 2006). School-age children may manifest avoidant behaviors through reduced participation in new activities, and adolescents may exhibit a reluctance to pursue typical developmental opportunities like dating and driving (APA, 2013). Older children and adolescents may also judge themselves as cowardly, harbor newfound beliefs that they are socially undesirable, and lose aspirations for their futures following a trauma. A young child's response to a traumatic event is often influenced by the reactions of others (Davis & Siegel, 2000; Dyregrov & Yule, 2006). However, school-aged children may respond more independently to a traumatic experience because they can better understand the situation, appreciate the long-term consequences, and reflect realistically on their role in the event (Dryegov & Yule, 2006).

Fletcher (2003) found that the 3 most commonly reported symptoms among youth who experienced trauma were feeling or showing distress at reminders of the trauma (51%), affective numbing (47%), and difficulty concentrating (41%). Portnova (2007) observed four salient symptom presentations among traumatized youth. The most prevalent symptom among youth with PTSD was sleep disturbances, including difficulty going to sleep, shallow sleep, and nightmares (34.8%). Trauma-related fears (23.6%) and aggressiveness (21.7%) were the next most common symptoms. Finally, approximately

20% exhibited increased tiredness and decreased activity, though these symptoms were significantly more prevalent among adolescents (Portnova, 2007).

Research examining the effects of trauma on a child's development and daily functioning has burgeoned over the past decade. Sizeable evidence suggests that exposure to a traumatic event during childhood places youth at increased risk for cognitive, behavioral, health, and interpersonal problems (Cook et al., 2005; Giaconia et al., 2000; Schoeman, Carey & Seedat, 2009; Van der Kolk, 2003). Van der Kolk and colleagues (2005) found that individuals exposed to a prolonged interpersonal trauma as a child had a higher incidence of problems with affect regulation, impulse control, memory and attention, self-perception, interpersonal relations, and somatization during adulthood than individuals with no history of childhood trauma.

Prevalence of PTSD. Kessler and colleagues (2012) found a PTSD lifetime prevalence of 3.9% among adolescents aged 13-17 years. This is slightly lower than the prevalence rate reported in the National Comorbidity Study for Adolescents (2010), which indicated a 5% lifetime prevalence rate of PTSD (Merikangas et al., 2010). Fletcher (2003) observed that 36% of children met criteria for current PTSD following a range of traumas compared to only 24% of adults. Morgan and colleagues (2003) observed that 29% of children who survived a devastating landslide continued to meet criteria for PTSD more than 30 years after the disaster. PTSD is thus one of the most common and enduring disorders affecting children and adolescents (Davis & Siegel, 2000).

Prevalence rates of PTSD are substantially higher among incarcerated youth than the general population (Abram et al., 2003; 2007). Abram and colleagues (2004) found

that 11.2% of incarcerated youths met criteria for PTSD. Over half the children with PTSD reported witnessing violence as the precipitating trauma (Abram et al., 2004). Other severe stressors that have been endorsed frequently among children with PTSD are natural disasters, war, sexual or physical maltreatment, and accidents (Salmon & Bryant, 2002; Yule, 2001).

The prevalence rates of PTSD may differ by gender. Merikangas and colleagues (2010) indicated a lifetime PTSD prevalence rate of 8% for girls and 2.3% for boys. Kilpatrick and colleagues (2003) found the 6-month PTSD prevalence rates among adolescents exposed to interpersonal violence to be 3.7% for boys and 6.3% for girls. Macdonald and colleagues (2010) reported that, of 1,868 adolescents who experienced at least one potentially traumatic event, 11.3% of females were diagnosed with current PTSD compared to 6.3% of males.

Course and Outcome. Symptoms of PTSD usually begin within 3 months of a traumatic event, but symptom duration is variable. Approximately 50% of individuals exposed to a traumatic event experience complete symptom recovery within 3 months, but some may continue to experience symptoms for longer than 12 months. Symptoms may also be reactivated in response to reminders of the trauma, increased stress, or exposure to new traumatic events (APA, 2013). The severity, duration, and proximity of an individual to the traumatic event are factors that affect the likelihood of developing PTSD (APA, 2013; Salmon & Bryant, 2002). However, social support, family history, childhood experiences, personality variables, and preexisting psychopathology may also influence the onset of PTSD symptoms (APA, 2013; Davis & Siegel, 2000).

Youth are at a higher risk of developing and maintaining PTSD symptoms following exposure to a traumatic event than adults (Fletcher, 2003; Salmon & Bryant, 2002). Davidson and Smith (1990) found that PTSD is 3 times more likely to occur if the traumatic event is experienced prior to age 11 years. Teenagers are particularly vulnerable to trauma and PTSD because they must cope with their traumatic experience while simultaneously navigating the significant physical and social changes inherent of adolescent development (Davis & Siegel, 2000).

Gender. Females are 5 times more likely to develop PTSD than males and are more likely to report symptoms of PTSD after exposure to a traumatic event (Breslau et al., 1991; Davis & Siegel, 2000; Fletcher, 2003; Giaconia et al., 2000; Koenen & Widom, 2009). Females are also more likely to experience a comorbid internalizing disorder, such as depression or anxiety, whereas males more often exhibit aggression and experience comorbid externalizing behavior problems (Davis & Siegel, 2000; Jaffe et al., 1986; Macdonald et al., 2010). Gender differences may also exist in the presentation and prevalence of PTSD symptoms (Fletcher, 2003). Brosky and Lally (2004) found that 21% of incarcerated females endorsed symptoms of re-experiencing after a traumatic event compared to 8% of incarcerated males. Additionally, 34% of females, but only 17% of males, reported symptoms of increased arousal (Brosky & Lally, 2004).

Risk Factors. Individual and environmental factors may increase the probability that a child will develop PTSD after a traumatic event. Factors can be divided into 3 categories: pre-trauma factors, peri-trauma factors, and post-trauma factors (APA, 2013; Davis & Siegel, 2000; De Bellis, 2001). Pre-trauma factors increase the risk of exposure to a traumatic event or increase the risk of developing PTSD before the traumatic event

occurs (De Bellis, 2001). Environmental stressors, such as a dangerous school or neighborhood environment, residential instability, ethnic discrimination, and low socioeconomic status are salient pre-trauma risk factors (APA, 2013; Davis & Siegel, 2000; Goldman et al., 2011; Koenen, 2010; Roberts et al., 2011). Other pre-trauma risk factors include a family history of psychopathology, early conduct problems, hyperactivity, preexisting anxiety or depression, and lower intelligence (Breslau et al., 1991; Costello et al., 2002; Koenen et al., 2007; McNally & Shin, 1995). Koenen and colleagues (2007) found that childhood IQ was inversely associated with the risk of PTSD, such that each 15-point increase in IQ at age 5 years was associated with a 29% decreased risk of developing PTSD in the future.

Peri-trauma risk factors are directly associated with the trauma or aspects of the trauma experience (De Bellis, 2001). Examples include proximity to the trauma, perceived life threat, and level of fear during the event (APA, 2013; Fletcher, 2003; Trickey et al., 2012). Peri-trauma factors significantly increase the risk of PTSD symptoms after the traumatic experience.

Post-trauma risk factors increase the likelihood of PTSD only after an individual has experienced a traumatic event (De Bellis, 2001). Poor social support, social withdrawal, dissociation, self-blame, and experiencing additional negative life events (e.g., parental divorce or relocation) are widely supported as salient post-trauma risk factors for PTSD (Birmes et al., 2003; Cook et al., 2005; Fletcher, 2003; Pine & Cohen, 2002). Avoidant coping strategies and cognitive vulnerabilities, including rumination and thought suppression about the event, have also been implicated as post-trauma risk factors for youth (Ehlers et al., 2003; Pina et al., 2008).

Comorbidity. PTSD is highly comorbid and usually develops in the context of other psychological disorders (Fletcher, 2003; Kessler et al., 2012; Koenen et al., 2008). Koenen and colleagues (2008) found that all participants diagnosed with past-year PTSD and 93.5% of participants with lifetime PTSD met criteria for another mental disorder between ages 11-21 years. Depression, anxiety, attention-deficit/hyperactivity disorder (ADHD), and substance abuse/dependence are the most common comorbid diagnoses among youth with PTSD (Allwood et al., 2008; Danielson et al., 2009; Fletcher, 2003; Giaconia et al., 2000; Koenen et al., 2007). Depression and anxiety are especially comorbid with PTSD. Fletcher (2003) found that children with PTSD had comorbid diagnoses of generalized anxiety disorder (39%), depression (25%), and separation anxiety disorder (23%). Additionally, symptoms of depression were frequently endorsed by youth with PTSD, particularly feelings of guilt (43%) and low self-esteem (34%) (Fletcher, 2003). Kilpatrick and colleagues (2003) found that nearly 75% of adolescents with PTSD had at least one comorbid diagnosis of substance abuse/dependence or major depressive episode. Youth may engage in substance use to cope with PTSD symptoms or to boost self-esteem (Brown & Wolfe, 1994). However, youth involved in substance use are at additional risk for aggression, social rejection, and violence, all of which can exacerbate PTSD symptoms (Margolin & Vickerman, 2007).

Environmental, psychological, and interpersonal factors influence the likelihood that a child will display PTSD symptoms following a traumatic event. The following biological, cognitive, and developmental models suggest possible mechanisms through which specific factors might interact to engender PTSD.

Models of PTSD

Numerous theoretical models have been suggested to explain the onset and maintenance of PTSD symptoms after exposure to a traumatic event. Three models appear frequently in the literature and are discussed here. These include changes in biological networks (De Bellis, 2001), cognitive, or information-processing, vulnerabilities (Ehlers & Clark, 2000), and developmental variables (Salmon & Bryant, 2002).

Biological Models of PTSD. Biological models of PTSD are often conceptualized within a diathesis-stress framework. Psychological diatheses are relatively stable individual differences, such as unique personality traits, that increase a person's vulnerability to stress and the development of psychological disorders (Ellwood et al., 2008). This model suggests that exposure to a traumatic event triggers the expression of PTSD symptoms for those individuals who are biologically predisposed. Various neural pathways and structures, including the locus coeruleus, catecholamine system, HPA axis, and other components of the sympathetic nervous system, interact to initiate the onset and maintenance of symptoms (De Bellis, 2001; Perry, 1994; Pervanidou, 2008).

Activation of the HPA axis is essential for maintaining homeostasis during stress. However, chronic activation or dysregulation can engender severe long-term consequences such as memory disturbances, difficulties with concentration, heightened arousal, and impaired executive functioning abilities (De Bellis, 2001; Perry, 1994; Van der Kolk, 2003). The biological model suggests that individuals predisposed to PTSD symptoms experience HPA axis dysregulation in response to a traumatic event, which

triggers a cascade of adverse effects. Specifically, variations in the production of cortisol and certain neurotransmitters are believed to underlie many of the characteristic overarousal symptoms of PTSD, including anxiousness, hypersensitivity, and difficulty sleeping (Yehuda, 1999). The HPA axis is reactivated each time an individual re-experiences the trauma, which perpetuates the maladaptive stress response cycle and the associated symptoms (McFarlane, Yehuda, & Clark, 2002).

Cognitive Models of PTSD. Cognitive or information-processing models of PTSD assert that the relationship between exposure to a traumatic event and a subsequent extreme emotional response is mediated by an individual's assessment of the traumatic event's meaning (Fletcher, 2003). Ehlers and Clark's (2000) cognitive model of PTSD suggests that the disorder manifests when an individual appraises a traumatic event in a way that produces a sense of serious current threat. The perception of ongoing threat is typically accompanied by symptoms of re-experiencing, arousal, anxiety, and other emotional responses. These symptoms encourage the individual to employ avoidant cognitive coping strategies, which further exacerbate the perception of the trauma as threatening (Ehlers & Clark, 2000).

Thought control strategies, rumination, thought suppression, and other maladaptive cognitive coping techniques influence the onset and maintenance of PTSD symptoms (Lancaster, Rodriquez, & Weston, 2011; Meiser-Stedman, 2002). Ehlers and colleagues (2003) assessed the role of cognitive variables on the development of chronic PTSD among 86 youth involved in traffic accidents. They observed that the presence of cognitive factors, including rumination and negative appraisals of intrusion/unfairness,

significantly improved the prediction of PTSD symptom severity at 3 and 6 months (Ehlers, Mayou, & Bryant, 2003).

Many cognitive models of PTSD have been proposed. Emotional processing theory posits that a person's pre-trauma schemas, memory of the event, and memory of experiences prior to the event can negatively interact to impede the emotional processing of a trauma. Chronic PTSD may thus ensue when a traumatic event is not emotionally processed in full (Elwood et al., 2009). PTSD may also result from distorted memories of the traumatic event (Foa & Rothbaum, 1999). Memories that contain flawed associations and evaluations of the traumatic experience are more likely to be avoided. However, avoidance of trauma memories often exacerbates re-experiencing and arousal symptoms. Ultimately, cognitive models suggest that an individual's failure to emotionally re-experience and cognitively habituate to memories of a traumatic event underlie the development and maintenance of PTSD symptoms (Elwood, et al., 2009; Foa & Rothbaum, 1999).

Developmental Models of PTSD. Developmental models posit that PTSD symptoms stem from the interplay between certain environmental and individual factors (Cahill, Kaminer, & Johnson, 1999; Pynoos, Steinberg, & Piacentini, 1999). Meiser-Stedman (2002) suggested that proximal trauma reminders (e.g., physiological reactivity), proximal secondary stresses (e.g., changes within the family), ecology (e.g., parent, school, and peer relationships), and intrinsic factors (e.g., genetic predisposition) moderate a child's short-term reaction to a trauma. Low intelligence, difficult temperament, and a preexisting psychological disorder are other factors that increase PTSD symptoms among traumatized youth (Breslau et al., 1991; Koenen et al., 2007;

Koenen, 2010; McNally & Shin, 1995). Maternal depression, poverty, weak interpersonal relationships, and caregiver instability are salient contextual factors pertinent to the onset of PTSD as well (Breslau et al., 1991; Koenen, 2010; Pine & Cohen, 2002). The likelihood that a child will develop PTSD after a traumatic event increases as the number of adverse contextual and constitutional factors rise (McKeever & Huff, 2003).

Salmon and Bryant (2002) asserted that knowledge base and language development significantly influence how a traumatic event is appraised, encoded, and represented in an individual's memory. A child's ability to use coping strategies to regulate, process, and manage emotional responses to a trauma is typically not fully developed until middle childhood or adolescence. Therefore, children are more likely to invoke inappropriate coping strategies and less likely to verbalize distressing thoughts to others (Salmon & Bryant, 2002).

Another aspect of developmental models suggests that a supportive and empathic adult can serve numerous adaptive functions for youth with immature cognitive, linguistic, and emotional capabilities (Pynoos, Steinberg, & Piacentini, 1999; Salmon & Bryant, 1999). Examples of such functions include helping the child appraise and interpret the experience, correcting misconceptions, and providing adaptive coping strategies. Additionally, children often demonstrate similar reactions and coping strategies after a traumatic event as their parents (Shaw, Espinel, & Shultz, 2012).

Youth frequently manifest symptoms of PTSD after experiencing a traumatic event. However, the prevalence and severity of PTSD symptoms among traumatized youth may vary according to pre-trauma and post-trauma factors. The next sections focus

on PTSD symptoms following child maltreatment, risk factors for PTSD, and the interaction of specific risk factors in predicting PTSD symptom severity among maltreated youth.

CHAPTER 2:

PTSD AND CHILD MALTREATMENT

Prevalence

Children are more vulnerable than adults for PTSD-related symptoms following exposure to a potentially traumatic event, and are 1.5 times more likely to be diagnosed with PTSD than adults (De Bellis, 2001; De Bellis, Hooper, Woolley & Shenk, 2010; Fletcher, 1996). Childhood maltreatment is associated with increased risk for lifetime and current PTSD (Davis & Siegel, 2000; Widom, 1999). PTSD symptoms are often observed among maltreated youths during the period immediately following disclosure (De Bellis, 2001; De Bellis & Van Dillen, 2005). Famularo and colleagues (1994) found a 35.8% prevalence rate of PTSD in a non-clinically referred sample of maltreated youths who were interviewed within 8 weeks of maltreatment disclosure. Approximately 33% of participants continued to meet criteria for the disorder at a 2-year follow-up (Famularo, Fenton, Kinscherff & Augustyn, 1996a).

The prevalence of PTSD among clinically referred samples of sexually maltreated youths varies, with prevalence rates ranging from 42%-90% (Davis & Siegel, 2000; De Bellis, 2001; Dubner & Motta, 1999; McLeer, Callaghan, Henry, & Wallen, 1994). McLeer and colleagues (1998) found that approximately 36% of non-clinically referred sexually maltreated children met criteria for current PTSD within 2 months of disclosure. The reported prevalence rates of PTSD among youth victims of physical maltreatment extend as high as 50% in clinically referred samples (De Bellis, 2001; Dubner & Motta, 1999). Widom (1999) found that 32.7% of victims of physical maltreatment met criteria for lifetime PTSD and 19.1% met criteria for current PTSD. Some physically maltreated

youths may be at greater risk for behavioral difficulties and social deficits than PTSD, however (Briscoe-Smith & Hinshaw, 2006; Davis & Siegel, 2000; Pelcovitz et al., 1994). PTSD prevalence rates among neglected youths are not as well represented in the literature, though Widom (1999) found that 30.6% of neglected children met criteria for lifetime PTSD and 17.3% met criteria for current PTSD.

Females are at greater risk for PTSD across all types of maltreatment than males (Koenen & Widom, 2009). Lansford and others (2002) found that physical maltreatment prior to age 5 years resulted in worse long-term outcomes for females, and Koenen and Widom (2009) observed that female victims of sexual maltreatment were more than 4 times as likely as male victims to develop PTSD. Sexual maltreatment, more than any other form of maltreatment, increases the probability of PTSD for males and females (Ackerman, Newton, McPherson, Jones, & Dykman, 1998; Foa & Street, 2001). Gwadz and colleagues (2007) found that several forms of childhood maltreatment were associated with PTSD symptoms among females, but only sexual maltreatment was associated with PTSD symptoms among males.

Symptoms, Course, and Outcome

Trauma-related symptoms that occur frequently in maltreated youths with PTSD include heightened arousal, re-experiencing, avoidance, and affective numbing (Breslau & Davis, 1992; Deblinger, McLeer, Atkins, Ralphe, & Foa, 1989; Fletcher, 2003; Kearney, Wechsler, Kaur, & Lemos-Miller, 2010). Other symptoms include sleep disturbances, hyperactivity, aggressiveness, inattention, and somatic complaints (Ackerman et al., 1998; Avery, Massat, & Lundy, 2000; Saigh, Yasik, Oberfield, Halamandaris, & McHugh, 2002). Academic problems, social withdrawal, and peer

difficulties have also been found among youth with maltreatment-related PTSD (Avery et al., 2000; Davis & Siegel, 2000). Fletcher (2003) examined the prevalence of PTSD symptoms among children exposed to maltreatment and children exposed to a non-abusive stressor such as a car accident. Maltreated youths were more likely than non-maltreated traumatized youths to experience symptoms of negative affect, including feelings of guilt (59% vs. 32%), a pessimistic attitude toward the future (35% vs. 12%), and depression (28% vs. 10%) (Fletcher, 2003).

Earlier onset and longer duration of maltreatment may lead to greater long-term consequences for the victim, as brain development is more likely to have been disrupted (De Bellis et al., 1999). Bolger and Patterson (2003) observed that youth victims of chronic maltreatment had more problems with peers, showed more aggression and externalizing problems, and had lower self-esteem than victims of acute maltreatment. Lansford and colleagues (2002) found that maltreated kindergarteners had a significantly greater level of PTSD symptoms in high school than non-maltreated peers. PTSD symptoms have also been found to increase when the victim had a close relationship with the perpetrator and the maltreatment was perceived as violating (Davis & Siegel, 2000; Kendall-Tackett, Williams, & Finkelhor, 1993).

Disagreement exists with respect to the relationship between age of maltreatment and PTSD symptoms. Many researchers have found PTSD symptoms to be more problematic among victims of childhood maltreatment than among victims of adolescent maltreatment (Ackerman et al., 1998; Dubner & Motta, 1999; Kolko, Hurlburt, Zhang, Barth, Leslia, & Burns, 2010). Kaplow and others (2008) reported that children who were sexually maltreated earlier in life had more PTSD symptoms at the time of their

disclosure than victims maltreated during adolescence. However, Schoedl and colleagues (2010) found that the risk of severe PTSD symptoms was 10 times higher among individuals who reported sexual maltreatment after age 12 years than prior to age 12 years.

Comorbidity. Childhood PTSD is highly comorbid with other psychiatric disorders, including ADHD, depression, and anxiety, conduct, and substance use disorders (Cohen, 2005; Davis & Siegel, 2000; De Bellis & Thomas, 2003; Famularo, Fenton, Kinscherff, & Augustyn, 1996b; Fletcher, 2003). Maltreated youths with PTSD have significantly more comorbid diagnoses than maltreated youths without PTSD, especially with respect to internalizing disorders such as dysthymia and major depressive disorder and externalizing disorders such as oppositional defiant disorder (Ackerman et al., 1998; Avery, Massat, & Lundy, 2000; De Bellis et al., 1999; Linning & Kearney, 2004). Saigh and colleagues (2002) found that traumatic exposure in the absence of PTSD was not associated with a higher incidence of psychiatric disorders among children. This finding suggests that PTSD, not simply exposure to a traumatic event, is associated with increased risk of psychopathology for youths (Saigh et al., 2002).

Growing evidence also indicates that untreated PTSD predisposes youths to substance use disorders, depression, suicidality, and conduct disorder in adolescence and early adulthood (Avery, Massat, & Lundy, 2000; Cohen, 2005; Deykin & Buka, 1997; Dodge, Petit, & Bates, 1997; Silverman, Reinherz & Giaconia, 1996). Clark and colleagues (1997) found that adolescents with alcohol abuse or dependence were 6–12 times more likely to have been physically maltreated and 18–21 times more likely to have been sexually maltreated than youths with no history of maltreatment. Breslau and others

(2000) found that the risk for major depression was 2.8 times higher among trauma-exposed individuals who developed PTSD relative to non-traumatized controls, but only 1.3 times higher among trauma-exposed individuals who did not develop PTSD. PTSD and major depression may be influenced by common vulnerabilities (Breslau, Davis, Peterson, & Schultz, 2000).

Limitations of the Research examining Child Maltreatment and PTSD. Research is scarce with respect to the long-term clinical implications of PTSD-related symptoms among maltreated youths. Additionally, the consequences of chronic maltreatment-related PTSD on adolescent development and functioning is in need of study. More research is also needed to disentangle symptoms of PTSD from symptoms of common comorbid disorders. Perrin and colleagues (2000) cautioned that the overlapping nature of PTSD symptoms with other disorders may result in misdiagnosis (e.g., intrusive thoughts may interfere with attention, thereby suggesting a diagnosis of ADHD). Additional research on individual factors, such as age and gender, as well as aspects of the trauma experience, would provide helpful information for identifying youths at the highest risk of PTSD following maltreatment.

Very few studies have assessed maltreatment-related PTSD in the context of symptom intensity. Thus, whether individual or environmental factors contribute to the onset of PTSD symptoms following maltreatment, or whether they heighten the severity of existing PTSD-related symptoms, is unclear. Even fewer studies have examined what factors lead to severe PTSD symptoms versus a mild or moderate symptom presentation. Also, past studies have not examined the relationship between characteristics of childhood maltreatment, such as the type of maltreatment, and other risk factors such as

the victim's gender and comorbid diagnoses, in predicting the severity of PTSD symptoms. The extant literature is in need of research evaluating which youths are at greatest risk for severe PTSD following maltreatment based on easily identifiable aspects of the child (e.g., gender) and the maltreatment experience (e.g., the type of maltreatment).

Studies examining the prevalence of pediatric PTSD consistently reveal that maltreated youths are at increased risk for PTSD and PTSD-related symptoms relative to non-maltreated peers. Furthermore, research regarding symptoms, course, and comorbidity provide support for a significant relationship between childhood maltreatment and PTSD. The following sections address salient risk and protective factors for PTSD among maltreated youths.

Risk Factors

Several factors are associated with increased risk of PTSD following maltreatment, including female gender, lack of support by caregivers, physical and emotional proximity to the perpetrator, inadequate coping skills, family history of mood disorders, and prior history of trauma (Briere & Scott, 2006; Hart & Rubia, 2012; Lawson, 2009; Pine & Cohen, 2002; Romero et al. 2009; Walker, Carey, Mohr, Stein, & Seedat, 2004). Youth victims of joint physical and sexual maltreatment are at particular risk for PTSD (Ackerman et al., 1998; Bolger & Patterson, 2003). Additionally, the risk for PTSD increases if maltreatment began when the child was young, the perpetrator used threats or force, the victim was coerced to maintain secrecy, or the victim experienced feelings of guilt (De Bellis & Thomas, 2003; Kolko et al., 2002). Other significant risk factors include neurobiological dysfunction, poor attachment and personal adjustment,

affect dysregulation, intellectual and academic deficits, cognitive vulnerabilities, dissociation, and depression. These are discussed next.

Biological Factors. Maltreated youths who develop PTSD may also experience neurological and biological changes. Recurrent and chronic maltreatment may have cumulative and detrimental effects on brain development (Watts-English, Fortson, Gibler, Hooper, & De Bellis, 2006). Carrion and colleagues (2001) found that maltreated youths with PTSD or subthreshold PTSD had smaller cerebral and total brain volumes than healthy controls. Additionally, De Bellis and others (2002) observed decreased intracranial, cerebral cortex, prefrontal cortex, and right temporal lobe volumes among adolescents with maltreatment-related PTSD. Changes in the corpus callosum have also been observed among maltreated youths. Teicher and colleagues (2004) found that maltreated youths had a 16% reduction in corpus callosum area relative to healthy, non-maltreated children, and an 11% reduction in corpus callosum area relative to psychiatric youth with no history of maltreatment. The authors also found a gender-related effect, such that neglect significantly reduced corpus callosum area for boys whereas sexual maltreatment was most detrimental for girls (Teicher, Andersen, Polcari, Anderson, & Navalta, 2002).

Neurobiological changes among youths with maltreatment-related PTSD may also be influenced by gender. De Bellis and Keshavan (2003) found that boys with PTSD had larger ventricular volumes than maltreated girls with PTSD. Additionally, De Bellis and colleagues (1999) observed that maltreated boys with PTSD had smaller measurements of the corpus callosum and trended toward smaller total brain volumes than girls with maltreatment-related PTSD. These findings suggest that boys may be more vulnerable to

the effects of severe stress, in terms of brain structure development, than girls (De Bellis et al., 1999; De Bellis & Keshavan, 2003).

Attachment and Social Support. Maltreated youths are at heightened risk for insecure and disorganized attachments with their caregivers (Barnett, Ganiban, & Cicchetti, 1999; Carlson, Cicchetti, Barnett, & Braunwald, 1989; Cicchetti, Toth, & Lynch, 1995; Cicchetti, Rogosch, & Toth, 2006). Children with insecure attachments are more prone to behavioral, social, and emotional problems than securely attached youths (Barnett et al., 1999; Cicchetti et al., 1995; 2006). Alink and colleagues (2009) found that maltreated children with insecure maternal attachments demonstrated poorer emotional regulation than securely attached children, which predicted higher levels of internalizing and externalizing symptoms. Attachment style has also been found to influence coping strategies and psychological distress among maltreated youths (Shapiro & Levendosky, 1999). Ruchkin and colleagues (1998) observed that posttraumatic stress levels among adolescent male rape victims were closely related to paternal rejection and low emotional warmth.

Family cohesiveness, support, and conflict may also significantly influence the development of trauma-related symptoms among maltreated youths (Faust & Katchen, 2004; Foy, Madvig, Pynoos, & Camilleri, 1996; Lauterbach, Koch, & Porter, 2007). Avery and colleagues (2000) found that sexually maltreated youths with PTSD were associated with increased levels of family disruption relative to controls. Deblinger and others (1999) observed that sexually maltreated youths who perceived their mothers as using guilt and anxiety-provoking parenting methods demonstrated increased PTSD symptoms relative to sexually maltreated youths who endorsed an accepting maternal

parenting style. Poor peer support is also a salient risk factor for PTSD among maltreated youths. Adams and Bukowski (2007) found a strong link between childhood sexual maltreatment and anxiety disorders in adulthood when victims reported a poor maternal relationship and a low number of friends. Vrancenu and colleagues (2007) found that childhood maltreatment predicted decreased social support and increased stress in adulthood, with social support partially mediating the relationship between childhood maltreatment and adult PTSD symptoms. These findings suggest that inadequate social support is a salient risk factor for PTSD among individuals with a history of childhood maltreatment (Vrancenu, Hobfall, & Johnson, 2007).

Externalizing Behaviors and Inattention. Maltreated youths who exhibit externalizing temperaments or behavior problems are at increased risk for PTSD and peer rejection (Briscoe-Smith & Hinshaw, 2006; Koenen, 2010; Widom, 1999). Saigh and colleagues (2002) found that 45.8% of children with PTSD scored in the clinical range on a measure of childhood externalizing problems compared to only 16% of traumatized children with no PTSD diagnosis. Anger, in particular, has also been implicated as a robust risk factor for PTSD among maltreated youths (Saigh, Yasik, Oberfield, & Halamandaris, 2007). Bolger and Patterson (2003) found that aggressive behavior mediated the relationship between chronic maltreatment and rejection by peers, thereby increasing the risk for PTSD. Anger has also been associated with a reduced likelihood of recovery from PTSD (Koenen, 2010).

Children with maltreatment-related PTSD have significantly more attention problems than traumatized youths without PTSD (Beers & De Bellis, 2002; Saigh et al., 2002). Beers and De Bellis (2002) found that maltreated youths with PTSD were more

vulnerable to distraction and demonstrated greater impulsivity on a task of sustained attention than non-maltreated controls. Pine and colleagues (2005) found that children with maltreatment-related PTSD exhibited an attention bias away from threat, such that they were significantly slower in identifying pictures of threatening faces than non-maltreated peers. Some attention problems observed among maltreated youths may thus actually represent avoidance symptoms of PTSD (Pine et al., 2005).

Academic and Intellectual Impairment. A strong link has been established between maltreatment and academic impairment. Maltreated youths evidence greater deficits on measures of cognitive and academic abilities, receive poorer teacher assessments of school performance, earn lower grades, demonstrate worse academic adjustment, and exhibit more grade repetitions than non-maltreated peers (Kendall-Tackett & Eckenrode, 1996; Shonk & Cicchetti, 2001; Veltman & Browne, 2001; Watts-English et al., 2006). Furthermore, youths with a history of maltreatment have 3 times the dropout rate of the general population (Cook et al., 2005; Shonk & Cicchetti, 2001). Traumatized children with PTSD are also at heightened risk for academic impairment (De Bellis, Hooper, Woolley, & Shenk, 2010). Saigh and colleagues (1997) observed that adolescents with PTSD earned lower scores on a measure of academic achievement relative to non-traumatized peers.

Lower IQ has also been linked to childhood maltreatment and PTSD (Carrey, Butter, Persinger, & Bialik; 1995, Saltzman, Weems, & Carrion, 2006). De Bellis and colleagues (1999) found that verbal, performance, and full-scale IQ scores negatively correlated with maltreatment duration among children with PTSD. Kira and others (2012) observed that the re-experiencing and arousal symptoms of PTSD appeared to

suppress IQ among trauma-exposed adolescents. The authors suggested that these symptoms may exacerbate the negative effects of distress on mental processing (Kira, Lewandowski, Somers, Yoon, & Chiodo, 2012).

Lower verbal IQ and deficits in verbal memory have been associated with maltreatment-related PTSD symptoms (Samuelson et al., 2010; Yasik et al., 2007). Bremner and colleagues (2004) found that women with PTSD and a history of childhood sexual maltreatment evidenced lower scores on tasks of verbal declarative memory than women with a history of sexual maltreatment who did not develop PTSD. Saigh and colleagues (2006) found that the verbal IQ scores of trauma-exposed individuals without PTSD did not differ statistically from the verbal IQ scores of non-traumatized individuals. They concluded that PTSD, not simply exposure to a traumatic event, is associated with lower verbal IQ (Saigh, Yasik, Oberfield, Halamandaris, & Bremner, 2006).

Cognitive Vulnerabilities. Maltreated youths with PTSD demonstrate deficits in executive functioning skills, including poor behavioral inhibition and a weakened ability to fluidly update information in working memory (Beers & De Bellis, 2002; Wekerle, Waechter, & Chung, 2012). Deficits in attention, abstract reasoning, and higher-level cognitive processes, such as problem solving, planning, and mental flexibility, have also been observed (Beers & De Bellis, 2002; Cook et al., 2005). Impairments in these areas may underlie academic and cognitive processing difficulties commonly observed among maltreated youths and maintain symptoms of PTSD (Salmon & Bryant, 2002; Valle & Silovsky, 2002). Examples of cognitive processing difficulties include cognitive distortions, negative self-attributions, implementation of ineffective coping strategies,

and lower self-efficacy (Bolger & Patterson, 2003; Diehl & Prout, 2002; Feiring, Taska, & Lewis, 2002). Chaffin and colleagues (1997) found that sexually maltreated youths who utilized internalizing coping strategies, such as self-blame or isolation, were associated with more guilt and PTSD overarousal symptoms than sexually maltreated youths who engaged in avoidant or social coping strategies. Lemos-Miller and Kearney (2006) found that trauma-related cognitions, specifically self-blame and negative thoughts about self and the world, were significantly correlated with PTSD symptoms of re-experiencing, avoidance/numbing, increased arousal, and distress among maltreated adolescents.

The impact of distorted cognitive processes may vary depending on individual factors of the child, such as IQ, and contextual factors such as the type of maltreatment experienced. Runyon and Kenny (2002) compared sexually and physically maltreated youths aged 8-17 years and found that type of maltreatment and a negative explanatory style were the best predictors of trauma-related distress. Physically maltreated youths exhibited less trauma-related distress but were more likely to demonstrate a negative explanatory style than sexually maltreated youths (Runyon & Kenny, 2002).

Dissociation and Affect Dysregulation. Maltreated youths engage in dissociative behaviors more frequently than non-maltreated youths (Reckline & Buirski, 1996). Victims of physical and sexual maltreatment exhibit significantly higher levels of dissociative symptoms than non-maltreated peers (Collin-Vezins & Herbert, 2005; Macfie, Cicchetti, & Toth, 2001). Dissociation may be a successful coping strategy for victims of ongoing maltreatment, but a maladaptive strategy if employed long-term or generalized to other areas of functioning (Kearney et al., 2010; Macfie et al., 2001). Kira

and colleagues (2012) posited that mild emotional numbness/dissociation may act as a successful coping mechanism immediately following a traumatic experience by limiting the negative effects of distress on mental processing.

Dissociation may also be an important predictor for maltreatment-related PTSD (Hetzel, & McCanne, 2005; Putnam, 1997). Kaplow and colleagues (2005) found that youths who reported dissociative symptoms immediately following disclosure of sexual maltreatment were at heightened risk for PTSD relative to non-dissociative sexually maltreated children. The authors suggested that dissociation acts as a robust predictor of PTSD because it prevents victimized youths from adequately processing a traumatic event, thereby increasing the likelihood that they will manifest avoidance and re-experiencing symptoms in the future (Kaplow, Dodge, Amaya-Jackson, & Saxe, 2005). Lemos-Miller and Kearney (2006) found that four aspects of dissociation – amnesia, absorption, passive influence, and depersonalization/derealization – significantly correlated with re-experiencing, increased arousal, avoidance/numbing, and distress symptoms of PTSD. The authors posited that dissociation may engender social isolation, lowered self-esteem, and cognitive vulnerabilities, thus heightening the risk of PTSD (Lemos-Miller & Kearney, 2006). Post-trauma dissociation may contribute to impairments in attention. Kaplow and colleagues (2008) found that dissociation mediated the relationship between PTSD and attention problems among sexually maltreated youths.

Dissociation is associated with affect dysregulation, which is a problem for many victims of maltreatment (Briere, 2006; Kim & Cicchetti, 2010). Recognizing, understanding, and expressing emotions are common affective deficits experienced by

maltreated youths (Camras, Sachs-Alter, & Ribordy, 1996). Shields and Cicchetti (1998) found that maltreated children were more likely to exhibit emotional negativity and contextually inappropriate emotional expressions than non-maltreated peers. Kim and Cicchetti (2010) found that deficits in affect regulation among maltreated youths contributed to later internalizing and externalizing symptoms as well as poor peer relationships. Dissociation may prevent a child from learning to properly regulate and understand his emotions, thereby increasing the likelihood that he will incorrectly interpret or perceive the emotional expressions of others (Ford, 2005; Kearney et al., 2010).

Depression. Depression may be a salient link between childhood maltreatment and the development of PTSD (Gwadz et al., 2007; Storr, Ialongo, Anthony, & Breslau, 2007). Lemos-Miller and Kearney (2006) found that trauma-related cognitions and dissociation were related to PTSD symptoms among maltreated adolescents if depressive symptoms were present. Ariga and colleagues (2008) evaluated female juvenile offenders with a history of maltreatment and found that youths with PTSD showed significantly higher psychiatric comorbidity, especially with respect to depression, than offenders who were PTSD-negative. The authors concluded that depression is a strong predictor of PTSD and its symptoms for maltreated female juvenile offenders (Ariga, Uehara, Takeuchi, Ishige, Nakano, & Mikuni, 2008).

Boney-McCoy and Finkelhor (1996) found that maltreated children were more likely to experience PTSD and depressive symptoms than non-maltreated children. Follow-up assessment 15 months later revealed that victims of sexual maltreatment were 4 times more at risk for depression than youths with no history of maltreatment. Sexually

maltreated boys were approximately 4.5 times more likely to be depressed than non-maltreated boys, and sexually maltreated girls were approximately 3.5 times more likely to be depressed than non-maltreated girls (Boney-McCoy & Finkelhor, 1996).

Linning and Kearney (2004) examined 58 maltreated youths, 37 of whom met criteria for PTSD, and found that children with PTSD had significantly more comorbid diagnoses of major depressive disorder and/or dysthymia than children without PTSD. In particular, dysthymia and problems with concentration or decisiveness were key predictors of PTSD. The authors speculated that youths with dysthymia or depression may already experience salient risk factors for PTSD, such as cognitive distortions, family problems, poor social support, and low self-esteem. These predispositions may thus heighten their vulnerability to PTSD symptoms after maltreatment (Linning & Kearney, 2004). Additionally, results of this study are consistent with other findings that not all youths develop PTSD or PTSD-related symptoms following maltreatment. Examining individual and environmental factors that may protect maltreated youths from developing PTSD is thus important.

Protective Factors

Personal resilience has been identified as one of the strongest protective factors against adverse outcomes for victims of childhood maltreatment (Cicchetti & Rogosch, 1997; Cook et al., 2005). A child is often considered resilient if he exhibits average competence in multiple domains of functioning (e.g., behavioral, social, academic) following a traumatic event (Walsh, Dawson, & Mattingly, 2010). Several factors have been found to foster resilience among traumatized youths, including secure attachments with supportive adults, cognitive skills, self-regulation, and parental warmth (Bolger &

Patterson, 2003; Cicchetti & Rogosch, 1997; Masten, 2001). The following section addresses salient individual and environmental protective factors for maltreated youths at risk for PTSD.

Individual Factors. Ego resiliency and ego overcontrol have been found to predict resiliency among maltreated youths (Cicchetti & Rogosch, 1993; Cicchetti & Rogosch, 1997; Kim, Rogosch, & Cicchetti, 2001; Manly, Morgan, & Eckenrode, 1992). Ego resiliency represents a child's capacity to adjust his emotional and behavioral responses to a particular situation, whereas ego control refers to a child's ability to monitor and modulate his feelings (Cicchetti & Rogosch, 1997; Haskett, Nears, Ward, & McPherson, 2006). Adaptive functioning abilities and cognitive skills are other sources of constitutional resilience for maltreated youths.

Adaptive Functioning. Positive temperament, internal locus of control, external attributions for blame, affect regulation, educational goals, and high self-esteem have been associated with resilience for maltreated youths (Cieslak, Benight, & Lehman, 2008; Cook et al., 2005; Edmond, Auslander, Elze, & Bowland, 2006; Luthar, Cicchetti, & Becker, 2000). Bradley and colleagues (2005) found a negative correlation between self-esteem and PTSD symptom severity among victims of childhood maltreatment. Bolger and Patterson (2001, 2003) evaluated perceived internal control and internalizing problems for maltreated and non-maltreated youths. Greater perceived internal control was significantly associated with lower levels of internalizing problems for maltreated children, but not for non-maltreated youths. The authors posited that an internal locus of control may function as a unique protective factor against internalizing problems for maltreated youths (Bolger & Patterson, 2001; 2003).

Cognitive Factors. Intelligence may be a key protective factor for maltreated youths. Herrenkohl and colleagues (1994, 1995) conducted a longitudinal study to determine whether cognitive ability could discriminate high functioning (resilient) maltreated children from low functioning (less-resilient) maltreated children. IQ scores successfully discriminated high functioning maltreated youths from those youths who were less resilient (Herrenkohl, Herrenkohl. & Egolf, 1994; Herrenkohl, Herrenkohl, Rupert, Egolf, & Lutz, 1995). Others have found that verbal IQ is the strongest indicator of resiliency among youths at risk for PTSD (Silva et al., 2000). Saltzman and colleagues (2006) speculated that a higher verbal IQ may act as a protective factor against the development of re-experiencing symptoms for trauma-exposed youths by enabling more accurate trauma appraisals, increased self-efficacy, and more successful coping strategies.

Children who demonstrate good problem solving abilities, exhibit an adaptive cognitive style, and are fast learners also tend to be resilient (Himelin & McElrath, 1996; Masten, Best, & Gamerzy, 1990). Faust and Katchen (2004) suggested that academic success may promote resilience by enhancing a maltreated child's sense of self-efficacy and control. Furthermore, academic achievement may increase a child's knowledge base and reasoning abilities, such that he can develop and implement more adaptive coping strategies (Faust & Katchen, 2004).

Environmental Factors. Stress-resilient children often have close, positive relationships with their caregivers and receive robust peer and familial support (Afifi & MacMillan, 2011; Fletcher, 2003; Milgram & Toubiana, 1996). Social support has also been found to buffer the maladaptive effects of traumas, such as maltreatment and family violence, for adolescents and young adults (Hyman et al., 2003; Muller, Goebel-Fabbri,

Diamond, & Dinklage, 2000; Runtz & Schallow, 1997). Schumm and colleagues (2006) found that women who experienced childhood maltreatment and were later victims of adult rape were 17 times more likely to develop PTSD than non-victimized individuals. However, high social support significantly predicted lower PTSD severity for women who experienced both childhood maltreatment and adult rape. Therefore, social support may also buffer the adverse impact of multiple traumatic experiences (Schumm, Briggs-Philips, & Hobfoll, 2006).

Supportive Relationships. Strong parent and familial support have been implicated as prominent protective factors against negative child maltreatment outcomes (Muller et al., 2000; Werner & Smith, 1992; Zielinski & Bradshaw, 2006). Children whose parents provide nurturing care and constructively set limits are more resilient than youths whose parents are rigid and disengaged (Bell, 2001; Herrenkohl et al., 1995; Wyman et al., 1992). Others have found that a predictable, caring, and consistent caregiver is the most important protective factor for trauma-exposed youths (Schore, 2003). Kim and Cicchetti (2004) examined the relationship between mother-child relationship quality and maladjustment for maltreated and non-maltreated youths. Secure mother-child relationship quality was inversely related to internalizing and externalizing behaviors for maltreated youths. The authors suggested that maltreated children whose mothers provide emotional security may develop a greater sense of self-worth and therefore be less likely to develop psychopathology and maladaptive behaviors (Kim & Cicchetti, 2004).

Youths, especially adolescents, may also draw upon the support of their peers to buffer the negative effects of maltreatment (Ezzell, Swenson, & Brondino, 2000; Faust &

Katchen, 2004). Collishaw and colleagues (2007) found that victims of childhood maltreatment with normal peer relationships throughout adolescence and good friendships in adulthood were associated with higher resilience, even after controlling for differences in maltreatment severity. Others have found that maltreated youths who report having a reciprocal friendship are over 3 times more likely to be classified as resilient than those without a reciprocal friend (Bolger & Patterson, 2003). Edmond and colleagues (2006) found that maltreated youths who had friends that engaged in positive behaviors were more resilient and less likely to use substances during adolescence than youths with friends who engaged in negative behaviors. Positive friendships may foster resilience for maltreated youths by encouraging prosocial behaviors and enhancing self-esteem (Bolger & Patterson, 2003; Edmond et al., 2006).

Limitations of the Research on Protective Factors and PTSD in Maltreated Youths. Most studies examining protective factors for maltreated children have used very small samples, thus limiting the generalizability of findings. Additionally, most past studies have used a cross-sectional design, which prevents conclusions about the long-term influence of various protective factors. Much of the extant research has also relied on the retrospective self-reports of adults with a history of childhood maltreatment. Many studies have also neglected to evaluate factors that promote resilience for chronically maltreated children or children who have experienced multiple types of maltreatment. Additionally, studies have failed to assess multiple protective factors simultaneously, such that conclusions about the salience of a particular factor, relative to other factors, are only speculative. Most importantly, few studies have focused on identifying factors that specifically protect maltreated youths from PTSD or PTSD-

related symptoms. Most researchers focus on factors that promote general resilience against adverse developmental outcomes.

Researchers have not examined which protective factors best mitigate posttraumatic symptoms for maltreated children at highest risk for PTSD. Specifically, a child may possess numerous protective factors but still present with many PTSD symptoms following maltreatment. Expanding the research on factors associated with the development of severe PTSD symptoms, irrespective of protective variables, may guide future intervention with maltreated youths.

PTSD Symptom Severity

Several contextual and constitutional variables have been identified as risk factors for PTSD among youths exposed to a potentially traumatic event. The degree to which a risk factor influences the onset and maintenance of PTSD symptoms varies for each child. However, researchers have generally found that the cumulative presence of multiple risk factors enhances the likelihood that a child will manifest PTSD symptoms following maltreatment (De Bellis & Thomas, 2003; Kaplow et al., 2005; Salmon & Bryant, 2002; Silva, Alpert, Munoz, Singh, Matzner, & Dummit, 2000). The severity of PTSD symptoms among maltreated youths is thus expected to also depend on the absence or presence of salient risk factors. The remainder of this review examines the unique contributions of established risk factors on the development of severe PTSD and PTSD-related symptoms among maltreated youths. The proposed study will focus on identifying factors most pertinent to PTSD symptom severity among maltreated youths.

Maltreatment Type. The consequences of childhood maltreatment vary as a function of individual and environmental factors. However, some types of maltreatment

may place a child at greater risk for psychopathology or functional impairment than other types. Briere and Runtz (1990) found unique effects for different forms of childhood maltreatment. Psychological maltreatment was associated with low self-esteem, physical maltreatment was linked with aggression towards others, and sexual maltreatment was associated with interpersonal dysfunction (Briere & Runtz, 1990).

The extant literature yields conflicting findings with respect to the type of maltreatment most associated with severe PTSD symptoms. However, the victim's perceived proximity to injury or death during the traumatic experience has been positively associated with more severe symptoms (Caffo, Forresi, & Lievers, 2005; Price, Higa-McMillan, Kim, & Frueh, 2013). Copeland and colleagues (2007) found that violent or sexual traumas were associated with the highest rates of PTSD symptoms among youths aged 9-16 years. Sexual maltreatment has been more consistently linked to PTSD symptoms than other types of maltreatment (Briscoe-Smith & Hinshaw, 2006; Gwadz et al., 2007; Kendall-Tackett, Williams, & Finkelhor, 1993). Sexually maltreated youths display greater levels of re-experiencing, avoidance, and hyperarousal symptoms than physically maltreated, neglected, or non-maltreated youths (Deblinger et al., 1989; Hulette, Freyd, Pears, Kim, Fisher, & Blecker-Blease, 2008). Significantly higher levels of trauma-related distress have also been reported among victims of sexual maltreatment compared to victims of physical maltreatment (Runyon & Kenny; 2002). Collin-Vezina and Hebert (2005) found that sexual maltreatment increased the odds by fourfold that a child would exhibit clinical levels of PTSD symptoms. Wechsler-Zimring and Kearney (2011) found that adolescents with a history of sexual and/or physical maltreatment exhibited more severe PTSD symptoms than adolescents with a history of neglect only.

Psychological, or emotional, maltreatment has also been associated with severe PTSD symptoms, though the number of studies regarding this type of maltreatment is limited (Kolko et al., 2010; Sullivan, Fehon, Andrew-Hyman, Lipschitz, & Grilo, 2006; Taft, Schumm, Marshall, Panuzio, & Holtzworth-Munroe, 2008). Sullivan and colleagues (2006) evaluated 89 adolescents with a history of maltreatment to determine whether different maltreatment subtypes predicted PTSD symptom severity. Emotional and sexual maltreatment were significantly associated with higher levels of overall PTSD symptom severity. Sexual and emotional maltreatment both predicted the severity of re-experiencing symptoms, whereas only emotional maltreatment predicted the severity of hyperarousal and avoidant/numbing symptoms (Sullivan et al., 2006).

Limitations of research on maltreatment type and PTSD symptom severity. The biggest limitation in past studies of risk factors for severe PTSD symptoms is the predominant use of sexually maltreated samples. Limited research has been conducted on neglected or emotionally maltreated youths. Additionally, research examining the effect of multiple types of maltreatment on PTSD symptom severity is scarce. Maltreatment severity is also rarely reported. Thus, not differentiating victims of severe physical maltreatment from victims of mild physical maltreatment, for example, may contribute to inconsistent findings. Finally, most studies examining maltreatment type and PTSD symptom severity are hampered by small sample sizes.

Gender. Few researchers have examined the unique influence of gender on PTSD and PTSD-related symptom severity among maltreated youths. Gwadz and colleagues (2007) evaluated 85 homeless and at-risk youths with a history of childhood maltreatment to determine possible gender differences in the manifestation and

expression of PTSD symptoms. More females (8.7%) than males (0%) met full diagnostic criteria for PTSD. Additionally, homeless females exhibited more PTSD symptoms than males, with 60% of females exhibiting partial PTSD symptoms compared to only 25% of males. The authors suggested that females are more likely than males to develop PTSD symptoms in response to various types of traumas (Gwadz et al., 2007).

Past studies have revealed gender to be an independent risk factor for PTSD and PTSD-related symptoms following sexual maltreatment (Caffo et al., 2005; Walker, Carey, Mohr, Stein, & Seedat, 2004; Wolf, Sas, & Wekerly, 1994). Feiring and colleagues (1999) evaluated 196 youth victims of sexual maltreatment to determine the relationship between gender and psychological distress. Girls reported significantly more internalizing and PTSD symptoms than boys. Girls exhibited higher levels of intrusive thoughts and hyperarousal symptoms (Feiring, Taska, & Lewis, 1999). Another study found that women with a history of sexual maltreatment reported greater levels of PTSD symptom severity than male victims of sexual maltreatment (Ulllman & Filipas, 2005).

However, findings from Maikovich and colleagues (2009) are not consistent with the results of these studies. Gender differences in posttraumatic stress symptom (PTSS) levels and/or symptom trajectories across 36 months were examined among sexually maltreated youths. PTSS levels and symptom trajectories across time did not significantly differ for girls and boys, although females were more likely than males to experience sexual maltreatment. Sexually maltreated males may exhibit similar PTSS levels as sexually maltreated females (Maikovich, Koenen, & Jaffee, 2009).

Limitations of research on gender and PTSD symptom severity. Researchers have generally compared maltreated youths of one gender to maltreated youths of the

opposite gender when examining gender as a potential risk factor for PTSD. However, these studies often fail to acknowledge gender differences in the stressor event. For example, sexual maltreatment is grossly underreported for males, yet it is the type of maltreatment most consistently associated with severe PTSD symptoms. Therefore, whether being female is an independent risk factor for severe PTSD symptoms or whether being female is merely a risk factor for sexual victimization is unclear. Furthermore, studies that do include male victims of sexual maltreatment often use small sample sizes, which limits the generalizability of findings.

Family Environment and Social Support. Family violence, controlling parenting, and a poor familial response to maltreatment disclosure have been suggested as salient predictors for PTSD symptoms among maltreated youths (Muller et al., 2000; Ullman & Filipas, 2001; Wyman et al., 1992). Family conflict (prior to, during, or after trauma exposure) has also been found to be associated with more severe symptoms of PTSD (Fletcher, 2003). Hyman and colleagues (2003) evaluated 172 women with a history of childhood sexual maltreatment to determine specific forms of social support that might contribute to maladjustment following maltreatment. Higher levels of perceived social support significantly predicted lower levels of PTSD symptoms. In particular, self-esteem support (the perception that others valued the victim) and appraisal support (the perception that the victim had the ability to obtain advice from others) were inversely related to PTSD symptom levels (Hyman, Gold, & Cott, 2003).

Ullman and Filipas (2001) evaluated sexually assaulted females to determine whether negative social reactions related to PTSD symptom severity. Social reactions of victim blame, treating the victim differently, distraction, egocentrism, and controlling

responses were associated with more severe PTSD symptoms. Specifically, being treated differently by others was most predictive of severe PTSD. The authors suggested that victims who receive negative social responses upon disclosure may be more likely to internalize ideas of unworthiness and believe that the trauma has fundamentally changed them, thus prompting the development of more severe PTSD symptoms (Ullman & Filipas, 2001).

Limitations of research on family environment, social support, and PTSD symptom severity. Few researchers have examined the relationships between family environment, social support, and PTSD symptom severity in maltreated youths. Most of the extant research has focused on adult female victims of childhood sexual maltreatment and relied on retrospective self-reports. No studies evaluating the role of siblings or non-offending household members on the development of PTSD symptoms have been conducted. Additionally, studies have not examined poor peer relationships or friendships during childhood as a possible explanation for differences in PTSD symptoms among maltreated youths.

Ethnicity. Ethnic and cultural factors may play a salient role in the development and severity of PTSD symptoms for maltreated youths (Triffleman & Pole, 2010; Tummala-Narra, 2007). Extant findings are inconsistent, but often suggest that racial and ethnic minority youths may be at increased risk for child maltreatment, exposure to other traumatic events, and more severe posttraumatic symptoms relative to Caucasian youths (Elliott & Urquiza, 2006; Kearney et al., 2010; Khaylis, Waelde, & Bruce, 2007; Westby, 2007). Specifically, multiracial (Lemos-Miller & Kearney, 2006), Hispanic (Abram et al., 2004), African American (Andŕes-Hyman, Cott, & Gold, 2004), and Native American

(Deters, Novins, Fickenscher, & Beals, 2006) youths appear to be at greatest risk for negative sequelae following maltreatment. Additionally, the expression of PTSD symptoms may differ across ethnic minority youths.

Some research suggests that maltreated Hispanic youths manifest greater psychopathology than maltreated Caucasian or African American youths (Abram et al., 2004; Mennen, 2004; Price et al., 2013). Numerous cultural factors may place maltreated Hispanic youths at greater risk for psychopathology compared to other groups. Cultural values regarding family unity and collectivism may diminish the likelihood that a maltreated youth would seek help or disclose their experience. Additionally, mothers of maltreated youths may be more likely to support their perpetrating husband to maintain familial financial stability, and the cultural ideal of premarital sex may dissuade sexually maltreated females from disclosing their experience (Fluke, Yuan, Hedderson, & Curtis, 2003). These factors may stimulate heightened feelings of hopelessness, guilt, and nervousness among victims, which may contribute to greater levels of depression and PTSD symptoms (Fluke et al., 2003; Moisan, Sanders- Phillips, & Moisan, 1997).

Others have reported, however, that maltreated African American youths are at greater risk for PTSD and other negative outcomes than Caucasian or Hispanic youths (Andres-Hyman et al., 2004). Paxton and colleagues (2004) examined the prevalence of PTSD among African American youths and found that direct victimization was highly correlated with PTSD and depressive symptoms (Paxton, Robinson, Shah, & Schoeny, 2004). However, other researchers have found fewer PTSD symptoms among maltreated African American youths. Lemos-Miller and Kearney (2006) found that African American status weakened the relationship between trauma-related cognitions,

dissociation, and PTSD symptoms, which suggests that African American status may actually be a resiliency factor. Moreover, increased emotional support, extended family networks, and church involvement may buffer psychopathology for maltreated African American youths (Lemos-Miller & Kearney, 2006; Murray, Smith, & Hill, 2001). Sanders-Phillips and colleagues (1995) found sexually maltreated African American females to have better psychological functioning than same-aged sexually maltreated Latina females. Unlike Latino families, African American households are more often headed by a single woman and perpetrators of maltreatment are therefore more likely to reside outside the home (Sanders-Phillips, Moisan, Wadlington, Morgan, & English, 1995). Thus, a child may find it easier to disclose maltreatment to a family member and receive maternal support (Kenny & McEachern, 2000).

Limitations of research on ethnicity and PTSD symptom severity. Very few studies have examined maltreatment-related PTSD using a diverse sample of ethnic minority youths, and fewer have considered how ethnic background may differently affect symptom development and severity (Triffleman & Pole, 2010). Additionally, studies that do use ethnic minorities tend to analyze them as one, homogenous, minority group rather than examine each ethnic group separately. This may account for many of the inconsistencies in the extant research. Furthermore, studies that have assessed youths of various ethnic backgrounds separately tend to be limited by small sample sizes, and thus the generalizability of findings is limited.

Depression. Depression may serve as a salient risk factor for severe PTSD symptoms following childhood maltreatment. Kolko and colleagues (2010) examined the correlates of severe posttraumatic stress (PTS) symptoms among 1,848 maltreated youths

and found that depression was a significant contributor to heightened PTS symptoms. Maltreated youths with PTSD and depression have also been found to report higher levels of PTSD-related symptoms than youths with PTSD only (Kearney et al., 2010). Runyon and colleagues (2002) compared maltreated youths with PTSD, non-maltreated youths with depression, and maltreated youths with both PTSD and depression, to examine potential differences in PTSD symptoms. Children with maltreatment-related PTSD and comorbid depression were more likely to have intrusive PTSD symptoms, such as flashbacks and difficulty sleeping, than maltreated youths with PTSD only. The authors suggested that children with both disorders may be less likely to mentally avoid their emotional distress, and therefore were more likely to experience flashbacks. The flashbacks, in turn, may prompt feelings of hopelessness and powerlessness that contribute to depression (Runyon, Faust, & Orvaschel, 2002).

Limitations of research on depression and PTSD symptom severity. Research on the relationship between depression and PTSD severity is sparse. Moreover, studies have failed to determine if depression is a risk factor for severe PTSD symptoms or if PTSD symptoms heighten the risk for depression. Past studies have also neglected to evaluate the relationship between specific depressive symptoms and PTSD symptoms. Examining the relationship between different symptoms of depression and PTSD symptom severity may provide further insight on the inconsistencies in the extant literature.

Dissociation and Dissociative Symptoms. A strong correlation has been found between dissociation and PTSD symptom severity among individuals exposed to a traumatic event (Marshall & Schell, 2002). Dissociation has been found to be a

significant predictor of PTSD symptoms among victims of sexual maltreatment (Johnson, Pike, & Chard, 2001; Kaplow et al., 2005). Colin-Vezina and Hebert (2005) found that approximately 30% of sexually maltreated youths aged 7-12 years displayed dissociative symptoms compared to 4.5% of non-maltreated youths. Furthermore, 46% of the sexually maltreated youths with dissociative symptoms also presented with symptoms of PTSD (Colin-Vezina & Hebert, 2005). Johnson and colleagues (2001) found that sexually maltreated youths who utilized dissociation during the maltreatment experience exhibited higher levels of PTSD symptoms than youths who did not employ dissociation. Researchers have suggested that the initial dissociative reactions used by maltreated youths, often as a coping strategy, may actually lead to chronic PTSD by preventing the child from emotionally processing the trauma (Macfie et al., 2001; Shalev, 1993; Shalev, 1997).

Disagreement exists regarding how to conceptualize a dissociative reaction following a traumatic event. Many researchers have found that traumatic dissociation acts chiefly as a predictor for the later development of PTSD symptoms and other negative outcomes (Johnson et al., 2001; Kaplow et al., 2005; Lemos-Miller & Kearney, 2006). However, others suggest that dissociation is an entirely separate response to a traumatic event and not simply a risk factor for PTSD (Hetzel & McCanne, 2004; Hulette et al., 2008; Marshall & Schell, 2002). Hulette and colleagues (2008) examined the relationship between dissociation and posttraumatic symptoms among maltreated preschoolers. Maltreated youths were associated with greater dissociation and posttraumatic symptoms than non-maltreated peers. However, sexually maltreated youths exhibited higher levels of posttraumatic symptoms and physically maltreated

youths tended to display higher levels of dissociation (Hulette et al., 2008). Marshall and Schell (2002) also found that the use of dissociation during a traumatic experience did not predict later PTSD symptom severity. These findings lend support to a correlational, not predictive, relationship between dissociation and PTSD symptom severity (Hulette et al., 2008; Marshall & Schell, 2002).

Limitations of research on dissociation and PTSD symptom severity. Few researchers have examined the relationship between dissociation and PTSD symptom severity in maltreated youths. Moreover, the generalizability of the extant research is hindered by small sample sizes and the predominant use of sexually maltreated samples. Additionally, the majority of past studies have assessed the relationship between peritraumatic dissociation and PTSD symptom severity. Expanding the research on posttraumatic dissociation and PTSD severity may help clarify the effects of dissociative reactions for maltreated youths.

Intelligence and Coping Strategies. Lower intellectual functioning has been associated with higher rates of PTSD symptoms and greater PTSD severity among maltreated youths (Bucker et al., 2012; De Bellis, Hooper, Spratt, & Woolley, 2009; Saltzman et al., 2006; Sullivan, Bennett, Carpenter, & Lewis, 2008). De Bellis and colleagues (2009) found that neglected children demonstrated poorer academic achievement and significantly lower IQ, language, visual spatial, learning/memory, and attention/executive functioning abilities than non-maltreated youths. Lower IQ, neurocognitive functioning, and academic achievement were also associated with more PTSD symptoms among neglected youth. Total PTSD and re-experiencing symptoms were negatively associated with poorer language, visual-spatial processing,

attention/executive functions, and academic achievement. PTSD symptom severity was also negatively related to lower IQ scores (De Bellis et al., 2009).

De Bellis and colleagues (2010) evaluated 216 youths, 98 with histories of maltreatment, and found that poorer visual memory was significantly associated with more PTSD symptoms. Saltzman and colleagues (2006) found that IQ, particularly verbal IQ, scores were inversely correlated with re-experiencing symptoms of PTSD among trauma exposed youths. Poor visual memory and a low verbal IQ may thus impair a child's ability to effectively process and verbalize a traumatic event, thereby heightening his risk for more severe PTSD symptoms (De Bellis et al., 2010; Saltzman et al., 2006). Others have found an inverse relationship between years of education and PTSD symptom severity irrespective of IQ (Ullman & Filipas, 2001).

Maladaptive coping strategies have also been associated with more severe PTSD symptoms among maltreatment victims (Feiring et al., 1999; Ullman & Filipas, 2005). Shenk and colleagues (2012) examined the relationships between childhood maltreatment, experiential avoidance, and PTSD symptoms among maltreated and non-maltreated adolescent females. Experiential avoidance was defined as avoiding painful thoughts, emotions, memories, and distressing physiological reactions (e.g., quickened pulse, difficulty breathing). Maltreated youths demonstrated more experiential avoidance than non-maltreated youths. Greater use of experiential avoidance was also associated with higher levels of PTSD symptoms among victims of maltreatment (Shenk, Putnam, & Noll, 2012). Others have found that minimization (the downplaying of stressful events) significantly predicts higher PTSD symptoms for trauma-exposed youths (Springer & Padgett, 2000). Maladaptive cognitive coping strategies such as experiential avoidance

and minimization may heighten the risk for severe PTSD symptoms by preventing maltreated youths from processing their traumatic experience effectively (Shenk, Putnam, & Noll, 2012; Springer & Padgett, 2000).

Self-blame, guilt, and emotional avoidance have also been suggested as predictors of severe PTSD symptoms for maltreated youths (Chaffin et al., 1997; Feiring et al., 2002). Wolfe and colleagues (1994) found that victims with PTSD reported more abuse-related guilt than maltreated youths without PTSD. Furthermore, feelings of guilt significantly exacerbated PTSD symptoms. Therefore, perceived trauma-related culpability may increase the risk of greater PTSD symptoms for maltreated youths (Wolfe, Sas, & Wekerle, 1994). Tull and colleagues (2007) examined the association between PTSD symptom severity and the tendency to negatively evaluate emotions among 102 youth victims of interpersonal violence. Fear of emotions significantly predicted PTSD symptom severity. Thus, maltreated youths who avoid or negatively evaluate their emotional responses to a traumatic event may be at greater risk for severe PTSD symptoms (Tull, Jakupcak, McFadden, & Roemer, 2007).

Limitations of research on intelligence, coping strategies and PTSD symptom severity. Much of the research on intelligence, coping strategies, and PTSD symptom severity has relied on retrospective self-reports. Additionally, most studies have used small sample sizes, thereby limiting the generalizability of findings. Past studies have also neglected to examine relationships between intelligence, coping strategies, and PTSD symptom severity for victims of different maltreatment types. Lastly, research evaluating possible transactional effects of intelligence and depressive symptoms on PTSD development is virtually nonexistent. Better understanding of the relationship

between intelligence and depression, with respect to the development of more severe PTSD symptoms, may help guide future interventions with high-risk maltreated youths. Treatments for maltreated children with PTSD are discussed next.

Treatment

Interventions for traumatized youths include play, psychodynamic, cognitive-behavioral, and pharmacological therapies. Other approaches include psychoeducation, anxiety-management training, exposure-based practices, affect regulation, and coping skills (Cohen et al., 2006; Dyregrov & Yule, 2006; Feeny, Foa, Treadwell, & March, 2004). The extant research generally supports cognitive-behavioral therapy (CBT) as the most efficacious intervention for maltreated youths (Cohen, Deblinger, Mannarino, & Steer, 2004; Faust & Katchen, 2004; Kowalik, Weller, Venter, & Drachman, 2011). Additionally, researchers have found reduced externalizing and depressive symptoms among maltreated children whose parents also receive CBT (Kolko, 1996; Pine & Cohen, 2002).

CBT includes training in expressive techniques, an examination of the relationship between thoughts, feelings, and behaviors, and cognitive restructuring (Dyregrov & Yule, 2006). Approaches that are used with traumatized children include psychoeducation about reactions to trauma, relaxation training, thought stopping, cognitive processing, and exposure. Specific techniques for maltreated youths include structured play, expressing maltreatment-related emotions, modifying negative attributions about others, and teaching maltreatment prevention skills (Cohen & Mannarino, 2008). Additionally, CBT that includes a trauma narrative component is

particularly effective for reducing maltreatment-related fears and general anxiety (Deblinger, Mannarino, Cohen, Runyon, & Steer, 2011).

Extensive research has supported the efficacy of CBT with victims of sexual maltreatment (Celano, Hazzard, Webb, & McCall, 1996; Deblinger et al., 2001; King et al., 2000; Ramchandani & Jones, 2003). Cohen and colleagues (2004) examined the efficacy of trauma-focused cognitive-behavioral therapy (TF-CBT) versus Child Centered Therapy (CCT) for sexually maltreated youths with PTSD. Youths who received TF-CBT demonstrated significantly more improvements in PTSD symptoms than those youths assigned to CCT. Furthermore, twice as many children who received CCT, compared to TF-CBT, continued to meet full diagnostic criteria for PTSD at post-treatment (Cohen et al., 2004). A separate study by Kolko (1996) evaluated the efficacy of CBT for physically maltreated youths. Abuse-focused CBT was found superior to standard care in diminishing the risk of new maltreatment, strengthening family cohesion, and improving externalizing symptoms of PTSD (Kolko, 1996).

Most of the treatment research for traumatized youths has evaluated victims of sexual maltreatment (Cohen et al., 2004; Dyregrov & Yule, 2006; Stallard, 2006). Unfortunately, studies examining the efficacy of CBT for neglected, physically maltreated, or emotionally maltreated youths are scarce. The role of gender has also received scant attention in the extant research. Leenarts and colleagues (2013) performed a meta-analysis of 27 studies to examine the efficacy of different interventions for maltreated youths with PTSD or other trauma-related psychopathology. The authors found that few studies have considered possible gender differences in treatment responsiveness, despite evidence that girls and boys may manifest PTSD symptoms

differently (Leenarts, Diehle, Doreleijers, Jansma, & Lindauer, 2013). More knowledge about the risk and protective factors that contribute most significantly to the development of severe PTSD symptoms may help guide future interventions for maltreated youths.

Purpose of Present Study

The research literature regarding PTSD in maltreated youth is burgeoning, but several gaps remain. First, few studies have evaluated which risk factors are associated with higher-levels of PTSD symptoms in maltreated youths. Second, the examination of large, ethnically representative samples is uncommon. Third, most researchers have compared maltreated youths to non-maltreated youths and have not examined differences in PTSD symptoms for victims of different forms of maltreatment. Studies that have examined a particular type of maltreatment involve small samples of sexually maltreated females (Kira et al., 2012). Fourth, past studies have not differentiated risk factors associated with a severe PTSD symptom presentation from risk factors associated with a mild PTSD symptom presentation following maltreatment. Little is known as to why maltreated youths differ with respect to PTSD symptom levels. Fifth, past studies have not evaluated multiple risk and protective factors simultaneously. The relative contributions of different risk factors on PTSD symptoms are thus speculative. Finally, studies in this area often involve retrospective self-reports by adults with a history of childhood maltreatment.

The present study sought to address these shortcomings by evaluating cognitive, interpersonal, and affective factors as predictors for heightened PTSD symptoms among maltreated youths. Additionally, the present study expanded previous work by examining risk factors among a large, gender-balanced sample of ethnically diverse

maltreated youths. The first aim of this study was to examine a model of PTSD in which dissociation, depression, and posttraumatic cognitions predicted PTSD symptoms. Specifically, this study examined which individual and environmental characteristics place a child at greatest risk for manifesting high-levels of PTSD symptoms following maltreatment.

The second aim of the present study was to evaluate the model's fit with respect to salient individual differences. Specifically, this study examined whether the model fit across variations in intelligence, gender, age group, ethnicity, and type of maltreatment. The contributions of these factors to PTSD symptoms among maltreated youths are rarely considered within an ecologically based and culturally sensitive model of PTSD (Lemos-Miller & Kearney, 2006). This information will hopefully inform assessment and treatment practices and enable more accurate identification of maltreated children at highest risk for PTSD.

Hypotheses

The first hypothesis tested a model of PTSD wherein depression, dissociation, and posttraumatic cognitions scores on the Children's Depression Inventory (CDI), Adolescent Dissociative Experiences Scale (ADES), and Posttraumatic Cognitions Inventory (PTCI), respectively, would predict higher-levels of PTSD symptoms on the Children's Posttraumatic Stress Disorder-Inventory (CPTSD-I) (Bucker et al., 2012; De Bellis et al., 2009; Feiring et al., 2002; Johnson et al., 2001; Kaplow et al., 2005; Kolko et al., 2010; Lemos-Miller & Kearney, 2006; Marshall & Schell, 2002; Runyon et al., 2002; Saltzman et al., 2006; Springer & Padgett, 2000; Ullman & Filipas, 2005; Wolfe et

al., 1994). Hypothesis 1 was that this model would display sufficient goodness-of-fit across various indices. This model served as the basis for the remaining hypotheses.

Hypothesis 2 was that the model from hypothesis 1 would better fit maltreated youths with below average intelligence (FSIQ = 55-84) than youths with average intelligence (FSIQ = 85-114). Intelligence has been implicated in the relationship between trauma exposure and PTSD symptoms, although this relationship has received scant attention. Maltreated youths with lower IQ scores may be at heightened risk for PTSD symptoms following a traumatic event due to their decreased mental ability to process their experience effectively (De Bellis et al., 2009; Saigh et al., 2006; Saltzman et al., 2006; Samuelson et al., 2010; Yasik et al., 2007).

Hypothesis 3 was that the model from hypothesis 1 would better fit females than males. Females are at greater risk for maltreatment and are more likely to manifest PTSD symptoms than males (Caffo et al., 2005; Gwadz et al., 2007; Koenen & Widom, 2009; Wolf, Sas, & Wekerly, 1994). PTSD in females is also associated with higher comorbidity, more severe symptom presentations, and greater adverse outcomes than PTSD in males (Blain, Galovski, & Robinson, 2010; Feiring, Taska, & Lewis, 1999; Ullman & Filipas, 2005).

Hypothesis 4 was that the model from hypothesis 1 would better fit younger youths (aged 9-13 years) than older youths (aged 14-18 years). Earlier onset of maltreatment has been associated with greater negative outcomes, and maltreated children endorse PTSD symptoms as more problematic than adolescents (Ackerman et al., 1998; Dubner & Motta, 1999; Kaplow et al., 2008; Kolko et al., 2010).

Hypothesis 5 was that the model from hypothesis 1 would better fit multiracial, African American, and Hispanic youths than Caucasian youths. Minority ethnic group membership is associated with greater risk for PTSD following exposure to a traumatic event (Abram et al., 2004; Andŕes-Hyman et al., 2004; Deters et al., 2006; Elliott, & Urquiza, 2006; Kearney et al., 2010; Khaylis, Waelde, & Bruce, 2007; Westby, 2007). However, very few researchers have examined the role of ethnicity vis-à-vis PTSD symptoms among maltreated youths (Triffleman & Pole, 2010).

Hypothesis 6 was that the model from hypothesis 1 would better fit victims of sexual maltreatment than victims of neglect, physical maltreatment, or multiple forms of maltreatment. Youth victims of sexual maltreatment are more likely to manifest PTSD symptoms than youths exposed to other forms of maltreatment and are more likely to experience greater symptom severity (Ackerman et al., 1998; Bolger & Patterson, 2003; Boney-McCoy & Finkelhor, 1996; Briscoe-Smith & Hinshaw, 2006; Collin-Vezina & Hebert, 2005; Copeland et al., 2007; Deblinger et al., 1989; Gwadz et al., 2007; Hulette et al., 2008; Runyon & Kenny, 2002; Sullivan et al., 2006; Wechsler-Zimring & Kearney, 2011).

CHAPTER 3:

METHOD

Participants

Participants included 360 youths aged 9-18 years from Department of Family Services (DFS) sites in the Las Vegas area. Participants were female (59%), male (40%), or transgendered (1%) with a mean age of 13.75 years (*SD* = 2.47 years). Participants were multiracial (26.4%), African American (24.7%), Caucasian (25.3%), Hispanic (11.9%), Asian American (1.9%), Native American (2.2%), or other (1.7%, includes Puerto Rican, Pacific Islander, Hungarian, and Guamanian) (unavailable, 5.8%). Participants consisted of youths in DFS custody who were referred for psychological evaluation following removal from their primary caregiver for reasons such as neglect, sexual maltreatment, and/or exposure to domestic violence. Evaluation's typically occurred between one month and one year following residential removal.

The mean number of traumatic events endorsed by participants was 2.82 (*SD*= 1.57, range 0-11). Participants were diagnosed with chronic PTSD (n= 164), acute PTSD (n= 29), subthreshold PTSD (n= 68), delayed onset PTSD (n= 1), PTSD negative (n= 86), or no diagnosis (n= 12). Participants were given a total symptom score (range= 0-27) based on the number of PTSD-related symptoms they were experiencing. PTSD symptoms in the present study ranged from 0 - 24 with a mean of 12.89 symptoms (*SD*= 5.94 symptoms). Symptoms fall into 6 clusters and include exposure to a traumatic event, situational reactivity, re-experiencing, avoidance/numbing, increased arousal, and significant distress.

Measures

Demographic/Information Sheet. A demographic/information sheet was used to obtain information regarding participant gender, age, race/ethnicity, country of origin, biological parent marital status, family socioeconomic status, and religion. Additional questions regarding the types of maltreatment experienced, as well as characteristics of the perpetrator(s), were administered verbally (Appendix I).

Children's PTSD Inventory (CPTSD-I) (Saigh, 1998). The CPTSD-I is a semi-structured interview that assesses PTSD symptoms in youths aged 7-18 years (Saigh et al., 2000). Test items correspond to DSM-IV-TR PTSD diagnostic criteria. Youth responses to test items are scored on a dichotomous scale (0 for absence of symptom and 1 for presence of symptom) on 5 subtests. The first subtest (2 questions) assesses exposure to a traumatic incident and situational reactivity during stress exposure, the second subtest (11 questions) assesses re-experiencing symptoms, the third subtest (16 questions) assesses avoidance and numbing symptoms, the fourth subtest (7 questions) assesses increased arousal, and the fifth subtest (5 questions) assesses level of distress (Saigh et al., 2000). The CPTSD-I also assesses the duration of distress for each symptom endorsed. The CPTSD-I yields 1 of 5 possible diagnoses: PTSD Negative, Acute PTSD, Chronic PTSD, Delayed Onset PTSD, and No Diagnosis. The latter applies to youths who fail to acknowledge experiencing a trauma despite evidence to the contrary (Saigh et al., 2000).

Three members of the DSM-IV PTSD Work Group established the content validity of the CPTSD-I. These members independently rated the correspondence between CPTSD-I items and the DSM-IV PTSD diagnostic criteria using a 0-100 point

Likert-type scale (0=lowest correspondence and 100=highest correspondence). Mean subtest ratings were 86.7 for the Situational Reactivity subtest and 90 for other subtests. These ratings indicate a high degree of correspondence between the CPTSD-I and the DSM-IV PTSD diagnostic criteria (Saigh et al., 2000).

Saigh and colleagues (2000) assessed internal consistency and reliability of the CPTSD-I among traumatized and non-traumatized youths aged 7-18 years (mean age, 13.8 years) and among youths aged 6-17 years (mean age, 12.5 years). Moderate to high internal consistencies have been found for all subtests (.53-.89) and a high internal consistency was found for overall diagnosis (.95) (Saigh et al., 2000).

The CPTSD-I also demonstrates excellent estimates of interrater reliability. Saigh and colleagues (2000) reported a 98.1% interrater agreement and a Cohen's kappa of .96 at the diagnostic level. This indicates excellent diagnostic agreement between raters. Additionally, four subtests yielded excellent estimates of interrater reliability (Cohen's kappa's of .84-1.00) and only one subtest (Situational Reactivity) yielded a fair to moderate kappa coefficient (.66) (Saigh et al., 2000).

Saigh and colleagues (2000) also obtained excellent estimates of test-retest reliability. A 97.6% agreement was found at the diagnostic level (Cohen's kappa = .91) and the individual subtests yielded test-retest reliability estimates ranging from .78-1.00. The Significant Impairment subtest yielded fair to good test-retest reliability (.66) (Saigh et al., 2000).

Yasik and colleagues (2001) examined the validity of the CPTSD-I among traumatized and non-traumatized youths aged 7-18 years (mean age 13.4 years). The CPTSD-I exhibited high concurrent validity with 3 well-established criterion measures:

clinician-derived diagnosis, Diagnostic Interview for Children and Adolescents-revised PTSD module, and Structured Clinical Interview for DSM PTSD module. Pearson product-moment correlation coefficients with the CPTSD-I were obtained for sensitivity (.87-1.00), specificity (.92-.99), positive predictive power (.65-.96), negative predictive power (.95-1.00), and diagnostic efficiency (.93-.95) (Yasik et al., 2001).

The authors also evaluated convergent and discriminant validity of the CPTSD-I with the Revised Children's Manifest Anxiety Scale (RCMAS) (Reynolds & Richmond, 1978), the Children's Depression Inventory (CDI) (Kovacs, 1992), and the Junior Eysenck Personality Inventory (JEPI) (Eysenck, 1963). Overall symptom endorsement on the CPTSD-I was significantly correlated with symptom endorsement on the RCMAS and CDI, whereas the CPTSD-I and JEPI extraversion scale were not significantly correlated. These findings provided evidence for CPTSD-I convergent and discriminant validity (Yasik et al., 2001). Cronbach's alpha for the present study was .91.

Adolescent Dissociative Experiences Scale (A-DES) (Armstrong, Putnam, Carlson, Libero, & Smith, 1997). The A-DES is a 30-item self-report measure that assesses dissociation in youths aged 12-18 years following exposure to a range of experiences (Armstrong et al., 1997). Youth responses to test items are scored on an 11-point Likert-type scale ranging from 0 (never) to 10 (always). Each individual is instructed to indicate how often a particular experience happens to him when not under the influence of drugs or alcohol. Cronbach's alpha for the present study was .94.

This instrument contains 4 domains reflecting key aspects of dissociation. Dissociative amnesia refers to memory lapses pertaining to the dissociative experience. Absorption and imaginative involvement refers to difficulty separating reality from

fantasy. Passive influence refers to a perceived lack of control over bodily sensations and movement. Depersonalization and derealization refer to feeling disconnected from one's body and the world. Within this last domain, dissociated identity refers to feeling that one's emotions and behaviors are not one's own and dissociative relatedness refers to feeling that interpersonal relationships are not real (Armstrong et al., 1997).

Armstrong and colleagues (1997) examined the validity of the A-DES among 102 adolescents (73 inpatients, 12 outpatients, 17 youths with learning and emotional disorders) aged 12-18 years. The Spearman Brown split half reliability was .92. Cronbach's alpha coefficient for the scale was .93 and the subscale alphas ranged from .72-.85, indicating good overall and subscale internal consistency. Additionally, scores did not vary based on demographic variables such as age, ethnicity, and gender. However, youths with no history of maltreatment scored significantly lower than youths with a history of physical or sexual maltreatment. Also, adolescents who met criteria for dissociative disorder scored higher than adolescents in all other diagnostic categories, with the exception of adolescents diagnosed with a psychotic disorder (Armstrong et al., 1997).

Smith and Carlson (1996) examined the reliability and construct validity of the A-DES, as well as provided preliminary norms using a non-clinical sample of 60 high-school youths aged 12-17 years and 46 college students aged 18-21 years. The total mean scores were 2.24 for high school students and .78 for college students. Subscale mean scores ranged from 1.87-2.75. Additionally, two-week test-retest reliability estimates were good (.77) for high school students. The authors found excellent internal consistency for the A-DES total score (Cronbach's alpha of .92) and moderate to good

internal consistency for the subscales (Cronbach's alpha ranged from .64-.83). Furthermore, acceptable Spearman-Brown split half reliability for the measure was reported (.94). Smith and Carlson (1996) also assessed concurrent validity by comparing responses of the college-aged participants on the A-DES to the Dissociative Experiences Scale (Carlson & Putnam, 1993). Good concurrent validity (.77) was found (Smith & Carlson, 1996).

Farrington and colleagues (2001) provided normative and reliability data for the A-DES among 768 non-clinical youths aged 11-16 years. Excellent internal consistency was reported for the overall scale (.94) and an adequate Spearman-Brown split half reliability was found (.90). The mean A-DES score for the sample was 2.66, and no significant age or gender differences were found (Farrington, Waller, Smergen, & Faupel, 2001).

Muris and colleagues (2003) examined subscale norms and the reliability of the A-DES among 331 non-clinical adolescents aged 12-18 years (mean age 14.7). The mean A-DES score was 1.27 and the authors reported mean subscale scores of 1.79 for absorption/imaginative involvement, 1.58 for passive influence, 1.36 for dissociative amnesia, and .82 for depersonalization/derealization. Good internal consistency was found (Cronbach's alpha = .93) and A-DES scores were unrelated to demographic variables such as gender and age. Additionally, A-DES scores were significantly associated with PTSD symptoms and other anxiety disorder symptoms (Muris, Merckelbach, & Peters, 2003)

Seeley and colleagues (2004) examined the reliability and construct validity of the A-DES among 65 female youths (31 victims of sexual maltreatment) aged 11-18 years.

The authors found high internal consistency of the measure (Cronbach's alpha = .94) and observed that the A-DES was able to discriminate sexually maltreated youths from non-sexually maltreated youths. However, A-DES total scores did not significantly differentiate maltreated youths with PTSD from maltreated youths with other disorders. Lastly, A-DES scores were significantly correlated with therapist ratings of dissociative symptoms (r= .55), suggesting good convergent validity (Seeley, Perosa, & Perosa, 2004).

Children's Depression Inventory (CDI) (Kovacs, 1992). The CDI is a 27-item self-report questionnaire for youths aged 7-17 years. The CDI measures depressive symptoms over the past 2 weeks and yields a total score as well as 5 subscale scores for Negative Self-Esteem, Anhedonia, Ineffectiveness, Interpersonal Problems, and Negative Mood. Individuals endorse 1 of 3 statements that best applies to them (e.g., "I am sad once in a while," "I am sad many times," "I am sad all the time") and responses are scored 0, 1, or 2, with 2 representing the most severe presentation of the depressive symptom. Higher total scores are thus associated with more severe depression (Nelson, Politano, Finch, & Wendel, 1987). Cronbach's alpha for the present study was .86.

Nelson and colleagues (1987) examined the relationship between age, gender, and CDI score with inpatient males and females aged 6-18 years. The authors found no significant main effect of age, but observed a significant effect for gender, such that females aged 13-18 years reported significantly more depressive symptoms than males of the same age. Additionally, females were more likely to report suicidal thoughts than males. A high coefficient alpha was reported (.86), indicating good internal consistency of the CDI with emotionally disturbed youths (Nelson et al., 1987).

Smucker and colleagues (1986) reported normative and reliability data for the CDI with 1252 youths aged 6-18 years (mean age 11.7 years) recruited from eight public schools. The mean total score for all youths was 9.09 with a standard deviation of 7.04. The cutoff score was 19 based on the upper 10%. The authors also examined potential sex differences in CDI scores and found a mean female score of 8.99 and a mean male score of 9.21. The internal consistency was good (.83 - .89) and test-retest reliability after a 3-week interval was adequate (.74 - .77) (Smucker, Craighead, Craighead, & Green, 1986).

Finch and colleagues (1987) also examined test-retest reliability of the CDI with 108 non-clinical youths aged 7-12 years after 2-week, 4-week, and 6-week intervals. They found good test-retest reliability at 2 weeks (.82) but adequate test-retest reliability at 4 weeks (.66) and 6 weeks (.67). Additionally, differences in mean CDI scores were observed across the four administrations. In particular, the initial mean score of all participants (10.10) was higher than the mean score at 2 weeks (8.90) (Finch, Saylor, Edwards, & McIntosh, 1987).

Nelson and Politano (1990) analyzed the test-retest reliability of the CDI in 96 psychiatrically hospitalized youths aged 6-15 years after 10-day and 30-day intervals. The authors found a significant decrease in scores between the initial and subsequent CDI administrations, though no gender differences were observed. Stability coefficients between administrations for the entire sample were adequate and ranged from .47 - .62. However, females evidenced greater stability in CDI scores than males between the 10- and 30-day administrations (Nelson & Politano, 1990).

Twenge and Nolen-Hoeksema (2002) performed a within-scale meta-analysis on 310 samples of youths aged 8-16 years to examine the effects of age, gender, and ethnicity on the CDI. The authors found that boys' CDI scores remained relatively stable from ages 8-16 years with the exception of a slight increase in symptoms at age 12 years. Conversely, girls showed a significant increase in CDI scores from childhood to adolescence. No gender differences were found in CDI scores from ages 8-12 years, but females aged 13-16 years reported significantly higher levels of depressive symptoms than same-aged males. A relationship between ethnicity and CDI score was also observed, with Hispanic youths scoring significantly higher (10.34) than African American (8.67) and Caucasian youths (8.84) (Twenge & Nolen-Hoeksma, 2002).

Timbremonte and colleagues (2004) examined the predictive and discriminant validity of the CDI with 80 youths aged 8-18 years (mean age 12.2 years). Using a cutoff score of 16, the authors reported moderate specificity (83.8%), high sensitivity (94.4%), and good total predictive value (86.3%). Additionally, youths diagnosed with depression had significantly higher scores on the CDI than controls, and each 1-point increase in CDI score was associated with a 1.36-point increased risk for a depressive disorder. Good discriminant validity was also found, with the CDI correctly differentiating 87% of all participants with an anxiety disorder and 85% of all participants with a disruptive behavioral disorder from participants with depression (Timbremont, Braet, & Dreessen, 2004).

Posttraumatic Cognitions Inventory (PTCI) (Foa, Ehlers, Clark, Tolin, & Orsillo, 1999). The PTCI is a 36-item self-report questionnaire that measures trauma-related thoughts and beliefs. Each item is rated on a 7-point Likert-type scale ranging

from 1 (totally disagree) to 7 (totally agree). The PTCI yields a total negative cognitions score as well as 3 factor scores: Negative cognitions about self, Negative cognitions about the world, and Self-blame. No age requirements have been developed for this measure. Cronbach's alpha for the present study was .92.

Foa and colleagues (1999) examined the psychometric properties of the PTCI among 601 adult volunteers (392 participants had experienced a traumatic event and 170 participants had moderate to severe PTSD). The authors reported high internal consistency for the measure (total score Cronbach's alpha = .97) as well as for each factor scale (Cronbach's alpha's = .86 - .97). Test-retest reliability after a one-week interval was .74 - .89 and .80 - .86 after a 3-week interval. The PTCI also demonstrated convergent validity with two other scales that measure trauma-related cognitions. All three PTCI scales, as well as the total score, were significantly correlated with PTSD severity, depression, and general anxiety. Furthermore, traumatized individuals scored significantly higher on the PTCI than non-traumatized individuals (Foa et al., 1999).

Beck and colleagues (2004) examined the factor structure, internal consistency, and discriminant validity of the PTCI among 112 individuals who had experienced a serious motor vehicle accident. The authors' findings support the 3-factor structure of the PTCI reported by Foa and colleagues (1999), and reveal similar internal consistencies (total score Cronbach's alpha= .93, factor scales Cronbach's alpha's= .81 - .93). Additionally, total score and scores on the negative cognitions about self and negative cognitions about the world subscales significantly discriminated individuals with PTSD from those without the disorder (Beck et al., 2004). More recently, these findings were replicated among 326 trauma-exposed Israeli adults (Daie-Gabai et al., 2011).

Wechsler Intelligence Scale for Children, Fourth Edition (WISC-IV)

(Wechsler, 2003a). The WISC-IV is an individually administered instrument that assesses the cognitive ability of youths aged 6-16 years. The WISC-IV consists of 10 core subtests, which are grouped into 4 indexes: Verbal Comprehension, Perceptual Reasoning, Working Memory, and Processing Speed. The Verbal Comprehension Index (VCI) measures a youth's ability to verbally reason with previously learned information. The Perceptual Reasoning Index (PRI) assesses a youth's ability to use nonverbal reasoning skills to interpret, organize, and manipulate visually perceived stimuli. The Working Memory Index (WMI) evaluates a child's ability to hold and manipulate information in immediate awareness, and the Processing Speed Index (PSI) measures a youth's capacity to fluently perform cognitive tasks (Flanagan & Kaufman, 2009; Kaufman, Flanagan, Alfonso, & Mascolo, 2006). Scores on these indexes comprise the Full Scale IQ (FSIQ) score, which serves as an estimate of a child's general intellectual ability. The WISC-IV also contains supplemental subtests that can be substituted for 1 or more core subtests if needed (Baron, 2005).

Administration and scoring rules vary by subtest and are detailed in the WISC-IV *Administration and Scoring Manual* (Wechsler, 2003b). However, each subtest includes a reverse rule for when initial items are too difficult for the examinee, as well as a discontinue rule to inform the administrator of how many consecutive incorrect responses are required before moving to the next subtest (Kaufman et al., 2006). The FSIQ, as well as each index, yields a standard score with an average of 100 and a standard deviation of 15. The subtests that constitute each index have an average score of 10 with a standard deviation of 3. Cronbach's alpha for the present study was .89.

The *WISC-IV Technical and Interpretive Manual* (Wechsler, 2003c) is the predominant source of information regarding the psychometric properties of the measure within a standardization sample (Ryan, Glass, & Bartels, 2010). The WISC-IV standardization sample was representative of the US population of youths aged 6-16 years and consisted of 2200 children (Williams et al., 2003). The internal consistency of the full measure and indexes was high with reliability coefficients ranging from .88 - .97. Reliability coefficients of individual subtests were also high (.79 - .90). Additionally, Wechsler (2003c) reported test-retest stability coefficients for the subtests, indexes, and FSIQ after a mean interval of approximately 1 month. FSIQ and index stability coefficients were excellent (.86 - .93). However, coefficients for the 15 subtests demonstrated greater variability (.76 - .92), indicating subtests are not as stable as the indexes or FSIQ. Research also supports that youths with higher abilities at initial testing tend to benefit more from prior exposure to the WISC-IV than children with lower abilities. Substantial improvements in FSIQ and index scores at retest have been observed among youths who initially scored highly on the measure (Ryan et al., 2010).

The WISC-IV also demonstrated high concurrent validity with well-established criterion measures, including the WISC-III (Wechsler, 1991) and the Children's Memory Scale (Cohen, 1997). Correlations between the WISC-III and WISC-IV index scores were high (.74 - .87) and the average difference between WISC-III and WISC-IV FSIQ scores was 2.5 (Williams et al., 2003). Additionally, factor analyses of WISC-IV scores with clinical samples indicate that Wechsler's (2003c) 4-factor model, which was based on the general population, is also appropriate for clinical populations (Chen & Zhu, 2011; Watkins et al., 2006).

Procedure

Procedures were in accordance with UNLV and DFS policies regarding research with human participants. The UNLV Office for the Protection of Research Subjects, Institutional Review Board (IRB), Social and Behavioral Sciences committee approved protocol # 0705-2351 on September 17, 2007 and protocol # 0801-2586 on June 6, 2008. Both protocols were subsequently consolidated into protocol #1005-3485M, which has been renewed and approved annually by the UNLV Office for the Protection of Research Subjects, Institutional Review Board (IRB), Social and Behavioral Sciences. Protocol #1005-3485 was most recently approved on October 8, 2013 as part of an ongoing study. An approved contract by UNLV and DFS was also in accordance with state and county laws regarding the treatment of children in protective custody. Participants were recruited through DFS-related sites in Las Vegas, which referred maltreated youths to the offices of Dr. Stephanie Holland for a comprehensive psychological assessment. The measures used in the present study were part of DFS's standard mental health evaluation, so a summary report detailing diagnostic findings, clinical impressions, and further assessment/treatment recommendations was completed for each participant.

The assessment process did not require parental permission given the youths' status in DFS custody. Youth assent was also not required because the present study involved secondary analysis of assessments conducted as part of a routine agency procedure. However, youths were provided with information about the study following assessment completion. All participant data was de-identified prior to analysis by the researcher and replaced with a code to ensure anonymity. De-identified research data was stored in a locked cabinet in a secure university lab.

Assessment procedures were conducted in a confidential environment without DFS staff. Participating youths completed a self-report demographic/information form as well as the CPTSD-I, A-DES, CDI, PTCI, and WISC-IV. Dr. Holland's office provided researchers with the reason for removal from home. A graduate student or licensed psychologist interviewed each participant via the CPTSD-I following completion of the demographic/information form. These measures lasted approximately 45 minutes. Youths were excluded from the study if they did not endorse experiencing a traumatic event. A licensed psychologist or graduate student under the supervision of Dr. Stephanie Holland conducted the remaining measures of the assessment. The self-report measures for the present study took approximately 30 minutes to complete.

Youths were encouraged to take breaks during the assessment process. A graduate student or licensed psychologist was also available to provide support to youths who expressed emotional distress when discussing sensitive topics. Youths were encouraged to ask questions throughout the assessment and share their feelings. If a youth expressed intent to harm themself or others appropriate actions were taken. Youths were instructed that they were not obligated to answer questions and that they would incur no repercussions if they choose not to respond. Youths were routinely referred for therapy or therapeutic services following the assessment report.

Data Analyses

Hypotheses were tested via structural equation modeling (SEM) using EQS. SEM is preferable to conventional regression approaches because it provides overall goodness-of-fit estimates, allows analysis of multiple factors, and helps minimize measurement error. The study used SEM to examine the various predictor-outcome (A→B) paths for

adequate fit. Multiple indices of fit are recommended when conducting SEM (Kline, 2005). The present study employed 3 goodness-of-fit indices for each model: comparative fit index (CFI), Bollen incremental fit index (IFI), and standardized root mean square residual (SRMR). Acceptable goodness-of-fit in this study was defined as CFI and IFI values of .90+ and SRMR values of <.10 (Kline, 2005). Additionally, the Akaike Information Criterion (AIC) was used as a measure of comparative fit between models. The AIC enables researchers to compare models to determine if they can be considered different (Akaike, 1987; Kieseppa, 2003; Lin & Dayton, 1997). Better model fit is defined as Lower AIC values, and AIC values that differed by more than 2 were considered to be significantly different (Akaike, 1987).

The first hypothesis involved a model whereby posttraumatic cognitions, dissociation, and depression (the "A" variables) predicted PTSD symptoms (the "B" variable). This model served as the basis for the remaining hypotheses (see Table 1 for a correlation matrix of all variables).

The second hypothesis involved testing the original model among youths with below average and with average intelligence. The third hypothesis involved testing the original model among male and female youths. The fourth hypothesis involved testing the original model among younger and older aged youths. The fifth hypothesis involved testing the original model among multiracial, African American, Hispanic, and Caucasian youths. The sixth hypothesis involved testing the original model among youth victims of sexual maltreatment, neglect, physical maltreatment, and multiple forms of maltreatment.

Post-hoc multivariate t-tests were conducted on an exploratory basis to compare posttraumatic symptom levels as well as depression, dissociation, and posttraumatic

cognition scores for youths identified as highest and lowest risk for PTSD symptoms. High-risk and low-risk youths were grouped according to age group, ethnicity, and type of maltreatment experienced. Subsequent post-hoc exploratory analyses were then conducted to evaluate the effects of gender on posttraumatic symptoms for highest-risk youths.

CHAPTER 4:

FINDINGS OF THE STUDY

General Comparisons

A chi-square test for independence revealed that females were significantly more likely than males to have clinically significant PTSD symptoms, χ^2 (2, n = 345) = 9.39, p = .002, phi = .165. A chi-square test of independence indicated no significant association between ethnicity (i.e., African American, Caucasian, Hispanic, or multiracial status) and clinical PTSD symptoms, χ^2 (3, n = 315) = 7.655, p = .054, phi = .156. A chi-square test of independence indicated no significant difference between age group (i.e., 9-13 years versus 14-18 years) and PTSD symptoms, χ^2 = (2, n = 330) 2.818, p = .093, phi = -.092. A chi-square test for independence indicated a significant association between sexual maltreatment and clinically significant PTSD symptoms χ^2 (1, n = 347) = 19.89, p < .001, phi = -.239. However, chi-square tests of independence indicated no significant association between either physical maltreatment [(χ^2 (1, n = 345) = 3.718, p = .054, phi = -.104] or neglect [χ^2 (1, n = 297) = .167, p = .683, phi = -.024] and clinically significant PTSD symptoms. Finally, a chi-square test for independence indicated no significant association between intelligence group (i.e., FSIQ=55-84 versus FSIQ=85-114) and clinical PTSD symptoms, χ^2 (2, n = 115) = .846, p = .358, phi = .086.

Hypothesis Testing

Hypothesis 1. The first hypothesis was that depression, posttraumatic cognitions, and dissociation ("A" variables) would predict PTSD symptoms ("B" variable). The A→ B path of the hypothesized model met goodness-of-fit criteria (CFI= 1.00, IFI= 1.00, SRMR= .006, AIC= -1.344; χ^2 = .656, p= .418). Hypothesis 1 was supported (Figure 1).

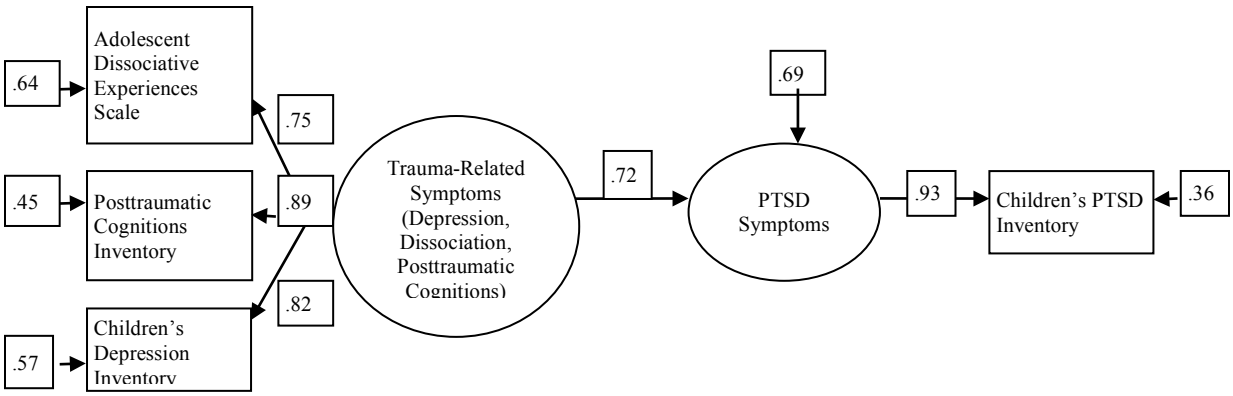

Figure 1. Structural Equation Model with Path Coefficients for Depression, Dissociation, Posttraumatic Cognitions and PTSD Symptoms.

Hypothesis 2. The second hypothesis was that the original model would have better goodness-of-fit among youths with below average (FSIQ=55-84) than average (FSIQ=85-114) intelligence. For youths with below average intelligence, the model met goodness-of-fit criteria (CFI= .98, IFI= .98, SRMR= .04, AIC= -.09; χ^2= 1.90, *p*= .17). The model also met goodness-of-fit criteria for youths with average intelligence (CFI= .99 IFI= .99, SRMR= .03, AIC= .03; χ^2= 2.03, *p*= .16). Model fit between the groups was similar (model AIC difference< 2). Hypothesis 2 was not supported.

Hypothesis 3. The third hypothesis was that the original model would have better goodness-of-fit among female youths than male youths. The model met goodness-of-fit criteria for females (CFI= .99, IFI= .99, SRMR= .01, AIC= .05; χ^2= 2.05, *p*= .15) and males (CFI= 1.00, IFI= 1.00, SRMR= .01, AIC= -1.37; χ^2= .63, *p*= .43). Model fit between the groups was similar (model AIC difference < 2). Hypothesis 3 was not supported.

Hypothesis 4. The fourth hypothesis was that the original model would have better goodness-of-fit for younger youths than older youths. The model did not meet goodness-of-fit criteria for younger youths (CFI= .92, IFI= .92, SRMR= .05, AIC= 8.93;

χ^2= 10.93, p< .001). However, the model met goodness-of-fit criteria for older youths (CFI= .99, IFI= .99, SRMR= .01, AIC= .68; χ^2= 2.68, p= .10). Model fit between the groups was different, such that the model better fits older youths than younger youths (model AIC difference= 8.253). Hypothesis 4 was not supported.

Hypothesis 5. The fifth hypothesis was that the original model would have better goodness-of-fit for African American, Hispanic, and multiracial youths than Caucasian youths. The model met goodness-of-fit criteria for all ethnicities: African American youths (CFI= 1.00, IFI= 1.00, SRMR= .01, AIC= -1.47; χ^2= .53, p= .47), Hispanic youths, (CFI= .94, IFI= .95, SRMR= .05, AIC= 1.89; χ^2= 3.89, p= .05), multiracial youths (CFI= .99, IFI= .99, SRMR= .03, AIC= .62; χ^2= 2.62, p= .11), Caucasian youths (CFI= .98, IFI= .98, SRMR= .03, AIC= 1.47; χ^2= 3.47, p= .06). The model better fit African American (AIC= -1.47) or multiracial (AIC= .62) youths than Caucasian (AIC= 1.47) or Hispanic (AIC= 1.89) youths. Hypothesis 5 was partially supported.

Hypothesis 6. The sixth hypothesis was that the original model would have better goodness-of-fit for sexually maltreated youths than youths who have experienced physical maltreatment, neglect, or multiple forms of maltreatment. The model met goodness-of-fit criteria for all forms of maltreatment: sexual maltreatment (CFI= 1.00, IFI= 1.01, SRMR= .01, AIC= -1.74; χ^2= .26, p= .61), physical maltreatment (CFI= .99, IFI= .99, SRMR= .03, AIC= 1.01; χ^2= 3.01, p= .08), neglect (CFI= 1.00, IFI= 1.00, SRMR= .01, AIC= -1.71; χ^2= .29, p= .59), multiple maltreatment (CFI= 1.00, IFI= 1.00, SRMR= .01, AIC= -1.11; χ^2= .89, p= .35). The model better fit victims of neglect (AIC= -1.71) or sexual maltreatment (AIC= -1.74) than victims of physical maltreatment (AIC= 1.01) or multiple maltreatments (AIC= -1.11). Hypothesis 6 was partially supported.

Post Hoc Analyses

Youths at highest risk for PTSD symptoms based on multiple risk factors were examined on an exploratory basis via Hotelling's T values retrieved from a MANOVA analysis. As expected, analyses revealed that older African American or multiracial youths had significantly more PTSD symptoms (*M*= 13.80, *SD*= 5.60) than younger Caucasian or Hispanic youths (*M*= 10.89, *SD*= 5.97; F (1, 143)= 7.27, *p*= .008). Additionally, older youths who experienced sexual maltreatment had significantly more PTSD symptoms (*M*= 14.61, *SD*= 5.62) than younger youths who experienced physical maltreatment (*M*= 11.50, *SD*= 6.17; F(1, 173)= 11.88, *p*= .001). However, total depression, posttraumatic cognitions, and dissociation scores did not differ by ethnicity, age, or type of maltreatment (Tables 2 and 3).

Subsequent exploratory analyses were conducted to assess whether gender contributed to variations in PTSD symptoms across high-risk youths. Older female victims of sexual maltreatment or neglect had significantly more PTSD symptoms (*M*= 15.04, *SD*= 5.63) than older male victims of sexual maltreatment or neglect (*M*= 11.44, *SD*= 5.22). Posttraumatic cognitions and dissociation scores did not differ between groups, but female victims had significantly higher depression scores (*M*= 13.89, *SD*= 10.20) than male victims (*M*= 9.87, *SD*= 8.38; F(1, 134)= 4.73, *p*= .031) (Table 4). Additionally, older African American or multiracial females had significantly more PTSD symptoms (*M*= 11.79, *SD*= 5.41) than older African American or multiracial males (*M*= 11.87, *SD*= 5.53; F(1, 103)= 6.27, *p*= .014). Total depression, posttraumatic cognitions, and dissociation scores did not differ across genders (Table 5).

CHAPTER 5:

DISCUSSION, CONCLUSIONS, RECOMMENDATIONS

Discussion of Results

The present study had two aims. The first aim was to examine a model of PTSD in which dissociation, depression, and posttraumatic cognitions related to greater PTSD symptoms among a large, gender-balanced, sample of ethnically diverse maltreated youths. The second aim was to evaluate the model's fit with respect to individual differences across ethnicity, intelligence, gender, age group, and type of maltreatment experienced.

First Aim: Predictive Model of PTSD

Dissociation, depression, and posttraumatic cognitions were expected to relate to PTSD symptoms for maltreated youths. Results supported this hypothesis. Past research has largely focused on depression as a strong psychological risk factor for PTSD among traumatized youths (Kearney et al., 2010; Lemos-Miller & Kearney, 2006). However, results of this study also highlight the important roles of dissociation and posttraumatic cognitions in contributing to PTSD symptoms for this population.

Dissociation. Dissociation was associated with higher levels of PTSD symptoms for maltreated youths. This finding is consistent with previous research and suggests that dissociative symptoms may exacerbate posttraumatic symptoms among individuals who have experienced traumatic victimization like childhood maltreatment (Carrion & Steiner, 2000; Perry, 1994). Youths often employ dissociation, which is characterized by avoidance, emotional detachment, and a failure to integrate memories pertinent to a

specific traumatic event, as a temporary coping strategy following maltreatment (Marshall & Schell, 2002; Shalev, 1997).

Youths that are unable to subsequently implement effective coping strategies may continue to manifest dissociative symptoms to alleviate persistent posttraumatic symptoms. However, chronic dissociative symptoms are associated with emotional and cognitive dysregulation, which hinders a youth's ability to adaptively confront and process a traumatic experience (Briere & Scott, 2006; Lemos-Miller & Kearney, 2006; Macfie et al., 2001). Additionally, persistent dissociation often interferes with positive peer interactions and the cultivation of developmentally appropriate social skills, thereby leading to lower self-esteem, increased social isolation, and heightened risk for greater PTSD symptomatology (Ayoub et al., 2006; Briere, 2006; Johnson et al., 2001). Dissociative symptoms such as poorly integrated trauma memory, avoidance, emotional dysregulation, and weak social skills may heighten PTSD symptoms for maltreated youths by reducing the likelihood that they seek treatment for their symptoms. Additionally, dissociative symptoms may bolster a maltreated youth's risk for developing comorbid psychopathology, principally depression.

Depression. Depression was also associated with a more severe PTSD symptom presentation for maltreated youths. Depressive and posttraumatic symptoms share many features and may reinforce one another following traumatic exposure. Youths that manifest depressive symptoms following maltreatment may be at increased vulnerability for posttraumatic symptoms because factors that contribute to depression, such as negative cognitive schemas, HPA axis dysfunction, and emotion dysregulation, also

underlie and maintain PTSD (Ariga et al., 2008; Ford, 2005; Kearney et al., 2010; Kolko et al., 2010; Lemos-Miller & Kearney, 2006).

Depressive symptoms may also heighten posttraumatic symptoms for victimized youths. Maltreated youths with comorbid PTSD and depression report higher levels of posttraumatic symptoms, particularly intrusive symptoms (e.g., flashbacks and sleep disturbances), than youths with PTSD only (Runyon et al., 2002). Youths with both disorders may be less likely to mentally avoid their emotional distress, which, in the absence of effective coping strategies, may strengthen their perceived ineffectiveness and hopelessness. This hopelessness, in turn, may prompt youths to continue implementing maladaptive coping strategies such as thought suppression or social isolation, thereby increasing and maintaining depressive and posttraumatic symptoms (Kleim, Ehlers, & Glucksman, 2012).

Posttraumatic Cognitions. The model in the present study also demonstrated that negative trauma-related cognitions are associated with higher levels of posttraumatic symptoms for maltreated youths. Cognitive distortions, including negative thoughts about self, negative thoughts about the world, and self blame, significantly impact PTSD symptom levels for maltreated youths and have been linked with re-experiencing, avoidance/numbing, increased arousal, and distress (Lemos-Miller & Kearney, 2006; Linning & Kearney, 2004; Muller & Lemieux, 2000). Additionally, posttraumatic cognitive distortions, particularly holding a negative view of oneself, in tandem with depressive symptoms are robustly associated with higher levels of PTSD symptoms following maltreatment (Diehl & Prout, 2002; Runyon & Kenny, 2002).

Youths who develop a pessimistic explanatory style, characterized by negative inferences about the cause and consequences of their traumatic experience, may be more likely to display self-blame, hopelessness, and less self-efficacy following maltreatment (Kleim et al., 2012). In turn, such youths may be more likely to manifest and maintain greater levels of posttraumatic and depressive symptomatology. Also, youths with negative trauma-related cognitions often employ maladaptive cognitive coping strategies to alleviate their distress, such as rumination or dissociation, which paradoxically heightens PTSD and depressive symptomatology (Ehlers, Maercker, & Boos, 2000). Negative posttraumatic cognitions are also associated with poor self-esteem, emotional dysregulation, and social isolation, all of which contribute to depressive and dissociative symptoms (Ayoub et al., 2006; Kearney et al., 2010).

Second Aim: Individual Differences

The second aim of this study was to evaluate the applicability of the original model across variations in youth intelligence, gender, age group, ethnicity, and type of maltreatment experienced. These variables have been associated with PTSD for some maltreated youths, but their influence on symptom manifestation and expression across cognitively and demographically diverse youths is not well understood. Thus, this study sought to examine the contributions of these factors to PTSD symptoms among maltreated youths.

Intelligence. The original model was expected to have better fit for youths with low intelligence (FSIQ = 55 – 84) than average intelligence (FSIQ = 85 - 114). The model met goodness-of-fit for both groups, and the difference in model fit between groups was small. Thus, results did not support this hypothesis. This finding also does

not support prior research, which has found an inverse relationship between intellectual functioning and PTSD symptoms for victims of childhood trauma (Bucker et al., 2012; De Bellis et al., 2009; Saltzman et al., 2006; Sullivan et al., 2008).

Several factors may contribute to the inconsistency between present findings and past research. First, the present study evaluated intelligence dichotomously (youths were classified as having low intelligence or average intelligence based on WISC-IV cut-offs). Specific IQ scores were not evaluated independently because of small sample size. Thus, present results may underestimate the importance of intelligence in a model of PTSD in maltreated youths.

Second, the majority of studies examining the relationship between IQ scores and PTSD symptoms have relied on retrospective self-reports of adults who experienced a traumatic event during childhood (Bremner et al., 2004; Saigh et al., 2006). The present study did not rely on such methods. The discrepancy between this study's findings and prior research may therefore indicate that the relationship between IQ scores and PTSD symptomatology varies by age. Moreover, definitions of intelligence differ throughout the extant research. In addition to IQ scores, intellectual functioning has been operationalized as academic achievement, language skills, visual spatial learning and memory, and attention/executive functioning abilities (Bremner et al., 2004; De Bellis et al., 2009; De Bellis et al., 2010; Saltzman et al., 2006; Samuelson et al., 2010). Conclusions about the role of intelligence on PTSD symptoms should therefore be interpreted cautiously.

Finally, the negative effects of childhood trauma on intellectual functioning may manifest as deficits in cognitive skills rather than lower IQ scores. Childhood

maltreatment is associated with weaknesses in abstract reasoning, problem solving, mental flexibility, and executive functioning (Beers & De Bellis, 2002; Wekerle et al., 2012). Impairments in these areas may increase the likelihood that a maltreated youth would implement maladaptive coping strategies (i.e., dissociation or rumination on negative trauma-related cognitions), thereby increasing their risk for greater depressive and PTSD symptoms when those coping techniques fail. Whether intelligence functions as a potential risk or protective factor in the development of PTSD symptoms for maltreated youths remains unclear.

Gender. The original model was expected to have better fit for females than males. Results did not support this hypothesis. The model met goodness-of-fit for both groups and the difference in the model's fit between males and females was small. Prior research has consistently found that females report greater trauma-related symptoms than males (Greenwald et al., 2002; Gwadz et al., 2007; Tolin & Foa, 2006; Wolfe, Scott, Wekerle, & Pittman, 2001). A similar gender effect has also been demonstrated for youth victims of maltreatment (Feiring et al., 1999; Ullman & Filipas, 2005). However, the majority of studies evaluating gender differences in maltreatment-related PTSD symptoms have utilized small samples of sexually maltreated youths (Caffo et al., 2005; Walker et al., 2004; Wolf et al., 1994). Sexual maltreatment is grossly underreported in males due to associated social stigma, such that research on male victims of sexual maltreatment is limited (Wolfe, 2006).

Findings from the present study suggest that posttraumatic cognitions, dissociation, and depression are similarly related to PTSD symptoms for males and females across a range of maltreatment types and other demographic factors (i.e., gender

was not a unique predictor of PTSD symptoms for the present sample). This suggests that, contrary to popular belief, being female may not be an independent risk factor for greater maltreatment-related PTSD symptoms.

However, exploratory analyses revealed that gender was associated with significant differences in PTSD symptoms when combined with other individual factors (i.e., maltreatment type, ethnicity, and age), in that male status weakened the relationship between trauma-related cognitions, dissociation, depression, and PTSD symptoms for highest risk youths. Specifically, older female victims of sexual maltreatment or neglect were associated with significantly higher PTSD symptom levels than male victims of sexual maltreatment or neglect, and older multiracial or African American females were associated with greater PTSD symptom levels than demographically similar males. This suggests that the inconsistency between the present study's findings and past research may be due to the large, demographically heterogeneous, sample used by the present study to test the original model of PTSD.

These findings may highlight a discrepancy in our present understanding of gender and maltreatment-related PTSD symptomatology. Specifically, results of the present study suggest that only certain females are at heightened risk for greater PTSD symptoms following maltreatment, which opposes the widely accepted notion that female gender, in itself, is an independent risk factor for PTSD. Results of the present study suggest that being female may be associated with greater PTSD symptom levels only for those youths already at high risk for manifesting the disorder based on other factors. Further research examining the influence of gender on PTSD symptoms, especially in

combination with other potential risk factors, is necessary considering the present study's findings.

Age group. The original model was expected to have better fit for younger youths (9–13 years) than older youths (14–18 years). Results did not support this hypothesis, as the model only met goodness-of-fit for older youths. Moreover, the difference in model fit between groups was large, such that it better fit older youths than younger youths. The inconsistent findings between the present study and past research may be due to the constructs associated with heightened PTSD symptoms. Specifically, dissociation and posttraumatic cognitions require a high-level of cognitive maturity and introspective awareness, both of which may be poorly developed among younger youths. The present study results suggest that depressive symptoms, dissociative symptoms, and negative trauma-related cognitions may not be associated with PTSD symptom levels for younger youths following maltreatment. That is, depression, posttraumatic cognitions, and dissociation may only place older maltreated youths at greater risk for heightened PSTD symptoms.

Advanced cognitive capabilities might enable older youths to more fully assess the gravity of their maltreatment experience and subsequently engage in maladaptive compensatory strategies, such as substance use, to cope with their resultant negative emotions (Arata et al., 2007; Maniglio, 2011). Older youths may also be more likely to manifest comorbid symptomatology and develop a foreshortened sense of future in response to their traumatic experience (Davis & Siegel, 2000; Dyregov & Yule, 2006). Furthermore, older youths may be more likely to harbor beliefs that they are socially undesirable following maltreatment, thus making them more prone to experiencing weak

peer relationships, rejection, and social isolation than younger youths (Dyregov & Yule, 2006).

Finally, older youths may be better able to report their symptoms than younger youths, thereby making them more likely to receive accurate diagnoses and endorse higher levels of PTSD symptoms. Conversely, younger youths may struggle to articulate their symptoms and other aspects of their maltreatment-related distress. Younger youths are also more likely to mimic their parents' reaction to a traumatic event than older youths, which may impact maltreatment-related PTSD symptom presentations given that many youths experience maltreatment from a parent or close family member (Salmon & Bryant, 1999; Shaw et al., 2012). The present findings provide support for expanding research on age and PTSD symptom levels and suggest that assessments of PTSD for younger youths should not rely solely on self-report instruments.

Ethnicity. The original model was expected to have better fit for multiracial, African American, and Hispanic youths than Caucasian youths. The model met goodness-of-fit for all ethnicities, but better fit was found among African American and multiracial youths than Caucasian and Hispanic youths. Thus, results partially supported this hypothesis.

Prior research evaluating the influence of ethnicity on PTSD symptoms for maltreated youths is limited and inconsistent, with the exception that Caucasian youths typically manifest fewer symptoms than ethnic minority youths (Elliott & Urquiza, 2006; Khaylis et al., 2007; Triffleman & Pole, 2010; Westby, 2007). The present study found that African American or multiracial status strengthened the relationship between trauma-related cognitions, depression, dissociation, and PTSD symptoms for maltreated youths.

This supports previous research implicating African American and multiracial status as possible risk factors for negative outcomes, including PTSD, for victimized youths (Andres-Hyman et al., 2004; Kearney et al., 2010; Paxton et al., 2004). As predicted, the present study also found that Caucasian status weakened the relationship between depression, dissociation, posttraumatic cognitions, and PTSD symptoms, but, unexpectedly, so did Hispanic status. Caucasian status and Hispanic status emerged as potential protective factors against PTSD symptoms for maltreated youths.

Ethnic minority youths may be at heightened risk for maltreatment and PTSD symptoms due to higher rates of poverty and discrimination, as well as cultural beliefs about disciplining and child rearing practices (Triffleman & Pole, 2010; Tummala-Narra, 2007; Westby, 2007). In particular, Hispanic youths are especially likely to manifest PTSD symptoms following maltreatment due to cultural and religious ideals regarding sexuality, family unity, and financial stability (Fluke et al., 2003; Moissan et al., 1997; Price et al., 2013). However, other cultural and religious beliefs often endorsed by ethnic minority groups (e.g., church attendance and reliance on extended family networks) may act as buffers against psychopathology and enhance resiliency among victimized youths (Murray et al., 2001; Sanders et al., 1995; Triffleman & Pole, 2010). The influence of such beliefs on PTSD symptoms was not assessed in the present study and may underlie the unexpected finding. Specifically, Hispanic youths in the present study may possess more of the aforementioned cultural protective factors than African American or multiracial youths, thereby weakening their likelihood of manifesting severe PTSD symptom levels following maltreatment. Moreover, the expression of trauma-related symptoms may differ across ethnic minority groups, such that traditional instruments

used to assess PTSD and comorbid symptomatology may fail to demonstrate cultural sensitivity for certain groups (Murray et al., 2001; Shen, 2009; Tummala-Narra, 2007).

Much remains unknown with respect to the relationship between ethnic group membership and PTSD symptom levels for maltreated youths (Lemos-Miller & Kearney, 2006). Results of the present study emphasize the need to explore specific cultural beliefs and attitudes, rather than ethnic group membership, as possible contributors to heightened PTSD symptoms for maltreated minority youths (Triffleman & Pole, 2010). Minority status alone does not appear to be reliably associated with greater PTSD symptomatology.

Maltreatment Type. The original model was expected to have better fit for victims of sexual maltreatment than victims of physical maltreatment, multiple forms of maltreatment, or neglect. The model met goodness-of-fit for all maltreatment types, but better fit was found for victims of sexual maltreatment and neglect than victims of physical maltreatment or multiple forms of maltreatment. Thus, results partially supported this hypothesis.

Present findings support previous research indicating that sexual maltreatment is associated with high levels of PTSD symptoms for victimized youths (Briscoe-Smith & Hinshaw, 2006; Colin-Vezina & Hebert, 2005; Gwadz et al., 2007; Kendell-Tackett et al., 1993; Runyon & Kenny, 2002). Specifically, sexual maltreatment strengthened the relationship between depression, dissociation, posttraumatic cognitions, and PTSD symptoms in the present study but, unexpectedly, so did neglect. That is, both sexual maltreatment and neglect emerged as salient risk factors for greater PTSD symptoms among maltreated youths. Research has consistently found that sexually maltreated

youths display higher levels of re-experiencing, avoidance, and hyperarousal symptoms than victims of other forms of maltreatment (Deblinger et al., 1989; Hulette et al., 2008). Additionally, sexual traumas are characterized by several factors that have been consistently associated with increased risk for PTSD, including close physical and emotional proximity to the perpetrator, lack of support by caregivers, and personal space violations (De Bellis & Thomas, 2003; Hart & Rubia, 2012; Pine & Cohen, 2002; Romero et al., 2009).

Conversely, little is known about the relationship between neglect and PTSD symptoms (Kolko et al., 2010; Taft et al., 2008). However, youth victims of chronic maltreatment report more peer difficulties, lower self-esteem, and greater social isolation than victims of acute maltreatment (Bolger & Patterson, 2003; De Bellis et al., 1999). Neglected youths may therefore be more likely to implement maladaptive coping strategies, such as dissociation or rumination about negative trauma-related cognitions, given their limited social networks and peer support.

Additionally, research suggests that exposure to a prolonged interpersonal trauma is associated with a high incidence of problems with affect regulation, self-perception, memory, and attention (Cook et al., 2005; Van der Kolk et al., 2005). Neglected youths may therefore be at greater risk for depression, dissociation, and trauma-related cognitions than victims of other forms of maltreatment given that the nature of their traumatic experience is typically ongoing and persistent. As previously discussed, depressive symptoms, dissociative symptoms, and negative posttraumatic cognitions appear to reinforce and intensify PTSD symptoms for certain maltreated youths. The present results provide evidence that different forms of maltreatment do not influence

PTSD symptom levels equally, and lends further support for expanding the limited research on neglected youths.

Clinical Implications

The present study may have implications for assessing and treating youths at highest risk for a severe PTSD symptom presentation following maltreatment. Youths who have experienced maltreatment are at elevated risk for symptoms of PTSD and comorbid psychopathology, but some youths appear to be at much greater risk for adverse outcomes than others. This study highlights several key factors to consider when assessing and treating maltreated youths.

Assessment. Clinicians who assess maltreated youths should always screen for PTSD symptoms. Additionally, results of the present study suggest that clinicians should thoroughly assess for posttraumatic cognitions and symptoms of comorbid psychopathology, particularly dissociation and depression, when trauma exposure is endorsed or suspected (Ariga et al., 2008; Saigh et al., 2002). Youth assessment should include observation of the child with caregivers, a clinical interview, and self-report measures evaluating daily functioning and symptoms associated with PTSD (Crooks & Wolfe, 2007). Clinicians should attempt to garner information about the youth from as many sources as possible (e.g., parents, teachers, guardians) and use multiple methods to assess overall functioning after maltreatment (Sheeringa, Wright, Hunt, & Zeanah, 2006).

Clinical interviews are often the most effective method for gathering information about a child's trauma history, trauma-related symptoms, and general level of functioning (Azar & Wolfe, 2006; Silverman & Ollendick, 2005). However, a clinician must develop rapport and trust with a maltreated youth prior to conducting a clinical interview given

the sensitive nature of the topic. Trauma-exposed youths are often reluctant to disclose their experience, so interviewers may need to meet with the child numerous times to thoroughly build rapport (Crooks & Wolfe, 2007). Furthermore, findings from the present study underscore the importance of culture and ethnicity in PTSD symptom presentations, such that interviewers should strive to build rapport in a manner that is respectful and culturally sensitive. Once trust is established, the interviewer should empathically, but directly, ask youths about specific maltreatment experiences, as it is important that they are given the opportunity to discuss traumatic experiences in their own words (Becker-Blease & Freyd, 2006). Semi-structured interviews, such as the CPTSD-I (Saigh, 1998), enable clinicians to properly diagnose PTSD while also allowing for open-ended discussions and follow-up questions.

Findings from the present study highlight the need to focus interview questions on trauma-related symptoms in addition to specific diagnostic criteria. Additionally, recent research suggests the importance of garnering information about the severity of a youth's maltreatment experience (Jackson et al., 2014). Clinicians should also be mindful of youths' behaviors in addition to their verbal responses. Nonverbal behaviors often provide important clues about a youth's symptoms and can help clinicians identify pertinent follow-up questions. In particular, results of the present study suggest that clinicians should be especially vigilant in monitoring younger youths' nonverbal behaviors throughout the interview, because such youth's may lack the ability to clearly articulate their maltreatment experience.

Self-report measures may also provide helpful information to clinicians. The present study did not use self-report measures of PTSD, but such instruments may be

particularly beneficial when assessing youths who are hesitant to speak about their traumatic experience. Numerous trauma questionnaires are available, such as the Child PTSD Symptom Scale (Foa, Johnson, Feeny, & Treadwell, 2001), which evaluates the severity of PTSD in children and adolescents, and the Trauma Symptom Checklist for Children (Briere, 1996), which assesses traumatic exposure and resultant symptomatology in youths. Clinicians should select a self-report instrument based on each youth's particular trauma history and experience (Silverman & Ollendick, 2005). However, the present study's findings demonstrate the importance of comprehensive assessments when evaluating demographically diverse maltreated youths.

Self-report measures may also reveal critical information about other trauma-related symptoms, such as dissociation, depression, and negative posttraumatic cognitions. Findings of the present study underscore the importance of evaluating these symptoms when assessing maltreated youths because they provide valuable information about youths at heightened risk for PTSD symptoms. The CDI (Kovacs, 1992) is frequently utilized as a measure of depression for youths because it yields information about self-esteem, anhedonia, negative mood, and interpersonal problems in addition to a global depression score. The present study's findings suggest that youths with few depressive symptoms may be at lower risk for PTSD symptoms than youths with high levels of depression. Thus, depressive symptom levels may function as a barometer of PTSD symptoms.

Similarly, the present study highlights the importance of measuring dissociation when assessing trauma-exposed youths. Lower levels of dissociation, as measured via the A-DES (Armstrong et al., 1997), were associated with fewer PTSD symptoms for

maltreated youths and may indicate resilience. Conversely, higher levels of dissociation may be associated with more severe PTSD symptom presentations, especially for victims of chronic maltreatment. Findings of the present study also reveal an important relationship between posttraumatic cognitions and PTSD symptoms. The PTCI (Foa et al., 1999) assesses negative trauma-related cognitions in terms of self-blame, thoughts about the world, and thoughts about self. Results of the present study suggest that maltreated youths with lower PTCI scores may be associated with fewer PTSD symptoms, whereas youths with higher scores may be at particular risk for a severe PTSD symptom presentation. Clinicians should therefore routinely screen for dissociative symptomatology and negative trauma-related cognitions when assessing maltreated youths.

Present findings also indicate that individual factors, including ethnicity, age group, gender, and the type of maltreatment experienced, are pivotal to consider when assessing maltreated youths. Specifically, this study suggests that older (aged 14-18 years) females who are African American or multiracial, or a victim of neglect or sexual maltreatment, are at the greatest risk for high PTSD symptom levels following maltreatment. Clinicians are thus urged to collect information about these and other individual factors when assessing maltreated youths because they may impact youth risk and resilience.

Treatment. The present study suggests that depression, dissociation, and negative posttraumatic cognitions may impact PTSD symptoms for maltreated youths. Interventions to reduce PTSD symptoms and distress should therefore also target these comorbid symptoms. Various interventions, including anxiety management,

psychoeducation, cognitive restructuring, and coping skills training, can help address these symptoms and should be used when treating demographically diverse maltreated youths (Cohen et al., 2004; Cohen et al., 2006; Deblinger et al., 1999; Kearney et al., 2010). Trauma-focused cognitive behavioral therapy (TF-CBT) (Cohen & Mannarino, 1993) is a combination of these and other techniques that targets PTSD symptoms stemming from child maltreatment and other childhood traumas. TF-CBT is empirically supported and considered by many to be the gold standard treatment for trauma-exposed youths.

TF-CBT was originally developed for sexually maltreated youths and their non-offending caregivers, but has since been adapted for victims of other traumatic experiences (Cohen & Mannarino, 2006). This 12-16 session intervention is effective for behavioral and emotional symptoms among ethnically diverse youths aged 3-18 years (Weiner, Schneider & Lyons, 2009) and is among the few interventions designed specifically for maltreated youths. TF-CBT consists of three phases. The first phase includes the child and parents and involves psychoeducation about trauma, reactions to trauma, PTSD, coping techniques, and emotion identification and regulation. The second phase involves developing a trauma narrative, which enables youths to emotionally and cognitively process their traumatic experience in a way that is adaptive and meaningful. The last phase focuses on safety, prevention, and ways in which a youth could implement the skills learned in phases one and two if exposed to another traumatic event. Treatment gains from TF-CBT have been found to persist upwards of 12 months (Grasso et al., 2011).

The present study found that depression, dissociation, and negative posttraumatic cognitions are associated with greater PTSD symptoms for maltreated youths, but that the influence of these trauma-related symptoms on PTSD symptom levels varies based on individual characteristics of the child and the maltreatment experience. Specifically, older ethnic minority youths (with the exception of Hispanic youths) and older victims of sexual maltreatment or neglect who present to treatment with high levels of PTSD symptoms may be likely to also experience comorbid negative trauma-related cognitions, dissociation, and depression. Thus, interventions for maltreated youths should address these trauma-related symptoms in addition to PTSD symptomatology. TF-CBT has been shown to decrease symptoms of depression and dissociation and improve youths' coping skills and overall functioning (Cohen et al., 2004; Cohen et al., 2006; Deblinger et al., 1999).

Findings of the present study also underscore the importance of individual variables, such as age and ethnicity, on PTSD and other trauma-related symptoms. Trauma-exposed youths may therefore require different interventions depending on demographic factors or the type of maltreatment experienced. For example, interventions that focus on attachment and parent variables may be most appropriate for very young children. Child-parent psychotherapy (CPP) (Lieberman, Ippen, & Van Horn, 2006) is a well-supported intervention for ethnically diverse youths who have experienced trauma such as maltreatment. CPP aims to improve the overall functioning of trauma-exposed youths by bolstering parent-child relationships and restoring a child's sense of safety (Lieberman, Chu, Van Horn, & Harris, 2011). Conversely, older youths, especially those with extensive maltreatment experiences and severe PTSD symptom presentations, may

benefit from dialectical behavior therapy (Fleischhaker et al., 2011; Linehan, Armstrong, Suarez & Allmon, 1991; Perepletchikova et al., 2011) that includes techniques like mindfulness and emotion regulation to target trauma-related symptoms and distress. However, research on the efficacy of this intervention with maltreated youths is limited (James, Winmill, Anderson, & Alfoadari, 2011).

Limitations

Findings from the present study should be considered with caution due to various limitations. First, this study relied on DFS records, youth interviews, and self-reports. Previous caregivers and parents were unavailable for interview and DFS reports may have been incomplete. For example, participants were often unable to report certain variables such as their parent's income, education, and employment. Thus, confounding effects could not be assessed due to limited information. Furthermore, youth self-reports may have been impacted by forgetfulness or failure to communicate a complete maltreatment history. Findings may have therefore been limited with respect to accuracy of maltreatment history. However, the interview (CPSTD-I) used to evaluate trauma history and PTSD symptoms has consistently demonstrated excellent reliability and validity, and the Cronbach's alpha for the present study was .91.

A second limitation was the potential effects of traumatic experiences other than maltreatment. Many youths in the present study experienced multiple traumatic events in addition to being removed from their homes. Though participants were evaluated for numerous types of maltreatment, the effects of non-maltreatment related traumatic exposure (e.g., witnessing domestic violence) and residential removal were not accounted for during analyses. Furthermore, no information with respect to maltreatment frequency

was obtained. A recent study, however, revealed that frequency of maltreatment was not predictive of behavioral outcomes (Jackson et al., 2014).

Third, the cross-sectional design and restricted age range (9-18 years) limit the findings. The present findings cannot be applied to youths younger than 9 years of age. Also, participants were grouped as older or younger based on whether they would typically be attending middle school or high school. Numerous developmental changes occur between these periods in terms of a youth's independence, cognitive maturity, and peer reliance. Future research may therefore reveal that certain ages are more robustly associated with heightened PTSD symptom levels following maltreatment than other ages. Each age was not evaluated independently in the present study because of sample size concerns.

Fourth, findings with respect to the role of ethnicity on trauma symptoms should be considered cautiously because information on participant ethnicity was solicited via self-report. Younger youths in particular may have been unsure of their ethnic background. There was also variability in the multiracial sample in terms of participants' ethnic backgrounds. Specifically, multiracial participants were included in analyses as a unitary group despite variations in ethnic backgrounds. Multiracial sub-groups were not evaluated independently due to sample size concerns.

Fifth, this study utilized a convenience sample, such that generalizability to other settings and populations is unclear. In particular, youths in the present study experienced a level of maltreatment sufficiently severe to warrant removal from their homes and placement in the foster care system or with an approved caregiver. Youths whose

maltreatment exposure did not meet DFS requirements for residential removal may have experienced PTSD symptoms but were not available for the present study.

Recommendations for Future Research

Future research evaluating factors associated with heightened levels of PTSD symptoms for maltreated youths should address these limitations. Researchers should gather information about demographics, maltreatment history, and other potential symptom contributors from multiple informants. Information garnered via youth self-report should be bolstered by interviews and, when possible, standardized measures. Researchers should also collect information about maltreatment severity because PTSD symptoms and developmental outcomes may differ across mild and severe cases of maltreatment (Jackson et al., 2014).

Research evaluating the impact of residential removal and non-maltreatment-related traumatic exposure is also needed. Specific PTSD symptom presentations may vary depending on whether a youth experienced maltreatment in tandem with another traumatic experience or in isolation (De Bellis, 2001; Kearney et al., 2010). Researchers should also evaluate the impact of intra-familial versus extra-familial maltreatment on pediatric PTSD symptoms to determine whether symptom levels vary as a function of a youth's relationship with the perpetrator.

Researchers should also continue to examine why certain maltreated youths are at higher risk for a more severe PTSD symptom presentation than others considering the preliminary findings in this study. In particular, future studies should attempt to identify why youths who are older (aged 14-18 years), multiracial or African American, and victims of sexual maltreatment or neglect may be at highest risk for PTSD symptoms

following maltreatment. Researchers should thus strive to identify specific factors that contribute most robustly to severe PTSD symptoms for highest-risk youths. Identification of such factors may provide researchers with valuable information about patterns of risk among maltreated youths, and ultimately better inform assessment and prevention practices for this population.

Moreover, few studies have evaluated specific characteristics associated with resiliency and positive outcomes for maltreated youths, such that information on this topic is largely speculative. Information regarding maltreatment severity, peer relationships, and removal history might help clinicians and researchers better understand possible symptom patterns in youths who do not manifest PTSD symptoms following maltreatment. Additionally, obtaining detailed information about familial routines and practices (e.g., parenting strategies and disciplining) might help researchers identify other factors associated with fewer PTSD symptoms for maltreated youths as well as clarify cultural protective factors for ethnic minority youths.

Finally, evaluating narrower aspects of depression, dissociation, and posttraumatic cognitions (i.e., on the subscale or item level) may enable researchers and clinicians to more accurately identify which demographically at-risk youths are most likely to manifest severe PTSD symptomatology following maltreatment. This information might help inform screening and assessment practices and more speedily connect highest risk youths to intervention services.

APPENDIX I

Information Sheet

Please fill this sheet out completely. The information you provide will be given a number so you name will not be on any papers you fill out. Please feel free to skip an item if you don't feel comfortable answering, but please try to honestly answer all questions the best you can.

1. Your ID#: _____

2. Your age: _____

3. Are you: (circle one) Male Female

4. Your Race: (circle one) Asian African-American Caucasian Hispanic Multiracial

   Native American Other_____

5. Place of birth (state, and country): _____

   a. If you were not born in the United States, what country were you born in? _____

6. Biological mother's race/ethnicity:_____

7. Biological mother's place of birth: _____

8. Biological father's race/ethnicity: _____

9. Biological father's place of birth: _____

10. Did mother/guardian graduate from high school? Yes No

    a. How many years did mother/guardian go to college or trade school after high school? _____

11. Did father/guardian graduate from high school? Yes No

    a. How many years did father/guardian go to college or trade school after high school? _____

12. What kind of work does mother/guardian do? _____

13. What kind of work does father/guardian do? _____

14. How many brothers and sisters do you have? _____

15. Are your parents/guardians married now? (circle one)

Married Never married Separated Divorced

16. If your parents/guardians are separated or divorced, who has custody of you? (circle one)

Joint custody (both parents) Mother has custody Father has custody

17. Have you ever used alcohol or drugs? Yes No

18. Does your family participate in religion on a regular basis? Yes No

19. Are you religious? Yes No

20. Is English the first language you learned? Yes No

20a. If English is not the first language you learned, what language did you first learn? _____

21. Please list all the languages you are fluent in (e.g., English, Spanish, etc.)

_____

22. What language do you primarily speak in your home?

_____

APPENDIX II

Table 1

Pearson Correlation Coefficients Among All Variables

Variables	PTSD Sx	A-DES	CDI	PTCI	Ethnicity	Gender
PTSD Sx	-					
A-DES	.50**					
CDI	.58**	.63**				
PTCI	.60**	.68**	.73*			
Ethnicity	.10	.01	.08	.06		
Gender	-.22**	-.07	-.16**	-.11	-.06	
Age	-.01	.02	.01	.02	.06	-.09
Phys. Maltr.	.09	-.05	-.02**	-.07	.05	.001
Sex Maltr.	-.22**	-.06	-.15*	-.11	-.11*	.29**
Sex Viol.	-.18**	-.06	-.13**	-.11	-.14*	.28**
Neglect	.01	.01	-.01	-.07	-.16**	-.20**
WISC-IV	-.23*	-.36**	-.30**	-.30**	-.02	-.22*

Note. PTSD Sx = CPTSD-I Total Symptom Score, A-DES = Dissociation Total Score, CDI = Depression Total Score, PTCI = Posttraumatic Cognitions Total Score, Phys. Maltr. = Victim of Physical Maltreatment, Sex Maltr = Victim of Sexual Maltreatment by family member, Sex Viol = Victim of Sexual Maltreatment by nonfamily member or same-aged peer, Neglect = Victim of Neglect, WISC-IV = Full Scale IQ Score. * = $p < .05$, ** = $p < .01$

Variables	Age	Phys. Maltr.	Sex Maltr.	Sex Viol.	Neglect	WISC-IV
PTSD Sx	-					
A-DES						
CDI						
PTCI						
Ethnicity						
Gender						
Age						
Phy. Maltr.	.05					
Sex Maltr.	-.21**	-.14**				
Sex Viol.	-.16**	-.05	.22**			
Neglect	.12*	-.22**	-.19**	-.05		
WISC-IV	-.25**	.03	-.03	.09	-.08	-

Table 2

Mean Total Scores for Low Risk and High Risk Youths by Age and Ethnicity

	Older African American or Multiracial Youths (High Risk)	Younger Caucasian or Hispanic Youths (Low Risk)
PTSD Symptoms	13.81 (5.60)*	10.89 (5.97)*
Depression	12.18 (9.30)	10.81 (8.41)
Dissociation	70.03 (62.06)	77.10 (64.71)
Posttraumatic Cognitions	97.39 (40.64)	83.97 (42.12)

*$p < .01$

Table 3

Mean Total Scores for Low Risk and High Risk Youths by Age and Maltreatment Type

	Older Victims of Sexual Maltreatment (High Risk)	Younger Victims of Physical Maltreatment (Low Risk)
PTSD Symptoms	14.61 (5.62)*	11.50 (6.17)*
Depression	12.86 (10.43)	11.03 (9.14)
Dissociation	77.42 (69.71)	69.50 (55.94)
Posttraumatic Cognitions	97.50 (47.82)	89.27 (42.78)

*$p < .01$

Table 4

Mean Total Scores for Older Victims of Sexual Maltreatment or Neglect by Gender

	Older Male Victims of Sexual Abuse or Neglect	Older Female Victims of Sexual Abuse or Neglect
PTSD Symptoms	11.44 (5.22)**	15.04 (5.63)**
Depression	9.87 (8.38)*	13.89 (10.20)*
Dissociation	64.63 (55.08)	80.39 (72.31)
Posttraumatic Cognitions	91.15 (37.67)	100.75 (49.02)

*$p < .05$. **$p < .01$

Table 5

Mean Total Scores for Older African American or Multiracial Youths by Gender

	Older African American or Multiracial Males	Older African American or Multiracial Females
PTSD Symptoms	11.87 (5.53)*	14.79 (5.41)*
Depression	9.93 (8.40)	13.52 (9.49)
Dissociation	70.90 (62.16)	71.08 (62.78)
Posttraumatic Cognitions	96.30 (41.10)	99.08 (40.79)

*$p < .05$

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VITA

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Education

August 2012-Present	Master of Arts in Psychology	University of Nevada, Las Vegas
May 2012	Bachelor of Science in Psychology *summa cum laude*	Tulane University

Honors and Awards

2014	Association for Psychological Science Student Research Award	San Francisco, CA
2014	Liberal Arts Ph.D. Student Summer Faculty Research Award	University of Nevada, Las Vegas
2012	Phi Beta Kappa	Tulane University
2011	International Golden Key Honor Society	Tulane University
2009	The National Society of Collegiate Scholars	Tulane University
2009	Dean's List (2009-2012)	Tulane University

Clinical Experience

August 2013 – Present **Doctoral Practicum Student**
The UNLV PRACTICE Clinic
Primary Supervisor: **Christopher Kearney, Ph.D.**

Conducted assessments and provided therapy to adults, children, and families with various psychological and interpersonal difficulties at the on-campus training community clinic. Primary diagnoses include Obsessive Compulsive Disorder, Conduct Disorder, Dissociative Identity Disorder, Selective Mutism, Adjustment Disorder, and PTSD. Received weekly individual and group supervision. Used a cognitive behavioral therapy approach to intervention.

August 2013 - Present **Doctoral Student**
UNLV Psychological Assessment and Testing Clinic
Primary Supervisor: **Michelle Paul, Ph.D.**

Conducted comprehensive psychological assessments and completed integrated reports for individual adolescents and children with a range of psychological disorders in a community clinic setting. Primary diagnoses included anxiety disorders, ADHD, cognitive disabilities, and learning disorders. Received individual supervision. Measurements include the Woodcock Johnson Achievement, Woodcock Johnson Cognitive, Wechsler Intelligence Scales for Children-IV, Stanford Binet-V, Wide Range Assessment of Memory and Learning, Wide Range Assessment of Visual Motor Abilities, the Delis-Kaplan Executive Functions System, and subtests of the NEPSY-II.

September 2012 – June 2013 **Desert Psychological Services**
Doctoral Student
Primary Supervisors: **Christopher Kearney, Ph.D. and Stephanie Holland, Psy.D.**

Assisted administering psychodiagnostic/psychoeducational assessments and wrote integrated reports for children who had been removed from their homes by Child Protective Services. Primary measures included Children's PTSD Inventory, Adolescent Dissociative Experiences Scale, Posttraumatic Cognitions Inventory, Children's Depression Inventory, State Trait Anger Expression Inventory, and Resiliency Scales.

March 2010 – May 2012 **Child and Adolescent Anxiety Disorders Clinic**
Clinic Screener
Primary Supervisor: **R. Enrique Varela, Ph.D.**

Spoke to guardians of potential clients about clinic services and completed intake forms.

Research Experience

March 2013 - Present **Master's Thesis, University of Nevada, Las Vegas**

Title: Identifying maltreated youths at heightened risk for posttraumatic symptoms.
Faculty Advisor: Christopher Kearney, Ph.D.

This study examined a model of PTSD in which dissociation, depression, and posttraumatic cognitions predicted PTSD symptoms for maltreated youths. This study also evaluated whether the model fit across variations in intelligence, gender, age, ethnicity, and type of maltreatment. Participants (n=360) included youths aged 9-18 years from Department of Family Services (DFS)-related sites in Las Vegas. The first hypothesis was that the model would display sufficient goodness-of-fit across various indices. The second hypothesis was that the model would better fit youths with below average intelligence than youths with average intelligence. The third and fourth hypotheses were that the model would better fit females than males as well as younger youths (aged 9-13 years) than older youths (aged 14-18 years). The fifth and sixth hypotheses were that the model would better fit multiracial, African American and Hispanic youths than Caucasian youths, as well as better fit vi tims of sexual maltreatment than victims of other forms of maltreatment. Hypotheses were tested via structural equation modeling using EQS. Hypothesis one was supported. Hypotheses two, three, and four were not supported. Hypotheses five and six were partially supported.

July 2010 – April 2012 **Honor's Thesis, Tulane University**

Title: Parental control and child anxiety in a multi-ethnic sample: The role of peer support and age
Faculty Advisors: R. Enrique Varela, Ph.D. and Julie A. Alvarez, Ph.D.

This study sought to assess the role of peer support and child age on the relationship between parental control and child anxiety. Participants (n=50) included multi-ethnic youth ages 7-13 from the Tulane University Child and Adolescent Anxiety Disorders Clinic. The first hypothesis was that older children (ages 10-13) who endorsed robust peer support as well as high parental control would display less anxiety than older children with high parental control but weak peer support. The second hypothesis was that the relation between parental control and child anxiety would not be influenced significantly by peer support for younger children (ages 7-9). Multiple hierarchical regressions were used to analyze these hypotheses.

Hypothesis one was not supported. Hypothesis two was supported when maternal control was endorsed but not supported when paternal control was endorsed, suggesting that ethnic minority youth may give different attributions to maternal and paternal control.

September 2010-May 2011 **Tulane University**

Title: The Role of Parental Control, Youth's Cognitive Schemas and Emotion Regulation Skills on Youth Anxiety Across Different Age Groups
Faculty Advisors: R. Enrique Varela, Ph.D. and Christiane Creveling, Ph.D.

Participated in this study as lead research assistant. Collected data from students in multiple New Orleans public schools, assisted in creating an original coding system, coded data, and entered data in SPSS.

March 2010 - October 2010 **Tulane University**

Title: Perceptions of parenting, emotional self-efficacy, and anxiety in youth: Test of a mediational model.
Faculty Advisor: R. Enrique Varela, Ph.D.

Participated in this study as a research assistant. Coded and entered data into SPSS.

Professional Presentations

Ross, E. (2014, May). Domains of Depression and Dissociation Predict Heightened Posttraumatic Symptoms for Maltreated Youths. Student Research Award Symposium presented at the 26th Annual Association for Psychological Science Conference, San Francisco, CA.

Ross, E., Kearney, C., & Sheldon, K. (2014, May). Domains of Depression and Dissociation Predict Heightened Posttraumatic Symptoms for Maltreated Youths. Poster presented at the annual Association for Psychological Science Conference, San Francisco, CA.

Wingerter, D., Hawley, N., **Ross, E.,** Day, T., & Kearney, C. (2013, May). Cognitive Ability as a Predictive Variable for PTSD Youth Populations. Poster presented at the annual Nevada Psychological Association's Healthcare Reform Conference, Las Vegas, NV.

Ross, E. H., Varela, R. E., Niditch, L. A., Hedemann, E., Creveling, C. C., & Hensley-Maloney, L. (2011, September). What is the role of peer support in the relation between age, gender and anxiety in clinically anxious youth? Poster presented at the Annual Conference of the Society for Developmental and Behavioral Pediatrics in San Antonio, TX.

Publications

Kearney, C.A., & **Ross, E.** (in press). Selective mutism. In R. Cautin & S. Lilienfeld (Eds.),*Encyclopedia of clinical psychology*. Hoboken, NJ: Wiley-Blackwell.

Kearney, C.A., & **Ross, E.** (2014). Problematic school absenteeism. In C.A. Alfano & D.C. Beidel (Eds.), *Comprehensive evidence-based interventions for school-aged children and adolescents*. New York: Wiley.

Teaching Experience

January 2011-May 2011 — **John Dibert Elementary School, New Orleans Louisiana**
Course Instructor
Second Step Intervention

A school-based mental health intervention targeted to reduce bullying and violence among elementary and middle school students. I was responsible for adapting lesson plans, implementing course material, and completing fidelity checklists following each class. Course goals include 1) teach children to identify and understand their own and others' emotions 2) reduce impulsiveness 3) choose positive goals and 4) manage emotional reactions and decision-making processes when emotionally aroused.

Workshops

Day, T.L., Ross, E.H. (2013, February). *Posttraumatic Stress Disorder in Maltreated Youth.* Presented at a staff development continuing education conference for Las Vegas social workers, Las Vegas, NV.

Teaching Assistant Experience

Fall 2013 – May 2014 — **University of Nevada, Las Vegas**
Teaching Assistant
PSY 451: Basic Principles of Psychotherapy
PSY 420: Psychology of Learning
PSY 715: Child Assessment

Fall 2012 – May 2013 — **University of Nevada, Las Vegas**
Teaching Assistant
PSY 330.1 & 330.2: Developmental Psychology – Infancy and Childhood
PSY 421: Behavior Modification

Supplemental Clinical Training

August 2013 — Service Members and Veterans on Campus by Augusto Ruiz, Psy.D., and Lisa French, Psy.D. – 9-hour workshop sponsored by the Uniformed Services University of the Health Sciences

Professional Memberships

2013– Present — Association for Psychological Science

2013– Present — American Psychological Association

2013– Present — Nevada Psychological Association