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Posttraumatic Stress Disorder in Maltreated Multiracial Youth

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POSTTRAUMATIC STRESS DISORDER IN MALTREATED MULTIRACIAL YOUTH

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ABSTRACT

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Lemos-Miller and Kearney (2006) first identified depression as a meditator of (1) dissociation and posttraumatic cognitions and (2) PTSD in maltreated children. In addition, they found that African American status weakened the mediating relationship, whereas multiracial status strengthened the mediating relationship. Multiracial youth in Lemos-Miller and Kearney's study experienced a stronger relationship between depression and PTSD than other ethnic groups.

The present study evaluated the Lemos-Miller and Kearney (2006) model of PTSD among a larger sample of multiracial youth. The present study sought to identify whether the Lemos-Miller and Kearney (2006) finding regarding multiracial youth could be replicated. The presented study also evaluated the mediating potential of family environment, dissociation, and posttraumatic cognitions vis-a-vis this model.

The Lemos-Miller and Kearney model of PTSD met goodness-of-fit criteria when dissociation and posttraumatic cognitions were examined separately. The model did not meet goodness-of-fit criteria when family cohesion, family conflict, dissociation, and posttraumatic cognitions were examined as mediator variables. Findings and clinical implications are discussed.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

Research into the effects of maltreatment in diverse adolescents removed from their home is sparse. Lemos-Miller and Kearney (2006) were among the first to examine the relationship among maltreatment, depression, and PTSD in diverse adolescents. The authors proposed that depression mediated the relationship between (1) posttraumatic cognitions and dissociation and (2) PTSD symptoms in maltreated adolescents. The following sections summarize findings from their study, which serves as the springboard for the present study.

Participants included 90 adolescents aged 11-17 years in a state-administered residential facility. Participants were European American (34.4%), African American (27.8%), Hispanic American (18.9%), multiracial (12.2%), Native American (4.4%), Asian American (1.1%), or other (1.1%). Participants reported high rates of exposure to community violence (60.0%), physical maltreatment (56.8%), domestic violence (36.6%), and/or sexual maltreatment (17.3%). Assessment included Children's PTSD Inventory (CPTSD-I) (Saigh et al., 2000), Children's Depression Inventory (CDI) (Kovacs, 1992), Posttraumatic Cognitions Inventory (PTCI) (Foa et al., 1999), and Adolescent Dissociative Experiences Scale (A-DES) (Armstrong et al., 1997).

African American status weakened the relationship between depression and PTSD, while multiracial status strengthened this relationship. Specifically, African American status weakened the relationship between (1) negative mood and PTSD and (2) negative self-esteem and PTSD. The presence of support in the African American community may provide further insight to these findings (Murry et al., 2001).

Additionally, multiracial status strengthened the relationship between negative mood, anhedonia, and negative self-esteem and subsequent PTSD symptoms. The authors concluded that low self-esteem, identity confusion, and lack of support may be evident in multiracial youth.

Findings in this study demonstrated the influence of ethnicity on PTSD symptoms, specifically the increased risk for PTSD in multiracial youth. Unfortunately, this study was limited by a small multiracial sample size and did not examine other factors that may place multiracial adolescents at increased risk for PTSD, such as negative family environment. Further, this study did not examine the role of potential mediators such as posttraumatic cognitions, family environment, and dissociation. With these limitations in mind, the proposed study examined depressive symptoms in multiracial youth, attempt to replicate Lemos-Miller and Kearney findings with a larger sample of multiracial youth, and evaluate potential mediators for multiracial youth. The following chapter reviews the literature on maltreatment and its consequences. PTSD symptoms following maltreatment will be discussed with a focus on comorbid disorders, theoretical models, and risk factors. The review will conclude with a discussion of race, ethnicity, ethnic identity and multiracial youth including identity formation, unique challenges, family environment, substance abuse, cognitive and academic achievement, and psychological health.

CHAPTER 2

REVIEW OF RELATED LITERATURE

Child Maltreatment

History

Physical maltreatment awareness developed within the last 40 years when medical doctors coined the term "battered child syndrome" to describe children physically injured by their parents (Kempe, Silverman, Steele, Droegemueller, & Silver, 1962). Recognition of sexual abuse followed within the next 10 years (Trickett, Negriff, Ji, & Peckins, 2011). The subsequent federal Child Abuse Prevention and Treatment Act and the National Center on Child Abuse and Neglect provided services to victims and their families.

Definitions

The Keeping Children and Families Safe Act of 2003 defined child maltreatment as "any recent act or failure to act on the part of a parent or caretaker 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], 2010). The American Psychological Association Committee on Professional Practice and Standards (1998, p.16) defined maltreatment as "actions that are abusive, neglectful, or otherwise threatening to a child's welfare."

Four categories of maltreatment have been identified: physical, sexual, neglect, and emotional. Physical maltreatment refers to infliction of bodily injury on a child by non-accidental means. Examples include beating, shaking, scalding, and biting

(Dubowitz & Bennett, 2007). Sexual maltreatment refers to sexual contact or attempted contact between a child and a caregiver or adult for purposes of the caregiver's sexual gratification or financial gain. Neglect refers to failure to provide health care, education, protection from environmental hazards, or supervision (Dubowitz & Bennett, 2007). Emotional maltreatment refers to persistent and extreme neglect of a child's basic emotional needs (Cicchetti & Toth, 2005). Debate about the most accurate definition of maltreatment continues, however, and acceptable disciplinary practices used by parents differ across cultures (Cicchetti, 2004; Cicchetti & Toth, 2005).

Prevalence

In 2009, 3.3 million referrals were made to American child protective services (CPS) agencies for alleged maltreatment of 6 million children. CPS investigated one-quarter of the referrals and found 22.1 % victims of maltreatment (USDHHS, 2010). Approximately 12/1000 of all children and 16/1000 children under age 3 years are maltreated (Cicchetti, 2004; Cicchetti & Toth, 2005). One-third of reports made to CPS are not investigated, so rates of child maltreatment are likely greater than what is reported. In 2006, CPS investigated 3.6 million children and found 905,000 children to be victims of maltreatment, providing a national victimization rate of 12.1/1000 children (USDHHS, 2007).

Prevalence of fatalities. Many (n=1770) children died from maltreatment in 2009. Neglect caused approximately 40% of the fatalities and multiple maltreatment type caused 37% of the fatalities (USDHHS, 2010). Many (81%) fatalities occurred in chidren less than age 4 years, with boys having the highest death rate (2.4/100,000) (USDHHS, 2010). Fatalities occurred in European American (39%), African American

(29%), and Hispanic American (17%) children. Some (11%) children were of unknown race and others (4%) were American Indian or Alaska Native, Asian American, or multiracial (USDHHS, 2010).

Prevalence by maltreatment type. Many maltreatment victims suffer from neglect (78.0%), physical maltreatment (17.8%), sexual maltreatment (9.5%), psychological maltreatment (7.6%), and medical neglect (2.4%) (USDHHS, 2010). Some (15%) victims experience some other type of maltreatment such as abandonment, threats, or congenital drug addiction. These percentages may overlap because a child may be a victim of more than one type of maltreatment. USDHHS (2009) reported that maltreatment victims suffer from neglect (59.0%), physical maltreatment (10.8%), and sexual maltreatment (7.6%).

Prevalence by gender. USDHHS (2010) reported that more maltreatment victims are female (51.1%) than male. Brosky and Lally (2004) examined 152 incarcerated youth and found higher sexual and physical maltreatment rates for girls than boys. Many (75.0%) girls reportedly experienced a traumatic event such as physical or sexual maltreatment, whereas 51.3% of boys reported similar trauma. Adolescent girls experienced higher rates of physical and sexual maltreatment, and revictimization than boys (Abram et al., 2004; Cloitre, Tardiff, Marzuk, Leon, & Potera, 1996; Kaplan, Pelcovitz, & Labruna, 1999; Wood, Foy, Goguen, Pynoos, & James, 2002). However, some researchers report little difference in prevalence rates of physical and emotional maltreatment for boys and girls (Davis & Siegel, 2000; Kaplan et al., 1999). Gnanadesikan and colleagues (2005) found that 51.7% of Northern Plain Native

Americans experienced sexual and physical trauma, with higher rates of sexual trauma in girls than boys..

Prevalence by age. The rate of maltreatment is 20.6/1000 children for children aged 0-1 year, and the rate decreases with age (USDHHS, 2010). USDHHS (2009) indicated similar findings, with rates of maltreatment highest for children aged 0-1 year (21.9/1000). Most (72%) children aged 0-1 year and 72.9% of children aged 1-3 years were neglected compared to 55% of youths aged 16+ years. Some (15.0%) children aged 4-7 years experienced physical maltreatment and 8.2% experienced sexual maltreatment compared to 20.1% and 16.5% of 12-15 year olds, respectively.

Prevalence by ethnicity. USDHHS (2010) reported that child maltreatment victims were mostly European American (44.0%), African American (22.3%), and Hispanic American (20.7%). African Americans experienced the highest rates of maltreatment (15.1/1000), followed by multiracial (12.4/1000) youth, Native American or Alaskan natives (11.6/1000), Hispanic American (8.7/1000), Pacific Islander (11.3/1000), European American (7.8/1000), and Asian American (2.0/1000) youth. The National Institute of Justice (Kilpatrick, Saunders, & Smith, 2003) found that African Americans and Native Americans experienced greater rates of sexual maltreatment, physical maltreatment, and witnessing violence than European American and Asian American youth. Native American youth had the highest rates of sexual maltreatment while European American and Asian American youth had the lowest rates of sexual maltreatment. Native Americans, African Americans, and Hispanic Americans had the highest rates of physical maltreatment, ranging from 20-25%. However, Fluke and colleagues (2003) found higher rates of CPS referrals for African American children,

than children from other ethnic groups, including Native Americans and Hispanic American.

Others have examined prevalence rates for different groups across nations. Sebre and colleagues (2004) found that children from Moldova (43%), Lithuania (42%), Latvia (33%), and Macedonia (18%) reported emotional and/or physical maltreatment. Children from Moldova reported the highest rates of physical maltreatment and children from Lithuania reported the highest rates of emotional maltreatment. Euser and colleagues (2010) found that 2.8% of Dutch children experienced maltreatment in 2005. Children investigated by CPS reported emotional neglect (13.7 %) and sexual maltreatment (4%) (Euser, van Ijzendoorn, Prinzie, Bakermans-Kraneburg, 2010). In Saudi Arabia, 188 cases of maltreatment were reported to government agencies from 2000-2008. Of those, 94 were substantiated as maltreatment or neglect. The most common type of maltreatment in Saudi Arabia was physical maltreatment (48.9%), followed by neglect (32.3%), sexual maltreatment (15%), and emotional maltreatment (3.8%) (Al Eissa & Almuneef, 2010). According to the Australian Institute of Health and Welfare, the rate of maltreatment ranged from 2.4-9.3/1000 children (Australian Institute of Health and Welfare, 2008).

Prevalence of perpetrators. Perpetrators were parents (81.0%), other relatives (6.3%), unmarried partners of parents (4.3%), "other" relationships (3.9%), or an "unknown" relationship with the child (2.8%). Women perpetrated maltreatment more often (53.8%) than men (USDHHS, 2010). Some (9%) perpetrator information was unavailable. Perpetrators were European American (49%), African American (20%), Hispanic American (18.7%), Asian American (1.1%), Alaskan Native or American

Indian (1.1%), and multiracial (0.9%). Ethnicity information was not available for 9.5% of perpetrators (USDHHS, 2010).

Prevalence of disability. Some (11%) victims had a disability such as mental retardation, emotional disturbance, visual or hearing impairment, learning disability, physical disability, behavioral problem, or medical problem. Specifically, victims had medical conditions (5.2%), behavioral problems (3.9%), and emotional disturbances (3.2%) (USDHHS, 2010).

Prevalence by family characteristics. Children from low socioeconomic households had significantly higher rates of maltreatment than other children. Children with an unemployed parent or no parent in the workforce had higher rates of maltreatment than children of employed parents. Children with a single parent living with a partner had 6 times the rate of neglect and 8 times the rate of overall maltreatment than children living with married biological parents (USDHHS, 2010).

Effects of Maltreatment

Maltreated children often, but not always, display psychopathology and negative developmental outcomes. Half of all children who experience maltreatment develop clinically significant cognitive, behavioral, and/or emotional problems (Azar & Wolfe, 2006; Zielinski & Bradshaw, 2006). Chronically maltreated children exhibit more emotional and behavioral problems than other maltreated children and nonmaltreated children (Ethier, Lemelin, & Lacharite, 2004). The biological, emotional, and behavioral consequences of maltreatment are discussed in depth next.

Biological effects. Biological effects of maltreatment include disruptive structural changes in the corpus callosum, cortex, hippocampus, and amygdala. Global

adverse brain development is evident in maltreated children, including enlarged ventricular spaces and smaller cerebral volumes (De Bellis et al., 1999). Functional consequences include dysregulation of neurotransmitters and the hypothalamic-pituitary-adrenal axis (HPA), the central aspect of the stress response (Grassi-Oliveira & Stein, 2008). The following sections describe the specific neurobiological consequences of maltreatment.

The amygdala is located at the top of the brain stem and can be sensitized to fear and danger. Chronic stress can cause the amygdala to be irritable and overly reactive (Whitsett, 2007). The hippocampus is important in long-term memory consolidation. The hippocampus floods with cortisol and becomes unable to consolidate traumatic memory during trauma exposure. Whitsett (2007) claims that re-experiencing occurs because of hippocampal malfunction during stressful situations. Trauma memory is coded as implicit memory instead of explicit memory, and implicit memory is triggered during trauma reminders (Whitsett, 2007).

The hippocampus contains high levels of glucocorticoid receptors and is vulnerable to stress. High levels of stress can prevent neuronal growth in this area and can reduce functioning of the hippocampus, which directly affects memory (Carrion, Haas, Garrett, Song, & Reiss, 2010). Maltreatment may also interfere with the myelination of the axons in the corpus callosum that leads to inefficient transmission of information between the two hemispheres (De Bellis et al., 1999; Teicher et al., 2004).

Electroencephalogram (EEG) coherence is defined as "cross correlation in the frequency domain between spatially separate neuroelectric signals" and reflects the number and strength of synaptic connections (Nunez, 1981; Thatcher, Krause, & Hrybyk,

1986). Miskovic and colleagues (2010) used EEG on 38 maltreated females to examine changes in brain development. They found greater left hemisphere coherence in the maltreated group, while right hemisphere coherence was similar in the maltreated and nonmaltreated groups. Greater left hemisphere coherence was associated with physical abuse, neglect, and psychiatric impairment. The maltreated group showed greater frontal lobe, central, and parietal lobe coherence than the nonmaltreated group. Interestingly, the relationship between maltreatment and psychiatric impairment was not significant, suggesting that psychiatric impairment in maltreated females is mediated by increased left hemisphere EEG coherence. The authors suggested that abnormalities in the left hemisphere and frontal lobe are associated with a maltreated child's inability to regulate negative emotions and other difficulties such as startle response, aggression, and impulsivity associtated with the stress response (Miskovic et al., 2010).

The stress response occurs when the body is faced with danger and releases hormones. Trauma causes neural activation and increased levels of norepinephrine, dopamine, epinephrine, and cortisol (De Bellis et al., 1999; van der Kolk, 1996). Epinephrine is fast acting, efficient, and short lasting while cortisol is slow acting and remains in the system longer. Both hormones narrow our attention to the dangerous situation (Whitsett, 2007). Increased epinephrine and norepinephrine may cause agitation and a decrease in attention to non-threatening stimuli (Rossman et al., 2000). As a result, the body may decrease the number of epinephrine and norepinephrine receptors, which leads to less overall arousal.

A vast amount of literature is devoted to the HPA axis and cortisol levels in maltreated children. The HPA axis is a feedback loop that informs the body when a

threat has diminished and hormone levels can return to normal. The hypothalamus releases corticotropin releasing factor (CRF) and stimulates the release of adrenocorticotropic hormone from the pituitary gland and cortisol from the adrenal gland during a stress response. Cortisol release inhibits the HPA axis by reducing the release of the CRF (Lopez, Akil, & Watson, 1999). The HPA axis is necessary for survival but can have detrimental effects if activated chronically because levels of cortisol do not change under chronic stress (Twardosz & Lutzker, 2010). Chronic elevated levels of cortisol can disrupt synaptic connections or cause ulcers and heart disease (Whitsett, 2007).

Maltreatment can lead to dysregulation of the HPA system, which can lead to excess cortisol. Increased cortisol, especially during childhood, leads to cellular death in areas with high concentration of glucocoritcoid receptors. These areas include the hippocampus, prefrontal lobe, amygdala, and cerebellar vermis (Sapolsky, 2000; Twardosz & Lutzker, 2010). Research is inconsistent regarding cortisol levels in maltreated children. Some suggest that maltreated children have elevated levels of cortisol (Cicchetti & Rogosch, 2001; De Bellis et al., 1999; Gunnar, Morison, Chrisholm & Schuder, 2001; Whitsett, 2007). Whitsett (2007) stated that maltreated children have elevated levels of cortisol levels but not enough to trigger the negative feedback loop. Others, however, have found similar levels of cortisol between maltreated and nonmaltreated children (Cicchetti & Rogosch, 2001; Murray-Close, Han, Cicchetti, Crick & Rogosch, 2008) or lower levels of cortisol among maltreated children than nonmaltreated children (Bruce et al., 2009).

Type of maltreatment may help explain inconsistencies in cortisol findings. Low levels of cortisol were associated with externalizing problems, foster care placement,

sexual maltreatment, and neglect (Bruce et al., 2009; Cicchetti & Rogosch, 2001; King et al., 2001). Bruce and colleagues (2009) found that maltreated children in foster care had lower basal cortisol than nonmaltreated children. High basal cortisol was associated with internalizing problems, sexual maltreatment, physical maltreatment, and emotional maltreatment (Bruce et al., 2009, Cicchetti & Rogosch, 2001). Basal cortisol levels were positively associated with severity of emotional maltreatment and negatively associated with severity of neglect. Bruce and colleagues (2009) did not find a relationship between cortisol and frequency of maltreatment, severity of physical or sexual maltreatment, and severity of supervisory neglect.

Maltreated children with internalizing problems had significantly higher levels of basal cortisol than nonmaltreated children with internalizing problems. Sexually maltreated females had significantly higher cortisol levels than nonsexually maltreated females and levels of cortisol decreased through adulthood (Tricket et al., 2011). Neglect and emotional maltreatment are different types of stressors resulting in different levels of cortisol. Neglect is a pervasive, chronic stressor and emotional maltreatment is a periodic, acute stressor (Bruce et al., 2009).

Disturbances in the normal diurnal rhythm occur for children reared in deprived social environments. The normal diurnal rhythm is marked by an increase in cortisol levels 30 minutes after waking followed by a gradual decrease in cortisol throughout the day (Schmidt-Reinwald et al., 1999). Maltreated children with externalizing problems have a blunted diurnal response (Cichetti et al., 2010). Maltreated children with internalizing problems have greater elevations in cortisol throughout the day than nonmaltreated children and maltreated children without internalizing problems. No

differences in morning and afternoon cortisol levels are evident when maltreated and nonmaltreated children are compared without internalizing and externalizing behavior subgroups (Cicchetti & Rogosch, 2001).

A few studies have examined cortisol reactivity to a lab stressor in maltreated children. Kirschbaum and others (1993) found that maltreated females did not demonstrate an increase in cortisol levels in a social stress test. Gordis and others (2008) found that maltreated children had asymmetry in amylase and cortisol in response to a stress test. Greater asymmetry in sexually maltreated females was associated with higher levels of depression and antisocial behaviors (Shenk et al., 2010). Additionally, Gordis and colleagues (2010) found lower levels of ANS response in maltreated children than nonmaltreated children.

Supportive social environments protect the HPA axis from dysregulation during stressful situations. Nachimas and colleagues (1996) found that fearful children did not show high levels of cortisol if they were with a parent who responded sensitively to the child (Nachimas et al., 1996). Dettling and colleagues (2000) found similar results when they examined preschool children in day care. Children with low responsive caretakers had higher levels of cortisol throughout the day than those with highly responsive caretakers. Fortunately, providing children with a warm, responsive environment restores functioning of the HPA axis (Fisher, Gunnar, Chamberlain, & Reid, 2000).

The inconsistency in the research regarding cortisol is complicated by the amount of support a child receives, psychopathology, type of maltreatment experienced by the child, and method of measurement of cortisol (plasma or salivary). The neurological and biological effects generally lead to a disruption in a child's ability to cope with stressors

in his environment and that creates a vulnerability to psychopathology such as posttraumatic stress disorder and depression (Kaplow & Widom, 2007; Putnam, 2003; Teicher et al., 2004).

Health effects. Sexual trauma is associated with many health-related symptoms (Clark et al., 2010). For example, adolescents exposed to violent events had elevated levels of diastolic blood pressure. Overall levels of trauma were associated with higher immunoglobin levels that may be mediated by alcohol use and cigarette smoking in maltreated adolescents. Costello and colleagues (2007) found that puberty development in maltreated females was 9 months earlier than nonmaltreated females. Retrospective studies also reveal that physical and sexual maltreatment predicted earlier menarche in maltreated than nonmaltreated females (Foster et al., 2008; Zabin et al., 2005).

Peer relationships. Feiring and colleagues (2000) found that peer relationship difficulties did not occur for all maltreated children, though other relationship problems often occur. For example, shame in sexually maltreated children was associated with low satisfaction in same-sex friendships, many friends of the opposite sex, and low perception of peer acceptance and close friendships. Bolger and Patterson (2001) found that chronically maltreated children were more likely to be rejected by peers than nonmaltreated children because of increased aggressive behavior in maltreated children. Further, peer alienation predicted externalizing behaviors in physically maltreated preschool children, while emotion dysregulation predicted peer rejection in emotionally maltreated preschool children (Egeland, Yates, Appleyard, & Van Dulmen, 2002; Kim & Cicchetti, 2010). Anthonysamy and colleagues (2008) found that maltreated children were withdrawn, aggressive, and less prosocial than nonmaltreated children. The

difficulties in peer relationships cited in these studies consistently link peer rejection to emotion dysregulation and aggression (Trickett, Negriff, Ji, & Peckins, 2011).

The effects of maltreatment extend beyond peer relationships and into romantic relationships. Sexual maltreatment is associated with increased sexual activity and influences adolescents' beliefs about sexual behavior (Tricket et al., 2011). Sexually maltreated girls are more preoccupied with sex, had their first sexual experience at a younger age, and had more sexual partners than nonmaltreated adolescent girls (Noll, Trickett, & Putnam, 2000; Noll, Trickett, & Putnam, 2003; Randolph & Mosack, 2006). Maltreatment has been associated with fear of intimacy, lack of closeness, lack of affection, lack of personal disclosure, and negative perception of partners in relationships (Colman & Widom, 2004; DiLillo, Lewis, & Loreto-Colgan, 2007).

Affect regulation. Maltreated children experience deficits in affect regulation, specifically in recognizing, expressing, and understanding emotions (Camras, Sachs-Alter, & Ribordy, 1996). Physically maltreated children experience high levels of distress, aggression, impulsivity, irritability, hypervigilance, and paranoia and cannot recognize pain in others when exposed to anger-provoking situations. Additionally, physically maltreated boys experience fear when exposed to unresolved anger between two adults. Some suggest that constant exposure to violence triggers greater emotional reactivity (Cicchetti & Toth, 2005; Kaplan et al., 1999).

Physically maltreated children show an increased sensitivity to the detection of anger. The increased sensitivity to anger may lead to a decreased sensitivity for emotions other than anger (Cicchetti & Toth, 2005; Kaplan et al., 1999). Neglected children do not show a response bias, but have difficulties discriminating emotions (Pollak, Cicchetti,

Hornung, & Reed, 2000). Maltreated toddlers use few words to describe negative affect and respond to peer distress with anger, fear, and aggression instead of empathy or concern. Cicchetti and Toth (2005) suggested that this difference occurs because maltreated children expect a negative response from their caregiver when they use words to describe negative emotions.

Psychological effects. Physical maltreatment has been linked to depression, anxiety, aggression, conduct disorder, delinquency, attention deficit hyperactivity disorder, oppositional defiant disorder, posttraumatic stress disorder, personality disorders, substance abuse, suicide, somatization, and dissociation (Cicchetti, 2004; Cicchetti & Toth, 2005; Davis & Siegel, 2000; Johnson et al., 2002; Kaplan et al., 1999). Differences in the presentation of these disorders may provide information about the risk and resiliency factors important in PTSD. The following sections discuss internalizing and externalizing behaviors commonly associated with maltreatment.

Internalizing behaviors. Depression is an internalizing disorder that commonly occurs following exposure to a traumatic event. Paxton and colleagues (2004) found subclinical depression among African American boys, 75% of whom were exposed to traumatic violence. Similarly, exposure to violence was correlated with depressive symptoms in African American youth (Paxton, Robinson, Shah, & Schoeny, 2004). Kaplan and colleagues (1999) reported that 8% of physically maltreated children had a current diagnosis of major depressive disorder (MDD), 40% had lifetime MDD, and 30% had a disruptive behavior disorder diagnosis. Kaufman (1991) found that 18% of maltreated children met criteria for MDD and 25% met criteria for dysthymia. The

presence of emotional maltreatment and neglect may be stronger predictors for these disorders than physical maltreatment (Kaplan et al., 1999).

Phillip-Sanders and colleagues (1995) found higher depression rates in sexually maltreated Latin American girls than sexually maltreated African American girls. Higher depression scores were related to age at maltreatment and relationship to perpetrator. Latin American girls were more likely to be maltreated at a younger age by a family member than African American girls. Latin American girls also reported greater family conflict and lack of maternal support after maltreatment than African American girls, contributing to elevated depressive symptoms (Sanders-Phillips, Moisan, Wadlington, Morgan, & English, 1995).

Similar patterns emerged in maltreatment studies in different countries. Finzi and colleagues (2001) assessed 6-12-year-olds from Tel Aviv and found mean Children's Depression Inventory (CDI) scores for physically maltreated (15.9), neglected (11.4), and nonmaltreated (6.5) children. Physically maltreated children displayed high levels of suicidal behavior and expression such as ideation, threats, and attempts. Neglected children scored the same as controls for suicidal behavior and expression of intent (Finzi et al., 2001). Physically maltreated children are at greater risk for suicide and other risk-taking behaviors than nonmaltreated children (Avery, Massat, & Lundy, 2000; Kaplan et al., 1999; Linning & Kearney, 2004). History of physical maltreatment also increases a person's risk of committing suicide by 5 times, whereas a history of emotional maltreatment increases a person's risk 12 times (Cicchetti & Toth, 2005).

Widom and others (2007) found that about 25% of participants who experienced maltreatment or neglect before age 11 years met criteria for lifetime MDD. Children who

were physically maltreated or experienced multiple types of maltreatment were more likely to experience lifetime MDD (31.4%), whereas neglected children were more likely to experience current MDD (15.9%). Most (96%) children who met criteria for lifetime MDD had a lifetime diagnosis for another DSM-IV-TR disorder (Widom, DuMont, Czaja, 2007). Tyler and colleagues (2008) found that neglected females were more likely than neglected males to become withdrawn and depressed.

A common coping mechanism used by maltreated children is dissociation. Dissociation refers to a failure to successfully manage painful emotional experiences. In children, dissociation can occur in memory, perception, or identity (Macfie, Cicchetti, & Toth, 2001). Dissociation usually occurs during and after trauma as a coping mechanism, but it can easily become a dysfunctional method of coping (Barnyard, Williams, & Siegel, 2001; Macfie et al., 2001). Dissociation ranges from normal, everyday lapses in memory to dissociative identity disorder. Some dissociation in children is normal, such as memory lapses about school or homework. However, dissociation becomes problematic when a child cannot remember an event when prompted. Some children use dissociation to cope with maltreatment and have difficulty remembering the trauma because the trauma memory was not encoded (Haugaard, 2004).

Physically and sexually maltreated children exhibit more dissociative symptoms than nonmaltreated children. Macfie and colleagues (2001) found that maltreated children aged 3-6 years displayed more dissociative symptoms than nonmaltreated children. Some (17%) physically maltreated and/or neglected children were in the clinical range for dissociation. Severity and chronicity of maltreatment, and externalizing

and internalizing behaviors were correlated with dissociation in boys and girls (Macfie et al., 2001).

Externalizing behaviors. Physically maltreated children are more likely to steal, smoke cigarettes, abuse drugs, and engage in risky sexual behaviors than nonmaltreated children. An increase in risky sexual behavior may explain high rates of teenage pregnancy for maltreated and neglected teenaged youth (Cicchetti & Toth, 2005; Kaplan et al., 1999). Additionally, neglected children cheat at school and disobey rules more than nonmaltreated children (Cicchetti & Toth, 2005).

Some (20%) maltreated children aged 11-15 years reported low levels of substance abuse, while 9% reported moderate to high levels of substance abuse (Wall & Kohl, 2007). Most (60%) adolescents diagnosed with a substance abuse or dependence disorder reported physical or sexual maltreatment. Children exposed to multiple types of maltreatment report more substance abuse than other maltreated children and nonmaltreated children (Danielson et al., 2009). Sexual and physical maltreatment are associated with high levels of substance abuse while emotional maltreatment is associated with low levels of substance abuse (Moran, Vuchinich, & Hall, 2004).

Schuck and Widom (2001) found that depression mediated the relationship between maltreatment and substance use. Furthermore, severity of maltreatment and gender of the adolescent impact substance abuse behaviors (Kaufman et al., 2007). Female victims of maltreatment were more likely to abuse substances after physical maltreatment than male victims.

Adolescent victims of maltreatment often run away from home to escape maltreatment, which increases their risk of victimization and mental health difficulties

(Tyler, Hoyt, Whitbeck & Cauce, 2001a; b). Males are more likely to be victimized because they are more likely to run away and stay in public places. Kim and colleagues (2009) found that physical maltreatment and psychological maltreatment predicted running away behavior and running away behavior predicted high levels of delinquency and victimization.

Maltreated children also report more exposure to peer delinquency than nonmaltreated children, and exposure to peer delinquency is associated with self-report of delinquency after 1 year (Negriff, Ji, & Trickett, 2011). Delinquent behaviors in maltreated children increase when maltreated children associate with delinquent peers (Perkins & Jones, 2004; Salzinger, Rosario, & Feldman, 2007). Children exposed to both physical maltreatment and neglect report higher levels of delinquency than children exposed to sexual maltreatment, physical maltreatment, or neglect, though maltreated children report more delinquent behaviors than nonmaltreated children (Arata, Langhinrichsen-Rohling, & O'Brien, 2007; Mersky & Reynolds, 2007).

Maltreatment is a greater predictor of delinquency for European American adolescent males than family structure, socioeconomic status, verbal IQ, family size, and birth order (Heck & Walsh, 2000). Topitzes and colleagues (2011) examined maltreatment and crime history in 1539 minority children from a low socioeconomic background. Child maltreatment significantly predicted delinquency for males but not females. Most (51%) maltreated males committed acts of delinquency compared to 32.2% of nonmaltreated males. Maltreatment increased the risk of adult convictions for males and females by 58.3% and 148.9%, respectively. The authors suggested that there may be a delay in female criminal behavior because females may not be viewed as

delinquent. Female victims may also associate with men involved in criminal activity or use alcohol or drugs, both of which increase the risk of criminal activity for female victims of maltreatment (Fagan, 2001). Children placed in foster care exhibit more delinquent behaviors than children who were not removed from their homes after maltreatment (Ryan & Testa, 2005). DeGue and Widom (2009) found that residential instability increased risk of criminal activity in adults maltreated as children.

Hatcher and colleagues (2009) examined internalizing and externalizing behaviors in maltreated children and found that African American and European American children experienced similar problems. Internalizing and externalizing problem behaviors were significantly higher for African American than European American children (Hatcher, Maschi, Morgen, & Toldson, 2009). The differences in problem behavior frequency may be explained by the overrepresentation of African American youth in at-risk settings. For example, 45% of African American youth are in state custody (USDHHS, 2001) and 30% are in the juvenile justice system (Rozie-Battle, 2002).

Jaffee and Maikovich-Fong (2011) found that chronic maltreatment was associated with poor caregiver mental health, substance use, low SES, and poor neighborhood. In addition, caregiver depression, arrest record, and safety of neighborhood predicted externalizing behaviors in maltreated children. Caregiver depression and level of education predicted internalizing behaviors in maltreated children, suggesting these factors contribute to the effects of chronic maltreatment on internalizing/externalizing problems.

Cognitive and academic achievement. Coohey and colleagues (2011) examined achievement in maltreated children at baseline, 18 months, and 3 years after

maltreatment. Chronically maltreated children scored 13.3 points lower at baseline, 5.9 points lower after 18 months, and 8.3 points lower after 3 years than non-chronically maltreated children. They found that chronic maltreatment was related to lower math scores compared to other types of maltreatment. Children who were physically maltreated performed better on reading tests than children who were neglected or experienced multiple types of maltreatment. In contrast, Coohey and colleagues (2001) found that chronically maltreated children with behavioral problems performed similarly to non-chronically maltreated children with behavior problems on math tests within 3 years of maltreatment report. Jaffee and Maikovich-Fong (2011) found that chronically maltreated children experienced more externalizing and internalizing problems and lower IQ than children exposed to situational maltreatment. The researchers found the developmental period in which the maltreatment occurred did not influence IQ and externalizing/ internalizing problem behaviors.

Revictimization. Sexual maltreatment victims are twice as likely to be revictimized physically and sexually in romantic relationships than non-victims (Barnes, Noll, Putnam, & Trickett, 2009). Additionally, male victims of maltreatment are more likely to use threats and physical force against their dating partners than nonmaltreated males (Wolfe, Scott, Wekerle, & Pittman, 2001). Whitsett (2006) proposed that sexually maltreated children often become victims of rape and subsequent maltreatment because they use dissociation as a coping strategy. Dissociation may be associated with an inability to notice cues that alert danger for subsequent maltreatment. Another possibility is that the stress response is less sensitive in maltreated children, which may prevent the victim from recognizing danger.

Tyler and colleagues (2008) found that children and adolescents who experienced neglect were more likely to have been revictimized 3 years later than nonmaltreated children. The researchers suggested that parents who leave their children unattended or use drugs and alcohol in the presence of their children cannot protect them from potential offenders. The children may feel they are not loved and engage in risky behaviors that increase the likelihood of revictimization (Tyler et al., 2008).

Summary and Limitations of Research on the Effects of Maltreatment

Biological effects of maltreatment include dysfunction in the amygdala, hippocampus, and corpus callosum (Carrion et al., 2010; DeBellis et al., 1999; Whitsett, 2007). Maltreatment causes an increase in norepinephrine, dopamine, and epinephrine (De Bellis et al., 1999; van der Kolk, 1996). Dysregulation of the HPA axis, caused by excess levels of cortisol, can lead to cell death in areas of the brain with high concentrations of glucocorticoid receptors (Lopez et al., 1999; Twardosz & Lutzker, 2010). Maltreatment type has been linked to abnormal levels of cortisol in maltreated children (Bruce et al., 2009; Tricket et al., 2011). Some maltreated children exhibit a blunted diurnal response in cortisol levels, whereas others demonstrate elevated cortisol throughout the day. Inconsistent research regarding cortisol levels in maltreated children is complicated by maltreatment type and comorbid disorders. Health effects of maltreatment include high blood pressure, high immunoglobin levels, and early menarche in females (Clark et al., 2010; Foster et al., 2008; Zabin et al., 2005).

Difficulties in peer relationships include low satisfaction in peer relationships, low peer acceptance, and aggressive behavior towards peers (Bolger & Patterson, 2001; Feiring et al., 2000). Type of maltreatment directly influence peer relationships with

maltreated children (Bolger & Patterson, 2001). Sexual maltreatment has been linked to difficulties in romantic relationships and increased sexual behaviors, greater number of sexual partners, and sexual activity at a younger age in sexually maltreated adolescent females than nonmaltreated females (Noll et al., 2000; Randolph & Mosack, 2006).

Maltreated children experience deficits in recognizing, expressing, and understanding emotions (Camras et al., 1996). Maltreated children show greater emotional reactivity and an increased sensitivity to the detection of anger (Cicchetti & Toth, 2005; Kaplan et al., 1999). Neglected children have difficulties discriminating emotions and maltreated toddlers have difficulties expressing negative emotions (Pollak et al., 2000).

Psychological effects of maltreatment include internalizing and externalizing disorders. Internalizing behavior disorders in maltreated children include depression (Paxton et al., 2004), suicidal behaviors and ideation (Avery et al., 2000; Finzi et al., 2001), and dissociation (Macfie et al., 2001). Externalizing behavior disorders in maltreated children include risky sexual behavior, substance use, alcohol use, running away, and delinquent behaviors (Cicchetti & Toth, 2005; Danielson et al., 2009; Kim et al., 2009; Negriff et al., 2011; Wall & Kohl, 2007). Maltreated children are at greater risk of being revictimized than nonmaltreated children (Barnes et al., 2009; Wolfe et al., 2001). Cognitive and academic deficits in maltreated children include low math performance and IQ. Children exposed to physical maltreatment perform better on reading tests than neglected children, whereas chronically maltreated children have lower IQ than children exposed to situational maltreatment (Coohey et al., 2001; Jaffee & Maikovich-Wong, 2011).

A number of limitations exist with respect to these studies. Researchers typically recruit from intervention programs or foster care facilities or rely on retrospective data (Yehuda, Spertus, & Golier, 2001). In addition, few studies have focused on trauma exposure in ethnic minority groups (Beal, Ausiello, & Perrin, 2001; Triffleman & Pole, 2010), specifically multiracial youth. The few studies that examine ethnicity and race in relation to maltreatment are limited in sample size or do not examine multiracial youth. Ethnic minority youth are at increased risk for exposure to trauma and psychopathology (Kilpatrick et al., 2003). Ethnic minority groups may face additional stressors in the form of violence and discrimination, making them more vulnerable to posttraumatic symptoms. The following section will discuss PTSD in depth.

Posttraumatic Stress Disorder

PTSD Criteria

PTSD is an anxiety disorder involving characteristic symptoms following a traumatic stressor (American Psychiatric Association, 2000). Traumatic stressors include events such as rape, physical attack, war, vehicular accident, or a natural disaster. A diagnosis of PTSD is appropriate when a trauma involves:

- direct personal experience of an event involving actual or threatened death
- serious injury, or other threat to one's physical integrity
- witnessing an event that involves death, injury, or a threat to the physical integrity of another person
- learning about unexpected or violent death, serious harm, or threat of death or injury experienced by a family member or another close associate

A person's response to an event is accompanied by fear, helplessness, horror, and disorganized behavior (agitation in children). A person must also persistently re-

experience the trauma via thoughts, dreams, flashbacks, and distress or reactivity. The distressing dreams may occur weeks after the trauma and may be generalized or specific to the event (DeBellis & Van Dillen, 2005). Avoidance of stimuli related to the trauma occurs when a person avoids thoughts, feelings, activities, situations, or people. Avoidance may also occur when a person experiences feelings of numbness, loses interest in activities or people that were once pleasing, and feels that the future is shortened. A person may experience amnesia related to the event. Lastly, a person may experience increased arousal in the form of sleep difficulties, hypervigilance, startle response, irritability, anger, or loss of concentration. Symptoms must be present for a month or more and cause significant distress in order for a diagnosis. Acute PTSD is diagnosed when symptoms are present for less than 3 months, chronic PTSD is diagnosed when symptoms are present for 3 months or longer, and delayed onset PTSD is diagnosed when symptoms appear 6 months after the traumatic event (American Psychiatric Association, 2000).

PTSD and Children

PTSD symptoms in children manifest themselves differently than in adults. Children may have generalized nightmares instead of dreams about a specific event and may experience agitated or disorganized behaviors rather than fear or helplessness (Davis & Siegel, 2000; Margolin & Vickerman, 2007; Salmon & Bryant, 2002). Furthermore, symptoms may present as repetitive play related to the trauma (Davis & Siegel, 2000; Margolin & Vickerman, 2007). Children may experience long periods of re-experiencing that alternate with avoidance and numbing (Dyregov & Yule, 2006). This symptom pattern may lead to underdiagnosis of PTSD in children. In addition, children may not be

able to describe or understand their experiences, trauma, and symptoms (Davis & Siegel, 2000). They thus report fewer cognitive and avoidance symptoms (Fletcher, 1996). Children with PTSD may also experience headaches, stomachaches (American Psychiatric Association, 2000), sleepwalking, night terrors, bedwetting, and attentional difficulties (Davis & Siegel, 2000).

The age of a child influences subsequent posttraumatic reactions. The reactions of preschool children to traumatic events often match their parents' reaction to the event. Children aged 8-10 years better understand the traumatic situation than preschool children and can react to the situation more independently than younger children (Dyregov & Yule, 2006). Adolescents may engage in risk-taking behaviors as a form of re-enactment and may have a sense of a foreshortened future because they better understand long-term perspectives than young children (Davis & Siegel, 2000; Dyregov & Yule, 2006).

Portnova (2007) found that the most common PTSD symptoms in children were difficulty going to sleep and waking up tired and drowsy (34.8%). The next most common symptom was fear related to trauma (23.6%) and this occurred more frequently for children aged 3-6 years. Aggressiveness and irritability (21.7%) and depressive symptoms (19.9%) were evident in children exposed to trauma. Tiredness, exhaustion, and decreased activity were experienced more by youths aged 12-18 years than younger children.

Prevalence of PTSD in Youth

Reinherz and colleagues (1993) found a lifetime PTSD prevalence rate of 6.3% among adolescents with a mean age of 17.9 years. This rate was slightly higher than the

rate of 5.8% for adults in the same sample. These prevalence rates suggest that PTSD is one of the most common disorders affecting youth following depression, phobias, and substance dependence (Davis & Siegel, 2000). The National Comorbidity Study indicated the lifetime prevalence of PTSD in children to be 10% (Kessler, Sonnega, Bromet, & Hughes, 1995). Prevalence rates may increase to 26% when diagnostic criteria are made more sensitive to young children and applied to children who have experienced trauma (DeBellis & Van Dillen, 2005). Lifetime prevalence of PTSD in American adolescents is 5.0% and is higher among girls (8.0%) than boys (2.3%) (Merikangas et al., 2010).

Rates of PTSD are higher among incarcerated youth than the general population (Dixon, Howie, & Starling, 2005; Steiner, Garcia, & Matthews, 1997). Abram and colleagues (2004) found that 90% of incarcerated youth experienced trauma and 11.2% had PTSD (Abram et al., 2004). Rates of PTSD are somewhat higher for girls (37%) than boys (30%) in custody (Dixon et al., 2005; Steiner et al., 1997). Rates of PTSD also vary according to type of trauma experienced by the child: natural disasters (0-5%), war (27-33%), violent crimes (27-33%), and sexual maltreatment (0-90%) (Salmon & Bryant, 2002).

Course and Outcome

PTSD symptoms usually occur within 3 months of the traumatic event. Symptoms typically last 3-12 months but can persist longer. The severity, onset, and duration of symptoms vary depending on social support, family history, childhood experiences, personality, and other psychopathology (American Psychiatric Association, 2000). Children are particularly vulnerable to PTSD if the trauma occurred before age 11

years. Children who experienced trauma before age 11 years are 3 times more likely to be diagnosed with PTSD than children who experienced trauma after age 11 years. Trauma during adolescence may make teenagers particularly vulnerable to PTSD symptoms because of their extensive physical and social changes during this time (Davis & Siegel, 2000).

Gender

Girls are 5 times more likely than boys to develop PTSD and report symptoms after trauma exposure. Girls also tend to experience comorbid internalizing disorders, such as anxiety and depression, whereas boys tend to experience comorbid externalizing behaviors (Davis & Siegel, 2000). Girls also report greater severity of symptoms (Khoury et al., 1997; Pynoos, Goenjian, Tashjian, & Karakshian, 1993). Incarcerated girls are 50% more likely to experience PTSD symptoms than incarcerated boys (Cauffman, Feldman, Waterman, & Steiner, 1998). Girls experience symptoms differently than boys. Brosky and Lally (2004) found that 21% of incarcerated girls and 8% of incarcerated boys reported re-experiencing symptoms and that 34% percent of girls and 17% of boys reported increased arousal.

Ethnicity

The National Institute of Justice (Kilpatrick et al., 2003) found that Asian Americans (6.5%), Native Americans (7.1%), and European Americans (7.3%) had similar rates of PTSD. African Americans (11.0%) and Hispanic Americans (11.6%) had higher rates of PTSD than other groups. The elevation in prevalence rates for African Americans and Hispanic Americans may be attributed to differences in prior exposures to trauma such as racism and discrimination. Racism may be a risk factor for psychological

trauma, may exacerbate the impact of psychological trauma, or may be considered trauma itself. Differences in prevalence may also be due to lack of protective factors or access to treatment following trauma (Ford, 2008). The research is limited regarding risk and protective factors for maltreated minority youth and no rates were available for multiracial youth.

Bal and Jensen (2007) examined application of DSM-IV-TR criteria for PTSD to other countries in which children experienced natural disasters. They assessed 293 Turkish children exposed to earthquakes and found that 60% experienced moderate to severe levels of PTSD symptoms. The authors concluded that the DSM-IV-TR criteria applied to young earthquake victims in other countries (Bal & Jensen, 2007). Catani and others (2008) examined rates of PTSD among Sri Lankan students exposed to war, tsunami, and family violence. Most (80%) were reportedly exposed to war and 50% reported violence in their homes. Many children (69%) were reportedly beaten with an object and 18.8% reported at least one injury from maltreatment. The authors found that violence in the home and exposure to war were strong predictors of PTSD for these children, with family violence being a stronger predictor than war. Some (33%) children were diagnosed with PTSD and 20% were diagnosed with major depressive disorder with suicidal ideation. Children from Sri Lanka diagnosed with PTSD reported somatic complaints and suicidal ideations (Catani, Jacob, Schauer, Kohila, & Neuner, 2008). Unfortunately few studies have examined PTSD across ethnic groups. The studies that examine ethnicity are limited in sample size and do not include information on multiracial youth. Therefore, research on multiracial youth is very limited and inconclusive. The proposed study will help address this limitation by examing PTSD,

depression, family environment, dissociation, posttraumatic cognitions in a sample of maltreated multiracial youth.

PTSD and Maltreatment

Prevalence

Maltreated children are at greater risk for PTSD than nonmaltreated children (Ackerman, Newton, McPherson, Jones, & Dyman, 1998; Copeland, Keeler, Angold, & Costello, 2007; Epstein, Saunders, & Kilpatrick, 1997; Famularo, Fenton, Augustyn, & Zuckerman, 1996; Gwadz, Nish, Leonard, & Strauss, 2007; Kilpatrick et al., 2003; Pecora, White, Jackson, & Wiggins, 2009; Saigh, Yasik, Sack, & Koplewicz, 1999; Salmon & Bryant, 2002; Widom, 1999; Yehuda, Spertus, & Golier, 2001). Prevalence of PTSD in children who have been physically or sexually maltreated varies. Yehuda and colleagues (2001) found that PTSD rates range from 21-55% and Saigh and others (1999) found that PTSD rates range from 11.1-70.8% for maltreated children. Copeland and colleagues (2007) found the lifetime prevalence rate of PTSD in physically maltreated children to be 7.2%. Famularo and colleagues (1996) found that 40% of severely maltreated children met criteria for PTSD immediately after leaving parental care and rates decreased to 33% 2 years later.

Maltreated girls are most likely to develop PTSD, especially those exposed to trauma before age 15 years (Breslau, Davis, Andreski, Peterson, & Schultz, 1997; Brewin, Andrews, & Valentine, 2000). Children and adolescents exposed to long-term maltreatment, multiple types of maltreatment, victimization by more than one person were vulnerable to the onset of PTSD (Linning & Kearney, 2004; Suliman et al., 2009). Suliman and colleagues (2009) examined PTSD and the impact of multiple traumatic events in South African adolescents. Female participants endorsed greater anxiety,

depressive symptoms, and PTSD symptoms than male participants. Ackerman and colleagues (1998) found, in a clinic setting, that 26% of physically maltreated children had PTSD and 50% of physically maltreated girls had PTSD compared to 18% of physically maltreated boys. Kilpatrick and colleagues (2003) found that 15.2% of boys and 27.4% of girls who were physically maltreated, and who received no services, experienced PTSD symptoms. PTSD rates for maltreated children were higher than rates for nonmaltreated boys and girls (3.1% and 6.0%, respectively). Youths may be at risk for PTSD based on variables other than gender or type of maltreatment. Among maltreated, homeless youth, 60% of girls and 25% of boys exhibited one or more PTSD symptoms. For girls, PTSD symptoms followed instances of physical, emotional, and sexual maltreatment. For boys, PTSD emerged primarily after sexual maltreatment (Gwadz, Nish, Leonard, & Strauss, 2007).

Symptomatology, Outcome, and Comorbidity

PTSD in children is often associated with a range of behavioral problems. Maltreated children with PTSD are more likely to exhibit trauma-related symptoms such as re-experiencing, avoidance, and arousal than maltreated children not diagnosed with PTSD (Linning & Kearney, 2004). Symptoms common in sexually maltreated youth are heightened arousal, re-experiencing, avoidance, and numbing. Other behavioral changes in maltreated children involve disturbed sleep, avoidance, loss of interest in activities, hypervigilance, and aggression (Avery et al., 2000). Trauma reactions in children with PTSD usually fluctuate between anxious/hyperarousal and blunted affect, and may include inappropriate affect, poor impulse control, and relationship problems (van der Kolk, 2005). Copeland and colleagues (2007) suggested that dreams, repetitive thoughts,

behavioral avoidance, and emotional avoidance are most predictive of PTSD in children. Avery and colleagues (2000) found that PTSD in sexually maltreated children indicated high levels of worry, appetite change, headaches, stomachaches, depression, and suicidal ideation. PTSD in maltreated children was correlated with attentional, behavioral, and performance problems in school, and increased levels of family disruption (Avery et al., 2000).

Koenen and Widom (2009) examined the long-term effects of sexual maltreatment, physical maltreatment, and neglect in children maltreated before age 11 years. The researchers interviewed maltreated and nonmaltreated children at mean age 29 years. Female participants experienced sexual maltreatment and multiple types of maltreatment, whereas males were more likely to have experienced neglect. Females developed PTSD at 4 times the rate as boys across all types of maltreatment, which was partially explained by an elevated exposure to rape and multiple traumas in females (Koenen & Widom, 2009).

Other behavioral changes occur in children with PTSD after maltreatment. Physically and sexually maltreated youth with PTSD score higher on internalizing and externalizing behaviors than maltreated children not diagnosed with PTSD (De Bellis et al., 1999). PTSD in maltreated youth is associated with sleep and appetite disturbances, social withdrawal, sadness, avoidance, somatic complaints, inattentiveness, family and academic problems, aggression, avoidance, and thought disturbances (Avery et al., 2000; Saigh, Yasik, Oberfield, Halamandaris, & McHugh, 2002). These symptoms typically continue for long periods of time. Famularo and colleagues (1996) found that 32.7% of severely maltreated children continued to meet criteria for PTSD over 2 years. PTSD in

maltreated youth remains stable because of the repetitive nature of the stressor (Arias, 2004; Fletcher, 2003).

Common comorbid diagnoses in maltreated children with PTSD include attention deficit hyperactivity, oppositional defiant, and conduct disorder. McLeer and colleagues (1994) reported that 23.1 % of sexually maltreated children with PTSD had attention deficit hyperactivity disorder, 15.4% had conduct disorder, and 11.5% had both (McLeer, Callaghan, Henry, & Wallen, 1994). Other disorders that commonly occur with PTSD in maltreated children include substance abuse disorders as well as anxiety, mood, psychotic, and adjustment disorders (Ariga et al., 2008; Dixon et al., 2005; Ford et al., 2000; Saigh et al., 2002; Schumacher, Coffey, & Stasiewicz, 2006; Stevens, Murphy, & McKnight, 2003; Titus, Dennis, White, Scott, & Funk, 2003; Weinstein, Staffelbach, & Biaggio, 2000).

Summary of Findings on PTSD and Maltreatment

PTSD is one of the most common disorders in children and adolescents (Davis & Siegel, 2000). Symptoms typically appear within 3 months of the traumatic event and persist for 12 months, but can last longer (American Psychiatric Association, 2000). Girls are more likely to experience PTSD and comorbid anxiety and depressive symptoms than boys after exposure to a traumatic event (Breslau et al., 1997; Brewin, Andrews, & Valentine, 2000; Kilpatrick et al., 2003). African American and Hispanic American youth have higher rates of PTSD than other ethnic groups (Kilpatrick et al., 2003) and the rates of PTSD in multiracial youth have not been examined in depth. Maltreated children are at risk for PTSD, with prevalence rates ranging from 11-78% (Saigh et al., 1999). Maltreated children experience anxiety, hyperarousal, impulsivity,

blunted affect, sleep difficulties, appetite changes, and avoidance (Avery et al., 2000; Copeland et al., 2007; van der Kolk, 2005). Research is limited in this area, especially with ethnic minority youth. Multiracial youth are not included in many studies resulting in limited knowledge about PTSD symptom presentation in this population. The proposed study seeks to examine PTSD and comorbid disorders in a large sample of multiracial youth. The next section will examine the most prevalent comorbid disorders in depth.

Comorbidity

Depression. Vulnerability to psychopathology, specifically depression and anxiety disorders, may serve as a risk factor for PTSD after a traumatic event. Deblinger and colleagues (1990) found that levels of depression varied as PTSD treatment progressed for sexually maltreated children. Depression increased at the beginning of treatment, perhaps because children were revisiting their traumatic experiences. Depressive symptoms faded as treatment progressed, suggesting a strong link between depressive and PTSD symptoms (Deblinger, McLeer, & Henry, 1990).

Depression may be a key gateway between child maltreatment and PTSD symptoms (Lemos-Miller & Kearney, 2006; Linning & Kearney, 2004; Storr, Ialongo, Anthony, & Breslau, 2007). Runyon and colleagues (2002) evaluated children with PTSD, MDD, or comorbid PTSD/MDD to determine specific differences in symptomatology among these groups. More girls than boys were diagnosed with MDD and PTSD/MDD and more boys than girls were diagnosed with PTSD only. Children with PTSD and MDD were more likely to report flashbacks and difficulty sleeping, whereas children with PTSD only were more likely to experience amnesia. Flashbacks in

children with PTSD and MDD may have caused powerlessness and hopelessness that contributed to depressive symptoms (Runyon, Faust, & Orvaschel, 2002).

Boney-McCoy and Finkelhor (1996) interviewed maltreated children, most of whom were sexually maltreated, and their parents. Maltreated children were more likely to experience PTSD and depressive symptoms than nonmaltreated children. Sexually maltreated children were at a greater risk for PTSD than other groups and 4 times more likely to experience depressive symptoms than nonmaltreated children. Sexually maltreated boys were almost 5 times more likely to develop depressive symptoms than nonmaltreated boys and sexually maltreated girls were almost 4 times more likely to develop depressive symptoms than nonmaltreated girls.

Linning and Kearney (2004) examined 58 maltreated youth in a residential setting, 37 of whom met criteria for PTSD. Youth with PTSD were more likely than those without PTSD to be diagnosed with dysthymia and/or major depressive disorder. Those experiencing difficulties with concentration and decisiveness were more likely to be diagnosed with PTSD. The authors suggested that youth with depression or dysthymia may have genetic predispositions, negative affect, learned helplessness, misattributions, family problems, and lack social support. These predispositions may thus make them more vulnerable to PTSD after maltreatment (Linning & Kearney, 2004).

Lemos-Miller and Kearney (2006) found that trauma-related cognitions and dissociation were linked to PTSD symptoms in maltreated adolescents particularly if depressive symptoms were present. The authors suggested that depression led to an increased presence of PTSD symptomatology in maltreated youth. Lemos-Miller and Kearney (2006) found that multiracial children had a stronger relationship between

depression and PTSD after maltreatment than other ethnic groups. African American children did not demonstrate this strong relationship between PTSD and depression, suggesting that African American children may have a stronger support network than multiracial children. The results of this study help demonstrate the relationship between ethnic group affiliation, maltreatment, and psychopathology.

Theoretical models of depression development. Child maltreatment may contribute to depression as a result of attention bias and cognitive patterns. Individual patterns in cognition about emotions may predict whether children have an attentional bias for sad cues. Caseras and colleagues (2007) found children at risk for depression had a preference for sad faces. Similarly, physiological changes in maltreated children may contribute to biased attention to emotional cues, such as bias toward images of threatening faces (Roelofs, Bakvis, Hermans, van Pelt, & van Honk, 2007) or atypical patterns of increased attentional control to anger cues (Pine et al., 2005). Children with depression often ruminate about causes and consequences of negative events (Rood, Roelofs, Bogels, Nolen-Hoeksema, & Schouten, 2009). Maltreated children who ruminate after experiencing sad emotions may have an attention bias for sad cues. Romens and Pollack (2012) found that maltreated children showed a preference for sad cues after they experienced a sad emotional state. Additionally, maltreated children who ruminated preferred sad cues and avoided happy cues. Maltreated children may experience difficulty in regulating emotions and pay more attention to sad than happy cues. As a result, the children may ruminate more which can lead to sad emotional states. This cycle can lead to ineffective coping and depression (Romens & Pollack, 2012).

Cognitive and attachment theories (Beck, 1976; Bowlby, 1969) posit that negative childhood events shape a child's response to future negative events. Beck (1976) suggested that childhood maltreatment leads to negative thoughts about self, world, and future and then depression. Negative attribution style and maltreatment specific cognitions mediate the relationship between maltreatment and depression (Brown & Kolko, 1999; Lemos-Miller & Kearney, 2006; McGee, Wolfe, & Olson, 2001). Additionally, negative attribution style mediates the relationship between verbal maltreatment and depression (Gibb & Alloy, 2006). Physical maltreatment and emotional maltreatment are associated with high levels of anxiety and anhedonia (Lumley & Harkness, 2007).

Young (1999) suggested that maladaptive schemas form as a result of a child's temperament and negative interactions with family and peers. This pattern of negative interactions then strengthens the maladaptive schemas. Lumley and Harkness (2007) found specific schemas associated with the development of particular disorders. Schemas related to vulnerability to another attack mediated the relationship between (1) physical and emotional maltreatment and (2) anxious symptoms. Schemas related to social isolation and emotional deprivation were associated with anhedonia and depression (Lumley & Harkness, 2007). Dissociation is another common comorbid disorder that increases the risk of PTSD.

Dissociation. A key coping mechanism used by maltreated children is dissociation, but it can easily become a dysfunctional method of coping (Barnyard et al., 2001; Macfie et al., 2001). Dissociation occurs as a result of focused attention (Whitsett, 2006) and often presents with PTSD symptoms such as nightmares, flashbacks,

autonomic hyperarousal, and intrusive memories. A child's stress response coupled with the unavailability of a parent can lead to dissociation to escape fearful stimuli (Classen, Koopman, & Spiegel, 1993; Dutra, Bureau, Holmes, Lyubchik, & Lyons-Ruth, 2009).

Collin-Vezina and Hebert (2005) evaluated sexually maltreated children aged 7-12 years. Nearly 30% of the maltreated group experienced dissociation symptoms (control, 4.5%) and 46% experienced PTSD symptoms. Those who experienced penetration displayed more PTSD and dissociation symptoms than those who did not experience penetration. Characteristics about the perpetrator and length of maltreatment were not a factor in PTSD or dissociation symptoms. Children who experienced intrafamilial maltreatment experienced similar symptoms as children who experienced extrafamilial maltreatment. Those maltreated once experienced similar symptoms as those chronically maltreated (Collin-Vezina & Hebert, 2005).

Kaplow and colleagues (2005) found that children who experienced dissociation, anxiety, increased arousal, and avoidance during or after sexual maltreatment were at greater risk for PTSD. They found dissociation to be the strongest predictor of PTSD because it prevented open expression of the trauma, adequate processing of the trauma, and thus re-experiencing (Kaplow, Dodge, Amaya-Jackson, & Saxe, 2005). Lemos-Miller and Kearney (2006) found that dissociation correlated with symptoms of PTSD in maltreated children. Amnesia, absorption, passive influence, and depersonalization/derealization significantly correlated with re-experiencing, avoidance/numbing, increased arousal, and PTSD-related distress. The researchers suggested that dissociation can lead to social isolation, ineffectiveness, anhedonia, poor

self-esteem, and poor cognitive and memory processes, thus making a child vulnerable to PTSD.

Hulette and colleagues (2011) found that maltreated children in foster care were more likely to experience dissociative symptoms than nonmaltreated peers. Girls were more likely to show dissociative symptoms than boys and the number of foster placements predicted the likelihood of experiencing symptoms. The highest rates of dissociation were in children who experienced neglect, physical maltreatment, and sexual maltreatment or physical maltreatment alone.

Theoretical models of dissociation development. The interpersonal protection model suggests that maltreated children do not have an internalized representation of protection. Children are thus unable to develop their own self-defense behaviors, which leads to many of the co-occurring disorders that emerge after maltreatment (Thomas, 2005). Attachment theory states that internalized representations are internal working models and are formed based on a child's attachment experiences with a caregiver. The representations guide future interpersonal relationships for the child. Thomas (2005) proposed that dissociation occurs when children lack effective models of protection and unsafe internal roles are activated. Dutra and colleagues (2009) found that early attachment and the parent-child relationship accounted for half of the variability in adult dissociative symptoms. Mother's lack of positive affective involvement, flatness of affect, and disruptive affective communication were important predictors in later dissociative symptoms. The authors suggested that dissociative symptoms emerged because of an inability to integrate mental states that stem from parental unavailability.

The child receives a message from the parents to not acknowledge pain or distress based on the parent's nonresponsiveness (Dutra et al., 2009).

The betrayal trauma theory suggests that dissociation is a mechanism used by children to block trauma-related information when maltreated by a caretaker. The support for this theory is demonstrated by an increase of dissociative symptoms in children betrayed by family members (Plattner, Silverman, & Redlich, 2003) and children maltreated before age 18 years (DePrince, 2005). The discrete behavioral states model (Putnam, 1997) indicates that dissociation occurs because maltreated children are not taught how to transition between emotional states by their parents. Poor perception of parent's parenting, parental rejection, inconsistent discipline, and disorganized or avoidant attachment have also been associated with increased dissociative symptoms in children (Deblinger, Steer, & Lipmann, 1999; Mann & Sanders, 1994; Ogawa, Sroufe, Weinfield, Carlson, & Egeland, 1997). In addition, lack of parental care and warmth, parental control, and poor relationship with parents are associated with dissociative symptoms in children (Maaranen et al., 2004; Modestin et al., 2002).

Chu and Deprince (2006) found a relationship between children and mothers who experienced trauma. Mothers with trauma histories may have difficulty creating a safe environment for their children because of maternal dissociative symptoms. The authors suggested that maternal dissociation predisposes children to trauma and dissociative symptoms (Chu & DePrince, 2006).

Summary of Findings on Comorbidity and Theoretical Models

Depression is a risk factor for PTSD. Depressive symptoms are present in maltreated children with PTSD and fluctuate as PTSD symptoms are treated (Deblinger

et al., 1999). Children with PTSD are also likely to be diagnosed with depression (Boney-McCoy & Finkelhor, 1996). Further, depressive symptoms strengthen the relationship between posttrauamatic cognitions and PTSD in multiracial but not African American youth (Lemos-Miller & Kearney, 2006). Theoretical models of depression development emphasize attentional bias for negative cues and rumination in addition to the influence of negative cognitions and family interactions (Beck, 1976; Brown & Kolko, 1999; Caseras et al., 2007; Lumley & Harkness, 2007; Pine et al., 2005; Roelofs et al., 2007; Rood et al., 2009; Romens & Pollack, 2012). Unfortunately, the mediating role of depressison in a large sample of multiracial youth has not been examined.

Dissociation has been identified as a coping mechanism and a risk factor in the development of PTSD symptoms (Collin-Vezina & Herbert, 2005; Macfie et al., 2001). Some (30%) maltreated children experience dissociative symptoms after maltreatment and those children are at a greater risk for PTSD (Collin-Vezina & Herbert, 2005; Kaplow et al., 2005; Lemos-Miller & Kearney, 2006). Victims of multiple types of maltreatment or physical maltreatment are at greater risk for PTSD symptoms than victims of other types of maltreatment (Hulette et al., 2011). Theoretical models of dissociation suggest that PTSD symptoms with a lack of parental availability following trauma leads to dissociative symptoms (Classen et al., 1993; Dutra et al., 2009). Similarly, interpersonal protection and attachment models emphasize internal working models and parental interaction (Dutra et al., 2009; Thomas, 2005). Betrayal trauma theory suggests that dissociation occurs as a child's attempt to block trauma related information, while the discrete behavioral states model indicates that children are not taught how to transition between emotional states by their parents (DePrince, 2005;

Plattner et al., 2003; Putnam, 1997). Overall theories of dissociation emphasize the importance of the parent-child relationships and the availability of parental support and appropriate modeling of emotional expression. Research examining the mediating role of dissociation is limited for ethnic minority youth. Models of PTSD development are addressed next.

Models of Child Maltreatment and PTSD Development

Several theoretical models of PTSD have emerged. Models discussed here focus on overall PTSD development (Fletcher, 2003; Foy, Madvig, Pynoos, & Camilleri, 1996), biological processes (Farkas, 2004), cognitive or information-processing variables (Ehlers & Clark, 2000; Salmon & Bryant, 2002), and developmental variables (Koenen, 2010).

Overall models of PTSD development. Foy and colleagues (1996) highlighted the etiological and mediating variables that contribute to PTSD after maltreatment. Their model emphasizes individual, environmental, vulnerability, and resilience factors that contribute to PTSD development. Mediating variables include severity and recency of traumatic event, prior history of trauma, and parent's reaction to trauma. The model proposes that additive trauma predicts significant distress and parental reactions to the trauma event can heighten a child's reactivity (Foy et al., 1996).

Fletcher's (2003) working model of PTSD development includes details of the traumatic stressor (nature, cause, severity, and duration), responses to stressor (cognitive, emotional, psychobiological, and behavioral), individual characteristics (biological vulnerabilities, age, gender, developmental stage, and coping skills), and social environment (family support, SES, and community support).

Fletcher's model emphasizes the characteristics of the traumatic event that are associated with a stress reaction. The dimensions associated with a stress reaction include death, injury, or loss of integrity; sudden occurrence; proximity; and chronicity. Fletcher distinguishes two types of traumatic stressors: (1) acute, nonabusive stressors and (2) chronic, abusive stressors. PTSD diagnosis occurs at a similar rate (36%) for children exposed to both types of trauma, though symptom presentation may be slightly different based on trauma type. Children exposed to chronic stressors are more likely to experience avoidance or numbing (54%), hyperarousal (71%), and re-experiencing (92%) than children exposed to acute stressors (30%, 55%, 86%, respectively).

Fletcher's model includes emotional reaction to the trauma as a contributing factor to PTSD. Numerous studies show that reactions of fear and hopelessness are associated with PTSD symptoms (Aaron et al., 1999; Rossman, Bingham, & Emde, 1997; Udwin, Boyle, Yule, Bolton, & O'Ryan, 2000). The importance of a child's reaction to the trauma was often more predictive of PTSD symptoms than gender, additional stressors, perceived threat, or actual injury (Bernat, Ronfeldt, Calhoun, & Arias, 1998). Emotional responses to trauma are linked to cognitive interpretations of the traumatic event (Fletcher, 2003). Appraisals of the traumatic event include assessing the importance, meaning, and predictability of an event. Appraisals mediate a child's emotional response to the trauma and are linked to PTSD symptoms. Sexually maltreated children report disruptions in beliefs about safety of the world, controllability, and trustworthiness. Specifically, uncertainty, inadequacy, dangerousness, self-hatred, lack of control, and poor attachment are associated with PTSD symptoms in adolescents. Youth who attribute the traumatic event to internal or stable causes are more likely to

experience PTSD symptoms than youth who attribute the traumatic event to external, unstable causes (Fletcher, 2003; Udwin et al., 2000).

Neurobiological changes and learning theories are also included in Fletcher's model. Cortisol, neurotransmitters, and cerebral volume are associated with PTSD symptoms in children (DeBellis et al., 1999; De Bellis et al., 2002; King et al., 2001). Learning theories, including classical and instrumental conditioning, explain fear, avoidance, and withdrawal (Foa, Steketee, & Rothbaum, 1989). Neutral stimuli become aversive when associated with stressful responses and avoidance and withdrawal are used to avoid anxiety. Conditioned responses and stimulus generalization can explain re-experiencing and fear responses associated with internal and external cues. The pattern of arousal and avoidance is reinforced and leads to maintenance of PTSD symptoms.

Fletcher believes individual characteristics to be influential in the onset of PTSD. Genetic vulnerabilities may predispose a child to dysfunctional stress response and psychological diagnoses. Personal characteristics such as mastery, self-efficacy, and locus of control can impact PTSD symptoms (Foa et al., 1989; Foa, Zinbarg, & Rothbaum, 1992). Previous psychological diagnoses are associated with PTSD when traumatic exposures other than maltreatment are involved (Davis & Siegel, 2000). Other individual factors in Fletcher's model include early stressful experiences, gender, and ethnicity. Children exposed to a numerous early life stressors, females, and minorities, are vulnerable to PTSD. Age and developmental levels of children are likely to be influential because young children may not understand trauma and lack appropriate coping skills, use dissociation, and engage in traumatic play. Avoidance, withdrawal, distraction, and blame are associated with PTSD in children (Fletcher, 2003).

Social characteristics are also included in Fletcher's model. Parental support is negatively associated to PTSD symptoms. Other influential family characteristics include parenting style, family cohesion and stress, and family psychological history. Children with positive, nurturing parents are more resilient after traumatic events than children of rigid, coercive parents. Chaotic, stressful family environments are linked to PTSD in children exposed to traumatic events. Fletcher's model also includes SES and exposure to other stressors (Fletcher, 2003).

Biological Models. Biological models of PTSD are based on the diathesis-stress paradigm (Flouri, 2005). Individuals may have a predisposition to posttraumatic stress symptoms and these symptoms are expressed following trauma exposure. The model includes explanations of how specific biological systems interact to produce and maintain PTSD symptoms. Studies in adults with PTSD indicate heightened levels of norepinephrine, dopamine, and serotonin abnormalities (Kowalik, 2004). The HPA axis, discussed earlier, has been linked to PTSD (Kowalik, 2004; Nemeroff et al., 2006). The following sections cover the structural and functional biological changes that occur in PTSD.

Changes in brain structure and volume, especially the hippocampus, have been observed in adults with PTSD (Carrion et al., 2010; Kowalik, 2004; Nemeroff et al., 2006). Researchers have also examined amygdala volume in maltreated children with PTSD. De Bellis and colleagues (2001, 2002) found that amygdala volume is similar in maltreated children and control groups, whereas Carrion and colleagues (2001) found reduced amygdala volumes in maltreated children compared to a healthy control group. Woon and Hedges (2008) examined amygdala volumes and found no difference between

maltreated children and a healthy control group, although children with PTSD had greater right amygdala than left amygdala volume.

Woon and Hedges (2008) found that maltreated children with PTSD have disrupted hippocampal development as adults. Maltreated children had normal hippocampal volumes as children, but these volumes decreased when they were adults. Reduced hippocampal volume occurs after trauma exposure or PTSD, and PTSD symptom severity is associated with greater reduction in hippocampal volumes.

Neuropsychological testing, measures of cerebral blood flow, and fMRI results reveal abnormalities in brain function of adults with PTSD. An exaggerated response to stimuli has also been observed in adults with PTSD (Kowalik, 2004). Early childhood traumas and stress may be associated with neuroendocrine alterations, sensitivity to later stressors, and susceptibility to PTSD and dissociative symptoms. Other structural changes include the cerebral region and corpus callosum. Children with PTSD have smaller total brain volume than children without PTSD (Kowalik, 2004; Teicher et al., 2004). Kitayama and colleagues (2007) examined corpus callosum size in adult females maltreated as children. The researchers found no difference in overall corpus callosum volume but found that the anterior and posterior midbody was smaller in adult females maltreated as children. This difference may not be apparent in maltreated children because their brains are still developing (Kitayama et al., 2007).

Recent studies show that children who experienced maltreatment, regardless of PTSD diagnosis, display disruption of neurotransmitters, specifically increased catecholaminergic activity (De Bellis, 2001; Kowalik, 2004). Stress in children may result in dysregulated neuroanatomical and neurophysiological systems (Meiser-Stedman,

2003). Maltreated children with PTSD exhibit some HPA axis dysfunction as indicated by salivary and urinary cortisol level tests (Bruce et al., 2009; Cicchetti & Rogosch, 2001; De Bellis et al., 1999; Gunnar et al., 2001; Kowalik, 2004). Ongoing trauma may continue to cause changes in a child's biology (De Bellis, 2001; Farkas, 2004). Genetic variation in the FKBP5 gene may alter sensitization to the stress response during development and place maltreated children at greater risk for PTSD than nonmaltreated children. This gene is important in the glucocorticoid signal transduction during the stress response. The genetic variations may alter the risk and resiliency factors for PTSD in adults maltreated during childhood (Binder et al., 2008). Biological models do not account for other factors that influence susceptibility to PTSD such as social, familial, and individual variables (Flouri, 2005).

Cognitive Model. Cognitive and information-processing models of PTSD are based on the theory that cognitions, appraisals, and emotions related to traumatic events are stored in memory or fear networks (Chemtob, Roitblat, Hamada, & Carlson, 1988; Ehlers & Clark, 2000; Foa, et al., 1989; Salmon & Bryant, 2002). Ehlers and Clark's (2000) model of PTSD emphasizes incomplete processing, lack of integration and lack of elaboration of the trauma memory, and negative appraisal of the trauma and the events following the trauma (Ehlers & Clark, 2000). Negative appraisals include overgeneralization of the traumatic event and perception of normal events as dangerous, or beliefs that negative events will continue to happen in the future. Negative appraisals also include cognitions about the victim's feelings during trauma and implications of the same reaction in the future. Appraisals continue after the trauma and lead to exacerbation or maintenance of PTSD because the victim engages in negative coping strategies. A

sense of threat may trigger dysfunctional cognitive and behavioral functioning as well as other symptoms of anxiety such as re-experiencing and arousal. Some behavioral and cognitive strategies used by the victim to help forget the trauma - such as thought suppression, rumination, selective attention, avoidant behavior, and safety behaviors - may actually worsen the symptoms and maintain the disorder.

According to Ehlers and Clark, re-experiencing is typically triggered by sensory impressions and not traumatic memory. An individual experiences the physiological sensations and emotions associated with trauma without actual memory of the event. Characteristics of the trauma, previous experience with trauma, intellectual ability, prior beliefs, and appraisal of the trauma influence memory. Some of the stimuli that trigger re-experiencing symptoms do not have a strong direct relationship with the trauma. The sensory impressions that trigger re-experiencing are similar to the sensory experience during the traumatic event, even though there may be additional information gathered later to contradict the original event (Ehlers & Clark, 2000).

Ehlers and colleagues (2003) applied this theory to children aged 5-16 years who were in traffic accidents. They found a small correlation between a child's perceived threat and fear during the incident and PTSD symptoms. They found a larger correlation between cognitive variables and subsequent PTSD symptoms. Rumination, negative appraisal, and incomplete processing were strong predictors of PTSD as time elapsed. In addition, younger children encoded information at a slower rate than older children and adults with PTSD. Lack of prior knowledge influenced a child's understanding and appraisal of trauma resulting in less detailed representation and gaps in memory. Language development also influenced how well information can be encoded verbally

(Salmon & Bryant, 2002). Parents may serve as external support by helping a child make sense of the traumatic event with discussion to prevent forgetting, helping the child appraise and interpret the experience, correcting misconceptions, and helping the child regulate emotions (Salmon & Bryant, 2002).

Developmental Model. The developmental model focuses on childhood constitutional and contextual factors that influence PTSD symptoms. Constitutional factors include characteristics such as intelligence, temperament, and psychological disorders. Children with higher IQ can process trauma better than children with lower IQ, thus lowering the risk for PTSD (Koenen, Moffitt, Poulton, Martin, & Caspi, 2007). A second constitutional factor is temperament. Children with hyperactivity, difficult temperament, and antisocial behavior are at greater risk for PTSD than children with less difficult temperaments (Koenen et al., 2007). Externalizing behaviors may interfere with one's ability to accept emotions (e.g., fear) associated with trauma and might interfere with support from parents. As a result, emotional processing and recovery from trauma are impeded. The last constitutional factor addressed by the authors is childhood psychological disorders. Some (15%) 11-15 year olds without a history of a psychological disorder developed PTSD compared to 41% with 1 disorder and 48% with 2+ disorders (Koenen, Nugent, & Amstadter, 2008). Genetic and/or environmental factors that contribute to the development of these other psychological disorders may contribute to PTSD.

Contextual factors emphasized in the developmental model include poverty, residential stability, maternal depression, and caregiver stability. Children raised in low SES environments were 2.5 times more likely to develop PTSD than those raised in a

high SES environment. Children who moved 3 or more times before age 11 years were twice as likely to develop PTSD than children who did not move before age 11 years (Koenen, 2010). Poverty, residential stability, maternal depression, and caregiver stability influence predictability and control of an environment. In animal models, unpredictability and lack of control lead to emotional dysregulation, insecure attachment, and dysregulation of the HPA axis (Coplan et al., 1998; Rosenblum & Paully, 1984). As discussed earlier, dysregulation of HPA axis has been linked to PTSD in children and adults (Bruce et al., 2009; Cicchetti & Rogosch, 2001; De Bellis et al., 1999; Gunnar et al., 2001; Koenen, 2010; Kowalik, 2004). Affect dysregulation and insecure attachment have also been identified as key risk factors for PTSD (Dietrich, 2007; Muller, Sicoli, & Lemieux., 2000; Muller, Lemieux, & Sicoli, 2001; Taft, Schumm, Marshall, Panuzio, & Holtzworth-Munroe, 2008).

Summary of Findings on Theoretical Models of PTSD

Overall models of PTSD development emphasize the importance of severity and recency of traumatic event, prior history of trauma, and parent's reaction to trauma as mediating variables (Foy et al., 1996). Fletcher's (2003) working model of PTSD incorporates the traumatic stressor, stress response, individual characteristics, and social environment. Biological models of PTSD focus on structural and functional changes in the brain. Structural changes occur in the hippocampus, amygdala, and corpus callosum (Carrion et al., 2001; DeBellis et al., 2000, 2001; Kityama et al., 2007; Kowalik, 2004; Nemeroff et al., 2006). Functional changes include dysfunction in the catecholaminergic system and dysregulation of the HPA axis (Kowalik, 2004; Nemeroff et al., 2006). Cognitive models of PTSD focus on processing, integration, and negative appraisal of

trauma memory after the traumatic event (Ehlers & Clark, 2000). Negative appraisals continue and lead to an exacerbation or onset of PTSD symptoms. Re-experiencing occurs when a victim is exposed to sensory stimuli associated with the trauma while memory loss occurs because of poor trauma memory integration. Developmental models of PTSD emphasize constitutional factors such as intelligence, temperament, and psychological disorders. Low IQ, difficult temperament, and psychological disorder make a child vulnerable to PTSD (Saltzman, Weems, & Carrion, 2006). Contextual factors include poverty, residential stability, and caregiver stability (Koenen, 2010). Low SES, maternal depression, residential instability make a child vulnerable to PTSD (Coplan et al., 1998; Rosenblum & Paully, 1984). Unfortunately, theoretical models of PTSD have not been evaluated for multiracial children. The proposed study will contribute to a better understanding of PTSD-related symptoms in a large sample of multiracial youth by examining potential mediating variables. The next section further elaborates risk factors for PTSD.

Risk Factors

Several factors can exacerbate risk of PTSD following maltreatment. Children most likely to demonstrate PTSD symptoms tend to be older and have a history of maltreatment (Copeland et al., 2007). Sexual maltreatment victims are more likely to develop PTSD when maltreatment occurs over an extended period of time and if physical coercion was involved (Wolfe, et al., 1994). Sexual maltreatment may be the most serious form of maltreatment and the strongest predictor of PTSD symptoms. Attempted sexual assault may also lead to PTSD symptoms (Boney-McCoy & Finkelhor, 1995). Additionally, PTSD symptoms are more likely to occur when a trusted person perpetrated

the traumatic event (Green et al., 2000). Other key risk factors include characteristics of trauma exposure, sex, age, attachment and family environment, cognitive impairment, and membership in a minority ethnic group.

Trauma. Trauma exposure serves as a risk factor for PTSD (Kearney, Wechsler, Kaur, & Lemos-Miller, 2010; MacDonald, Danielson, Resnick, Saunders, & Kilpatrick, 2010). Maltreated children exposed to violent death of a loved one, traumatic news, domestic violence, sexual maltreatment and physical maltreatment are at risk for PTSD (Copeland et al., 2007; Luthra et al., 2009). Prior trauma exposure is an additional risk factor for maltreated youth (Fletcher, 2003; Flouri, 2005; McKnight et al., 2004; Pandit & Shah, 2000). Children exposed to intimate partner violence experience similar levels of PTSD as children exposed to maltreatment (Bogat, DeJohnghe, Levendosky, Davidson, & von Eye, 2006; Carpenter & Stacks, 2009; Jarvis, Gordon, & Novaco, 2005; Kilpatrick et al., 2003; Lang & Stover, 2008). Children exposed to community violence in addition to physical and/or sexual maltreatment are at greater risk for PTSD than children exposed to community violence without maltreatment (Scott, 2007). Multiple maltreatment exposures are related to higher rates of PTSD and depression (Luthra et al., 2009; MacDonald et al., 2010). Chronicity and severity of maltreatment are associated with trauma symptoms (Clemmons, Walsh, DiLillo, & Messman-Moore, 2007; English, Graham, Litrownik, Everson, & Bangdiwala, 2005). Lastly, removal from home may serve as a traumatic event for children and adolescents. Children removed from their homes experience greater PTSD rates than children who remained in their homes (19.2% vs 10.7%, respectively) (Kolko et al., 2010).

Gender. Girls are more likely than boys to develop PTSD when exposed to trauma and are more likely to report symptoms than boys, despite maltreatment type (Blain et al., 2010). Maltreated girls report greater severity of symptoms and more anxiety than boys (Khoury et al., 1997; Pynoos et al., 1993). Girls exposed to one traumatic event were more likely to be diagnosed with PTSD than adolescent boys exposed to at least one traumatic event (11.3% and 6.3%, respectively). Adolescent girls exposed to maltreatment and neglect are more likely to develop PTSD than adolescent boys exposed to maltreatment and neglect (Koenen & Widom, 2009).

Age. Maltreated adolescents aged 14-16 years were more likely to experience posttraumatic symptoms than maltreated children aged 9-13 years (Copeland et al., 2007). MacDonald and colleagues (2010) found that older adolescents (17 years) were at a greater risk for PTSD than younger adolescents (12 years). Conversely, trauma exposure at a young age can lead to multiple maltreatment types and chronic exposure, both factors contributing to an increased risk of PTSD (Clemmons et al., 2007; English et al., 2005; Luthra et al., 2009; MacDonald et al., 2010).

Attachment and family environment. Family environment and early attachment patterns are linked to PTSD and maltreatment. Ruchkin and colleagues (1998) found that PTSD symptoms in adolescent male rape victims were strongly associated with parental rejection. Parental rejection with child maltreatment and exposure to interparental violence also impact intimate relationship violence perpetration in adults with PTSD symptoms (Taft, et al., 2008). Others (Muller et al., 2000, 2001) found that maltreated youth who endorsed insecure attachment styles experienced multiple PTSD symptoms. A disorganized/disoriented attachment makes children more

vulnerable to PTSD because they use dissociation to cope with stressors. A child in a chaotic home with disorganized attachment is thus more likely to experience PTSD symptoms after maltreatment (Muller et al., 2000, 2001).

Rossman and Ho (2000) examined 3 groups of community or shelter-based youths exposed to parental violence and/or maltreatment. PTSD symptoms of intrusive/re-experiencing and arousal/avoidance were positively associated with low SES, family stressors, spousal verbal and physical aggression, and neighborhood violence and negatively associated with mother availability. Adverse parenting is a key predictor of PTSD symptoms in trauma-exposed females (Ariga et al., 2008; Landolt, Vollrath, Ribi, Gnehm, & Sennhauser, 2003).

Bal and colleagues (2003) examined the relationship between family support and trauma among adolescents aged 12-18 years. Many (42%) reportedly experienced some type of stressor and 4.4% reported sexual maltreatment. Adolescents with high levels of perceived support from family displayed few trauma-specific symptoms if they experienced a trauma other than sexual maltreatment. Family cohesion was the strongest predictor of subsequent symptomatology for adolescents. Low cohesion was correlated with high levels of anxiety, depression, posttraumatic symptoms, anger, and dissociation for adolescents who reported trauma other than sexual maltreatment (Bal et al., 2003). Support from family may lead to expression of feelings regarding the traumatic event which leads to fewer trauma symptoms. Alternatively, adolescents reporting high availability of support from friends reported more internalizing and externalizing behavior problems. Adolescents who rely on peer support may not have family support and are at risk for poor adjustment (Bal, DeBourdeaudhji, Crombez, & Van Oost, 2004).

Deblinger and colleagues (1999) examined mother-child relationships after sexual maltreatment in children aged 7-13 years. Mother's level of depression was positively associated with child's PTSD symptoms. Children who described their mother as instilling guilt and anxiety experienced more PTSD symptoms than children who said their mother encouraged autonomy. Instilling guilt and anxiety may lead to increased self-blame and responsibility for the sexual maltreatment, thus contributing to PTSD symptoms. Children who described their parents as rejecting experienced more depressive symptoms than children who described their mother as accepting, though the direction of these associations is unclear. Other family factors identified as risk factors for PTSD after maltreatment include domestic violence, coercive parenting style, divorce, lack of supervision, parent substance abuse, parent depression, parent modeling of PTSD symptoms, family alcohol use, and poor financial resources (Friedman, Stevens, & Morris, 2008; Kearney et al., 2010; MacDonald et al., 2010; Ostrowski, Christopher, & Delahanty, 2007; Scheeringa & Zeenah, 2001).

Cognitive/Academic Impairment. Cognitive models of PTSD emphasize distorted cognitive functioning following maltreatment. Cognitive vulnerabilities include an inability to process trauma, self-blame, avoidance, and negative beliefs about safety (McNally, 2006; Moore, 2009). Other cognitive risk factors include rumination about the causes of traumatic events, anxiety sensitivity, and anticipation and overestimation of danger (Kearney et al., 2010). PTSD symptoms in maltreated adolescents are maintained by cognitive processes such as poor verbal processing, intense emotions, maladaptive thoughts, internal attributions of negative events, attention bias towards threat, overestimation of danger, and excessive worry (Briere, 1992; Kearney et al., 2010;

Margolin & Vickerman, 2007; Salmon & Bryant, 2002). These processes affect how children integrate information after trauma. Cognitive processing difficulties along with the emotional response from the trauma may lead to aggressive or risk taking behavior or an attention bias regarding threatening information thus contributing to PTSD symptoms (Rossman & Ho, 2000).

Masten and colleagues (2008) found that maltreated youths with or without PTSD identified fearful faces more quickly than controls with no history of maltreatment (Masten et al., 2008). Pine and colleagues (2005) found that children with a history of physical maltreatment and a PTSD diagnosis turned their attention away from threatening stimuli. Dalgleish and colleagues (2000) found that youth with PTSD estimated that negative events were more likely to happen to others than themselves (Dalgliesh et al., 2000). Leen-Feldner and colleagues (2008) found that youth who were fearful of the consequences of anxiety were at higher risk for PTSD symptoms than those who were not fearful.

Learning been linked to PTSD in maltreated adolescents. Maltreated children and adolescents classically condition fear responses to trauma related stimuli, which generalize to other stimuli. Operant conditioning occurs when a maltreated child avoids stimuli to reduce trauma-related symptoms and reinforces the avoidance with a temporary reduction in trauma-related symptoms. Adolescents conditioned after maltreatment are vulnerable to PTSD (Heflin & Deblinger, 2006).

Academic impairment is linked to maltreatment and PTSD. Saltzman and colleagues (2006) found that symptoms of PTSD correlated inversely with verbal and full-scale IQ scores, suggesting that low IQ scores are a risk factor for PTSD in

maltreated youth (Saltzman et al., 2006). Others have found that maltreated children with PTSD symptoms perform more poorly on memory, attention, abstract reasoning, and executive function tasks than control groups (Beers & De Bellis, 2002; Eisen, Goodman, Qin, Davis, & Crayton, 2007). Poor performance on tasks related to working memory, inhibition, auditory attention, and processing speed is linked to physical and sexual maltreatment and dissociation (DePrince, Weinzierl, & Combs, 2008, 2009).

Summary of Findings on Risk Factors

Victims of sexual maltreatment are at greater risk for PTSD than victims of other types of maltreatment (Boney-McCoy & Finkelhor, 1995; Wolfe et al., 2001). Physical maltreatment, prior trauma (Fletcher, 2003; Flouri, 2005; McKnight et al., 2004; Pandit & Shah, 2000), multiple maltreatment (Luthra et al., 2009; MacDonald et al., 2010), chronic maltreatment (Clemmons et al., 2007; English et al., 2005a), domestic violence (Copeland et al., 2007; Luthra et al., 2009), community violence, and removal from home (Kolko et al., 2010) are also risk factors for PTSD. Maltreated girls are slightly more at risk for PTSD than boys and experience comorbid anxiety and depression, while boys experience externalizing behavior disorders (Davis & Siegel, 2000; Khoury et al., 1997; Pynoos et al., 1993). Parental rejection and low parental warmth are associated with PTSD symptoms while insecure attachment and disorganized attachment are common in victims of maltreatment (Barnett, Ganiban, & Cicchetti, 1999; Cicchetti & Toth, 2005). Insecure and disorganized attachment styles are linked to PTSD in maltreated youth (Muller et al., 2000, 2001). Additional risk factors for PTSD include low SES, negative family environment, parental depression, neighborhood violence, low family cohesion, low social support, domestic violence, coercive parenting style, divorce, lack of

supervision, parent substance abuse, parent depression, parent modeling of PTSD symptoms, family alcohol use, and poor financial resources (Bal et al., 2003; Birmes et al., 2009; Burton, Foy, Bwanausi, Johnson, & Moore, 1994; Gold, Hyman, & Andres-Hyman, 2004; Friedman et al., 2008; Kearney et al., 2010; Kurtz, Gaudin, Howing, & Wodarski, 2003; MacDonald et al., 2010; Ostrowski et al., 2007; Pina et al., 2008; Scheeringa & Zeenah, 2001).

Academic and cognitive deficits have also been identified as risk factors for PTSD (Saltzman et al., 2006). Deficits have been identified in expressive and receptive language, memory, attention, abstract reasoning, and executive functioning (Beers & DeBellis, 2002; DePrince et al., 2008, 2009; Eisen et al., 2007). Other possible risk factors include variables associated with ethnic identity (MacDonald et al., 2010) although the role of ethnicity as a potential risk factor is unclear (Lemos-Miller & Kearney, 2006). The focus of the next several sections will be the impact of ethnic and multiracial identity on psychological adjustment.

Race, Ethnicity, and Ethnic Identity

Definitions

Race refers to physical characteristics of a person, such as skin color, hair texture, and facial features (APA, 2003). Race is often subsumed by the term ethnicity. Ethnicity refers to cultural values, attitudes, behaviors of an ethnic group, sense of ethnic group membership, and experiences of prejudice, discrimination, and powerlessness (Phinney, 1996).

Ethnic identity is defined as self-concept derived from value and significance attached to membership in a social group or groups (Phinney, 1992). Phinney (1992) described ethnic identity as the part of the person's self that comes from participation in a

social group and encompasses value and importance with participation in that social group, and includes self-identification, affirmation, and a sense of belonging. Self-identification refers to the label a person uses to define oneself. Belonging refers to positive feelings towards one's group such as pride, happiness, and attachment towards ethnic group. Other aspects of ethnic identity include participation in ethnic behaviors and practices and ethnic identity achievement. Ethnic behaviors and practices include involvement in social or cultural activities with other members of one's group. Ethnic identity achievement refers "a secure sense of oneself as a member of a minority group" (Phinney, 1992, p. 160). Phinney (1989) proposed 3 stages of ethnic identity development for adolescents: unexamined phase, search or exploration phase, and achieved phase.

Racial and ethnic identity. Charmaraman and Grossman (2010) examined the importance of race and ethnicity among African American, Latin American, Asian American, and multiracial adolescents. The authors used the term "racial-ethnic identity" because they believe the two constructs interact, especially with adolescents. African American and Latin American adolescents reported the highest level of centrality, which the authors defined as importance of race and ethnicity to the participant's identity. Asian American participants reported significantly lower levels of centrality than African American adolescents. Multiracial adolescents reported the lowest levels of centrality, significantly lower than African American and Latin American participants. Females reported higher levels of centrality than males. Some (27%) multiracial participants reported a level of disengagement. Disengagement was measured by responses that (1) focused on commonalities rather than differences among ethnic groups, (2) de-

emphasized the importance of ethnic background to one's identity, and (3) emphasized the importance of personal uniqueness rather than ethnic group membership (Charmarman & Grossman, 2010).

Terry and Winston (2010) examined ethnic identity in adolescents identified as African American, European American, or multiracial (African American/European American). Many (73%) multiracial adolescents changed their racial self-identification as they progressed through school, compared to 27% of monoracial adolescents who remained consistent in their self-identification. The authors claimed that racial self-identification is a personality characteristic and can change across time for multiracial adolescents. The most common self-identification label used by adolescents was "Black and White," suggesting there may be a shift in flexible thinking. When these adolescents were asked to choose one race, they chose "Black" suggesting that phenotypic characteristics may be influential in self-identification (Terry & Winston, 2010).

Hiltin and colleagues (2006) examined racial self-categorization among multiracial adolescents aged 14-18 years over a 5-year period. Twice as many adolescents had fluid multiracial identity change, meaning they self-reported different racial categories over time, than those who reported stable multiracial identity. African American youth were more likely to report one race and add other racial categories at subsequent trials than other groups. Further, the researchers found that Native American youth were more likely to change their self-categorization than other groups. Asian American adolescents typically added European American to their ethnic identity during the subsequent trials, whereas multiracial Asian American and European American adolescents identified themselves as Asian during the subsequent session. High self-

esteem and low intelligence were associated with lower likelihood of switching ethnic identity across time (Hitlin, Brown, & Elder, 2006).

Bracey, Bamaca, and Umana-Taylor (2004) found that multiracial adolescents showed higher levels of ethnic identity than monoracial European American adolescents, but lower levels of ethnic identity than monoracial Latin American, African American, or Asian American adolescents. Herman (2004) found that multiracial groups reported positive feelings toward their racial identity similar to that of monoracial European American participants, but multiracial Asian American and European American youth reported less positive feelings about their racial identity than other groups. Shih and Sanchez (2005) found that multiracial youth reported lower public racial regard than monoracial majority and monoracial minority youth. Public racial regard refers to a multiracial individual's perception of other's attitudes towards their racial identity. The authors claimed this alludes to multiracial individual's perception that others do not accept their racial identity. Shih and Sanchez (2005) also found that multiracial participants reported higher racial pride than monoracial majority and monoracial minority, suggesting they have positive attitudes about their racial identity despite their beliefs of how others may perceive them. The findings from this study suggest that multiracial and monoracial identities differ in this regard. Ethnic identity is thus fluid in multiracial adolescents.

Ethnic identity and psychological health. Individuals with strong sense of ethnic identity have greater self-esteem and positive coping styles than individuals with a weak sense of ethnic identity (Gray-Little & Hafdahl, 2000; Phinney, 1992, Phinney & Chavira, 1992; Rowley, Sellers, Chavous, & Smith, 1998; Smith, Walker, Fields,

Broskins, & Seay, 1999; Umana-Taylor, Diversi, & Fine, 2002). Roberts and others (1999) found members of ethnic minority groups demonstrated stronger ethnic identity than those of a majority group. Furthermore, African American youth had higher levels of ethnic identity than European Americans or Hispanic Americans. African American youth with strong ethnic identity had high self-esteem and low levels of depression (James, Kim, & Armijo, 2000; Yasui, Dorham, & Dishion, 2004). Phinney and Chavira (1992) found a positive relationship between self-esteem and strong ethnic identity in African American and Latin American, but not European American, youth. Ethnic identity was also associated with effective coping styles. Those with high levels of ethnic identity used discussion instead of passive or aggressive methods to cope (Phinney & Chavira, 1995). Several studies also reveal a negative relationship between ethnic identity and loneliness, depression, suicidal ideation, and anxiety (Arroyo & Ziegler, 1995; Phinney & Chavira, 1992; Roberts et al., 1999).

Strong identification with a group serves as a protective factor against some of the negative aspects of being a minority such as racism and discrimination (Branscombe, Schmitt, & Harvey, 1999), and ethnic identity is important in coping, optimism, and general mastery (Roberts et al., 1999). Victims of discrimination with strong ethnic identity have their own ethnic group as a supportive resource (Shelton et al., 2005). African American college students who valued their ethnic identity and viewed their ethnicity positively were not greatly affected by discrimination compared to those who did not (Sellers & Shelton, 2003).

Racism and discrimination for ethnic minorities may be classified as emotional maltreatment and become traumatic experiences that interfere with a positive self-concept

(Sanchez-Hucles, 1998). The diagnostic criteria of PTSD in the DSM-IV-TR do not consider responses to stress and experiences by minority cultures, so PTSD in response to discrimination is difficult to diagnose in minorities (Keane, Kaloupek, & Weathers, 1996; Marsella, Friedman, & Spain, 1996). Minorities may be more vulnerable to PTSD symptoms when faced with additional trauma (Allen, 1996), although African American status served as a protective factor for maltreated youth (Lemos-Miller & Kearney, 2006).

Khaylis and others (2007) examined the effect of ethnic identity on the severity of PTSD in the context of race-related stress. The researchers recruited 91 undergraduate students who experienced race-related stress (e.g., "Someone hurt my family member because of our race or ethnicity"). Participants were Asian (47.3%), Hispanic (18.7%), European American (11%), other (8.8%), African American (6.6%), and Middle Eastern (5.5%). PTSD and ethnic identity were positively correlated if the stressor was race-related. Those with higher levels of ethnic identity experienced higher levels of PTSD when exposed to race-related stress than those with lower levels of ethnic identity. These results are inconsistent with research that show strong ethnic identity serves as a protective factor against psychological disorders, but these results are for race-related stress and not other stressors (Khaylis, Waelde, & Bruce, 2007). The present study seeks to clarify inconsistencies in the literature regarding ethnic minority youth and PTSD. Specifically, the following sections explore the literature on multiracial youth.

Multiracial Youth

"A multiracial individual is one who self-identifies with more than race or whose parents identify with two or more difference races." The 2000 U.S. Census initially

recognized multiracial individuals when it allowed 2.5% of the population to choose more than one race when completing the form. The multiracial population continues to grow; approximately 2 million children in the United States have parents of different racial backgrounds (Burke & Kao, 2010).

A rise in multiethnic marriages and relationships contributed to the growing population of multiracial children in American population. Marriages between African Americans and European Americans have increased 400% and marriages between Asian Americans and European Americans have increased 1000% in the last 30 years. European American (47%), African American (60%), and Hispanic American (90%) teenagers reported dating a member of another ethnic group (Burke & Kao, 2010). The next section covers theories of ethnic identity development for multiracial individuals.

Theories of Multiracial and Ethnic Identity Development

Early research did a poor job of differentiating race and ethnicity, therefore, the following section includes theories of both racial and ethnic identity development. Erickson was among the first to outline identity development throughout the lifespan, from a state of identity confusion to a state of identity convergence (Schwartz & Pantin, 2006). Erickson defined adolescence as a time for a person to explore their identity without commitment and a time for minorities to incorporate their ethnic background into their identity. Unfortunately, racial categories in the United States have typically been mutually exclusive and less sensitive to multiracial adolescents (Burke & Kao, 2010).

Since the 1920s, multiracial individuals were included in early research as a pathological group. Park (1928) stated that other racial groups would not accept multiracial individials. Stonequist (1935) expanded Park's theory by adding stages of a

marginal status. In the first stage, preparation, the individual becomes familiar with both cultures. In the second stage, crisis, the individual recognizes differences between the two cultures and recognizes his status does not fully fit either group. In the third stage, resolution, the individual resolves this conflict by assimilating in the dominant group, assimilating in the minority group, or creating an identity as a multiracial individual.

Thornton and Wason (1995) identified 3 categories of multiracial identity development: problem approach, equivalent approach, and variant approach. The problem approach stems from the early view of minority individuals as "minority man" (Park 1928, 1931; Stonequist, 1937) in which a person is of 2 different identities. This approach focused on the problems and deficits of individuals from a multiracial background (Collins, 2000; Thornton, 1996). The problem approach proposed that multiracial individuals are vulnerable to rejection, isolation, and stigmatization from the groups they belong to as well as others. The problem approach also suggests that multiracial individuals must face the difficulties associated with being a minority, in addition to struggles faced by multiracial individuals, thus making them more vulnerable to psychological disorders (Teicher, 1968). The problem approach emerged when most of the research, including multiracial participants, revealed negative psychological outcomes for multiracial individuals (Johnson, 1992).

Alternative approaches emerged when multiracial relationships increased in the 1970s (Root, 1996). Laws banning interracial marriages were repealed and researchers began to include multiracial individuals as participants. The comparative (or equivalent) approach emerged when identity development in multiracial and monoracial individuals was thought to be similar. Researchers thus applied ethnic identity models developed for

monoracial individuals to multiracial individuals (Thornton & Wason, 1995). This approach was criticized because it did not allow individuals to identify with more than one ethnic group and did not account for the process a multiracial individual undergoes before deciding to identify with one or both groups (Gillem, Cohn, & Throne 2001).

The variant approach is the most recent approach. Thornton and Wason (1995) suggested that multiracial identity is separate from all other monoracial categories. This approach initiated the development of models that laid the framework for multiracial identity development. Jacobs (1992) proposed that multiracial children pass through the precolor constancy, postcolor constancy, and biracial identity stages. The precolor stage occurs in early childhood as a child's understanding of skin color is fluid. The postcolor constancy stage occurs at approximately 4 years when a child becomes ambivalent about their racial background and begins to understand the social implication associated with their ethnicity. The biracial identity phase occurs from ages 8-12 years when a child begins to develop a biracial identity (Shih & Sanchez, 2005).

Poston (1990) proposed that multiracial children experience 4 stages of ethnic identity. The first stage is personal identity when the individual becomes aware of their ethnic identity. The next stage is group categorization when a multiracial individual feels pressured to identify with one racial identity and thus feel alienated. The next stage is enmeshment and denial when the multiracial individual has chosen an identity but feels guilty and confused because the chosen identity is not an accurate reflection. The last stage, integration, occurs when the individual values all components of their ethnic background.

Doyle and Kao (2007) found that ethnic identity and socioeconomic status were linked. Individuals from high socioeconomic background were more likely to maintain ethnic identity stability than those from a low socioeconomic background. Doyle and Kao (2007) also linked ethnic identity stability to physical appearance. Individuals whose identities were linked to physical appearance were less likely to change their identities over time. Implicit in these findings is that ethnic identity changes because of individual and environmental factors. Rockquemore and Brunsma (2002) indicated that multiracial individuals fluctuate between their identities and identify with one identity based on their mood, whereas Harris and Sim (2002) found that identifying with one ethnicity may depend on a person's environment.

Other researchers have found that those who identify strongly with more than one group have a strong sense of self when faced with discrimination because they have flexibility in choosing which ethnic background to relate to and draw strength from. This increases the availability of possible support for multiracial individuals (Hong & Seltzer, 1995; Pittinsky, Shih, & Ambady, 1999; Roccas & Brewer, 2002). These findings were consistent with Kiang and others (2008) who found that any ethnic identity, regardless of ethnicity, served as a protective factor against psychological disorders.

Others claim multiracial children experience more problems such as isolation, depression, and shame than other children (Sanders-Phillips et al., 1995). Some suggest that multiracial children experience more problems because multiracial parents have more conflict in their relationships and are overprotective (Gibbs & Moskowitz-Sweet, 1991; Xie & Goyette, 1997). Lack of a sense of belonging to a particular group may also cause conflicts for multiracial children, especially for girls (Gibbs and Moscowitz-Sweet,

1991). Other unique challenges for multiracial adolescents are discussed in the following section.

Unique Challenges

One of the challenges that a multiracial individual may face is reconciling the difference between self-identity and the identity placed on them by others. One common example is choosing an ethnic group on forms that exclude a multiracial choice (Nakashima, 1992). Other challenges include justifying ethnic-related choices made to others or feeling pressure to identify with one ethnic group. These challenges can lead to guilt if an individual feels they are denying one part of their identity. Another challenge a multiracial individual may face is finding appropriate role models. Multiracial individuals are often categorized into a single race category and do not share their racial identity with both of their parents. Children may also have difficulty finding peers that share their multiracial background (Renn, 2000). Rejection and discrimination from not only the majority group but from each of their component ethnic groups can lead to isolation and loneliness (Shih & Sanchez, 2005).

Research on multiracial adolescents is sparse and most of the literature focuses on identity formation or problems that multiracial identity presents for development (Cooney & Radina, 2000). Most of the literature with multiracial children and adolescents includes a clinical population and does not include age group or consider developmental stages with respect to ethnic identity. Furthermore, some studies group all monoracial groups together, which can be problematic because ethnic groups have different levels of involvement in problem behaviors such as substance abuse and violent

behaviors (Cauce et al., 1992; Milan & Keiley, 2000; Radina & Cooney, 2000; Shih & Sanchez, 2005; Spencer, Icard, Harachi, Catalano, & Oxford, 2000).

Family and Peer Factors

Radina and Cooney (2000) found no significant difference among monoracial, multiracial, and minority adolescents with respect to their relationship to their mother. However, multiracial girls reported more contact with their fathers than European American or other monoracial girls and greater behavioral involvement with their mothers. This relationship may be explained by mothers' greater desire to protect their daughters and girls' struggle with peer acceptance. Multiracial boys reported less affective cohesiveness with their fathers than European American and other minority boys but reported similar levels of contact and behavioral involvement with their fathers than all other groups. Multiracial boys also reported less communication with their fathers than boys in other groups, with the biggest communication difference emerging for school-related topics. Multiracial adolescent relationships with their parents were approximately the same as European American and monoracial adolescents, with the exception of multiracial boys' relationships with their fathers. This difficulty may stem from inherent difficulties in adolescent boys' relationships with their fathers and the fathers' inability to handle the strain in the relationship (Radina & Cooney, 2000). Cauce and colleagues (1992) found that multiracial adolescents scored higher on a measure of trust and communication and lower on scale of alienation with respect to peer relationships than monoracial adolescents.

Substance Abuse/Violent Behaviors

Problem behaviors such as delinquency, drug use, alcohol use, smoking, and adolescent sexual activity have also been examined in multiracial and monoracial adolescents. Cooney and Radina (2000) found that multiracial male adolescents reported higher rates of delinquency behaviors than their monoracial minority peers. In contrast, female multiracial adolescents reported slightly lower rates of delinquency than their monoracial minority peers. Field (1996) found that multiracial adolescents reported more behavioral problems than monoracial majority and minority adolescents.

Choi and colleagues (2006) found multiracial youth were more likely than other ethnic groups to consume alcohol. Multiracial adolescents were also more likely than European American and Asian American youth to smoke marijuana. Multiracial youth were more likely than Asian American youth to smoke crack or cocaine. In contrast, no significant differences were found between multiracial youth and African American youth with respect to marijuana use. Substance use frequency was higher for multiracial youth than other groups. However, Cooney and Radina (2000) found no differences between multiracial adolescents and monoracial youth with respect to substance abuse and delinquency.

Chavez and Sanchez (2010) found a greater percentage of European American (38.6%) youth initiated alcohol use than multiracial (36.3%), African American (26.1%), Native American (22.1%), Asian/Pacific Islander (20.1%), and Latin American (31.7%) youth. The odds of alcohol initiation were 64% lower for Asian/Pacific Islander, 42% lower for African Americans, and 27% lower for Latin Americans compared to multiracial youth. The odds of tobacco use were 63% lower for Asian/Pacific Islander

youth, 68% lower for African American youth, and 38% lower for Latin American youth compared to multiracial youth, but European Americans demonstrated a 46% increase in the odds of tobacco use. Poverty level, negative affect, and parental knowledge were associated with increased substance use in multiracial, European American, and Latin American adolescents. Parental knowledge was negatively associated with substance abuse for multiracial adolescents, European American, and Latin American adolescents.

Negative affect was positively associated with substance use in multiracial, European American, and Native American adolescents and drinking in Asian/Pacific Islander and Latin American adolescents. Socioeconomic status was positively correlated with alcohol consumption in multiracial adolescents. Discriminatory experiences were significantly associated with cigarette smoking in multiracial and Asian/Pacific Islander youth. Multiracial youth in this study were more similar to high-risk European American and Native American youth (Chavez & Sanchez, 2010).

Jackson and Lecroy (2009) found monoracial youth from a minority group reported greater lifetime substance use than European American youth. Multiracial youth had a greater risk of substance use and engagement in negative activities than monoracial European American, Mexican American, African American, and Native American youth. Multiracial adolescents who lacked family involvement and support were more likely to engage in substance use and were more likely to be involved in negative activity than other adolescents. Negative activity was defined as stealing, gang banging, fighting, lying, skipping school, damaging property, carrying a weapon, problems with police, suspension from school, detention, cheating, and being arrested.

Choi and colleagues (2006) found that multiracial youth reported significantly higher rates of violent behaviors than European American and Asian American youth. Violent behaviors included physical fights, badly hurting someone in a fight, carrying a gun, carrying a knife or razor, cutting/stabbing someone, or threatening to beat someone. The researchers found fewer significant differences in violent behaviors across multiracial and African American youth, but reported that multiracial youth generally reported more violent behaviors. Higher levels of ethnic identity were significantly associated with less frequent violent behavior for multiracial youth.

Academic Achievement

Herman (2009) found that academic grades for multiracial students were related to their beliefs about the consequences of school failure, educational values of peers, and racial composition of their schools and neighborhoods. Multiracial students who identified as African American or Hispanic American had lower grades than European American or Asian American students. African American and Hispanic American multiracial students had lower grades than monoracial African American and Hispanic American groups. However, Herman (2009) found no relationship between value of ethnic group membership and grades.

Cooney and Radina (2000) found no significant differences in academic grades between multiracial and European American or monoracial peers. Male multiracial adolescents reported a higher rate of grade retention (24%) than their European American peers (16%). More (14%) multiracial girls reported more suspension or expulsion than European American females (8%), whereas monoracial female minorities had the highest rates of suspension/expulsion (19%). Multiracial boys reported a higher percentage of

expulsions and suspensions (29%) than European American males (22.5%), but lower than monoracial minority males (38%). Multiracial male and female adolescents reported marginally significant higher grades than monoracial minority adolescents. Multiracial male adolescents did not have a significantly different GPA than monoracial majority male peers, but multiracial female adolescents reported lower GPAs than monoracial majority peers.

Harris and Thomas (2002) found that multiracial children reported less grade retention, higher GPA, and higher test scores than monoracial minority adolescents, but this difference did not exist for Asian American/European American biracial adolescents compared to Asian American adolescents. Shih and Sanchez (2005) found that multiracial adolescents (Asian American/European American and African American/ European American) scored higher on a math test than monoracial European American adolescents. The research on academic achievement further reflects the inconsistencies in research on multiracial youth. The last section of this review will discuss psychological health of multiracial adolescents.

Psychological Health

Cooney and Radina (2000) found multiracial and monoracial minority males and females reported higher levels of depression than their European American peers, which the authors attributed to the family dynamic in multiracial homes or identity struggles. Multiracial adolescents were more likely to have seen a professional counselor than their monoracial peers. The authors suggested that this may be an attempt by their parents to protect their children in anticipation of difficulties from their ethnic background. Overall, the authors found more similarities than differences across the groups.

Shih and Sanchez (2005) found that 36% of studies reported both positive and negative psychological outcomes for multiracial adolescents, suggesting that adjustment in multiracial children is more complex than previously thought. Individuals from a multiracial background were exposed to more challenges but also had access to more peer support, especially when they felt rejected by one group. Shih and Sanchez (2005) found that studies using clinical samples indicated higher rates of depression, problem behaviors, poor school performance, and low self-esteem, whereas studies of non-clinical samples indicated positive outcomes such as happiness and high self-esteem for multiracial groups.

Milan and Keiley (2000) found that multiracial adolescents reported higher levels of depression than monoracial adolescents. Multiracial adolescents reported lower levels of depression than monoracial minority adolescents but the difference was not statistically significant. Cooney and Radina (2000) found that multiracial male adolescents reported higher levels of depression than monoracial majority male adolescents and monoracial minority male adolescents. Multiracial female adolescents reported higher levels of depression than monoracial majority female and slightly higher rates of depression than monoracial minority female adolescents (Cooney & Radina, 2000). Cauce and colleagues (1992) found that monoracial adolescents reported higher levels of depression than African American/European American and Asian American/European American biracial adolescents. Inconsistencies have thus emerged with respect to depressive symptoms in multiracial adolescents.

Self-esteem. Multiracial adolescents reported lower self-esteem than monoracial minority and monoracial majority adolescents (Field 1996; Milan and Keiley, 2000). In

contrast, Shih and Sanchez (2005) found that multiracial adolescents reported higher self-esteem than monoracial European American and monoracial minority individuals. Bracey and colleagues (2004) found that multiracial adolescents reported higher self-esteem than monoracial Asian American adolescents, but lower self-esteem than monoracial African American adolescents. However, others report no differences in self-esteem across multiracial and monoracial adolescents (Herman, 2004).

Summary of Findings on Multiracial Youth

The population of multiracial youth has increased in recent years (Burke & Kao, 2010). Racial identification remains fluid as multiracial adolescents progress through school (Terry & Winston, 2010), and stable racial self- identification has been positively associated with high self-esteem and IQ (Hiltin et al., 2006). Theories of multiracial identity development identify discrimination and stigmatization as risk factors for psychological disorders. Some suggest that multiracial identity protects individuals from discrimination because it expands opportunities for support, while others suggest multiracial identity makes individuals vulnerable to isolation, depression, and shame (Hong & Seltzer, 1995; Pittinsky et al., 1999; Roccas & Brewer, 2002; Sanders-Phillips et al., 1995).

Multiracial girls report more interaction with their fathers than monoracial girls, whereas multiracial boys report less communication with their fathers than all other ethnic groups (Radina & Cooney, 2000). Some found that multiracial adolescents are more likely to consume alcohol, smoke marijuana, and smoke crack or cocaine than all other ethnic groups (Chavez & Sanchez, 2010; Choi et al., 2006; Jackson & LeCroy, 2009). Others found no difference in substance and alcohol use between multiracial and

monoracial adolescents (Cooney & Radina, 2000). Multiracial adolescents identified as African American or Hispanic American had lower grades than monoracial African American and Hispanic American students (Herman, 2009). Others report that multiracial adolescents reported higher grades than monoracial minorities (Harris & Thomas, 2002) or no differences between monoracial and multiracial youth (Cooney & Radina, 2000).

Limitations of findings on multiracial youth

A major limitation of studies of psychological health in multiracial youth is use of clinical samples (Field 1996; Cooney & Radina, 2000; Milan & Keiley, 2000; Shih & Sanchez, 2005). These studies reveal poor psychological health outcomes for multiracial youth. Conversely, studies from a general population reveal that multiracial youth are satisfied, happy, and comfortable with their racial identity. Multiracial adolescents may experience difficulties with depression and school performance, especially when compared to monoracial European American adolescents (Cooney & Radina, 2000; Milan & Keiley, 2000; Shih & Sanchez, 2005), but inconsistencies and lack of research in this area prevent definitive conclusions.

Multiracial adolescents also reported higher levels of depression and behavioral problems than monoracial European American peers, but had better school performance than monoracial minority adolescents. The discrepancy between psychological and school adjustment demonstrates the complexity of examining adjustment in multiracial adolescents (Cooney & Radina, 2000; Field, 1996; Milan & Keiley, 2000). Very few studies have examined PTSD-related symptoms in multiracial youth. Further, few studies have examined the mediating roles of gender, depression, dissociation, family

environment, and posttraumatic cognitions in multiracial youth. The lack of research with multiracial youth, compounded with inconsistencies in existing research, lead to the proposed study.

Purpose of Present Study

Current models of PTSD demonstrate the devastating consequences of maltreatment on a child's psychological, neurobiological, behavioral, and cognitive functioning. Cognitive models emphasize the integration and processing of trauma-related information into memory. Biological models emphasize the impact of structural and functional neurobiological changes. Other theories outline the importance of environment such as family and peer relationships. Unfortunately, models of PTSD have not been evaluated among maltreated multiracial youth.

Lemos-Miller and Kearney (2006) examined the relationship between PTSD and depression in maltreated adolescents. Multiracial children had a stronger relationship between depression and PTSD after maltreatment than other groups. African American children did not demonstrate a strong relationship between PTSD and depression, suggesting that African American children may have a strong support network while multiracial children lack support. The findings from their study are among the first to examine PTSD symptoms in multiracial youth, but the study was limited by sample size. The first aim of the proposed study was to replicate the original findings with a larger sample size of multiracial adolescents. Depression was expected to mediate the relationship between (1) dissociation and posttraumatic cognitions and (2) PTSD symptoms in multiracial adolescents.

The second aim of this proposed study was to evaluate the mediating roles of other psychological factors in multiracial youth. The mediating roles of family environment, dissociation, and posttraumatic cognitions are supported in the literature but have not been evaluated extensively among multiracial youth. Family environment was expected to influence PTSD symptomology in multiracial adolescents (Bal et al., 2003; Birmes et al., 2009; Burton et al., 1994; Kurtz et al., 2003; Pina et al., 2008). Specifically, family cohesion and conflict were expected to mediate the relationship between (1) depression, dissociation, and posttraumatic cognitions and (2) PTSD symptoms.

Dissociation has been identified as a contributing factor for PTSD after maltreatment. Dissociation leads to depressive symptoms and interrupts one's ability to integrate trauma memories (Colin-Vezina & Herbert, 2005; Kaplow et al., 2005; Lemos-Miller & Kearney, 2006). Multiracial adolescents were expected to experience an elevated level of dissociative symptoms and dissociative symptoms were expected to mediate the relationship between (1) depression and posttraumatic cognitions and (2) PTSD symptoms.

Posttraumatic cognitions influence PTSD symptoms after maltreatment (Carrion et al., 2001; Harkness & Lumley, 2008; Lemos-Miller & Kearney, 2006). Negative thoughts about self, the word, and self are associated with re-experiencing, avoidance/ numbing, increased arousal, and significant distress in maltreated youth (Lemos-Miller & Kearney, 2006; Linning & Kearney, 2004). Posttraumatic cognitions were expected to mediate the relationship between (1) depression and dissociation and (2) PTSD symptoms.

Another aim of the proposed study is to examine trauma-related symptoms across gender and substance use behaviors. Girls are more susceptible to trauma-related symptoms than boys (Greenwald, 2002; Johnson et al., 2002; Wolfe et al., 2001). Elevated levels of substance use have been identified in the literature as a problem behavior for maltreated (Danielson et al., 2009; Moran et al., 2004; Schuck & Widom, 2001; Wall & Kohl, 2005) and multiracial youth (Chavez & Sanchez, 2010; Choi et al., 2006; Jackson & Lecroy, 2009). The proposed study seeks to examine the effects of gender and substance use in a diverse sample of maltreated adolescents.

Hypotheses

The first hypothesis was that depression ("B" variable) would mediate (1) dissociation and posttraumatic cognitions ("A" variables) and (2) PTSD symptoms ("C" variable) in multiracial youth. This hypothesis was preliminarily supported in a small sample by Lemos-Miller and Kearney (2006).

The second hypothesis was that family cohesion ("B" variable) would mediate (1) depression, dissociation, and posttraumatic cognitions ("A" variables) and (2) PTSD symptoms ("C" variable) in multiracial youth. This hypothesis was supported by studies demonstrating that family cohesion and support decrease risk for PTSD (Bal et al., 2003; Birmes et al., 2009; Pina et al., 2008).

The third hypothesis was that family conflict ("B" variable) would mediate (1) depression, dissociation, and posttraumatic cognitions ("A" variables) and (2) PTSD symptoms ("C" variable) in multiracial youth. This hypothesis was supported by research demonstrating that attachment (Barnett et al., 1999; Cicchetti & Toth, 2005; Dettling et al., 2000; Hesse & Main, 2006; Kaplan et al., 1999; Muller et al., 2000, 2001;

Nachimas et al., 1996; Toth & Cicchetti, 1996), family conflict (Burton et al., 1994; Kurtz et al., 2003), and parenting (Ariga et al., 2008; Landolt et al., 2003) influence PTSD symptoms.

The fourth hypothesis was that dissociation ("B" variable) would mediate (1) depression and posttraumatic cognitions ("A" variables) and (2) PTSD symptoms ("C" variable) in multiracial youth. This hypothesis was supported by research demonstrating the link between dissociation and PTSD in maltreated youth (Collin-Vezina & Herbert, 2005; Kaplow et al., 2005; Lemos-Miller & Kearney, 2006).

The fifth hypothesis was that posttraumatic cognitions ("B" variable) would mediate (1) depression and dissociation ("A" variables) and (2) PTSD symptoms ("C" variable) symptoms in multiracial youth. This hypothesis was supported by studies demonstrating that cognitions play a central role in PTSD (Carrion et al., 2001; Harkness & Lumley, 2008; Lemos-Miller & Kearney, 2006).

Gender and substance abuse were investigated on an exploratory basis. Females are at a greater risk for PTSD after maltreatment than males (Davis & Siegel, 2000; Khoury et al, 1997; Pynoos et al., 1993). In addition, elevated levels of depression have been found in multiracial females (Cooney & Radina, 2000). Others have found elevated levels of substance abuse in maltreated adolescents (Danielson et al., 2009; Moran et al., 2004; Schuck & Widom, 2001; Wall & Kohl, 2005) and multiracial adolescents (Chavez & Sanchez, 2010; Choi et al., 2006; Jackson & Lecroy, 2009). Exploratory analyses were used to investigate gender and substance use in multiracial youth following significant results from hypotheses 1-5.

CHAPTER 3

METHODOLOGY

Participants

Participants included 160 multiracial adolescents referred from Department of Family Services (DFS)-related sites in Clark County, Nevada. Most participants were African American and European American (16.2%), Native American and European American (15.3%), African American and Hispanic American (12.6%), and Hispanic American and European American (10.7%) (Table 1). Participants were aged 11-17 years (M=13.27, SD=2.79 years). Most were aged 15-17 years (51.3%). Most youth were female (57%), born in the United States (71%), and had 3 or more siblings (67%). Youth reported that their parents were never married (32%), divorced (24%), married (13%), separated (9%), widowed (3%), or unknown (19%). Many (40%) youth reported drug and/or alcohol use, whereas others denied drug and/or alcohol use (48%) or did not answer (11%).

Measures

Demographic/Information Sheet.

A demographic/information sheet was used to solicit information on gender, age, race/ethnicity, country of origin, biological parent race/ethnicity, parental marital status, religion, and drug and alcohol use (Appendix I). Addendum questions were administered verbally regarding type, frequency, and perpetrators of maltreatment as well as violence within the family.

Children's PTSD Inventory (CPTSD-I).

The CPTSD-I is a semi-structured interview that assesses DSM-IV-TR PTSD symptoms in youths aged 7-18 years (Saigh et al., 2000). Interview administration lasted 15-20 minutes. Youth responses were scored on a dichotomous scale on five subtests (1 for presence and 0 for absence). The first subtest (2 questions) assesses exposure to trauma and reactivity during stress exposure, the second subtest (11 questions) assesses re-experiencing symptoms, the third subtest (16 questions) assesses avoidance and numbing, the fourth subtest (7 questions) assesses increased arousal, and the fifth subtest (5 questions) assesses distress. The CPTSD-I also assesses duration of distress for each symptom. The CPTSD-I yields one of five diagnoses: PTSD Negative, Acute PTSD, Chronic PTSD, Delayed Onset PTSD, and No Diagnosis. A CPTSD-I total score of 4 or 5 indicated the presence of significant posttraumatic symptoms. No Diagnosis included youths who experienced a trauma but failed to acknowledge this during the interview (Yasik et al., 2001).

To establish content validity of the CPTSD-I, three members of the DSM-IV PTSD Work Group independently rated the measure of correspondence with current diagnostic criteria using a 0-100 point Likert scale (0=lowest correspondence and 100= highest correspondence). Mean subtest ratings were 86.7 for the Situational Reactivity subtest and 90 for all other subtests, indicating consistently high levels of correspondence between the CPTSD-I and DSM-IV PTSD Diagnostic criteria (Saigh et al., 2000).

Saigh and colleagues (2000) examined CPTSD-I internal consistency and reliability in traumatized and non-traumatized youths aged 7-18 years (mean age, 13.8 years) and a sample of 6-17 year olds (mean age, 12.5 years). Moderate to high internal

consistency estimates were found for the subtests (.53-.89) as well as overall diagnostic internal consistency (.95).

Excellent estimates of interrater reliability have been reported for the CPTSD-I. An overall interrater agreement of 98.1% was reported at the diagnostic level (Saigh et al., 2000). A Cohen's kappa of .96 was reported for the overall diagnostic level, indicating excellent diagnostic agreement between raters. Four subtests yielded Cohen's kappas of .84-1.00, indicating excellent interrater reliability. The sole exception was a fair to moderate kappa coefficient of .66 for the Situational Reactivity subtest (Saigh et al., 2000). Excellent estimates of test-retest reliability were also obtained, yielding 97.6% agreement at the diagnostic level, with a Cohen's kappa of .91. The individual subtests yielded estimates of test-retest reliability ranging from .78-1.00. The Significant Impairment subtest yielded fair to good test-retest reliability (.66) (Saigh et al., 2000). Cronbach's alpha for the present study was .89.

Yasik and colleagues (2001) examined validity of the CPTSD-I in traumatized and non-traumatized youths aged 7-18 years (mean age, 13.4 years). The ethnic composition of youth was 64.7% Hispanic American, 16.7% African American, 9.8% European American, and 8.8% Asian. The CPTSD-I displayed high concurrent validity compared to three well established and frequently used criterion measures: clinician derived diagnosis, Diagnostic Interview for Children and Adolescents-Revised PTSD module, and Structured Clinical Interview for DSM. Pearson product-moment correlation coefficients with the CPTSD-I were obtained for diagnostic efficiency (.93-.95), sensitivity (.87-1.00), specificity (.92-.99), positive predictive power (.65-.96), and negative predictive power (.95-1.00) (Yasik et al., 2001).

Yasik and colleagues (2001) evaluated convergent and discriminant validity of the CPTSD-I with the Revised Children's Manifest Anxiety Scale (RCMAS) (Reynolds & Richmond, 1978), Children's Depression Inventory (CDI) (Kovacs, 1992), and Junior Eysenck Personality Inventory (JEPI) (Eysenck, 1963). Significant correlations between CPTSD-I overall symptom endorsement and RCMAS and CDI symptom endorsement indicated strong convergent validity. The CPTSD-I and JEPI extraversion scales were not associated, providing evidence for CPTSD-I discriminant validity.

Adolescent Dissociative Experiences Scale (A-DES).

The A-DES is a 30-item self-report questionnaire that assesses dissociation following normal to pathological experiences in youths aged 12-18 years (Armstrong et al., 1997). A-DES scoring is based on a Likert-type scale where "0 = never" and "10 = always." The individual was asked to indicate how often a particular experience happens to him when not under the influence of drugs or alcohol.

This scale contains 4 domains of dissociation. Dissociative amnesia refers to memory lapses for dissociative experiences. Absorption and imaginative involvement refers to involvement in fantasy activities to the extent that reality fades away, or the distinction between reality and fantasy is difficult to make. Passive influence refers to lack of control over bodily actions and sensations. Depersonalization and derealization refer to feelings of separation from one's body and the world. 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 A-DES validity among 102 adolescents: 73 inpatients, 12 outpatient, and 17 control adolescents and 70 non-clinical 11-17 year old adolescents. The Spearman Brown split half reliability was .92. The Cronbach's alpha was .93 and the subscale alphas ranged from .72-.85, indicating good internal consistency. A-DES scores did not differ based on demographics such as age, gender, race, or grade. However, adolescents in the "no abuse" group scored significantly lower than adolescents in the "physical and sexual abuse" group. Adolescents in the dissociative disorder group scored higher than adolescents in all other diagnostic categories, excluding adolescents in the psychotic disorder group (Armstrong et al., 1997). Cronbach's alpha for the present study was .95.

Farrington and colleagues (2001) examined A-DES internal reliability and factor structure among 768 non-clinical youths aged 11-16 years from the United Kingdom. Excellent internal reliability and split half reliability were indicated with a Cronbach's alpha of .94 and a Spearman-Brown value of .90. No significant age or gender differences were found. The factor structure of the A-DES revealed one main factor reflecting dissociative experiences, but factors for the A-DES subscales were not apparent. The overall mean for the group of non-clinical adolescents was 2.66, providing data on a normative sample (Farrington, Waller, Smerden, & Faupel, 2001).

Smith and Carlson (1996) also provided normative data, reliability, and validity for the A-DES among 180 high school students aged 12-17 years and 46 college students aged 18-21 years. A-DES total mean scores were 2.24 for high school students and .78 for college students. Subscale means ranged from 1.87-2.75. Two-week test-retest reliability of .77 was also found for high school students. Smith and Carlson (1996)

examined A-DES internal consistency and concurrent validity. Internal consistency was indicated with a Cronbach's alpha of .92 for the A-DES total score. Internal consistency values of A-DES subscales ranged from .64-.83. Additionally, adequate Spearman-Brown split-half reliability was reported for the A-DES at .94. Concurrent validity was examined by comparing responses of the college-aged group on the A-DES to the Dissociative Experiences Scale (Carlson & Putnam, 1993). Results indicated good concurrent validity (.77) (Smith & Carlson, 1996).

Muris and colleagues (2003) examined psychometric properties of the A-DES among 331 non-clinical adolescents aged 12-17 years. Factor analyses revealed a single factor measuring dissociative experiences. The authors provided normative data for the A-DES and reported an A-DES total mean score of 1.27 in the non-clinical population. Mean scores for A-DES subscales were 1.79 for absorption/imaginative involvement, 1.58 for passive influence, 1.36 for dissociative amnesia, and .82 for depersonalization/ derealization. Good reliability was reported with a Cronbach's alpha of .93. Demographic variables such as age and sex were unrelated to A-DES scores. Higher A-DES scores were associated with more PTSD symptoms as well as other anxiety disorder symptoms (Muris, Merckelbach, & Peters, 2003).

A more recent examination of the A-DES examined internal reliability and construct validity among 65 girls aged 11-18 years (Seeley, Perosa, & Perosa, 2004). They found internal consistency to be high with a Cronbach's alpha coefficient of .94. Seeley and colleagues (2004) examined A-DES scores among sexually maltreated and control adolescent girls. They found that the A-DES was able to discriminate sexually abused adolescents and non-clinical adolescents. However, A-DES scores did not

differentiate maltreated girls with PTSD from maltreated girls with other disorders. Seeley and colleagues (2004) found that A-DES scores correlated with therapist ratings of dissociation symptoms (r=. 55).

Children's Depression Inventory (CDI).

The CDI is a 27-item self-report questionnaire for youths aged 7-17 years. The CDI measures depressive symptoms during the past two weeks and yields a total depression score and five subscale scores for Negative Mood, Interpersonal Problems, Ineffectiveness, Anhedonia, and Negative Self-Esteem. The child was asked to endorse one of three statements that best applied during the last 2 weeks (e.g., "I am sad once in while," "I am sad many times," and "I am sad all the time"). Each item is based on a 3-point response format from "0 = absence of a symptom" to "2 = definite symptom."

Smucker and colleagues (1986) reported normative and reliability data for the CDI from three public school samples consisting of 1,252 children aged 8-16 years. The authors found the mean to be 9.09 with a standard deviation of 7.04. The authors analyzed scores by gender and found the mean to be 9.21 and 8.99 for boys and girls, respectively. The cutoff score was 19 based on the upper 10%. The internal consistency was good (.83-.89) and test-retest reliability was adequate (.74-.77) (Smucker, Craighead, Craighead, & Green, 1986). Cronbach's alpha for the present study was .91.

Nelson and colleagues (1987) examined CDI characteristics with inpatient boys and girls aged 6-18 years. Girls aged 13+ received higher CDI total scores than boys, but there were no gender differences for the pre-teen group. These gender differences may be more prominent in adolescents than children. The majority of boys and girls endorsed items suggesting loss of interest in activities and suicide. However, overall age

differences were not apparent among CDI scores. Ethnic differences between African American and European American youths were not observed. Researchers reported coefficient alpha of .86 regarding internal consistency (Nelson, Politano, Finch, & Wendel, 1987).

Nelson and Politano (1990) assessed test-retest reliability of the Children's Depression Inventory (CDI) in 96 inpatient children aged 6-15 years. Subjects completed the CDI on three occasions: initially, 10 days later, and 30 days later. Scores decreased significantly from initial assessment to later administrations. Stability coefficients for the overall group ranged from .47-.62. Stability between the 10- and 30-day administrations was somewhat lower for boys than girls (Nelson & Politano, 1990).

Liss and colleagues (2001) reported notable gender differences in CDI scores, with girls scoring higher than boys. This gender difference was significant for younger and older age groups within the 7-17 age range. Among this large, diverse inpatient sample aged 7-17 years, racial differences in CDI scores were not apparent. Evidence for CDI discriminant validity was provided. Youths with depression-related disorders had higher CDI scores than those with primary aggressive/conduct disorders and those with primary aggressive/conduct disorders plus secondary emotional/depressive problems (Liss, Phares, & Liljequist, 2001).

Politano and colleagues (1986) examined racial/ethnic differences in CDI factor structure in 159 African American and 392 European American children aged 6-17 years. Five factors emerged via factor analysis: Social Isolation, Sadness, Lowered School Performance, Negative Self Image, Lethargy, and Suicidal Ideation. Separate factor analyses were conducted for African Americans and European Americans. African

American children scored higher with respect to opposition and lower on suicidal ideation, whereas European American children scored higher on the affective dimension (Politano, Nelson, Evans, & Sorenson, 1986).

Finch and colleagues (1987) examined test-retest reliability for the CDI in 108 children aged 7-12 years. Over the four administrations they found acceptable test-retest reliabilities at 2 weeks (.82), 4 weeks (.66), and 6 weeks (.67). However, initial CDI mean scores were higher than the 2-week CDI mean score. The biggest difference in the scores emerged between the first and second administrations of the measure (Finch, Saylor, Edwards, & McIntosh, 1987).

CDI internal structure was examined with a diverse nonclinical sample of children aged 4-18 years (Helsel & Matson, 1984). Analyses revealed four factors with good face validity: affective behavior, image/ideation, interpersonal relations, and guilt/irritability. A split-half correlation of .89 was found for internal reliability. CDI scores did not differ according to race or gender. However, older youths may report more depressive symptoms than younger children (Helsel & Matson, 1984).

Twenge and Nolen-Hoeksema (2002) evaluated the effects of age, gender, and socioeconomic status on the CDI. The researchers performed a within-scale meta-analysis on 310 data sets with 61,424 children aged 8-16 years. CDI scores steadily decreased with each administration. Analysis of age and gender show that boys' scores remained stable from 8-16 years with a slight increase in symptoms at age 12 years. Girls showed an increase in scores from childhood and adolescence. Overall, there were no statistically significant differences in the scores between genders, but boys scored slightly higher than girls. The analysis showed no correlation between CDI scores and

SES, but showed a relationship between ethnicity and scores. Hispanic Americans (10.34) scored significantly higher than African Americans (8.67) and European Americans (8.84) (Twenge & Nolen-Hoeksema, 2002).

Posttraumatic Cognitions Inventory (PTCI).

The PTCI is a 36-item self-report questionnaire that measures trauma-related thoughts and beliefs. The PTCI yields 3 factors in addition to a total negative cognitions score: negative cognitions about self, negative cognitions about the world, and self-blame. Each item is rated on a 7-point Likert-type scale ranging from 1 (totally disagree) to 7 (totally agree). No specific age requirements have been developed for this scale.

Cronbach's alphas for the total and factor scores have been reported for total score (.97), negative cognitions about self (.97), negative cognitions about the world (88), and self-blame (.86). Test-retest reliability was .74 -.89 after a one-week interval and .80 -.86 after a 3-week interval. The PTCI scales correlate with PTSD severity, depression, and general anxiety. The PTCI also yielded higher scores with traumatized individuals versus non-traumatized individuals (Foa et al., 1999). Cronbach's alpha for the present study was .96.

Family Environment Scale, Form-R (FES).

The FES is a 90-item true-false self-report questionnaire that assesses 3 main factors: Relationship, Personal Growth, and System Maintenance. The Relationship dimension features three subscales: cohesion, expressiveness, and conflict. The Personal Growth dimension features five subscales: independence, achievement orientation, intellectual-cultural orientation, active-recreational orientation, and moral-religious

orientation. The System Maintenance dimension features two subscales: organization and control. Moos and Moos (1986) reported internal consistencies of .61-.78.

Robertson and Hyde (1982) examined the factor analytic structure of the FES among high school students (mean age, 15 years, 8 months). The authors suggested that the following 7 subscales best represent the FES: Group Cohesion, Conflict, Structure, Religion, Activities, Protestant Ethic, and Verbal-Intellectual Orientation (Robertson & Hyde, 1982). Waldron and colleagues (1990) further examined the factor structure of the FES among college students and nonclinical adults. Reliability estimates of FES subscales varied from .43 (independence) to .51 (achievement orientation) to .77 (cohesion). Internal consistency was found in 5 FES subscales: cohesion (.77), intellectual-cultural (.75), moral-religious emphasis (.74), conflict (.74), and organization (.72). The other subscale alpha levels were .63-.66 (Waldron, Sabatelli, & Anderson, 1990). Roosa and Beals (1990) also examined the internal consistency of five scales: Cohesion, Expression, Conflict, Organization, and Control. Internal consistency was .36-.75 with the highest rate reported for the conflict scale (.61-.76) and the lowest for the control (.47-.67) and expression (.36-.69) scales (Roosa & Beals, 1990).

Perosa and Perosa (1990) assessed convergent and discriminant validity for the cohesion and adaptability dimensions of the FES with two other measures of family functioning. The measures were administered to 85 high school students and 98 undergraduates. Convergent validity among measures of cohesion was strong; convergent validity for measures of adaptability was moderate. Problems with discriminant validity were noted (Perosa & Perosa, 1990).

Boyd and colleagues (1997) reported FES reliability estimates in adolescents aged 11-18 years. Internal consistency varied from low to moderate. Internal consistency was acceptable for conflict, moral-religious emphasis, and cohesion scales (.72, .71, and .67, respectively). Lowest internal consistency estimates were reported for the independence and expressiveness scales (.31 and .39, respectively). Other subscale alphas were reported for achievement (.44), intellectual-cultural orientation (.47), control (.59), organization (.60), and active-recreational orientation (.62) (Boyd, Gullone, Needleman, & Burt, 1997). Family cohesion was measured by the FES cohesion scale and family conflict was measured by the FES conflict scale. Cronbach's alphas for the present study were .73 (cohesion) and .72 (conflict)

Procedures

Procedures were in accordance with UNLV and DFS policies regarding research with human subjects. The UNLV Office for the Protection of Research Subjects, Institutional Review Board (IRB), Social and Behavioral Sciences committee approved protocol #0705-2531 on September 17, 2007 and protocol #0801-2586 approved June 6, 2008. Both protocols were renewed as protocol #1005-3485M on December 5, 2010 by the UNLV Office for the Protection of Research Subject IRB as a part of an ongoing study. An approved interlocal contract by UNLV and DFS was in accordance with county and state laws regarding children in protective custody. Ongoing data collection was conducted at Desert Psychological Services in partnership with Clark County DFS. A Confidentiality Certificate from Department of Health and Human Services, National Institutes of Health (August 1, 2007) was issued for this study.

Participants were recruited through Desert Psychological Services. Youths included in the study were aged 11-17 years with past trauma exposure and current DFS placement. Youths were informed about research confidentiality, their rights as a participant, and limits of confidentiality. Participating youths completed a Uniform Psychological Psychoeducational Assessment (UPPA) administered by Desert Psychological staff. Youths completed a demographic/information form, CPTSD-I, CDI, A-DES PCI, MEIM, and FES. Assessment procedures were conducted in a confidential environment without DFS staff. The assessment was part of DFS's standard mental health evaluation and the assessor produced a report outlining diagnostic findings, clinical impressions, and further assessment/treatment recommendations. These reports were kept confidential by DFS staff and used only to assist in placement, treatment, and further assessment of DFS- affiliated youth.

The assessment process did not require parental permission given the adolescent's status in DFS custody following child maltreatment. Similarly, youth assent was not required because the study involved secondary analysis of assessments performed as a routine agency procedure. Furthermore, the dataset was de-identified by a DFS contractor (Dr. Holland/Desert Psychological Services) and replaced with a code number prior to transfer to the researcher for analysis. Data were stored in locked file cabinets in Dr. Christopher Kearney's office or research facility.

Participants were encouraged to take breaks during the assessment process. If a participant expressed significant distress during the assessment, then a licensed clinical psychologist was available for support. Participants were encouraged to process their feelings and ask questions throughout the assessment process. Adolescents were

encouraged to share distressing feelings with their parent/guardian, caregiver, counselor, or social worker. DFS-affiliated youth were routinely referred for individual, family, or group therapy or other therapeutic services following the UPPA report.

Data Analyses

Hypotheses were tested via structural equation modeling (SEM) because this procedure provides overall goodness-of-fit estimates, allows an analysis of multiple factors, and minimizes measurement error. Three goodness-of-fit indices were examined 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).

Mediational analyses were conducted using Holmbeck's (1997) multistep approach. The predictor-outcome path was examined for adequate fit. If the A → B→ C path displayed adequate fit, then the predictor-outcome path (A→C) was examined for goodness-of-fit. If the A→C path displayed adequate fit, then the A → B→ C path was examined under two conditions: (1) when the predictor-outcome path (A→ C) is constrained to zero and when the predictor-outcome path (A→C) is not constrained to zero. For mediation to occur, the unconstrained model should not provide better fit than the constrained model. Mediation is assumed to occur if these criteria are met.

Subscale scores were used in the meditational analyses of PTSD, depression, dissociation, and posttraumatic cognition symptoms. PTSD subscales included situational reactivity, re-experiencing, avoidance, arousal, and distress. Depression subscales include negative mood, interpersonal problems, ineffectiveness, anhedonia, and negative self-esteem. Dissociation subscales included dissociative amnesia,

absorption/imaginative involvement, passive influence, and depersonalization/ derealization. Posttraumatic cognitions included negative cognitions about world, negative cognitions about self, and self-blame.

The first hypothesis involved a model wherein depression ("B" variable) mediated (1) dissociation and posttraumatic cognitions ("A" variables) and (2) PTSD symptoms ("C" variable) (Figure 1).

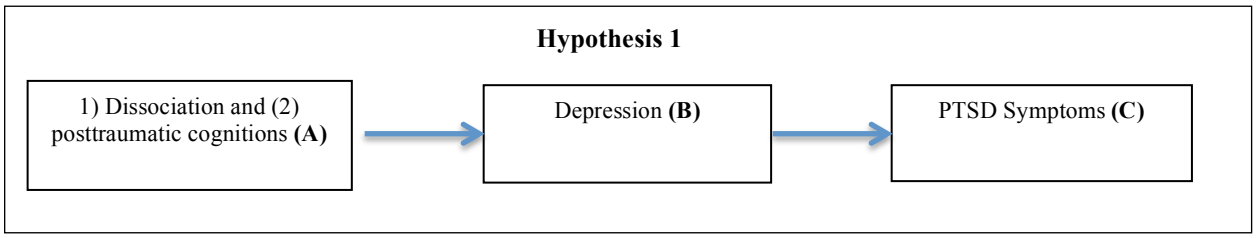

Figure 1. Hypothesis 1.

The second hypothesis involved a model wherein family cohesion ("B" variable) mediated (1) depression, dissociation, and posttraumatic cognitions ("A" variables) and (2) PTSD symptoms ("C" variable) (Figure 2).

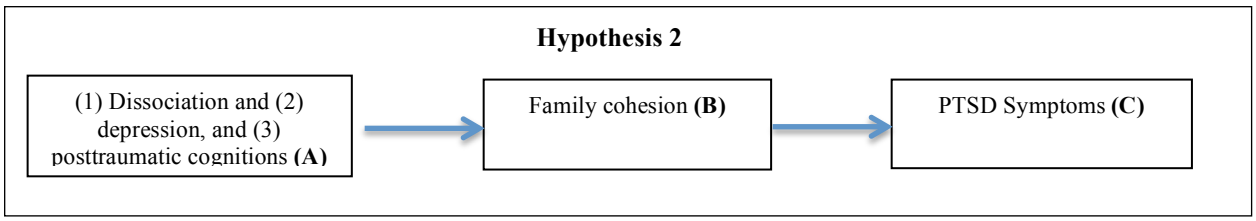

Figure 2. Hypothesis 2.

The third hypothesis involved a model wherein family conflict ("B" variable) mediated (1) depression, dissociation, and posttraumatic cognitions ("A" variables) and (2) PTSD symptoms ("C" variable) (Figure 3).

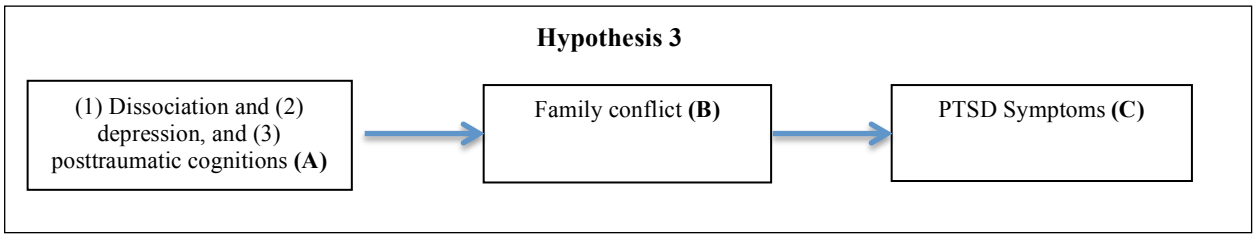

Figure 3. Hypothesis 3.

The fourth hypothesis involved a model wherein dissociation ("B" variable) mediated (1) depression and posttraumatic cognitions ("A" variables) and (2) PTSD symptoms ("C" variable) (Figure 4).

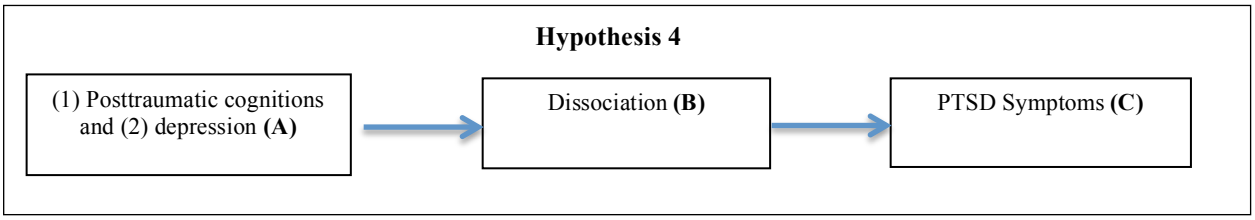

Figure 4. Hypothesis 4.

The fifth hypothesis involved a model wherein posttraumatic cognitions ("B" variable) mediated (1) depression and dissociation ("A" variables) and (2) PTSD symptoms ("C" variable) (Figure 5).

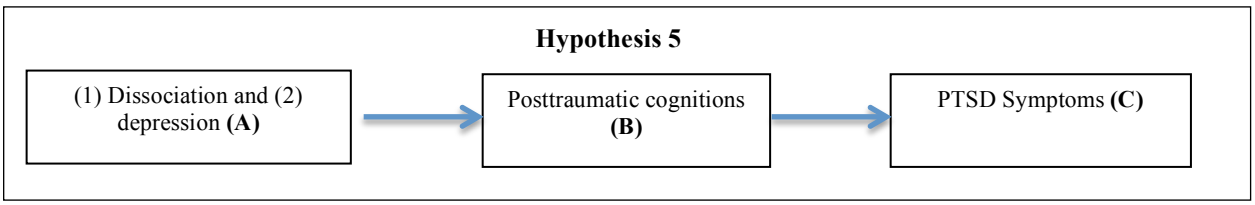

Figure 5. Hypothesis 5.

Multivariate t-tests were conducted to compare depression, dissociation, and posttraumatic cognition mean scores for males and females and for youth who endorsed drug and alcohol use and youth who did not endorse drug and alcohol use.

CHAPTER 4

FINDINGS OF THE STUDY

General Comparisons

A chi-square test for independence indicated no significant association between PTSD diagnosis and gender (χ^2=12.65, *p*=.18). A chi-square test of independence indicated a significant different in PTSD diagnosis and age group (11-13, 14-17 years) (χ^2=15.80, *p*= .001). Youth aged 14-17 (39.6%) were diagnosed with PTSD more than youth aged 11-13 years (23.9%).

Hypotheses

Hypothesis 1

The first hypothesis was that the Lemos-Miller and Kearney (2006) model of PTSD in maltreated adolescents would demonstrate adequate fit among a larger sample of multiracial youth. Depression ("B" variable) was thus expected to mediate (1) dissociation and posttraumatic cognitions ("A" variables) and (2) PTSD symptoms ("C" variable). The A→ B→ C path of the hypothesized model did not meet goodness-of-fit criteria, however (CFI=.80, IFI=.81, SRMR=.12; χ^2=325.22, *p*<.001). Dissociation and posttraumatic cognitions were subsequently examined separately as "A" variables. The first subsequent analysis involved examination of dissociation as the "A" variable. The second subsequent analysis involved examination of posttraumatic cognitions as the "A" variable.

First subsequent analysis. In the first subsequent analysis, depression ("B" variable) was expected to mediate dissociation ("A" variable) and PTSD symptoms ("C" variable) (Figure 6). The A→B→C path of the model met goodness-of-fit criteria

(CFI=.93, IFI=.93, SRMR=.07; χ^2=134.02, p<.001). The A→ C path of the model met goodness-of-fit criteria (CFI=.96, IFI=.96, SRMR=.05; χ^2=49.49, p<.001). In addition, the constrained A→B→C path of the model met goodness-of-fit criteria (CFI=.93, IFI=.93, SRMR=.07; χ^2=134.03, p<.001) and was not significantly different from the unconstrained model. Criteria for mediation were thus met.

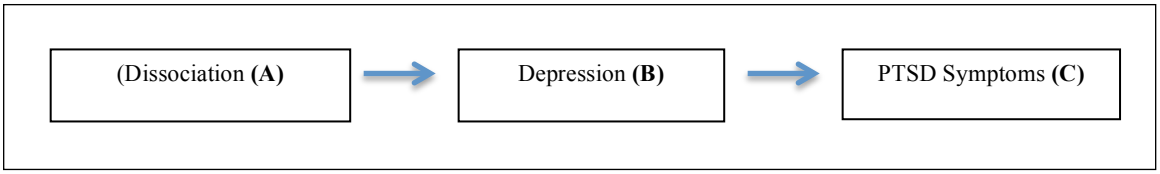

Figure 6. First subsequent analysis.

Post hoc analyses: individual depression subscales as mediator. Post hoc mediation analyses were conducted following this first subsequent analysis. Individual depression subscales ("B" variables) were examined as mediators of dissociation ("A" variable) and PTSD symptoms ("C" variable). Individual depression subscales included negative mood, interpersonal problems, ineffectiveness, anhedonia, and negative self-esteem.

Negative mood ("B" variable) was thus expected to mediate dissociation ("A" variable) and PTSD symptoms ("C" variable). The A→ B→ C path of the model met goodness-of-fit criteria (CFI=.96, IFI=.96, SRMR=.05; χ^2=59.46, p<.001). The A→C path of the model met goodness-of-fit criteria (CFI=.96, IFI=.96, SRMR=.05; χ^2=49.49, p<.001). In addition, the constrained A→B→C path of the model met goodness-of-fit criteria (CFI=.96, IFI=.96, SRMR= .05; χ^2=59.64, p<.001) and was not significantly different from the unconstrained model. Criteria for mediation were thus met.

Interpersonal problems ("B" variable) were also expected to mediate dissociation ("A" variable) and PTSD symptoms ("C" variable). The A→ B→ C path of the model

met goodness-of-fit criteria (CFI=.96, IFI=.96, SRMR=.05; χ^2=55.62, p<.01). The A→C path of the model met goodness-of-fit criteria (CFI=.96, IFI=.96, SRMR=.05; χ^2=49.49, p<.001). In addition, the constrained A→B→ C path of the model met goodness-of-fit criteria (CFI=.96, IFI=.96, SRMR=.05; χ^2=56.06, p<.01) and was not significantly different from the unconstrained model. Criteria for mediation were thus met.

Ineffectiveness ("B" variable) was also expected to mediate dissociation ("A" variable) and PTSD symptoms ("C" variable). The A→ B→ C path of the model met goodness-of-fit criteria (CFI=.95, IFI=.95, SRMR=.05; χ^2=59.93, p<.001). The A→C path of the model met goodness-of-fit criteria (CFI=.96, IFI=.96, SRMR=.05; χ^2=49.49, p<.001). In addition, the constrained A→B→C path of the model met goodness-of-fit criteria (CFI=.95, IFI=.95, SRMR=.05; χ^2=59.93, p<.001) and was not significantly different from the unconstrained model. Criteria for mediation were thus met.

Anhedonia ("B" variable) was also expected to mediate dissociation ("A" variable) and PTSD symptoms ("C" variable). The A→ B→ C path of the model met goodness-of-fit criteria (CFI=.94 IFI=.94, SRMR=.05; χ^2=68.58, p<.001). The A→C path of the model met goodness-of-fit criteria (CFI=.96, IFI=.96, SRMR=.05; χ^2=49.49, p<.001). The constrained model did not meet goodness-of-fit criteria (CFI=.90, IFI=91, SRMR=.15; χ^2=94.21, p<.001) and was significantly different from the unconstrained model. Criteria for mediation were not met.

Negative self-esteem ("B" variable) was also expected to mediate dissociation ("A" variable) and PTSD symptoms ("C" variable). The A→ B→ C path of the model met goodness-of-fit criteria (CFI=.94, IFI=.94, SRMR=.05; χ^2=67.18, p<.001). The A→C path of the model met goodness-of-fit criteria (CFI=.96, IFI=.96, SRMR=.05;

χ^2=49.49, p<.001). In addition, the constrained model met goodness-of-fit criteria (CFI=.94, IFI=.94, SRMR=.05; χ^2=67.18, p<.001) and was not significantly different from the unconstrained model. Criteria for mediation were thus met.

Post hoc analyses: individual dissociation subscales as "A" variables. Depression ("B" variable) was examined as a mediator of individual dissociation subscales ("A" variables) and PTSD symptoms ("C" variable). Dissociation subscales included dissociative amnesia, absorption/imaginative involvement, passive influence, and depersonalization/derealization.

Depression ("B") was thus expected to mediate dissociative amnesia ("A" variable) and PTSD symptoms ("C" variable). The A→B→C path of the model met goodness-of-fit criteria (CFI=.95, IFI=.96, SRMR=.07; χ^2=58.50, p<.01). The A→C path of the model met goodness-of-fit criteria (CFI=.99, IFI=.99, SRMR=.04). In addition, the constrained A→B→C path of the model met goodness-of-fit criteria (CFI=.95, IFI=.95, SRMR=.07; χ^2=59.14, p<.01) and was not significantly different from the unconstrained model. Criteria for mediation were thus met.

Depression ("B" variable) was also expected to mediate absorption/imaginative involvement ("A" variable) and PTSD symptoms ("C" variable). The A→B→C path of the model met goodness-of-fit criteria (CFI=.95, IFI=.95, SRMR=.07; χ^2=57.25, p<.01). The A→C path of the model met goodness-of-fit criteria (CFI=.99, IFI=.99, SRMR=.04). In addition, the constrained A→B→C path of the model met goodness-of-fit criteria (CFI=.95, IFI=.95, SRMR=.07; χ^2=57.10, p<.01) and was not significantly different from the unconstrained model. Criteria for mediation were thus met.

Depression ("B" variable) was also expected to mediate passive influence ("A" variable) and PTSD symptoms ("C" variable). The A→B→C path of the model met goodness-of-fit criteria (CFI=.95, IFI=.95, SRMR=.07; χ^2=68.40, p<.001). The A→C path of the model met goodness-of-fit criteria (CFI=.98, IFI=.98, SRMR=.04). In addition, the constrained A→B→C path of the model met goodness-of-fit criteria (CFI=.95, IFI=.95, SRMR=.06; χ^2=68.40, p<.001) and was not significantly different from the unconstrained model. Criteria for mediation were thus met.

Depression ("B" variable) was also expected to mediate depersonalization/ derealization ("A" variable) and PTSD symptoms ("C" variable). The A→B→C path of the model met goodness-of-fit criteria (CFI=.94, IFI=.95, SRMR=.07; χ^2=66.66, p<.001). The A→C path of the model met goodness-of-fit criteria (CFI=.99, IFI=.99, SRMR=.04). In addition, the constrained A→B→C path of the model met goodness-of-fit criteria (CFI=.94, IFI=.94, SRMR=.07; χ^2=66.42, p<.001) and was not significantly different from the unconstrained model. Criteria for mediation were thus met (Figure 7).

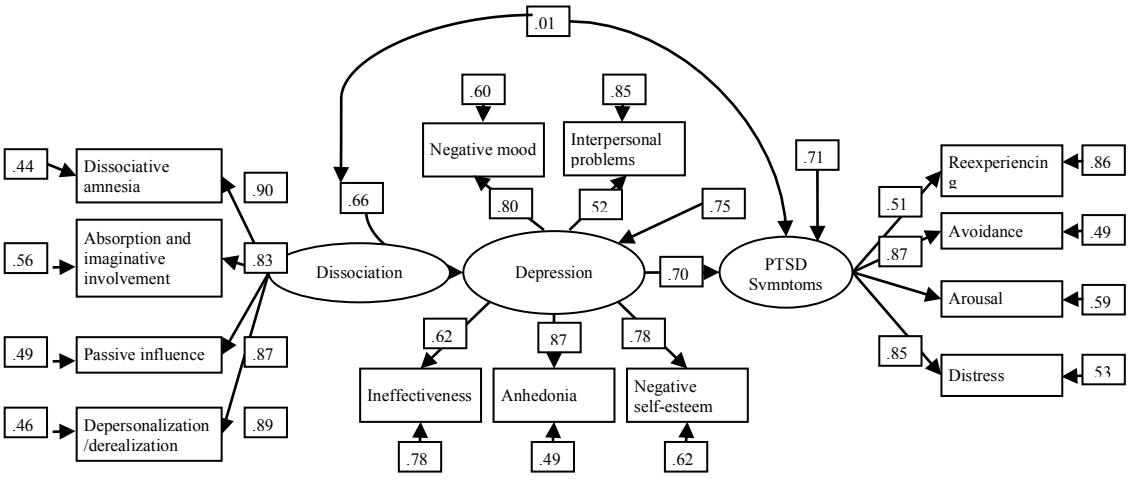

Figure 7. Structural Equation Model with Path Coefficients for Depression, Dissociation, and PTSD Symptoms.

Second subsequent analysis. In the second subsequent analysis, depression ("B" variable) was expected to mediate posttraumatic cognitions ("A" variable) and PTSD symptoms ("C" variable) (Figure 8). The A→B→C of the model met goodness-of-fit criteria (CFI= .93, IFI= .93, SRMR=.08; χ^2=111.69, p<.001). The A→C path of the model met goodness-of-fit criteria (CFI=.94, IFI=.94, SRMR=.07; χ^2=45.31, p<.001). In addition, the constrained A→B→C path of the model met goodness-of-fit criteria (CFI=.92, IFI=.92, SRMR=.09; χ^2=117.71, p<.001) and was not significantly different from the unconstrained model. Criteria for mediation were thus met.

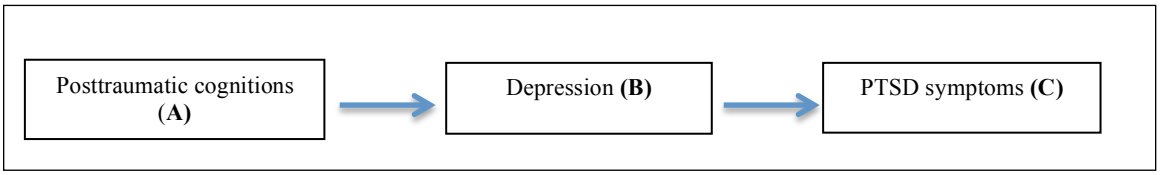

Figure 8. Second subsequent analysis.

Post hoc analyses: individual depression subscales as mediator. Post hoc mediation analyses were conducted following this second subsequent analysis. Individual depression subscales ("B" variables) were examined as mediators of posttraumatic cognitions ("A" variable) and PTSD symptoms ("C" variable). Individual depression subscales included negative mood, interpersonal problems, ineffectiveness, anhedonia, and negative self-esteem.

Negative mood ("B" variable) was thus expected to mediate posttraumatic cognitions ("A" variable) and PTSD symptoms ("C" variable). The A→ B→ C path of the model met goodness-of-fit criteria (CFI=.94 IFI=.94, SRMR=.07; χ^2=52.50, p<.001). The A→C path of the model met goodness-of-fit criteria (CFI=.94, IFI=.94, SRMR=.07;

χ^2=45.31, p<.001). The constrained model did not meet goodness-of-fit criteria (CFI=.89, IFI=.89, SRMR=.17; χ^2=76.66, p<.001) and was significantly different from the unconstrained model. Criteria for mediation were not met.

Interpersonal problems ("B" variable) were also expected to mediate posttraumatic cognitions ("A" variable) and PTSD symptoms ("C" variable). The A→ B→ C path of the model met goodness-of-fit criteria (CFI=.95 IFI=.95, SRMR=.07; χ^2=45.61, p<.001). The A→C path of the model met goodness-of-fit criteria (CFI=.94, IFI=.94, SRMR=.07; χ^2=45.31, p<.001). In addition, the constrained A→B→C path of the model met goodness-of-fit criteria (CFI=.95, IFI=.95, SRMR=.07; χ^2= 47.21, p<.001) and was not significantly different from the unconstrained model. Criteria for mediation were thus met.

Ineffectiveness ("B" variable) was also expected to mediate posttraumatic cognitions ("A" variable) and PTSD symptoms ("C" variable). The A→ B→ C path of the model met goodness-of-fit criteria (CFI=.94 IFI=.94, SRMR=.07; χ^2=49.02, p<.001). The A→C path of the model met goodness-of-fit criteria (CFI=.94, IFI=.94, SRMR=.07; χ^2=45.31, p<.001). In addition, the constrained A→B→C path of the model met goodness-of-fit criteria (CFI=.94, IFI=.94, SRMR=.07; χ^2=49. 38, p<.001) and was not significantly different from the constrained model. Criteria for mediation were thus met.

Anhedonia ("B" variable) was also expected to mediate posttraumatic cognitions ("A" variable) and PTSD symptoms ("C" variable). The A→ B→ C path of the model met goodness-of-fit criteria (CFI=.92, IFI=.92, SRMR=.08; χ^2=63.03, p<.001). The A→C path of the model met goodness-of-fit criteria (CFI=.94, IFI=.94, SRMR=.07; χ^2=45.31, p<.001). In addition, the constrained A→B→C path of the model met

goodness-of-fit criteria (CFI=.94, IFI=.94, SRMR=.07, χ^2=55.04, p<.001) and was not significantly different from the unconstrained model. Criteria for mediation were thus met.

Negative self-esteem ("B" variable) was also expected to mediate posttraumatic cognitions ("A" variable) and PTSD symptoms ("C" variable). The A→ B→ C path of the model met goodness-of-fit criteria (CFI=.91, IFI=.92, SRMR=.08; χ^2=64.24, p<.001). The A→C path of the model met goodness-of-fit criteria (CFI=.94, IFI=.94, SRMR=.07; χ^2=45.31, p<.001). In addition, the constrained A→B→C path of the model met goodness-of-fit criteria (CFI=.91, IFI=.92, SRMR=.08; χ^2=64.24, p<.001) and was not significantly different from the unconstrained model. Criteria for mediation were thus met.

Post hoc analyses: individual posttraumatic cognition subscales as "A" variables. Depression ("B" variable) was also examined as a mediator of individual posttraumatic cognitions subscales ("A" variables) and PTSD symptoms ("C" variable). Individual posttraumatic cognitions included negative cognitions about self, negative cognitions about the world, and self-blame.

Depression ("B" variable) was thus expected to mediate negative cognitions about self ("A" variable) and PTSD symptoms ("C" variable). The A→B→C path of the model met goodness-of-fit criteria (CFI=.97, IFI=.97, SRMR=.06; χ^2=52.63, p<.05). The A→C path of the model met goodness-of-fit criteria (CFI=.99, IFI=..99, SRMR=.04). In addition, the constrained A→B→C path of the model met goodness-of-fit criteria (CFI=.96, IFI=.96, SRMR=.07; x2=62.87, p<.05) and was not significantly different from the unconstrained model. Criteria for mediation were thus met.

Depression ("B" variable) was also expected to mediate negative cognitions about the world ("A" variable) and PTSD symptoms ("C" variable). The A→B→C path of the model did not meet goodness-of-fit criteria (CFI=.80, IFI=.80, SRMR= .20; χ^2= 144.66, p<.001). Criteria for mediation were not met.

Depression ("B") was also expected to mediate self-blame ("A" variable) and PTSD symptoms ("C" variable). The A→B→C path of the model met goodness-of-fit criteria (CFI=.95, IFI=.95, SRMR=.06; χ^2=67.01, p<.01). The A→C path of the model met goodness-of-fit criteria (CFI=.97, IFI=..97, SRMR=.04). In addition, the constrained A→B→C path of the model met goodness-of-fit criteria (CFI=.95, IFI=.95, SRMR=.06; χ^2=67.01, p<.01) and was not significantly different from the unconstrained model. Criteria for mediation were thus met (Figure 9).

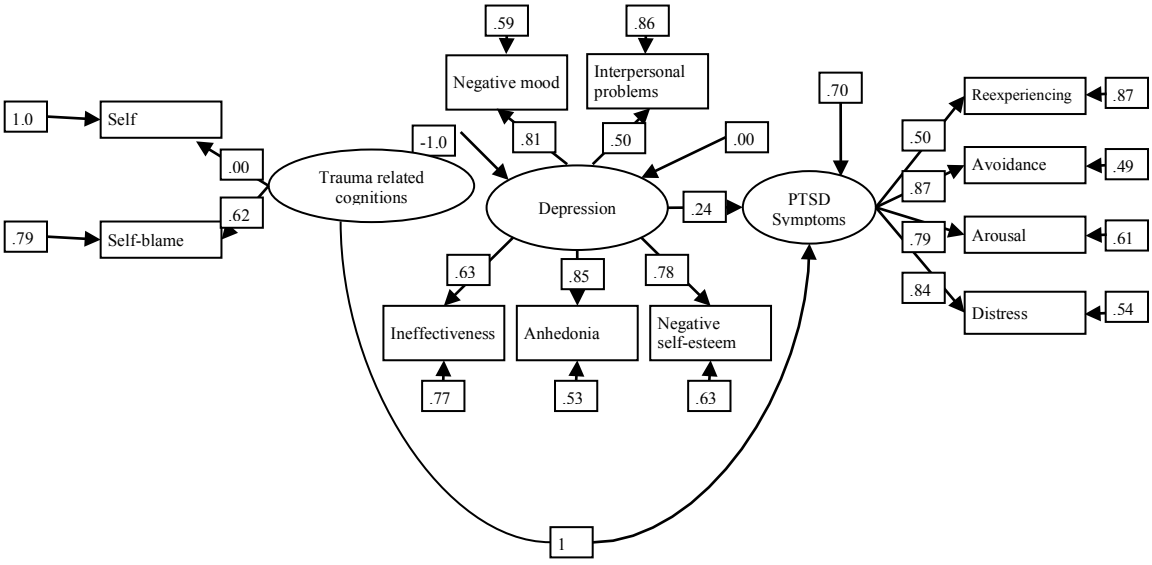

Figure 9. Structural Equation Model with Path Coefficients for Depression, Posttraumatic Cognitions, and PTSD Symptoms.

Hypothesis 2

The second hypothesis was that family cohesion ("B" variable) would mediate (1) depression, dissociation, and posttraumatic cognitions ("A" variables), and (2) PTSD symptoms ("C" variable). The A→B→C path of the hypothesized model did not meet goodness-of-fit criteria (CFI=.77, IFI=.78, SRMR=.10; χ^2=600.65, p<.001). Hypothesis 2 was not supported.

Hypothesis 3

The third hypothesis was that family conflict ("B" variable) would mediate (1) depression, dissociation, and posttraumatic cognitions ("A" variable), and (2) PTSD symptoms ("C" variable). The A→B→C path of the hypothesized model did not meet goodness-of-fit criteria (CFI=.79, IFI= .80, SRMR=.10; χ^2=218.12, p<.001). Hypothesis 3 was not supported.

Hypothesis 4

The fourth hypothesis was that dissociation ("B" variable) would mediate (1) depression and posttraumatic cognitions ("A" variables) and (2) PTSD symptoms ("C" variable). The A→B→C path of the hypothesized model did not meet goodness-of-fit criteria (CFI=.87, IFI=.88, SRMR=.08; χ^2=250.96, p<.001). Hypothesis 4 was not supported.

Hypothesis 5

The fifth hypothesis was that posttraumatic cognitions ("B" variable) would mediate (1) depression and dissociation ("A" variables) and (2) PTSD symptoms ("C" variable). The A→B→C path of the hypothesized model did not meet goodness-of-fit criteria (CFI=.81, IFI=.81, SRMR=.11; χ^2=323.81, p<.001). Hypothesis 5 was not supported.

Gender and drug/alcohol use

Gender was examined on an exploratory basis via Hotelling's T values retrieved from a MANOVA analysis. Hotelling's T values revealed that negative mood was significantly higher in females (*M*=3.19, *SD*=2.79) than males (*M*=1.78, *SD*=2.40; F (2, 93)=3.91, *p*=.024). Anhedonia was significantly higher in females (*M*=4.25, *SD*=3.32) than males (*M*=2.78, *SD*=2.87; F(2, 93)=3.39, *p*=.038) (Table 3). Dissociation and posttraumatic cognitions scores did not differ by gender (Table 4).

Drug and alcohol use behaviors were examined on an exploratory basis via Hotelling's T values retrieved from a MANOVA analysis. Hotelling's T values revealed that negative cognitions about the world were significantly higher in youth who endorsed drug and alcohol use (*M*=29.22, *SD*=11.93) than in youth who denied drug and alcohol use (*M*=23.85, *SD*=10.91; F(1,99)=3.96, *p*=.05). Dissociated relatedness was significantly higher in youth who endorsed drug and alcohol use (*M*=7.862, *SD*=8.36) than youth who did not endorse drug and alcohol use (*M*=5.72, *SD*=6.30; F(1,99)=4.95, *p*=.028). Depersonalization/derealization was significantly higher in youth who endorsed drug and alcohol use (M=24.86, SD=25.63) than youth who did not endorse drug and alcohol use (M=19.49, SD=21.75; F(1, 99)= 2.81, p=.097). Total depression, dissociation and posttraumatic cognition scores did not vary significantly by drug use endorsement (Table 5).

CHAPTER 5

DISCUSSION, CONCLUSIONS, RECOMMENDATIONS

Discussion of Results

Lemos-Miller and Kearney Model

Lemos-Miller and Kearney (2006) first identified depression as a meditator of (1) dissociation and posttraumatic cognitions and (2) PTSD in maltreated children. In addition, they found that African American status weakened the mediating relationship, whereas multiracial status strengthened the mediating relationship. Multiracial youth in Lemos-Miller and Kearney's study experienced a stronger relationship between depression and PTSD than other ethnic groups.

The present study had two primary aims. The first aim was to evaluate the Lemos-Miller and Kearney (2006) model of PTSD among a larger sample of multiracial youth. The present study sought to identify whether the Lemos-Miller and Kearney (2006) finding regarding multiracial youth could be replicated. The second aim of the present study was to evaluate the mediating potential of family environment, dissociation, and posttraumatic cognitions vis-a-vis this model.

Depression was thus expected to mediate (1) dissociation and posttraumatic cognitions and (2) PTSD symptoms. This hypothesis was supported but only when dissociation and posttraumatic cognitions were examined separately as "A" variables. The mechanism by which depression mediates dissociation and posttraumatic cognitions may occur independently and separately. The depression subscales involved in mediation of dissociation differ from the depression subscales involved in mediation of posttraumatic cognitions. Further, the variables involved in each model contribute to

PTSD symptoms in unique patterns. The mechanism underlying each model will be discussed in depth in the following paragraphs. The present study is the first to identify depression as a mediating variable for dissociation, posttraumatic cognitions, and PTSD among a large sample of multiracial youth. Findings of the present study are also consistent with previous studies revealing the important role of depression in PTSD.

Depression. Depression plays a key role in posttraumatic symptoms in multiracial youth after maltreatment and has been identified as the best predictor of PTSD (Roussos et al., 2005). Youth with PTSD score higher on measures indicative of major depressive disorder and dysthymia than youth without PTSD (Linning & Kearney, 2004). In addition, clinical levels of depression are often associated with high scores on trauma symptom scales (Collin-Vezina et al., 2005). Other studies have demonstrated a decrease in depressive symptoms when PTSD is treated (Cohen et al., 2004).

Existing theoretical models of PTSD and depression provide further support for the findings in the present study. Biological, cognitive, and developmental models of PTSD help explain the mediating role of depression in PTSD. Biological models of PTSD involve structural and functional abnormalities that produce and maintain PTSD symptoms. Changes in hippocampal and amygdala structures, neurotransmitter levels, and HPA axis dysfunction may be a biological predisposition to both depression and PTSD (Carrion et al., 2010; Kowalik, 2004; Nemeroff et al., 2006). The dysregulation of similar structures in PTSD and depression may account for the mediating role of depression in multiracial youth.

Developmental and environmental vulnerabilities such as parental support, previous psychological diagnoses, and emotional dysregulation contribute to both PTSD

and depressive symptoms (Koenen, 2010). Emotional dysregulation may prevent alleviation of depressive and trauma symptoms (Briere & Spinazzola, 2005; Ford, 2005). Previous diagnoses of depression, anxiety disorder, or conduct disorder are associated with increased risk of PTSD symptoms (Koenen et al., 2008). Other factors such as poverty, residential stability, maternal depression, and caregiver changes have also been associated with emotional dysregulation. The impact of these factors can lead to both depression and PTSD which may help further explain the mediating role of depression with respect to PTSD.

Dissociation. The first model in the present study demonstrated that depression mediates dissociation and PTSD in multiracial youth. Dissociative symptoms include dissociative amnesia, absorption/imaginative involvement, passive influence, and depersonalization/derealization. Dissociative symptoms also include avoidance, emotional numbing, and lack of integration of trauma memory (Ayoub et al., 2006; Bidell & Fischer, 2000, Macfie et al., 2001). Dissociative symptoms are strongly associated with depressive symptoms of social isolation, anhedonia, and poor self-esteem. Dissociative symptoms and comorbid depressive symptoms lead to an increased risk for PTSD in traumatized children (Ayoub, et al., 2006; Bidell & Fischer, 2000; Lemos-Miller & Kearney, 2006).

Lack of integrated trauma memory, avoidance, emotional numbing, hopelessness, and low self-esteem exacerbates and reinforces PTSD symptoms. In addition, youth without effective coping strategies may hinder trauma memory processing by engaging in long periods of dissociation and rumination. Negative mood may further worsen PTSD symptoms when youth use distraction and emotional inhibition to alleviate trauma and

depressive symptoms. Maltreated youth may also use distraction and emotional inhibition as a coping strategy, especially if they experience hopelessness as an aftermath to the traumatic event. Hopelessness impedes a child's ability to generate effective solutions to problems. Hopelessness may also lead to thought suppression and emotional numbing, which paradoxically increase and maintain PTSD and depressive symptoms (Kleim, Ehlers, & Glucksman, 2012). Lastly, depressive symptoms may increase social isolation and diminish support while strengthening the relationship between PTSD and dissociation (Feeny et al., 2000).

Posttraumatic Cognitions. The second model in the present study demonstrated that depression mediates posttraumatic cognitions and PTSD in maltreated multiracial youth. Posttraumatic cognitions include negative thoughts about self, negative thoughts about world, and self-blame. Posttraumatic cognitions have been associated with PTSD symptoms of re-experiencing, avoidance/numbing, increased arousal, and distress. Early cognitive theories suggested that child maltreatment leads to negative thoughts about the world, negative thoughts about self, and negative thoughts about the future, which lead to depression (Beck, 1976). Additionally, posttraumatic cognitions with comorbid depressive symptoms are strongly associated with PTSD symptoms (Diehl & Prout, 2002; Lemos-Miller & Kearney, 2006; Muller & Lemieux, 2000; Muller et al., 2001; Runyon & Kenny, 2002).

Cognitive models of PTSD emphasize the importance of negative appraisals and negative coping strategies in PTSD symptoms (Brown & Kolko, 1999; Lemos-Miller & Kearney, 2006; McGee, Wolfe, & Olson, 2001). Specifically, rumination may maintain or worsen symptoms of depression and PTSD. Similarly, models of depression

emphasize the importance of attention bias for sad cues and threatening faces in addition to rumination about negative events (Romens & Pollack, 2012). Rumination, negative coping strategies, and attention bias exacerbate and maintain PTSD and depression, and may help explain the strong link between depression and PTSD. In addition, cognitive factors associated with depression such as attention bias and rumination intersect with symptoms of PTSD such as re-experiencing and increased arousal (Ehlers & Clark, 2000).

A vulnerability stress model suggests that depressive symptoms appear after a traumatic event or when a person's mood deteriorates. As a result, the victim develops a pessimistic explanatory style that consists of negative inferences about the causes and consequences of negative events. According to the vulnerability stress model, self-blame leads to increased hopelessness and maintains cognitive processes of depression and PTSD (Kleim et al., 2012).

Youth with posttraumatic cognitions and depressive symptoms may engage in negative coping strategies to alleviate symptoms. Negative coping strategies may lead to exacerbated depressive and PTSD symptoms. For example, a maltreated child may ruminate to reduce sense of threat, but doing so may heighten symptoms of PTSD because rumination does not allow for change in negative appraisals (Kleim et al., 2012). Depressive symptoms may lead to rumination of posttraumatic cognitions, increased self-blame due to low self-esteem, and hopelessness about the future. Hopelessness prevents a child's ability to generate adaptive beliefs which leads to ongoing posttraumatic cognitions and PTSD symptoms (Kleim et al., 2012). Youth with depressive symptoms are also more likely to exhibit a sense of hopelessness that is accounted for by negative

thoughts about the future and the likelihood of trauma events occurring again. Posttraumatic cognitions that convey a sense of hopelessness, such as negative cognitions about the future, are particularly predictive of PTSD (Ehlers, Maercker, & Boos, 2000; Kleim, et al., 2012). Similarly, negative self-esteem is likely to emerge in the youth's appraisal of self in beliefs such as "I am inadequate." Lastly, maltreated children develop maladaptive schemas from negative interactions with family members. Schemas related to social isolation and emotional deprivation are closely linked to anhedonia and depression (Lumley & Harkness, 2007).

Multiracial youth. Results of the present study are also consistent with previous studies that have highlighted the impact of depression in multiracial youth (Cooney & Radina, 2000; Milan & Keiley, 2000). Some (Cooney & Radina, 2000; Herman, 2009) attribute high levels of depression in multiracial youth to family dynamics, achievement, or identity struggles.

Cooney and Radina (2000) found higher levels of depression in multiracial adolescents than European American adolescents. High rates of depression were associated with overprotectiveness of multiracial youth by their parents in adolescents struggling to find their independence. Additionally, lack of communication between adolescent boys and their father contributed to elevated levels of depression. African American and Hispanic American multiracial youth also demonstrated poorer grades than monoracial African American and Hispanic American youth (Herman, 2009). Depression may be linked to a sense of inadequacy that multiracial youth experience when they compare their accomplishments to others. Multiracial adolescents may feel

they cannot attain the accomplishments of their parents, for example, which can lead to hopelessness and other depressive symptoms (Cooney & Radina, 2000).

Identity struggles have also been associated with depression symptoms in multiracial youth (Cooney & Radina, 2000). Gibbs (1998), however, suggested that behavioral or psychological problems in multiracial youth should not be assumed to come from identity struggles. Adolescents from many ethnic backgrounds experience family distress, social struggles, and academic problems. Those assessing multiracial youth should rule out normative adolescent experiences before reporting that depressive symptoms are due to ambivalence or rejection of their ethnic background (Gibbs, 1998).

Elevated levels of depression in multiracial youth may explain the strength of the relationship between depression and PTSD for this vulnerable population. The vulnerability stress model suggests that an adverse life event, such as maltreatment, becomes interpreted through a pessimistic explanatory style which leads to negative thoughts about the future and negative thoughts about self (Kleim et al., 2012). The elevated levels of depression in multiracial youth may make it difficult for these youth to process and cope with adverse events such as maltreatment and removal from home. Youth may use ineffective coping strategies such as rumination, emotional numbing, and dissociation to alleviate trauma memory, which eventually worsen PTSD and depression symptoms.

Other Mediating Variables

Another aim of the present study was to evaluate the mediating potential of family environment, dissociation, and posttraumatic cognitions in multiracial youth. Other

variables were examined to solidify the mediating role of depression and to identify other potential mediating variables for multiracial youth.

Family Environment. Family cohesion was expected to mediate (1) depression, dissociation, and posttraumatic cognitions and (2) PTSD. This hypothesis was not supported. Family conflict was also expected to mediate (1) depression, dissociation, and posttraumatic cognitions and (2) PTSD. This hypothesis was not supported. Family environment thus did not emerge as a mediating variable even though previous studies have identified adverse family environments as a key predictor of PTSD symptoms (Ariga et al., 2008; Landolt et al., 2003). Additionally, other studies have shown a positive association between family stress and PTSD symptoms (Rossman & Ho, 2000).

The results regarding family environment may reflect the limiting impact of family environment in multiracial youth. Peer relationships may be more influential in multiracial youth than family relationships. Choi and colleagues (2012) found that multiracial youth are at greater risk of peer influenced problem behaviors than European American youth. Multiracial youth were more likely than European American youth to have substance abusing friends and friends with antisocial personality traits. Further, high rates of violence and substance use in multiracial youth were significantly correlated with the number of substance abusing friends.

Lack of significant findings in the present study may also be due to the use of the FES as a measure of family environment. The FES demonstrated low to moderate reliability among adolescents aged 11-18 years (Boyd et al., 1997). Children removed from their homes may have experienced conflicting feelings regarding the recent removal, or multiple removals, from home. Completion of the 90-item measure may

have been difficult considering the unstable nature of the children's placements and recent trauma.

Dissociation. Dissociation was expected to mediate (1) depression and posttraumatic cognitions and (2) PTSD. This hypothesis was not supported. Dissociation did not emerge as a mediating variable even though previous studies have identified dissociation as an influential variable for the onset and maintenance of PTSD symptoms (Collin-Vezina & Herbert, 2005; Kaplow et al., 2005; Lemos-Miller & Kearney, 2006). The lack of significant findings for a competing model using dissociation as a mediator, however, provides further support for the original model of a mediating role of depression.

Maltreated children often use dissociation to escape fearful stimuli after a traumatic event (Classen, Koopman, & Spiegel, 1993; Dutra, Bureau, Holmes, Lyubchik, & Lyons-Ruth, 2009). Dissociation is a strong predictor of PTSD because it prevents trauma processing and leads to re-experiencing (Kaplow et al., 2005). Social isolation, ineffectiveness, anhedonia, and poor self-esteem following dissociation may also make a child vulnerable to PTSD. Collin-Vezina and colleagues (2011) found that dissociation in maltreated youth in residential care was associated with trauma symptoms. Previous studies demonstrating the significant relationship between dissociation and PTSD used a diverse ethnic sample or a limited multiracial group. Mixed results from the present study may be due to the multiracial sample and difference in PTSD symptom presentation in multiracial youth.

Posttraumatic Cognitions. Posttraumatic cognitions were expected to mediate (1) depression and dissociation and (2) PTSD. This hypothesis was not supported.

Posttraumatic cognitions did not emerge as a mediating variable for multiracial youth even though previous studies have identified posttraumatic cognitions as an important variable with respect to PTSD (Carrion et al., 2001; Harkness & Lumley, 2008; Lemos-Miller & Kearney, 2006). The lack of significant findings for a competing model using posttraumatic cognitions as a mediator, however, provides further support for the original model of a mediating role of depression.

Previous studies reveal that posttraumatic cognitions influence PTSD symptoms following maltreatment (Carrion et al., 2001; Harkness & Lumley, 2008; Lemos-Miller & Kearney, 2006). Negative thoughts about self, negative thoughts about the world, and self-blame are associated with re-experiencing, avoidance/numbing, increased arousal, and significant distress in maltreated youth (Lemos-Miller & Kearney, 2006; Linning & Kearney, 2004). Posttraumatic cognitions in the present study did not mediate depression, dissociation, and PTSD. Previous studies demonstrating the significant relationship between posttraumatic cognitions and PTSD used a diverse ethnic sample or had a limited multiracial group. The inconsistency with the present study and past research may be due to the multiracial sample in the present study and significance of depression as a mediating variable for multiracial youth. The present findings provide further support for expanding the limited research on multiracial youth.

Gender. Gender was examined on an exploratory basis. Total depression scores were significantly lower in males than females. These results are consistent with previous studies whereby females experience more depressive symptoms than males (Davis & Siegel, 2000; Khoury et al, 1997; Koenen & Widom, 2009; Pynoos et al., 1993). Further, girls consistently report more trauma-related symptoms than boys

(Greenwald, 2002; Johnson et al., 2002; Tolin & Foa, 2006; Wolfe et al., 2001). Dissociation and posttraumatic cognitions did not differ by gender.

Drug and alcohol use. Drug and alcohol use behaviors were also examined on an exploratory basis. Youth who endorsed drug and alcohol use had more negative cognitions about the world than youth who did not endorse drug and alcohol use. Youth scored similarly on depression, dissociation, and posttraumatic cognitions despite drug use endorsement. These findings are consistent with Hyucksun Shin (2012), who found that maltreatment was linked to drug and alcohol use, especially for adolescent males. Maltreatment has also been linked to an increased likelihood of an alcohol use disorder, although this relationship was better accounted for by comorbid psychological disorders (Goldstein et al., 2013).

Research is inconsistent about the drug and alcohol use behaviors in multiracial youth. Choi and colleagues (2006) found multiracial youth were more likely than other ethnic groups to consume alcohol while Cooney and Radina (2000) found no differences between multiracial adolescents and monoracial youth with respect to substance abuse. Negative affect is also strongly associated with drug and alcohol use behaviors in multiracial youth (Chavez & Sanchez, 2010). Negative cognitions about the world and negative affect are highly correlated in maltreated multiracial youth (Table 2). The strong link between negative affect and drug and alcohol use may help explain the association between negative cognitions in the world and drug and alcohol use behaviors.

Others (Longman-Mills et al., 2013) found that high levels of religiosity weakened the relationship between maltreatment and drug and alcohol use. Gray and Montgomery (2012) found that perceived discrimination and ethnic orientation

moderated the relationship between trauma and alcohol use. Findings from their study highlight the importance of including ethnicity related factors in maltreatment research. Research examining the associations among drug and alcohol use, negative affect, and negative cognitions is in its early stages, especially for maltreated multiracial youth.

Age. Youth aged 14-17 years were more likely to be diagnosed with PTSD than youth aged 11-13 years. Older youth may be able to report their symptoms better than youth ages 11-13 years. Young children may mimic their parents' reaction to trauma which may lead to misdiagnosis or lack of detection of trauma symptoms. Older adolescents also engage in risk taking behaviors and have a sense of foreshortened future which may lead comorbid diagnoses ((Davis & Siegel, 2000; Dyregov & Yule, 2006). Additionally, older adolescents are at greater risk of a PTSD diagnosis because of greater trauma exposure than younger children. Older multiracial youth may struggle with peer relationships, rejection, and discrimination making them vulnerable to isolation and loneliness (Shih & Sanchez, 2005). Increased substance use, alcohol use, and high rates of depression in older multiracial adolescents may contribute to the elevated levels of PTSD diagnoses for youth aged 14-17 years. Further research examining PTSD diagnosies and age in multiracial youth is necessary considering the findings in the present study.

Clinical Implications

The present study has potential relevance for assessment and intervention practices for multiracial youths. The present study examined PTSD, depression, family environment, dissociation, and posttraumatic cognitions in multiracial youth in part to guide subsequent assessment and treatment strategies. An adolescent who has

experienced a trauma is at risk for PTSD and comorbid symptoms. This pattern of risk thus holds important implications for assessment and treatment. The following assessment and treatment sections focus on depression and PTSD following the significant findings in the present study.

Assessment

Clinicians who assess maltreated children should focus on PTSD and depressive symptoms, especially among multiracial youth. The initial phase of assessment should include diagnosis and case conceptualization including identification of PTSD and depressive symptoms that will guide treatment. Another component includes assessing for and diagnosing comorbid psychological disorders in maltreated multiracial children (Ariga et al., 2008; Dixon et al., 2005; Ford et al., 2000; Saigh et al., 2002; Schumacher et al., 2006; Stevens et al., 2003; Titus et al., 2003; Weinstein et al., 2000). Family history, previous treatment, and medical history should also be assessed as they contribute to depressive symptoms and influence treatment. Information from collateral sources, when available, is important during assessment because children report different levels of severity than parents and teachers (Jensen et al., 1999). Access to collateral sources may be difficult with youth in foster care, however. Clinicians should discuss family history, previous treatment, and medical history with caseworkers or foster parents to obtain a thorough history and background for the child.

Assessment should include observation of the child with caretakers, interview with the child, and self-report measures targeting symptoms associated with PTSD and depression (Crooks & Wolfe, 2007). Information from multiple assessment methods and informants will help provide a thorough presentation of a child's level of functioning

after maltreatment (Scheeringa, Wright, Hunt, & Zeanah, 2006). Observations in the home or a clinic setting may provide information about a child's interactions with guardians as well as the child's coping behavior. Child and parent behaviors should be observed. Important child behaviors include emotional or behavioral difficulties, responsiveness, anxiety, disagreement, and affection with the parent. Important parent behaviors include communication of understanding, acceptance, disapproval, attention, responsiveness, disagreement, and distraction when with the child (Budd, 2001).

An interview with the child may be an effective way to understand overall level of functioning (Azar & Wolfe, 2006; Crooks & Wolfe, 2007). The interviewer should develop rapport and establish trust with the child considering the sensitive nature of the topic and past maltreatment history. The child may be guarded with adults, so the interviewer should see the child more than once to establish rapport (Crooks & Wolfe, 2007). The interview should begin with a general discussion about activities the child enjoys and how the child feels about family or placement in foster care. The clinician should also address the child's emotions by asking questions about mood and how the child reacts to different emotions (Azar & Wolfe, 2006; Crooks & Wolfe, 2007). Cohen and colleagues (2012) recommend that therapists inquire about maltreatment history in addition to secondary trauma such as removal from home and foster care placement.

Findings from the present study indicate that interview questions should focus on trauma-related symptoms because of the high prevalence of PTSD in maltreated multiracial youth. A semi-structured interview such as the CPTSD-I (Saigh, 1998) can be used to guide maltreatment questions during the interview. Standardized instruments

can be also used to assess trauma symptoms. Another scale includes the UCLA PTSD Reaction Index (Steinberg, Brymer, Decker, & Pynoos, 2004).

Clinicians should also assess for PTSD in multiracial youth using self-report measures to supplement information from observations and interviews. Trauma-specific measures include the Trauma Symptom Checklist (Briere, 1996), which measures the impact of trauma as well as comorbid problems such as anxiety, depression, sexual concerns, dissociation, and anger. The Traumatic Events Questionnaire- Adolescents (Lipschitz, Bernstein, Winegar, & Southwick, 1999) assesses 6 forms of maltreatment as well as duration, identity of perpetrator, use of force, and details about the traumatic event. Comprehensive PTSD assessment is necessary in multiracial maltreated youth considering the findings in the present study.

The close link in the present study between PTSD and depression suggests that assessing depressive symptoms needs to be prioritized for maltreated multiracial youth. Interviews and ratings scales are the two most common methods used to assess depression in children and adolescents. Semi-structured diagnostic interviews such as the Diagnostic Interview for Children and Adolescents (Herjanic & Reich, 1982), and the Child and Adolescent Psychiatric Assessment (Angold et al., 1995) are recommended. Rating scales include Children's Depression Rating Scale (Poznanski, Cook, & Carroll, 1979), CDI, Mood and Feelings Questionnaire (Angold, Costello, Messer & Pickles, 1995), and Reynolds Child Depression Scale (Reynolds, 1989)

Other major domains of child functioning should be administered during an initial assessment considering the general findings on drug and alcohol use for multiracial youth. The Child Behavior Checklist (Achenbach & Rescorla, 2000) is one of the most

widely used measures of emotional, social, and behavioral functioning. This measure provides information about the presence of problem behaviors. The Teacher Report Form and Youth Self-Report may also be used for a multisource assessment. The Behavior Assessment System for Children (BASC-2; Reynolds & Kamphaus, 2004) assesses emotional and behavioral functioning and includes Teacher, Parent, and Self-Report Rating scales. The BASC-2 includes internalizing, externalizing, learning, behavioral symptoms, adaptive functioning, and validity scales. The Eyberg Child Behavior Inventory (Eyberg & Pincus, 1999) also focuses on common behavior problems and their intensity. These measures provide an overall description of the child's level of functioning that provides information about subsequent measures to administer.

Findings in the present study suggest that PTSD is strongly linked to depression in multiracial youth, so elevations in internalizing symptoms should prompt the administration of a PTSD questionnaire or interview. The present study also shows that negative cognitions about the world are associated with drug and alcohol use in multiracial youth. Elevations in negative cognitions should prompt an assessment of drug and alcohol use behaviors. Such findings also support the use of measures of overall functioning for maltreated multiracial youth.

Treatment

This study may highlight the need for systematic treatment approaches for maltreated, multiracial youth in residential placements. The link between depression and PTSD in the present study suggests that intervention should target these symptoms for multiracial youth. Exposure techniques, psychoeducation, cognitive restructuring, and coping skills training should be included in treatment for maltreated multiracial children

(Cohen & Mannarino, 1993, 1996; Deblinger et al., 1996). The combination of these techniques has led to the development of a trauma-specific therapy.

Trauma-Focused Cognitive Behavioral Therapy (TF-CBT) is an evidence-based treatment for sexually maltreated youth (Cohen & Mannarino, 1993) and has been expanded to become an effective treatment for many trauma victims (Cohen & Mannarino, 2006). TF-CBT is a 12- to 16-session intervention designed to reduce behavioral and emotional problems for children and families exposed to trauma. TF-CBT consists of progressive components divided into three phases. The initial phase of treatment includes psychoeducation about trauma, PTSD, treatment rationale, coping strategies, and emotion identification and regulation skills for the child and the parent (stabilization phase). The second phase includes the development of a trauma narrative to initiate and facilitate emotional and cognitive processing (trauma processing phase). The last phase of treatment focuses on safety and future development (integration phase).

TF-CBT has been shown to decrease PTSD, depression, anxiety, and posttraumatic cognitions in maltreated children (Cohen & Mannarino, 2006; Deblinger & Heflin, 1996; Deblinger et al., 1999). Cohen and Mannarino (1996) found that children and adolescents in TF-CBT experienced a greater reduction in symptoms than children in non-directive supportive therapy and child-centered therapy. TF-CBT has also been shown to decrease PTSD symptoms, internalizing symptoms, dissociative symptoms, sexualized behavior, and sexual competence in sexually maltreated children (Cohen et al., 2004). TF-CBT is one of the very few treatment programs developed specifically for this population. TF-CBT effectively reduces the symptoms that are strongly linked with the presence of PTSD in this population, including depression and family conflict. The

treatment gains from TF-CBT have been shown to last up to 12 months (Grasso et al, 2011).

Clinicians should emphasize the use of coping strategies in phase 1 of treatment with multiracial youth considering the findings in the present study. Effective coping strategies may prevent rumination, emotional inhibition, negative cognitive appraisals, and hopelessness as coping mechanisms in multiracial youth. Implementation of coping strategies early in treatment may weaken the relationship between depression and PTSD with multiracial youth. Additionally, emotional and cognitive processing during phase 2 of treatment target the dissociative symptoms and posttraumatic cognitions that often occur with maltreated youth. Early emphasis on phase 2 of the treatment plan may weaken the mediating role of depression with respect to dissociative symptoms and posttraumatic cognitions in multiracial youth. Future studies examining the effectiveness of TF-CBT are necessary to develop the most effective treatment plan for multiracial youth.

Limitations

Findings from the present study should be considered with caution considering several limitations. First, the researchers had limited access to maltreatment and family history and participant ratings may be subject to bias. This study relied on DFS records, caseworkers, and adolescent self-report to determine maltreatment history. DFS reports may have been incomplete and adolescent self-reports may have been affected by a failure to remember or articulate a complete maltreatment history. Findings may thus have been limited with respect to accuracy of maltreatment history. Parent and previous caregiver access was limited as they were often unavailable for interview. Participants

were often unable to report other variables such as parent income, parent, education, and parent employment. Confounding effects could not be evaluated as a result of limited information. However, the interviewers used a highly reliable and valid measure, with an in-sample Cronbach's alpha of .89, to elicit trauma history.

The second limitation was the potential effects of multiple traumas. Adolescents in the present study experienced multiple traumas and were removed from their homes, exposing them to an additional stressor. Participants were assessed for trauma but the effects of being removed from their homes were not accounted for during the analyses. Maltreatment type is an important variable with respect to subsequent PTSD symptoms. Neglect, sexual maltreatment, physical maltreatment, and witnessing domestic violence were included in the analyses as one group in the present study. Victims of sexual and physical maltreatment experience more PTSD-related symptoms than victims of neglect (Wechsler-Zimring & Kearney, 2012). The present study did not examine maltreatment types because of the limited access to maltreatment history.

The third limitation was the restricted age range of the participants. The present findings should not necessarily be applied to younger youths. The present study evaluated PTSD symptoms among multiracial youth. Ethnic identity was not evaluated as a mediating variable in this study because ethnic identity achievement typically occurs in late adolescence (Phinney, 1992).

The fourth limitation was variability of the multiracial sample (Table 1). Participants varied in ethnic background and were included in the analyses as a unitary group. The variability in ethnic backgrounds among the participants led to multiple

groups with diverse ethnic backgrounds. Each multiracial sub-group was not evaluated independently because of small sample size.

The fifth limitation was measurement of drug and alcohol use behaviors. Drug and alcohol use behaviors were examined together by one item on the information sheet (Appendix I). Alcohol and drug use were not examined separately or in great detail.

Recommendations for Future Research

Research examining PTSD in multiracial youth is currently in its early stages. Researchers should further examine the pattern of PTSD and depressive symptoms in multiracial youth to identify environmental and developmental variables that may contribute to PTSD and depressive symptoms. Additional information about PTSD and depression in maltreated multiracial youth will help inform assessment and treatment strategies with this vulnerable population. Researchers should also examine multiracial subgroups to further explain symptom presentation in maltreated youth.

Few studies have examined effective prevention programs associated with reduced PTSD symptoms in maltreated adolescents. Researchers should examine the effectiveness of early intervention programs for maltreated adolescents. Investigators should also compare PTSD symptoms in children receiving early intervention targeting depressive symptoms versus those receiving individual or no treatment. Information about prevention and early intervention may help inform and guide current foster care policies. Additionally, prevention programs targeting depressive symptoms in multiracial youth may reduce PTSD symptoms for multiracial youth.

Researchers should further examine the relationship between posttraumatic cognitions, dissociation, and drug and alcohol use considering the preliminary findings in

this study. Specifically, researchers should examine the impact of drug and alcohol use in maltreated youth with respect to PTSD and depression diagnoses.

Researchers should attempt to gather information from multiple informants to have the most accurate maltreatment history. Additional information from parents would add to the reliability and validity of the information provided by the participant. Future studies should include information from guardians with respect to the family environment. Parental mental health history, treatment history, and presence of other child disorders may also be important.

Researchers should differentiate maltreatment type to further tease apart PTSD-related symptoms and their specific relationship with type of trauma with multiracial youth. Specific PTSD symptom presentations may differ among those experiencing physical, sexual, and emotional maltreatment or neglect. Researchers should also study the impact of trauma with respect to maltreatment severity and how different rates of trauma affect the onset of PTSD. PTSD symptoms may vary, for example, across mild and severe cases of maltreatment.

Researchers should also examine the characteristics of maltreated adolescents without PTSD to identify resiliency factors in these youth. The type of abuse, severity of abuse, treatment history, and removal history will help inform clinicians and researchers about possible symptom patterns in children who do not develop PTSD after maltreatment. Extensive family information may also provide clues about the type of parenting strategies associated with less PTSD symptoms after maltreatment. Identification of these factors will lead to valuable information for treating and preventing PTSD in this population.

Appendix I

Information Sheet-C

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 Initials: _____

2. Your age: _____ 3. Are you: (circle one) Male Female Other

4. Your Race: (circle one)

Asian African-American European American Hispanic Multiracial Native American Other_____

_____

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

5a. 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

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

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 father other DFS

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?_____

THANK YOU

Appendix II

Table 1

Ethnic background of participants

	Percent
African American and European American	16.2
Native American and European American	15.3
African American and Hispanic American	12.6
Hispanic American and European American	10.7
African American and Native American	9.0
African American and Asian American	6.3
Native American and Hispanic American	5.5
African American and Puerto Rican	3.6
African American, European American, Native American	1.8
African American and unknown	0.1
African American, Native American, and Hispanic American	0.1
African American, Puerto Rican, European American	0.1
Asian American, European American, African American	0.1
Asian American, European American, Native American, Hispanic American	0.1
European American and Unknown	0.1
Filipino and European American	0.1
Haitian and Korean	0.1
Hispanic American and Asian American	0.1
Hispanic American and Pacific Islander	0.1
Hispanic American, Asian American, and European American	0.1
Hispanic American, Asian American, Native American, European American	0.1
Mexican and Italian	0.1
Mexican, European American, and Native American	0.1
Native American and unknown	0.1
Native American, Hispanic American, and European American	0.1
Puerto Rican and African American	0.1
Puerto Rican and European American	0.1
Puerto Rican, African American, and European American	0.1
Puerto Rican, Hispanic American, European American, Native American, “gypsy”	0.1
Total	100

Table 2.

Pearson Correlation Coefficients Among All Subscales

Subscale	CPTSD-I A	CPTSD-I B	CPTSD-I C	CPTSD-I D	CPTSD-I E	A-DES A
CPTSD-I A	-					-
CPTSD-I B	.44**					
CPTSD-I C	.28**	.68**				
CPTSD-I D	.75**	.75**	.67**			
CPTSD-I E	.54**	.54**	.47**	.61**		
A-DES A	.24*	.24*	.29**	.26**	.28*	
A-DES B	.22**	.27	.36**	.27**	.25**	.81**
A-DES C	.26**	.37**	.43**	.47**	.27**	.77**
A-DES D	.23	.34**	.42**	.43**	.40**	.80**
CDI A	.26**	.52**	.55**	.52*	.50**	.44*
CDI B	.06**	.16**	.16**	.18*	.17**	.45*
CDI C	.14	.29**	.28*	.35**	.25**	.35**
CDI D	.25**	.58**	.56**	.54**	.50**	.52**
CDI E	.18*	.49**	.39**	.37**	.29**	.40**
PTCI A	.32**	.54**	.55**	.55**	.44**	.53*
PTCI B	.41**	.51**	.65**	.52**	.39**	.24**
PTCI C	.25	.48**	.56**	.45**	.39	.24**

Note. CPTSD-I A2 = Situational Reactivity, CPTSD-I B = Re-experiencing, CPTSD-I C Avoidance/Numbing, CPTSD-I D = Increased Arousal, CPTSD-I E = Significant Distress, A-DES A = Dissociative Amnesia, A-DES B = Absorption/Imaginative Involvement, A-DES C = Passive Influence, A-DES D = Depersonalization/Derealization, CDI A = Negative Mood, CDI B = Interpersonal Problems, CDI C = Ineffectiveness, CDI D = Anhedonia, CDI E = Negative Self-Esteem, PTCI A = Negative Cognitions about Self, PTCI B = Negative Cognitions about the World, PTCI C = Self-blame. * = $p < .05$, ** = $p < .01$

Subscale	A-DES B	A-DES C	A-DES D	CDI A	CDI B	CDI C
CPTSD-I A				-		
CPTSD-I B						
CPTSD-I C						
CPTSD-I D						
CPTSD-I E						
A-DES A						
A-DES B						
A-DES C	.73**					
A-DES D	.72**	.80				
CDI A	.40**	.51**	.44**			
CDI B	.43**	.48**	.53**	.38**		
CDI C	.26**	.44**	.38**	.49**	.48**	
CDI D	.43*	.61**	.57**	.67**	.50**	.51**
CDI E	.38**	.53**	.41*	.65**	.38**	.56*
PTCI A	.48**	.67**	.63**	.64**	.39**	.66**
PTCI B	.24**	.40**	.35	.42**	.18**	.21**
PTCI C	.44**	.48**	.49**	.52**	.30**	.46**

Subscale	CDI D	CDI E	PTCI A	PTCI B	PTCI C
CPTSD-I A					
CPTSD-I B					
CPTSD-I C					
CPTSD-I D					
CPTSD-I E					
A-DES A					
A-DES B					
A-DES C					
A-DES D					
CDI A					
CDI B					
CDI C					
CDI D					
CDI E	.68**				
PTCI A	.66**	.63			
PTCI B	.41**	.29**	.57**		
PTCI C	.49	.40**	.78	.51**	-

Table 3.

Mean Depression Subscale Scores by Gender

	Male	Female
Negative Mood	1.78(2.40)*	3.19(2.79)*
Interpersonal Problems	0.98(1.42)	1.03(1.54)
Ineffectiveness	1.84(1.85)	1.94(1.89)
Anhedonia	2.78(2.87)**	4.25(3.32)**
Negative self-esteem	1.18(1.67)*	1.90(2.21)*

*p<.05., **p<.01.

Table 4.

Mean Total Scores by Gender

	Male	Female
Depression	8.57 (9.55)*	11.85 (8.03)*
Dissociation	59.70 (56.73)	58.61 (56.61)
Posttraumatic Cognitions	84.67 (41.36)	92.55 (41.54)

*$p<.05$.

Table 5.

Mean Total Scores by Drug/Alcohol Use

	Endorsed Drug/Alcohol Use	Did Not Endorse Drug/Alcohol Use
Depression	10.54(9.10)	10.60(9.12)
Dissociation	66.96(61.14)	55.95(53.05)
Posttraumatic Cognitions	94.24(44.83)	85.93(38.13)

*$p<.05$.

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