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Examining Resilience In Relation to PTSD Symptomatology In Maltreated Youth

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EXAMINING RESILIENCE IN RELATION TO PTSD SYMPTOMATOLOGY IN
MALTREATED YOUTH

By

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2009

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ABSTRACT

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Resilience following exposure to adverse life situations is an ongoing process that reduces the impact of traumatic experiences and opens potential for posttraumatic growth (Fincham, Altes, Stein, & Seedat, 2009; Luthar, Cicchetti, & Becker, 2000). The relationship between resilience and risk for PTSD in maltreated youth, however, remains unclear. This study sought to explore this relationship by examining a sense of mastery, a sense of relation to others, and emotional reactivity in youth endorsing a history of maltreatment related trauma. Participants were recruited from a Las Vegas Department of Family Services affiliated clinic and were administered the Children's PTSD Inventory (CPTSD-I) and the Resiliency Scale for Children and Adolescents (RSCA). A demographic questionnaire was also administered. Youth reporting high levels of the RSCA resource score reported lower symptoms of PTSD. A significant inverse relationship was also found between a sense of mastery and PTSD symptoms for all maltreatment types. Trauma type and the number of trauma exposures did not significantly moderate the relationship between the resource score and PTSD symptoms. Youth with higher levels of emotional reactivity reported increased PTSD symptoms compared to youth with lower levels of emotional reactivity. Implications are discussed.

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CHAPTER 1

INTRODUCTION

Resilience research represents a burgeoning field within the expanse of clinical psychology. This research originated in the 1970's amid endeavors to understand the etiology behind psychological illnesses (Masten, 2001). Resilience is characterized as an ongoing process of positive adaptation after exposure to adverse life events (Luthar, Cicchetti, & Becker, 2000). Researchers describe resilience as the ability to maintain psychological and physical health after adversity, and as the ability to successfully use resilience factors to bolster adaptation (Bonanno, 2008; Obradović, van Dulmen, Yates, Carlson, & Egeland, 2006). Presently, resilience research has expanded to focus on adaptation across multiple functional domains (Klika & Herrenkohl, 2013; Poulou, 2007).

Resilience remains an important area of inquiry among victims of maltreatment. Approximately 66% of youth in the United States experience trauma exposure that increases risk for PTSD (Cohen, Scheid, & Gerson, 2014). The relationship between PTSD and maltreatment increases in youth exposed to severe or multiple forms of maltreatment (Moore, Gaskin, & Indig, 2013). Sexually and physically maltreated youth indicate the highest risk for PTSD among maltreated youths (Ackerman, Newton, McPherson, Jones, & Dykman, 1998; Kearney et al., 2010; Putnam, 2009). Despite this clear association between maltreatment trauma and PTSD, resilience among maltreated youth at risk for PTSD remains considerably under researched in the extant literature.

Approximately 50-70% of youth remain resilient to psychopathology despite isolated trauma exposure (Bell, Romano, & Flynn, 2013; Bonanno & Mancini, 2008). Little is known, however, why some youth are resilient to trauma and others develop psychopathology. This

study investigated this question by examining key resilience factors in relation to PTSD symptomatology in maltreated youth. Resilience factors cumulatively reduce the risk of negative outcomes associated with adversity (Hollister-Wagner, Foshee, & Jackson, 2001). Furthermore, resilience factors help proactively protect against the negative effects of future adversity by promoting positive coping strategies (Henry, 2001; Reivich, Gillham, Chaplin, & Seligman, 2013). These factors occur across community, familial, and individual levels (Sarkar & Fletcher, 2014; Zimmerman et al., 2013).

The relationship between resilience and PTSD symptomatology with respect to trauma type also remains unknown. PTSD symptoms appear to vary by maltreatment type (Runyon, Deblinger, & Steer, 2013). Researchers also speculate that resilience varies by the type of traumatic experience, however, this remains unknown (Steenkamp, Dickstein, Salters-Pedneault, Hofmann, & Litz, 2012). Furthermore, a focus on sexual and physical maltreatment predominates the literature. Neglect and emotional maltreatment have not been adequately considered when examining resilience. Exposure to multiple traumas may also negate the positive impact of resilience factors. Approximately 13% of maltreated youth endorse experiencing an additional trauma (Scher, Forde, McQuaid, & Stein, 2004). Few researchers, however, compare single and multiple traumas in relation to resilience.

The majority of youth demonstrate resilience despite significant trauma histories (Bonanno & Mancini, 2008; Masten & Wright, 2010; Ungar, 2013a). The question of what creates resilience among some youth and not others remains unclear. This present study proposed that level of resilience partially explains variability of PTSD symptoms in maltreated youth. High levels of resilience reduce the negative impact of risk factors associated with PTSD symptoms; however, this has not been examined in relation to maltreatment (Fincham, Altes, Stein, & Seedat, 2009).

The primary aims of this study sought to overcome these limitations by examining resilience in a diverse range of youth endorsing different maltreatment types. First, this study examined the key resilience factors of low emotional reactivity, sense of relationships towards others, and perceived sense of mastery over the environment via the *Resiliency Scale for Children and Adolescents*. Second, this study examined resilience variables in relation to the primary maltreatment type endorsed (e.g. physical, sexual, neglect, psychological, and removal from home). Third, this study explored resilience variables in relation to single or multiple experiences of trauma exposure.

Key findings in maltreatment, PTSD, and resilience are summarized in Chapter 2. The review begins with the present state of the literature regarding child maltreatment definitions, prevalence, symptomatology, and effects. Next, PTSD definitions, epidemiology, symptomatology, comorbidity, and influential theoretical models are reviewed. The state of resilience research, including definitions and present theoretical framework is reviewed. Finally, the literature review will conclude with an overview of resilience as it relates to maltreatment and PTSD. Key risk and protective factors that contribute to resilience will be provided. The procedures and measures used in this study are outlined in Chapter 3. Results are detailed in Chapter 4 and a discussion of findings and implications in Chapter 5.

CHAPTER 2

LITERATURE REVIEW

Child Maltreatment

History of Child Maltreatment

Child maltreatment has existed throughout history and has only recently received legal attention and societal disapproval due to the harmful and lasting effects on youth (Radbill, 1987). The first successful American prosecution of child maltreatment occurred in 1874 when Mary Ellen, a severely maltreated child, was removed from her family (Jalongo, 2006). This case served as a catalyst for the development of legislative protection used today (Jalongo, 2006). The Federal Child Abuse Prevention and Treatment Act (CAPTA, 1974, P.L. 93-247) of 1974 provided finances to identify, prosecute, assess, investigate, and prevent child maltreatment. A recent amendment made to CAPTA in 2003 required intervention referrals for youth victims younger than age 3 years (CAPTA, 2003, P.L. 108-36; Herman, 2007).

Defining Child Maltreatment

Child maltreatment constitutes “(1) 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 (2) an act or failure to act which presents an imminent risk of serious harm” (U.S. Department of Health and Human Services, 2005). Maltreatment may also include “actions that are abusive, neglectful, or otherwise threatening to a child’s welfare” (American Psychological Association Committee on Professional Practices and Standards, 1999, p. 591). Types of child maltreatment include neglect as well as emotional, physical, and sexual maltreatment (Crooks & Wolfe, 2007).

Neglect represents the most common form of child maltreatment (Dubowitz, 2006).

Neglect constitutes “an act of omission, specifically the failure of a parent or other person legally responsible for a child’s welfare to provide for the child’s basic needs and proper level of care with respect to food, shelter, hygiene, medical attention, or supervision” (American Psychological Association Committee on Professional Practices and Standards 1999, p. 591). Neglect may include physical, emotional, medical, educational, and environmental disregard (Brittain, 2006; Dubowitz, Pitts, & Black, 2004).

Physical neglect comprises “a child suffering or in substantial risk of imminently suffering physical harm causing disfigurement, impairment of bodily functioning, or other serious physical injury created by a parent or other person legally responsible for the child’s welfare” (American Psychological Committee on Professional Practices and Standards, 1999, p. 591). Emotional neglect may be with or without intent to harm and includes acts of commission (e.g., terrorizing) and omission (e.g., ignoring psychological or social needs) (Hibbard, Barlow, & MacMillan, 2012). Omissions may result from unconcern, personal limitations, or a lack of knowledge (Junewicz, 1983). Medical neglect includes a failure to seek medical care in a timely manner and failure to recognize or respond to a youth’s health needs (Jenny, 2007; Merrick et al., 2010). Educational neglect occurs when a child obtains considerable school absences (7 or more) per school year due to problems in family functioning (Larson, Zuel, & Swanson, 2011). Environmental neglect includes a lack of environmental resources, opportunities, and safety (Dubowitz, Pitts, & Black, 2004).

The American Psychological Committee on Professional Practices and Standards defined emotional maltreatment as “a repeated pattern of behavior that conveys to children they are worthless, unwanted, or only of value in meeting another’s needs; may include serious threats of physical or psychological violence” (1999, p. 591). Emotional maltreatment differs from emotional neglect in that parents or caregivers commit acts towards youth that impair

psychological growth and development and harms a child's self-esteem and self-image (Junewicz, 1983). Emotional maltreatment may include insulting or verbally rejecting a child, scapegoating, using inconsistent discipline, demanding excessive responsibilities, and using fear-inducing techniques (Junewicz, 1983). Emotional maltreatment differs from poor or dysfunctional parenting practices by factoring in the relative risk of the child given her age, the consistency of the alleged maltreatment, and the severity of the maltreatment behavior (Wolfe & McIsaac, 2011). Emotional maltreatment also includes exploiting, isolating, or spurning a child (Sternberg et al., 2004).

Physical maltreatment includes “suffering by a child, or substantial risk that a child will imminently suffer, a physical harm inflicted nonaccidentally on him by his parents or caretaker” (American Psychological Association Committee on Professional Practice and Standards, 1999, p. 591). Deliberate acts such as shaking, kicking, burning, biting, poisoning, choking, or other harmful use of force or restraint constitutes physical maltreatment (Crooks & Wolfe, 2007). Physical maltreatment may be a single isolated incident or may involve multiple incidents over a period of time (Crooks & Wolfe, 2007).

Sexual maltreatment includes “contacts between a child and an adult or other person significantly older or in a position of power or control over the child, where the child is being used for sexual stimulation of the adult or other person” (American Psychological Association Committee on Professional Practice and Standards, 1999, p. 591). Sexual maltreatment includes experiencing genital or nongenital fondling, intercourse, incest, kissing in a sexual way, seeing an exhibitionist, and being invited to participate in a sexual activity (Haugaard, 2000; Williams, 1991). A forced child sexual experience results in higher psychological distress than a consensual sexual experience (Arreola, Neilands, Pollack, Paul, & Catania, 2008).

Prevalence

The Administration on Children, Youth, and Families (ACYF, 2012) reported 3.4 million referrals of alleged child maltreatment composing 6.3 million children in the United States in 2012. This statistic represents a 3.5% increase in child maltreatment reports from 2008 (ACYF, 2010, 2012). Child Protective Services (CPS) referrals within the United States consisted of substantiated cases (17.7%), indicated cases (0.9%), alternative response victim cases (0.5%), and unsubstantiated cases (80.9%) (ACYF, 2012). For 2012, 686,000 children were victims of maltreatment, indicating a 4.2% decrease in victimization from 2008 (ACYF, 2010, 2012). This represents a victimization rate of 9.2 victims per 1000 children (ACYF, 2012).

Maltreatment types included neglect (78.3%), physical maltreatment (18.3%), sexual maltreatment (9.3%), and other (10.6%) (ACYF, 2012). Other researchers indicate that physical maltreatment is 40 times more common than sexual maltreatment and is consistently underreported (Middleton, 2008). Approximately 27% of females and 16% of males in the general population of the United States allege a history of child sexual maltreatment (Finkelhor, Hotaling, Lewis, & Smith, 1990). A large percentage of sexually assaulted males (62%) and females (50%) reported that the sexual maltreatment included actual or attempted intercourse (Finkelhor et al., 1990). Approximately 13% of maltreatment victims report multiple forms of maltreatment (Scher, Forde, McQuaid, & Stein, 2004). The majority of neglected youth (95%) identify additional types of maltreatment exposure (Mennen, Kim, Sang, & Trickett, 2010).

Maltreated youth remain at higher risk for fatalities. National fatality rates for 2012 included 1,593 youth, with each state ranging from 0.00 to 4.64 fatalities per 100 youth (ACYF, 2012). Children younger than age 3 years are most vulnerable to maltreatment-related fatalities (70.3% of fatalities) (ACYF, 2012). Others estimate approximately 600 maltreatment-related fatalities in youth under the age of 5 years (Klevens & Leeb, 2010). Neglect and physical

maltreatment involved the highest fatality rates (ACYF, 2012).

Youth offenders endorse disproportionality high rates of child maltreatment history (60%), with female offenders 10 times more likely to endorse multiple types of severe maltreatment compared to male offenders (Moore, Gaskin, & Indig, 2013). Physical maltreatment remains common in incarcerated males (66%) and females (75%) (King et al., 2011). Sexual maltreatment rates also varied in incarcerated males (10%) and females (40%) (King et al., 2011; Yun, Ball, & Lim, 2011). Maltreatment chronicity may result in earlier involvement with the juvenile justice system than maltreatment severity (Yampolskaya, Armstrong, & McNeish, 2011).

Prevalence by Gender. Prevalence of maltreatment was similar across males (49.7%) and females (50.9%) in 2012 (ACYF, 2012). Males generally report more physical maltreatment than females, whereas females report more sexual maltreatment than males (MacMillan, Tanaka, Duku, Vaillancourt, & Boyle, 2013). A significant discrepancy exists in the prevalence rates for sexual maltreatment between males (24.8%) and females (75.2%) (Pérez-Fuentes et al., 2012). Higher maltreatment related fatality rates exist for males (57.6%) than females (42.1%) (ACYF, 2012).

Prevalence by Age. Approximately 75% of maltreated children are under age 12 years (Whitted, Delavega, & Lennon-Dearing, 2013). The Administration on Children, Youth, and Families (ACYF, 2012) reported average maltreatment rates per 1000 children at ages 0-1 year (21.9/1000), 1-3 years (11.8/1000), 4-7 years (10.2/1000), 8-12 years (7.5/1000), and 13-17 years (5.9/1000). Maltreatment type may also differ by age. Physical maltreatment rates varied among those aged 0-2 years (246/1000), 3-5 years (171/1000), 6-8 years (168/1000), 9-11 years (141/1000), 12-14 years (147/1000), and 15-17 years (120/1000) (ACYF, 2012). Rates of sexual maltreatment varied among youth aged <1-2 years (26/1000), 3-5 years (140/1000), 6-8 years

(172/1000), 9-11 (184/1000), 12-14 years (263/1000), 15-17 years (209/1000) (ACYF, 2012). Neglect rates varied from ages <1-2 years (297/1000), 3-5 years (210/1000%), 6-8 years (166/1000), 9-11 years (129/1000), 12-14 years (110/1000), and 15-18 years (84/1000) (ACYF, 2012). Medical neglect was highest for youth ages <1-2 years (332/1000) (ACYF, 2012). Psychological maltreatment rates varied among youth aged 1-2 years (214/1000), 3-5 years (199/1000), 6-8 years (178/1000), 9-11 years (160/1000), 12-14 years (142/1000), and 15-17 years (103/1000) (ACYF, 2012).

Prevalence by Ethnicity. Maltreated youth in 2012 consisted of European Americans (44.0%), African Americans (21.0%), and Hispanics (21.8%) (ACYF, 2012). Victimization rates varied among African Americans (14.2/1000), American Indians and Alaska Natives (12.4/1000), and multiracial groups (10.3/1000). African Americans reported more severe forms of maltreatment compared to other ethnic groups, but these results are mixed (Lee et al., 2012; Ullman & Filipas, 2005a). European Americans and Asian Americans reported the least severe forms of maltreatment (Ullman & Filipas, 2005a). Ethnic differences exhibit little influence on the timing, type, or chronicity of maltreatment (Lee et al., 2012). Fatality rates varied by ethnicity among European Americans (38.3%), African Americans (31.9%), and Hispanics (15.3%) (ACYF, 2012). Hispanic youth may be underrepresented in the child welfare system compared to the general population (Dettlaff & Johnson, 2011). Nontraditional immigrated families are overrepresented for maltreatment (Euser, van IJzendoorn, Prinzie, & Bakermans-Kranenburg, 2011).

Prevalence by Disability. Disabilities may increase risk for child maltreatment in youth (Algood, Hong, Gourdine, & Williams, 2011; Kendall-Tackett, Lyon, Taliaferro, & Little, 2005; Sullivan & Knutson, 1998). Children with disabilities have a 3-4 times increased risk for maltreatment (Murphy, 2011). Approximately 13.3% of maltreatment victims reported a

disability (ACYF, 2012). Others speculate higher rates of maltreatment in disabled youth (Fudge Schormans & Sobsey, 2007). Youth with neurological conditions, chronic respiratory conditions, and orthopedic problems report highest risk for maltreatment (Murphy, 2011). Youth with auditory disabilities also demonstrate significantly increased risk for sexual maltreatment than youth with other disabilities (Sullivan & Knutson, 1998).

Family Factors. Child maltreatment often co-occurs with intimate partner violence (Knickerbocker, Heyman, Slep, Jouriles, & McDonald, 2007). The exposure of women to intimate partner violence while pregnant increases risk of later child maltreatment (Chan et al., 2012). Aggression towards one's partner was found to co-occur 45% of the time with physical maltreatment among families from a New York county (Slep & O'Leary, 2005)

Risk for maltreatment increases in single parent and step/cohabiting families (Turner, Finkelhor, Hamby, & Shattuck, 2013). Factors that increase victimization rates within these families include adversity, drug and alcohol problems, high parental conflict, and community disorder (Turner et al., 2013). Youth with maltreated siblings exhibit higher risk for maltreatment (MacMillan, Tanaka, Duku, Vaillancourt, & Boyle, 2013).

Economic Factors. Low socioeconomic status and unemployment may increase risk of child maltreatment (Alink, Euser, van IJzendoorn, & Bakermans-Kranenburg, 2013; Ben-Arieh, 2010; Herrenkohl & Herrenkohl, 2007). Limited neighborhood resources, unemployment, residential housing/property value, residential instability, heightened child-care burden, and overcrowding correlate with increased rates of maltreatment in low-income neighborhoods (Coulton, Crampton, Irwin, Splisbury, & Korbin, 2007). Economic prosperity negatively correlates with child maltreatment (Finklehor & Jones, 2006).

Societal Costs of Maltreatment. Maltreatment remains an economically and psychologically costly public health problem (Briggs, Thompson, Ostrowski, & Lekwauwa,

2011; Brown, Fang, & Florence, 2011; Corso, Edwards, Fang, & Mercy, 2008). Lost economic productivity and increased social spending further raise the costs of maltreatment (Zielinski, 2009). Maltreated individuals also indicate heightened occupational difficulties and high medical expenditures (Florence, Brown, Fang, & Thompson, 2013; Zielinski, 2009). In addition to these high societal costs, maltreatment increases risk for many psychological and physiological problems.

Maltreatment Effects

Child maltreatment increases risk for a wide range of negative consequences that are complex and multifaceted. Child maltreatment poses risk for problems in brain development, behavioral problems, and psychopathology (Jaffee, 2012; Li & Godinet, 2014; Whittle et al., 2013). Maltreatment type and chronicity further modify symptom outcome in victims of maltreatment (Kira, Fawzi, & Fawzi, 2013). The effects of child maltreatment are summarized in the following sections.

Physiological Effects. Child maltreatment correlates with significant adverse physical consequences (Christian & Schwarz, 2011; MacMillan, 2010). Health-related quality of life remains significantly impaired in maltreated youth (Jud, Landolt, Tatalias, Lach, & Lips, 2013). Maltreated youth evidence a 70-100% increased risk for hospital admissions (Lanier, Jonson-Reid, Stahlschmidt, Drake, & Constantino, 2010). Hospital admissions among maltreated youth included increased rates of abdominal injuries, superficial head injuries, intestinal infections, poisonings, and parasitic diseases (O'Donnell et al., 2010; Wood, Pecker, Russo, Henretig, & Christian, 2012). Brain changes in growth, neural development, plasticity, and maturation are also common in maltreated youth (Kearney, Wechsler, Kaur, & Lemos-Miller, 2010). Victims also endorse heightened rates of health-risk behaviors such as early smoking, drug use, self-mutilation, alcohol abuse, attempted suicide, and early sexual intercourse (Herrenkohl, Hong,

Klika, Herrenkohl, & Russo, 2013; Pinto & Maia, 2013). Common health complaints include cardiopulmonary symptoms, gynecological and reproductive health problems, gastrointestinal problems, and chronic pain (Irish, Kobayashi, Delahanty, 2010; Rogosch, Dackis, & Cicchetti, 2011).

Child maltreatment may also increase health risk behaviors that contribute to future psychological distress and negative life events (Min, Minnes, Kim, & Singer, 2013). For instance, obesity influenced by trauma may contribute to chronic health conditions in adulthood (Helton & Liechty, 2013; Min et al., 2013). Long-term effects of maltreatment include increased rates of chronic health conditions as well as health risk behaviors such as smoking and substance dependence (Min et al., 2013; Schafer, Morton, & Ferraro, 2013).

Child maltreatment increases risk for neuroendocrine disorders (Doom, Cicchetti, Rogosch, & Dackis, 2013). Youth evidence increased rates of dopamine and norepinephrine (De Bellis et al., 1999). Chronic maltreatment affects the responsiveness of the hypothalamic-pituitary-adrenal (HPA) axis (Tarullo & Gunnar, 2006). The HPA axis moderates stress by activating the sympathetic nervous system (Young, Abelson, & Liberzon, 2008). The HPA axis secretes corticotropin-releasing hormone (CRH) in response to stress (Buitelaar, 2013). The CRH stimulates adrenocorticotropic hormone (ACTH), which leads to cortisol release (Buitelaar, 2013). Cortisol is the primary glucocorticoid in the brain and regulates HPA axis activity (Shea, Walsh, MacMillan, & Steiner, 2005). The release of cortisol reduces the level of ACTH in the brain through negative feedback regulation (Buitelaar, 2013). Dysregulation occurs after exposure to chronic stress (Cicchetti, Rogosch, Gunnar, & Toth, 2010).

Maltreated children exhibit dysregulation of the HPA axis, which correlates with depression, anxiety, learning and memory deficits, failure of response inhibition, aggression, and deficits in behavior regulation (Gowin et al., 2013; Lisonbee, Pendry, Mize, & Gwynn, 2010;

van Voorhees & Scarpa, 2004). HPA axis dysregulation further increases risk for major depressive disorder and PTSD (Shea, Walsh, MacMillan, & Steiner, 2005).

Pervasive maltreatment also results in variable cortisol levels (Doom et al., 2013). Youth exposed to isolated traumas initially exhibit hypercortisolism (Gustafsson, Anckarsäter, Lichtenstein, Nelson, & Gustafsson, 2010). Hypocortisolism, however, may result over time from the accumulation of traumas rather than exposure from a specific trauma incident (Gustafsson et al., 2010). This relationship appears particularly robust in females (Doom et al., 2013).

In addition, males exposed to acute maltreatment had higher cortisol/DHEA ratio levels and elevated cortisol levels than females with similar maltreatment exposure (Doom et al., 2013). High cortisol levels may result in atrophy of hippocampal cells and cognitive dysfunction (Sapolsky, 1996; Shea, Walsh, & MacMillan, 2005). Dysregulation of cortisol decreases prosocial behaviors and increases aggressive and disruptive behaviors and social withdrawal (Alink, Cicchetti, Kim, & Rogosch, 2012).

The severity of adverse effects may depend on the initial age that maltreatment occurs (Jaffee & Maikovich-Fong, 2011). Child maltreatment adversely affects brain development and growth (De Bellis & Keshavan, 2003). Maltreated youth aged 3 years and younger are particularly vulnerable to adverse developmental changes (Glaser, 2012). Atypical neuronal structures within the temporal lobes and prefrontal cortex and reduced cortical thickness in the superior frontal gyrus, orbitofrontal cortex, and anterior cingulate have been found in maltreatment victims (Kelly et al., 2013). Others indicate reduced dendritic remodeling of the cornu ammonis and 6% volumetric reductions in the subiculum and presubiculum of the hippocampus (Teicher, Anderson, & Polcari, 2012). Maltreatment correlates with delayed or deficient growth in the left amygdala and is associated with larger baseline hippocampal volumes

(Whittle et al., 2013). Other youth exhibit alterations in the left thalamus that may increase risk for generalized anxiety disorder (Liao et al., 2013). Furthermore, the superior parietal region of the brain thickens in some youth as a result of maltreatment (Whittle et al., 2013).

Approximately 50% of maltreated youth experience head injuries (Butchart, 2008; Schneeberger, Muenzenmaier, Battaglia, Castille, & Link, 2012; Wells, 2006). Traumatic brain injuries account for the majority of trauma-related deaths (Wells, 2006). Head trauma commonly occurs following physical maltreatment and prenatal exposure to substances (Mattson, 2010; Thyen, Leventhal, Yazdgerdi, & Perrin, 1997). Traumatic brain injuries may result in loss of consciousness, skull fractures, laceration and contusions of cerebral tissues, subdural/epidural hematoma, and parenchymal/ subarachnoi hemorrhage (Díaz-Olavarrieta et al., 2011; Spivack, 2001). Youth victims of shaking-impact syndrome are at significant risk for brain damage and nerve damage, including severe traumatic and hypoxic-ischemic injuries (Gedeit, 2001; Splaingard, 2001).

Psychological Effects. Child maltreatment correlates strongly with psychiatric disorders (King et al., 2011; Pecora, Jensen, Romanelli, Jackson, & Ortiz, 2009). Females exposed to child maltreatment have a 2-10 times increased risk of any mental disorder compared to nonmaltreated youth (King et al., 2011). Maltreated males have a 2-7 times heightened risk of every mental disorder except anxiety disorders (King et al., 2011). Early maltreatment also links to changes in personality and increases risk for various personality disorders (Hengartner, Müller, Rodgers, Rössler, & Ajdacic-Gross, 2013). Youth experiencing more than one type of maltreatment demonstrate heightened susceptibility for psychological problems (Mills et al., 2013).

Internalizing Problems. Child maltreatment may lead to psychopathology and increased risk for emotional dysregulation, negative affectivity, depression, and anxiety and personality

disorders (Perea, Paternina, Gomez, & Lattig, 2012; Scott, Smith, & Ellis, 2010). Internalizing problems appear most severe in youth exposed to emotional and multiple forms of maltreatment (Mills et al., 2013). Emotional regulation problems include difficulty identifying, verbalizing, or communicating emotion in an adaptive manner, inappropriate emotional reactivity, constrictive emotions, and attenuated empathy (Ford, 2005; Kim & Cicchetti, 2010). Maltreated youth are also at risk for somatic disorders, dissociative symptoms, eating disorders, purging behaviors, and PTSD (Bohn, Bernardy, Wolfe, & Häuser, 2013; Jonkman, Verlinden, Bolle, Boer, & Lindauer, 2013; Wonderlich et al., 2007).

Suicide attempts often occur in maltreated youth. Youth with maltreatment histories report significantly increased rates of self-mutilation and suicide compared to nonmaltreated youth (Pérez-Fuentes et al., 2012; Zoroglu et al., 2003). Sexually maltreated youth have a 12 times heightened risk of suicide compared to nonmaltreated youth (Middleton, 2008). The risk for suicide in youth positively correlates with maltreatment chronicity (Jonson-Reid, Kohl, & Drake, 2012). Cognitive distortions linked with child maltreatment increase risk for suicidal ideation (Miller & Esposito-Smythers, 2013).

Externalizing Problems. Maltreated youth commonly exhibit negative externalizing and delinquent behaviors (Åslund et al., 2011; Edmond, Auslander, Elze, McMillen, & Thompson, 2002). Psychological maltreatment correlates with attachment disorders, disruptive behavior, socialization problems, educational and developmental problems, and future psychopathology (Hibbard, Barlow, & MacMillan, 2012). Sexual maltreatment significantly correlates with anxiety and mood disorders, substance abuse, attention-deficit/hyperactivity disorder, and disruptive behavior disorders (King et al., 2011). Maltreated males demonstrate increased likelihood of externalizing problems (Finkelhor, 1990; Gomes-Schwartz, Horowitz, & Cardarelli, 1990). Children aged 8-11 years exhibited higher scores on peer and conduct

problems and emotional symptoms (Whitted, Delavega, & Lennon-Dearing, 2013).

All maltreatment forms significantly increase risk for substance use disorder during the lifespan (Elwyn & Smith, 2013; Rosenkranz, Muller, & Henderson, 2012; Tonmyr, Thornton, Draca, & Wekerle, 2010). Approximately two-thirds of individuals receiving treatment for drug abuse or dependence report a history of maltreatment (Middleton, 2008). Cumulative emotional maltreatment and emotional neglect correlates to substance abuse problem severity (Rosenkranz et al., 2012). Marijuana and alcohol remain the most common form of drug use in maltreated adolescents (Hovdestad, Tonmyr, Wekerle, & Thornton, 2011). A number of models explain the relationship between maltreatment and substance abuse. Maltreatment-related low self-esteem may result in youth attempting to escape psychological pain through substance use (Hovdestad et al., 2011). Consistent with this model, retrospective recall of child maltreatment significantly correlates to alcohol and drug use in adulthood (Elwyn & Smith, 2013). Youth may also engage in substance use via social modeling of their caretakers (Hovdestad et al., 2011).

Maltreatment may also lead youth to engage in risky sexual behaviors (Oshri, Tubman, & Jaccard, 2011). Maltreated youth using illicit substances endorsed higher rates of unprotected intercourse (Oshri et al., 2011). Victims of sexual maltreatment endorsed compulsive sexual behaviors, sadomasochistic sexual fantasies, sexual identity issues, loss of sexual interest, and chronic fatigue (Craine, Henson, Colliver, & MacLean, 1988). Severe maltreatment correlates with sexually risky behaviors as well as sexually transmitted infections and human immunodeficiency virus (Oshri et al., 2011). Maltreated youth indicate heightened rates of teenage pregnancy across maltreatment types (Smith, 1996).

Child maltreatment correlates with each personality disorder (Hengartner, Müller, Rodgers, Rössler, & Ajdacic-Gross, 2013). Comorbid personality disorders may aggravate risk for suicidal ideation, attachment problems, and additional trauma experiences (Allen, Cramer,

Harris, & Rufino, 2013). The development of personality disorders in maltreated youth may originate from disrupted or disorganized parent-child interactions (Shi, Bureau, Easterbrooks, Zhao, Lyons-Ruth, 2012). Child maltreatment also interacts with the monoamine oxidase gene to increase vulnerability for personality disorders such as antisocial personality disorder (Beach et al., 2010).

Maltreatment prior to age 12 years increases the self-report of psychotic symptoms (Arseneault et al., 2011). Maltreatment exposure may influence negative and positive symptom severity in youth with psychotic disorders (Ramsay, Flanagan, Gantt, Broussard, & Compton, 2011). Emotional neglect correlates with negative symptom severity (Ramsay et al., 2011). Negative symptoms include affective blunting or flattening, alogia, anhedonia, asociality, inattentiveness, and avolition (Lyne et al., 2013; Vogel et al., 2011). Child maltreatment may also be a significant risk factor for dissociative identity disorder and pathological dissociation (Dorahy et al., 2009; Sanders & Becker-Lausen, 1995).

Criminality. Severe PTSD and child maltreatment correlate with criminal behavior (Elklit, Karstoft, Armour, Feddern, & Chistoffersen, 2013; Fontaine & Nolin, 2012; Hengartner, Ajdacic-Gross, Rodgers, Müller, & Rössler, 2013). Child maltreatment correlates with aggressive and criminal behavior, juvenile offending, and violent delinquency (Elklit et al., 2013; Haapasalo & Pokela, 1999; Stewart, Livingston, & Dennison, 2008). Forensic inpatients endorsed substantial histories of neglect (59%), emotional maltreatment (75%), and physical maltreatment (52%) (Spitzer, Chevalier, Gillner, Freyberger, & Barnow, 2006). Cumulative trauma further increases risk for criminal behavior (Elklit et al., 2013). Physical maltreatment, neglect, and emotional maltreatment comprise the highest risk for later criminality, while sexual maltreatment represents a lower risk (Elklit et al., 2013).

Attachment Problems. Maltreatment may result in insecure or disorganized attachment

(Cicchetti, Rogosch, & Toth, 2011; Stronach et al., 2011; Wilkins, 2012). Disorganized or insecure attachment patterns occur in approximately 36% of maltreated youth, although other researchers indicate higher rates (Baer & Martinez, 2006; Cicchetti & Barnett, 1991). Poor attachment may also increase risk for adult sexual victimization (Reid & Sullivan, 2009). Maltreatment may lead to future insecure attachments with romantic partners in adolescence and adulthood (Reyome, 2010; Weiss, MacMullin, Waechter, & Wekerle, 2011).

Academic and Cognitive Problems. Substantial evidence for deficits in academic achievement and intelligence exist for children exposed to maltreatment (Nikulina & Widom, 2013). Youth maltreated over multiple developmental periods demonstrate lower IQ scores than youth maltreated over a single developmental period (Jaffee & Maikovich-Fong, 2011). Maltreatment may also increase risk for deficits in executive functioning (Augusti & Melinder, 2013). Maltreated children display decision-making impairments, working memory deficits, developmental delays in emotional regulation, and neurocognitive delays (Augusti & Melinder, 2013; Weller & Fisher, 2013). Decision-making impairments include difficulty identifying potential costs and potential rewards of behavior (Weller & Fisher, 2013). This difficulty fosters insensitivity to environmental changes and to excessive risk-taking behaviors (Weller & Fisher, 2013).

Long-Term Problems. Maltreatment increases risk for enduring psychological and physical negative outcomes in adulthood (Arnou, 2004; Christian & Schwarz, 2011; Jonson-Reid, Kohl, & Drake, 2012). Rates of adult cardiovascular disease risk increase with maltreatment histories (Batten, Aslan, Maciejewski, & Mazure, 2004). Chronic pain, migraines, marital problems, memory impairment, higher perceived stress, and adult depression are common in older adults maltreated as youth (Anda et al., 2006; Anda, Tietjen, Schulman, Felitti, & Crott, 2010; Dube et al., 2005; Gonzalez et al., 2012). Child trauma may also increase risk for

dementia and related cognitive deficits in mature adulthood (Burri, Maercker, Krammer, & Simmen-Janevska, 2013). Early maltreatment also correlates with future intimate partner dating violence, criminal offending, decreased educational and economical attainment, and mental health problems (Kendra, Bell, & Guimond, 2012; Mersky & Topitzes, 2010; Tyler, Melander, & Noel, 2009).

Limitations on the Effects of Maltreatment

The reviewed effects of maltreatment rely heavily on retrospective accounts of adults maltreated during youth (Topitzes, Mersky, Dezen, & Reynolds, 2013). Few studies, however, examine the immediate effects children endure shortly following trauma exposure. In addition, few studies account for resilience or other protective factors that mitigate the relationship between maltreatment exposure and negative outcomes. Child maltreatment significantly correlates to PTSD (Pecora, White, Jackson, & Wiggins, 2009). Furthermore, nearly half of all traumatized youth demonstrate resilience (Bonanno & Mancini, 2008). Few researchers, however, examine the symptomatology of PTSD within a resilience framework. Furthermore, the effects of trauma type have been largely neglected in the symptomatology of PTSD. Different types of trauma yield different clinical outcomes (Steenkamp, Dickstein, Salters-Pedneault, Hoffman, & Litz, 2012). This study focused primarily on the relationship between child maltreatment and PTSD. Specifically, this study investigated resilience in youth at high risk for PTSD. The following sections review PTSD in youth and prominent risk and protective factors in maltreated youth.

Posttraumatic Stress Disorder

PTSD Criteria

Posttraumatic stress disorder (PTSD) is a trauma-related disorder that results from exposure to one or more stressors or traumatic life events (American Psychiatric Association, 2013). DSM-5 features separate sets of criteria for PTSD for those older and younger than age 6 years (APA, 2013). A separate criteria set for children aged 6 years and younger allows for a developmentally appropriate approach to diagnosis by accounting for emerging verbal expression and abstract cognitive ability (Scheeringa, Peebles, Cook, & Zeanah, 2001; Scheeringa, Zeanah, Drell, & Larrieu, 1995).

A diagnosis of PTSD stems from exposure to actual or threatened death, sexual violence, or serious injury (APA, 2013). Examples of traumatic events include threatened or actual physical violence, exposure to war trauma as a soldier or civilian, kidnapping, terrorist attack, torture, human made or natural disasters, incarceration, and others (APA, 2013). Trauma exposure includes directly experiencing a traumatic event, witnessing a traumatic event in person, learning that a traumatic event happened to a close family member or friend, or experiencing exposure to details of a traumatic event (APA, 2013). In children, exposure to developmentally inappropriate sexual experiences without threat of violence or injury to oneself may constitute trauma exposure (APA, 2013).

PTSD symptoms include intrusion symptoms following exposure, avoidance of trauma-related stimuli, negative alterations in cognitions and mood associated with the trauma, and heightened reactivity and arousal (APA, 2013). Intrusion symptoms occur via intrusive and involuntary distressing memories, dreams, night terrors, dissociative reactions, and physiological and psychological distress in situations resembling the trauma (APA, 2013). Avoidance symptoms include efforts to avoid distressing feelings, memories, or thoughts related to the

trauma and efforts to avoid external reminders that trigger distressing feelings, memories, or thoughts (APA, 2013). Negative alterations in cognitions and mood include difficulty remembering important aspects of the trauma, inability to experience positive emotions, persistent negative emotional arousal state, feelings of detachment or estrangement from others, lack of participation or interest in important activities, distorted cognitions about the cause or consequences of a traumatic event, and self-blame for the event(s) (APA, 2013).

Symptoms of reactivity and arousal include angry outbursts and irritable behavior, aggression, self-destructive or reckless behavior, hypervigilance, exaggerated startle response, difficulties with concentration, and sleep disturbances (APA, 2013). A diagnosis of PTSD requires that symptoms occur for 1 month following trauma exposure and cause clinically significant distress or impairment (APA, 2013). DSM-5 further specifies if the presenting PTSD symptoms include a dissociative component such as depersonalization or derealization (APA, 2013). Delayed expression of PTSD may be specified if PTSD criteria are not met until at least 6 months following the trauma (APA, 2013).

DSM-5 includes a separate set of PTSD criteria for youth aged 6 years and younger. Youth in this age group may demonstrate spontaneous and intrusive memories through play reenactment that appears non-distressing (APA, 2013). Youth older than age 6 years may express intrusion symptoms through repetitive play that contains aspects of the trauma (APA, 2013). Repetitive and intrusive thoughts regarding the trauma, night wakefulness, and fears of the dark are common in youth (Yule, 2001). Youth may also express intrusion symptoms through frightening dreams without trauma-specific content (APA, 2013). Children may also reenact traumatic events or experience dissociative states (APA, 2013).

PTSD Prevalence. DSM-5 indicates a lifetime prevalence of PTSD in the United States at 8.7% (APA, 2013). Others indicate lifetime prevalence of 6.8% (Kessler et al., 2005). PTSD

rates vary from 0.5% to 1.0% in other European, Asian, African, and Latin American countries (APA, 2013). Prevalence rates increase among survivors of rape, politically or ethnically motivated internment and genocide, and military combat and captivity (APA, 2013).

Child Prevalence Rates. Despite a wide range of trauma experiences, less is known regarding the prevalence rate of PTSD in children and adolescents (Costello, Egger, & Angold, 2005). Children and adolescents endorse lower rates of PTSD following traumatic events (APA, 2013). Approximately 80% of youth experience a traumatic event across the world (Sharma-Patel et al., 2011). In the United States, approximately 13.9% of youth experience disaster exposure and 36.4% experience victimization (Becker-Blease, Turner, & Finkelhor, 2010). The most common traumatic events for American children include vicarious traumas such as receiving news regarding the death or injury of a family member or friend (13%) or witnessing an injury or death (10%) (Giaconia et al., 1995). Recent epidemiological studies indicate a lifetime prevalence of DSM-IV PTSD at 4.7% with increased rates in females (7.3%) compared to males (2.2%) (McLaughlin et al., 2013). Adolescent rates differ among those aged 13-14 years (3.7%), 15-16 years (5.1%), and 17-18 years (7.0%) (Merikangas et al., 2010). PTSD rates appear heightened in inpatient adolescents (42%) (Koltek, Wilkes, & Atkinson, 1998). Court-referred adolescents generally report heightened rates of traumatic experiences for both females (75%) and males (51%), with approximately 13% reporting multiple traumas (Brosky & Lally, 2004). Symptoms of PTSD also vary among court-referred adolescents in females (21-34%) and males (8-17%) (Brosky & Lally, 2004).

Gender Differences. Females indicate higher vulnerability for PTSD following accidents, disasters, violence, and loss than males (Ditlevsen & Elklit, 2012). Females also endorse higher rates of PTSD (6.3%) than males (3.7%) 6 months after a traumatic experience (Kilpatrick et al., 2003). These heightened rates include significantly elevated symptom endorsements in women

(Peters, Issakidis, Slade, & Andrews, 2006). Increased prevalence of sexual assault, elevated perceived distress, increased avoidance and numbing symptoms, and biological variations may partially account for gender differences for PTSD risk (Steven Betts, Williams, Najman, & Alati, 2013; Uddin, Sipahi, Li, & Koenen, 2013).

PTSD Prevalence by Trauma Type. Some types of trauma may yield higher prevalence rates for PTSD than others (Sauter & Franklin, 1998). Sexual assault, physical violence, violent death of a family member or peer, and injury represent the highest risk for PTSD (Copeland, Keeler, Angold, & Costello, 2007). PTSD rates in youth vary by sexual maltreatment (53%), war-related trauma (21-33%), and violent crime (27-33%) (Kaufman-Shriqui et al., 2013; Klasen, Gehrke, Metzner, Blotevogel, & Okello, 2013; Salmon & Bryant, 2002). Natural disaster PTSD prevalence rates include earthquakes (40%), tsunamis (39%), mudslides (25%), and tornadoes (41%) (Agustini, Asniar, & Matsuo, 2011; Evans & Oehler-Stinnett, 2006; Ghazali, Elklit, Yaman, & Ahmad, 2012; Yang et al., 2011; Zhang et al., 2012). Exposure to multiple traumas further increases PTSD risk (Harder, Mutiso, Khasakhala, Burke, & Ndeti, 2012; Macdonald, Danielson, Resnick, Saunders, & Kilpatrick, 2010). For example, sexually revictimized adolescents endorsed heightened prevalence of PTSD symptoms during a 6-month follow-up (Walsh et al., 2012).

Type of maltreatment interacts with other environmental and biological factors to influence risk for PTSD (Kim-Cohen & Turkewitz, 2012; Sauter & Franklin, 1998). Theoretical models of PTSD acknowledge the role of risk factors in increasing risk for PTSD and maintaining PTSD symptoms. The influence of resilience factors, however, remains largely unknown. Furthermore, few studies have identified the role of trauma type interacting with resilience in determining PTSD symptom severity. High levels of resilience may protect against risk factors associated with increased PTSD symptoms (Fincham, Altes, Stein, & Seedat, 2009).

This study expanded on this limitation by examining the role of resilience factors in relation to PTSD symptom severity. A review of theoretical PTSD models is provided below.

Theoretical Models of PTSD

Multiple models exist to explain the development and maintenance of PTSD symptoms (Jobson, 2009). Models include biological stress-diathesis perspectives, ecological models, and cognitive and information processing models (Ehlers & Clark, 2000; Elwood, Mott, Williams, Lohr, & Schroeder, 2009; McKeever & Huff, 2003). Considerable debate exists regarding which model best fits PTSD development. Some researchers support a combination model using a cognitive-behavioral perspective (Kalantzi-Azizi & Karademas, 2005; Meiser-Stedman, 2002). Others propose a biopsychosocial model (Shalev, 1997). Other models include personality development, social cognition, information processing, conditioning, and anxious-apprehension models (Brewin & Holmes, 2003; Miller, 2003). Primary models of PTSD are summarized in the next sections.

Biological Models. Diathesis-stress models of PTSD propose that traumatic and other negative life events interact with other vulnerabilities to increase risk for the disorder (Elwood, Mott, Williams, Lohr, & Schroeder, 2009). These vulnerabilities, or diatheses, include biological correlates that enhance risk for PTSD (Flouri, 2005; McKeever & Huff, 2003). Maltreatment during developmental critical periods and periods of increased neural plasticity increases risk for PTSD (McKeever & Huff, 2003). Trauma exposure may also result in adaptive biological changes that enhance resilience in some circumstances (Bowes & Jaffee, 2013). For example, exposure to mild or moderate repeated stress may result in decreased activation of the HPA-axis to future stressors resulting in an increased ability to regulate emotions (Bowes & Jaffee, 2013).

Child maltreatment may further adversely affect genetic expressions (Mehta et al., 2013).

Biological diatheses include gene polymorphisms abnormalities in brain functioning and neuroendocrine irregularities (Nemeroff et al., 2006, Zoladz & Diamond, 2013). Genes interact with environmental factors to influence risk for PTSD (La Greca, Lai, Joormann, Auslander, & Short, 2013). The pathophysiology of genetic polymorphisms may create additional risk for exposure to potentially traumatic events (Amstadter, Nugent, & Koenen, 2009; Burt, 2008). Furthermore, specific genetic polymorphisms may enhance PTSD vulnerability (Amstadter et al., 2009). Genetic markers indicated in the pathogenesis of PTSD include the Met allele (BDNF), serotonin hydroxylase genes (TPH1 and TPH2), serotonin transporter promoter polymorphism (5HTTLPR), FKBP5 stress-related gene, dopamine D2 receptor gene (DRD2), glucocorticoid receptor polymorphisms (GCCR), and gamma-aminobutyric acid A receptor polymorphism (GABRA2) (Bachmann et al., 2005; Binder et al., 2008; Goenjian et al., 2012; La Greca et al., 2013, Nelson et al., 2009; Rady, Elsheshai, Mokhtar, Wafa, & Elkholy, 2011). These genes may also increase risk for additional psychopathology such as depression that could maintain PTSD (La Greca et al., 2013). Genetics research remains in its infancy and additional research is needed to identify the role of genes in the developmental trajectory of PTSD (Dyregrov & Yule, 2006). Furthermore, the relationship between genetics, environment, and psychological outcome is bidirectional (Bowes & Jaffee, 2013). For example, youth genetically predisposed to certain behaviors or personality styles such as extroversion may seek out social opportunities that could contribute to resilience and decrease risk for PTSD (Bowes & Jaffee, 2013).

Abnormalities in brain functioning and structure correlate with PTSD development (Karl et al., 2006). PTSD and depression correlate with volumetric reductions in gray matter, particularly in prefrontal regions of the brain (Kroes, Rugg, Whalley, & Brewin, 2011). Individuals exposed to trauma also demonstrate decreased amygdala volumes, a smaller bilateral hippocampus, decreased premotor cortex volume, and a smaller interior cingulate cortex (Karl et

al., 2006; Nemeroff et al., 2006; Rocha-Rego et al., 2012). Hippocampal changes, while common in adults with PTSD, remains rare in youth (Villarreal & King, 2004). Individuals with PTSD further demonstrate exaggerated amygdala responsivity and a diminished response in the prefrontal cortex (Shin et al., 2005)

Neuroendocrine irregularities may also increase biological risk for PTSD. Variations in the hypothalamic-pituitary-adrenal (HPA) axis characterize exposure to prolonged stress (Santa Ana et al., 2006; Shea, Walsh, Macmillan, & Steiner, 2005). Youth with a trauma history secrete increased levels of the glucocorticoid cortisol compared to youth without a trauma history (Carrion & Wong, 2012). Increased levels of cortisol may result in reduced activity in the prefrontal cortex and decreased hippocampal volume (Carrion & Wong, 2012; Carrion, Wong, & Kletter, 2013). Other chemical changes include dopamine, serotonin, norepinephrine, and glutamate abnormalities (Druiy, Theall, Keats, & Scheeringa, 2009; Ravindran & Stein, 2009). Exposure to trauma releases norepinephrine that stimulates serotonin and dopamine release (Norman et al., 2012). Norepinephrine also reduces dopamine reuptake in the prefrontal cortex (Norman et al., 2012). Trauma also increases the release of serotonin, which is partially responsible for regulating stress and anxiety (Krystal & Neumeister, 2009). Neurochemical factors may also increase positive outcomes in individuals exposed to adverse situations (Elliott, Sahakian, & Charney, 2010). Neuropeptide Y and dehydroepiandrosterone may mediate the relationship between stress and resilience (Elliott et al., 2010).

Youth exposed to early stress may demonstrate increased sensitivity to future stressors (Kloet & Rinne, 2007). Early life stress and trauma increases risk for PTSD, emotional problems, and alterations in brain structure (Baker et al., 2013; Kloet & Rinne, 2007). The effects of early life stress differ between early (ages 1-7 years) and later (ages 8-17) child (Baker et al., 2013). Later child life stress correlates with volumetric reductions in the insula and

anterior cingulate cortex (Baker et al., 2013). This relationship was absent in youth aged 7 years and younger (Baker et al., 2013).

Ecological Models. Ecological models propose a complex transaction between social environments and familial, cultural, and personal factors leading to the development of PTSD (McKeever & Huff, 2003). Similarly, resilience to PTSD results from a dynamic process of interacting environmental variables (Rutten et al., 2013). In addition, ecological models include factors related to inherent predispositions, learned responses, and maladaptive cognitions (McKeever & Huff, 2003). Factors may include group marginalization, limited social support, large family size, parental divorce, limited parental support, private family problems, parental overprotectiveness, and others (Afifi, Boman, Fleisher, & Sareen, 2009; Alderfer, Navsaria, & Kazak, 2009; Birmes et al., 2009; Bokszczanin, 2008; McKeever & Huff, 2003). Resilience factors include internal and external factors that facilitate an adaptive response to adversity (Skodal, 2010; Mrazek & Mrazek, 1987; Werner, 2000). For example, resilience factors may include self-esteem, peer, familial, and community support systems, positive emotions, life-purpose, and self-efficacy (Richardson, 2002; Rutten et al., 2013). Stressors such as trauma interact with these preexisting risk and resilience factors to determine an individual's overall ecological adjustment (McKeever & Huff, 2003). Child maltreatment in particular remains a significant diathesis for PTSD (Zaidi & Foy, 1994). Ecological models remain limited in their ability to distinguish the impact of any single factor or to determine the specific weight given a constellation of risk and resilience factors (McKeever & Huff, 2003).

Fletcher's (2003) model of PTSD emphasizes a transactional approach composed of biological, cognitive, and ecological variables that influence risk and resilience for PTSD. Variations within an experienced trauma may result in distinct symptomatology (Kira, Lewandowski, Somers, Yoon, & Chiodo, 2012). Fletcher's model accounts for trauma and

symptom variability as well as severity as related to a trauma type (Fletcher, 2003). Fletcher also distinguished Type I traumas (discrete or single event traumas) from Type 2 traumas (complex or chronic trauma exposure) (Fletcher, 2003; Ford, Nader, & Fletcher, 2013; Paivio & Pascual-Leone, 2010). Type I traumas include detailed memories of the traumatic event; Type II traumas include symptoms of dissociation, numbing, and denial (Terr, 1991). Others speculate a Type III trauma, which includes multiple chronic exposures to violent traumas (Solomon & Heide, 1999). Type III traumas may include symptoms of dissociation and numbing, major developmental deficits, fragmented sense of self, alterations in memory and consciousness, hopelessness, maladaptive posttraumatic cognitions, and limited sense of future (Solomon & Heide, 1999).

This model of PTSD promotes a formulaic approach composed of interacting resilience and risk factors to determine overall risk for PTSD (Fletcher, 2003). Despite this approach, this model remains limited regarding the protective weight of resilience factors in maltreated youth. Transactional models have also largely focused on PTSD development and remain limited in assessing variability within PTSD symptoms. An examination of specific symptoms would increase insight into the relationship between resilience and less severe forms of PTSD. Indeed, many youth may experience impairment from a subthreshold level of PTSD (Carrion, Weems, Ray, & Reiss, 2002; Cukor, Wyka, Jayasinghe, & Difede, 2010; Kim et al., 2009). Additional research is also needed to examine the interplay between trauma types and PTSD symptomatology. Researchers speculate that resilient outcomes may vary in relation to the type of trauma experienced (Steenkamp, Dickstein, Salters-Pedneault, Hofmann, & Litz, 2012). The protective weight of key resilience factors may differ depending on trauma type.

Cognitive and Information-Processing Models. Cognitive variables predict PTSD (Horsch, McManus, & Kennedy, 2012). Cognitive variables such as a youth's response to trauma, appraisal of a trauma, distributed networks, pictorial and image representations, and

schemas significantly correlate with PTSD (Chemtob, Roitblat, Hamada, Carlson, & Twentyman, 1998; Dalgleish, 2004; Kleim, Ehlers, Glucksman, 2012). Cognitive and information-processing models stem from these cognitive principles and continue to receive much attention (Buckley, Blanchard, & Neill, 2000). Individual cognitive models focus on emotional processing theories, schema-based models, associative networks, or pictorial and image representations (Brewin, 1989; Brewin & Holmes, 2003; Dalgleish, 2004; Foa, Steketee, & Rothbaum, 1989). The multi-representational theory combines multiple cognitive theories to create a comprehensive cognitive explanation for PTSD (Dalgleish, 2004). Few studies apply these cognitive models to youth and considerable research is required to determine their efficacy (Salmon & Bryant, 2002). Ehlers and Clark (2000) addressed this criticism by developing a cognitive model of PTSD in youth.

Ehlers and Clark's (2000) cognitive model focuses on the development of PTSD and the maintenance of PTSD symptoms by examining the role of posttraumatic cognitions, aspects of the trauma memory, and an increased sense of environmental threats (Lancaster, Rodriguez, & Weston, 2011). PTSD occurs when one perceives an ongoing and pervasive threat from a previous traumatic event and its sequelae (Ehlers & Clark, 2000). This perception originates from idiosyncratic negative appraisals, cognitive processing style during trauma, subsequent negative beliefs about the self and world, and the use of maladaptive coping strategies (Dunmore, Clark, & Ehlers, 2001; Ehlers & Clark, 2000). Negative appraisals include overgeneralizing the impact and consequences of a trauma, appraisals of the way one felt during the trauma, interpretations of others' reactions to the event, interpretation of one's own symptoms, and appraisals of perceived danger (Ehlers & Clark, 2000). Negative appraisals enhance maladaptive coping strategies including avoidance and rumination (Ehlers & Clark, 2000). Negative appraisals correlate with suicide risk, reduced perceived ability to control

emotions, and persistent PTSD (Agar, Kennedy, & King, 2006; Maria, Gooding, Taylor, & Tarrier, 2012).

A positive appraisal of a trauma, however, may result in resilience (Bailey, Sharma, & Jubin, 2013). Positive appraisals include a primary positive appraisal of the traumatic event and a secondary appraisal of coping resources as sufficient to managing distress (Velichkovsky, 2009). Resilient traits of optimism, self-esteem, hope, and emotional stability lead to positive appraisals that result in adaptive behaviors such as a focus on problem solving and maintaining positive emotions during traumatic stress (Schaubroeck, Riolli, Peng, & Spain, 2011).

Ehlers and Clark (2000) also indicate disturbed autobiographical memory as a precursor to PTSD development. This view states that a strong associative memory, poor elaboration and contextualization of the trauma, and strong perceptual priming increase risk for PTSD and result in a generalization of cues similar to the trauma (Ehlers & Clark, 2000). The strength of the contextual integration through encoding may increase the number and type of intrusive cognitive experiences (Steel, Fowler, & Holmes, 2005).

Ehlers and Clark's (2000) cognitive model boasts considerable empirical support across trauma types (Karl, Rabe, Zöllner, Maercker, & Stopa, 2009; Lancaster, Rodriguez, & Weston, 2011; Stallard, 2003). Consistent with cognitive and information processing models, changes in maladaptive trauma-related appraisals reduce symptoms of PTSD (Kleim et al., 2013). Ehlers and Clark's model further demonstrates applicability to independent and interdependent cultures (Jobson & O'Kearney, 2009).

Limitations of PTSD Models. PTSD symptoms have been explained through several proposed empirical models, but many fail to account for the role of resilience factors and other trauma sequelae. Biological models account for neurological and biological correlates of PTSD, but few account for variations within the traumatic experience on PTSD development (Kim-

Cohen & Turkewitz, 2012). Researchers, however, indicate higher PTSD rates for sexual maltreatment than for other types of maltreatment (Kearney, Wechsler, Kaur, & Lemos-Miller, 2010; Putnam, 2009). Exposure to multiple forms of trauma may further increase risk for PTSD (Collin-Vézina, Coleman, Milne, Sell, & Daigneault, 2011). Cognitive and information-processing models account for appraisals and memories of the trauma but fail to account for the resilient influences of personality factors such as sociability, self-esteem, self-efficacy, and emotional reactivity (Ehlers & Clark, 2000; Harvey, 2007). Several researchers advocate for the combination of these models (Kalantzi-Azizi & Karademas, 2005; Meiser-Stedman, 2002). Ecological models such as Fletcher's (2003) account for trauma variability by applying a transactional view of pathogenesis, but these models are rarely applied to maltreated youth. This study employed a transactional model by examining the impact of key resilience factors on PTSD symptom severity. The following sections review the relationship between child maltreatment and PTSD.

Child Maltreatment and PTSD

General Prevalence

Children with maltreatment histories demonstrate higher risk for PTSD than youth in the general population (Pecora, White, Jackson, & Wiggins, 2009). Approximately 66% of American youth are exposed to trauma (Cohen, Scheid, & Gerson, 2014). Chronic or multiple traumas occur in approximately 33% of American youth (Cohen, Scheid, & Gerson, 2014). Estimating the prevalence of PTSD among victims of maltreatment, however, remains difficult (Fairbank, Putnam, & Harris, 2007). The relationship between maltreatment and PTSD strengthens as the number, type, and severity of child maltreatment increases (Moore, Gaskin, & Indig, 2013). Youth younger than age 11 years are at heightened risk for PTSD (Davidson & Smith, 1990). Females remain at higher risk for PTSD (Davis & Siegel, 2000). Youth in foster

care evidence heightened prevalence for PTSD (Salazar, Keller, Gowen, & Courtney, 2013).

Prevalence by Maltreatment Type. Researchers estimate that 27-50% of physically maltreated youth develop symptoms warranting a PTSD diagnosis (Ackerman, Newton, McPherson, Jones, & Dykman, 1998; Johansen, Eilertsen, Nordanger, & Weisaeth, 2013). Approximately 21-50% of sexually maltreated youth demonstrate PTSD (Kearney, Wechsler, Kaur, & Lemos-Miller, 2010). Other estimates indicate that as many as 66-90% of sexually maltreated youth evidence symptoms of PTSD or other psychological impairment (Kearney et al., 2010; Putnam, 2009). Approximately 30.6% of neglected youth meet criteria for PTSD (Widom, 1999). Emotional maltreatment in isolation remains sufficient for a PTSD diagnosis (Street & Arias, 2001). Furthermore, removal from home may constitute a primary trauma that increases risk of PTSD (Wechsler-Zimring, Kearney, Kaur, & Day, 2012). Removal may result in less severe or subthreshold levels of PTSD (Wechsler-Zimring et al., 2012). In addition to meeting full criteria for PTSD, approximately 32% of youth meet criteria for subthreshold PTSD (Silva et al., 2000).

Youth reporting multiple, frequent, or intense traumas display increased rates of PTSD (Carrion, Weems, Ray, & Reiss, 2002). Approximately one-third of American youth endorse multiple, chronic traumas (Cohen, Scheid, & Gerson, 2014). The number of traumas correlates to PTSD outcomes (Harder, Mutiso, Khasakhala, Burke, & Ndeti, 2012). Youth exposed to severe or ongoing trauma demonstrate increased risk for complex PTSD (Siebler, 2004; Spitzer, Chevalier, Gillner, Freyberger, & Barnow, 2006). Furthermore, exposure to multiple traumas increases risk for future behavior problems and enduring trauma symptoms (Shen, 2009).

Trauma exposure rates may also vary by gender. Female adolescents endorse more traumatic experiences than males (Cuffe et al., 1998). Furthermore, females endorse increased rates of sexual maltreatment and sexual assault (Finkelhor, Shattuck, Turner, & Hamby, 2014).

Males, however, endorse increased rates of physical assault and accidents (Reebye, Moretti, Wiebe, & Lessard, 2000). These gender differences may stem from increased disclosure of maltreatment and PTSD symptoms by females compared to males (Ullman & Filipas, 2005b). Females also receive more positive reactions to disclosures than males (Ullman & Filipas, 2005b).

Additional demographic factors may also correlate to PTSD risk. Sexual orientation minority youth demonstrate 1.5 to 4 times the risk for PTSD following maltreatment (Roberts, Rosario, Corliss, Koenen, & Austin, 2012). Exposure to domestic violence increases PTSD rates in youth (Margolin & Vickerman, 2011). Nearly 50% of youth exposed to domestic violence report symptoms of PTSD, although just 13% met criteria for the disorder (Rossman & Ho, 2000). Children exposed to violence demonstrate life-long vulnerability to biological, social, and emotional impairments (Sharma-Patel et al., 2011). Race and ethnicity may result in increased risk for PTSD following maltreatment; however, few researchers have examined the prevalence of PTSD and maltreatment among minority groups within the United States. African Americans endorse more trauma exposure than European Caucasians (Cuffe et al., 1998). Sexual maltreatment and PTSD risk increased for minority group males in families with one or no parents (Holmes & Slap, 1998). Negative social reactions to disclosure of sexual maltreatment may also vary by ethnicity (Ullman & Filipas, 2005a).

Prevalence studies focus predominantly on whether a child meets diagnostic criteria for PTSD following maltreatment. Few studies explore variations of PTSD symptoms following child maltreatment (Jonkman, Verlinden, Bolle, Boer, & Lindauer, 2013). Furthermore, little is known regarding what variables may mitigate PTSD symptomatology. The interchange between maltreatment risk for PTSD symptomatology and resilience also remains largely unknown. A review of key symptoms in maltreated youth is provided below.

Symptomatology and Outcome

Maltreated youth often endorse symptoms such as anxiety, anger, depression, dissociation, emotional problems, hyperactivity, conduct problems, and psychosomaticism (Bruce, Heimberg, Blanco, Schneier, & Liebowitz, 2012; Jonkman, Verlinden, Bolle, Boer, & Lindauer, 2013; Lamela & Figueiredo, 2013; Stange, Hamlat, Hamilton, Abramson, & Alloy, 2013; Sullivan & Knutson, 1998). Symptom profiles appear to differ by the maltreatment type experienced (Runyon, Deblinger, & Steer, 2013). Increased trauma exposure correlates with more symptoms (Jonkman, Verlinden, Bolle, Boer, & Lindauer, 2013). Maltreated youth may also oscillate between aggressive symptoms and victim distress following a trauma (Dodge, Pettit, & Bates, 1994).

Limitations Regarding PTSD Symptomatology. PTSD remains a common diagnosis in maltreated youth. Research studies remain limited regarding the outcome of youth diagnosed with PTSD. Despite recognition that trauma type may influence symptomatology, few researchers have examined symptom variations within each type of trauma exposure. Little is known regarding which variables interact and increase or decrease symptom severity. A number of additional comorbidities may also increase severity of PTSD symptomatology.

Comorbidity

Comorbid diagnoses in maltreated youth with PTSD are common. Traumatized inpatient youth report nearly twice as many comorbid diagnoses as other inpatient youth without a history of trauma (Kearney, Wechsler, Kaur, & Lemos-Miller, 2010; Lipschitz, Winegar, Hartnick, Foote, & Southwick, 1999). Children maltreated by a male endorsed more diagnoses than those maltreated by a female (Ackerman, Newton, McPherson, Jone, & Dykman, 1998). Child maltreatment increases risk for compulsive sexual behavior (Blain, Muench, Morgenstern, & Parsons, 2012).

Anxiety

Youth exposed to maltreatment endorse increased risk for additional anxiety disorders (Raabe & Spengler, 2013). Females remain at heightened risk for anxiety disorders compared to males following maltreatment (King et al., 2011). Linning and Kearney (2004) found frequent occurrences of separation anxiety disorder (35.1%), social anxiety disorder (48.6%), specific phobia (78.4%), panic disorder with and without agoraphobia (18.4%), generalized anxiety disorder (48.6%), and obsessive-compulsive disorder (10.8%) in maltreated youth with PTSD. The occurrence of comorbid anxiety disorders also varies by maltreatment type. Sexual maltreatment correlates with increased rates of panic disorder, generalized anxiety disorder, and social anxiety disorder (Cogle, Timpano, Sachs-Ericsson, Keough, & Riccardi, 2010). Physical maltreatment correlates with increased rates of specific phobias (Cogle et al., 2010).

Depression

Child maltreatment significantly increases risk for PTSD and comorbid major depressive disorder in youth immediately following maltreatment and later as an adult (Dannlowski et al., 2012; Kasen et al., 2001; Leeson & Nixon, 2011; Seraphin et al., 2010). Maltreatment increases risk of lifetime depression and negatively affects the course of depression and response to treatment (Nanni, Uher, & Danese, 2012). Risk for comorbid symptoms of depression and anxiety was particularly common in homeless females with PTSD (Gwadz, Nish, Leonard, & Strauss, 2007). Depression may also mediate the relationship between posttraumatic cognitions, dissociation, and PTSD (Lemos-Miller & Kearney, 2006).

Levels of depression and PTSD may vary based on type of maltreatment. Witnessing family violence or other violence increases risk for depression (Turner, Finkelhor, & Ormrod, 2006). Sexually maltreated men and woman demonstrate elevated risk for depression, PTSD, suicidal ideation, and suicide attempts (Bedi et al., 2011). Sexually maltreated youth with PTSD

evidence more occurrences of depression and risky externalizing behaviors than sexually maltreated youth without PTSD (Danielson et al., 2010). Depression remains the best-documented outcome of child sexual maltreatment (Putnam, 2003). Psychologically maltreated individuals exhibit increased rates of depression and PTSD compared to nonmaltreated individuals (Chirichella-Besemer & Motta, 2008). Victims of psychological maltreatment exhibit mild levels of depression and mild to moderate levels of anxiety (Chirichella-Besemer & Motta, 2008). These victims may endure isolation, humiliation, criticism, and emotional neglect that adversely affects self-esteem and increases depression (Hart, Binggeli, & Brassard, 1997).

The experience of mood symptoms may vary by ethnicity. European Caucasians report more internal attributions for maltreatment than other ethnic groups (Feiring, Coates, & Taska, 2001). Hispanic American women may experience more shame from sexual maltreatment than other ethnic groups (Feiring et al., 2001). Results remain limited due to difficulty separating subgroups of different ethnicities (Ullman & Filipas, 2005a). Few studies examine depression, maltreatment, and PTSD among African Americans. African American status, however, weakens the relationship between depression and PTSD (Lemos-Miller & Kearney, 2006).

Prevalence Rates in Maltreated Youth. Linning and Kearney (2004) indicated increased rates of dysthymia (43.2%) and major depressive disorder (35.1%) in maltreated youth with PTSD. Approximately 18% of a sample of maltreated youth aged 7-12 years met diagnostic criteria for depression and 25% for dysthymia (Kaufman, 1991). Depression also increases as the number of victimization experiences increases (Turner, Finkelhor, & Ormrod, 2006).

Approximately 70% of youth who endorse maltreatment indicate suicidal ideation (Danielson, de Arellano, Kilpatrick, Saunders, & Resnick, 2005). Females in the general population indicate significantly increased risk for depression (Zahn-Waxler, Race, & Duggal, 2005). The literature remains unclear, however, regarding gender differences in depression among maltreated males

and females (Chirichella-Besemer & Motta, 2008).

Maltreatment and Depression. The cognitive relationship between maltreatment and psychological comorbidity remains largely unknown (Leeson & Nixon, 2011). Researchers speculate that an overgeneral autobiographical memory may in part establish the link between maltreatment, PTSD, and depression (Stange, Hamlat, Hamilton, Abramson, & Alloy, 2013). An overgeneral memory occurs when an individual primarily retrieves general autobiographical memories and results from the avoidance of specific details of a traumatic event (Phung & Bryant, 2013). Individuals who recall more overgeneral memories report higher levels of depression (Stange et al., 2013). An overgeneral style may lead to executive dysfunctions that increase risk for depression (Hankin & Abramson, 2001; Rawal & Rice, 2012). Depression may also lead to precursor symptoms that increase risk for PTSD in maltreated youth (Kearney, Wechsler, Kaur, & Lemos-Miller, 2010; Lemos-Miller & Kearney 2006).

Social support may influence the relationship between depression, PTSD, and maltreatment. Reduced social support and maltreatment increase risk for depression and PTSD (Vranceanu, Hobfoll, & Johnson, 2007). Youth with decreased parent and peer support demonstrate additional risk for depression following stress (McMahon, Coker & Parnes, 2013; Piko, Luszczynska, & Filpatrick, 2013). Increased social support may protect against psychopathology such as depression and PTSD (Leontopoulou, 2013). Youth with fewer types of maltreatment receive additional benefit from social support and exhibit reduced risk for depression (Salazar, Keller, & Courtney, 2011). Social support alone appears to partially account for symptom variations in the relationship between maltreatment and depression (Salazar et al., 2011).

Child maltreatment may also lead to internalizing symptoms and depression in youth by altering the regulatory capacity of the fear circuit in the brain (Herringa et al., 2013). Similar to

PTSD, strong evidence exists of the relationship between hyperactivity of the HPA axis and major depressive disorder (Shea, Walsh, MacMillan, & Steiner, 2005). Early-life stress may disrupt the HPA axis and create vulnerability for PTSD and comorbid depression (Shea et al., 2005). Child maltreatment also reduces hippocampal gray matter volume and increases amygdala responsiveness to negative stimuli that may mediate the pathway to diagnoses of PTSD and depression (Dannlowski et al., 2012). HPA axis disruption may result in volumetric enlargement of the pituitary glands and hypothalamus (Kessing, Willer, & Knorr, 2011). Larger pituitary volumes correlate with depression and PTSD in maltreated youth (Kessing et al., 2011; Thomas & De Bellis, 2004). Enlarged pituitary volumes also correlate with early onset depression and other mood disorders (MacMaster, Leslie, Rosenberg, & Kusumakar, 2008). Additionally, larger pituitary volumes correlate with suicidal ideation in youth with PTSD (Thomas & De Bellis, 2004).

Genetic risks may also interact with maltreatment to produce comorbid depression. Youth with the long/long variation of the serotonin transport gene (5-HTTLPR) demonstrated increased risk for depressive symptoms following maltreatment (Banny, Cicchetti, Rogosch, Oshri, & Crick, 2013; Cutuli, Raby, Cicchetti, Englund, & Egeland, 2013). The short alleles of the serotonin transport gene also moderate the relationship between maltreatment and depression (Brown et al., 2013). Child maltreatment and the serotonin transporter gene interact to influence vulnerability for depression in children (Banny et al., 2013). Others indicate the monoamine oxidase A gene may increase vulnerability for depression following maltreatment (Beach et al., 2010).

Dissociation

Dissociative symptoms, along with PTSD and depression, represent common trauma responses in maltreated youth across all developmental periods (Maercker, Beauducel, &

Schützwohl, 2000; Milot et al., 2013; Mueller-Pfeiffer et al., 2013). Dissociative symptoms may emerge without threat of bodily harm (Mueller-Pfeiffer et al., 2013). Dissociation may occur during or after a traumatic event (Armstrong, Putnam, Carlson, Libero, & Smith, 1997). Dissociation may also serve as a way to adapt to adversity during a traumatic experience (Valentino, Cicchetti, Rogosch, & Toth, 2008). Unfortunately, despite strong evidence for dissociation following trauma, considerable variation hinders the clarity of its link between maltreatment and PTSD (Dietrich, 2003). Researchers remain unclear regarding what features of a trauma influence the development of dissociation (Mueller-Pfeiffer et al., 2013). Dissociation may serve to protect an individual from negative or traumatic experiences by allowing them to free themselves from the traumatic memory (Foa & Rothbaum, 1998).

Dissociation resulting from maltreatment revolves around distortions to perceptual, emotional, sensory, or motor functions as well as disruptions to one's identity, awareness, or perception (Van der Hart, Nijenhuis, Steele, & Brown, 2004). The degree of dissociation may differ between individuals with PTSD (Putnam et al., 1996). Not all trauma victims endorse dissociative symptoms. Rather, dissociative symptoms appear to occur in trauma victims who endorse a number of additional risk factors (Briere, 2006). Trauma severity predicts chronic dissociation (Braehler et al., 2013; Maercker, Beauducel, & Schützwohl, 2000). Furthermore, number of perpetrators, affect modulation abilities, and coping style may moderate the relationship between maltreatment and dissociation (Briere, 2006; Mueller-Pfeiffer et al., 2013). Individuals with high levels of dissociation also endorse more severe levels of PTSD (Hyer, Albrecht, Boudewyns, Woods, & Brandsma, 1993).

The common comorbidity of dissociation with PTSD has led researchers to infer a possible dissociative subtype of PTSD among maltreatment victims exposed to more severe trauma experiences (Ginzburg et al., 2006). Evidence for this view includes the dissociative

qualities of some PTSD symptoms such as diminished interest in significant activities, detachment from others, restricted range of affect, and trauma amnesia (Butler, Duran, Jasiukaitis, & Koopman, 1996). Furthermore, the diagnosis of PTSD contains dissociative symptoms of depersonalization/derealization, amnesia, flashbacks, and numbing (APA, 2013).

Symptoms of Dissociation. Dissociative symptoms are influenced by the proximity of a trauma (APA, 2013). Dissociative symptoms include depersonalization, derealization, amnesia, and absorption (Armstrong, Putnam, Carlson, Libero, & Smith, 1997). Symptoms also include disruptions or discontinuities of consciousness, identity, emotion, perception, motor control, body representation, and behavior (APA, 2013). A diagnosis of PTSD includes symptoms of depersonalization/derealization characterized by feelings of unreality or detachment from one's body or environment (APA, 2013). Dissociative symptoms may also increase risk for future traumas by decreasing alertness to dangers, which may increase vulnerability for interpersonal violence (Briere, 2006). Researchers remain divided on this point, however (Briere, 2006; Sandberg, Matorin, & Lynn, 1999).

Psychoform dissociation refers to the separation of mental content following trauma (Schild & Dalenberg, 2012). Psychoform dissociation significantly relates to maltreatment occurring before age 13 years (Mueller-Pfeiffer et al., 2013). Sexually maltreated victims report higher levels of psychoform dissociation when victimized by a perpetrator outside the family (Mueller-Pfeiffer et al., 2013). Women demonstrate more psychoform dissociation than men when exposed to emotional child maltreatment (Mueller-Pfeiffer et al., 2013). Somatoform dissociation significantly relates to maltreatment occurring after age 12 years (Mueller-Pfeiffer et al., 2013). Somatoform dissociation refers to psychologically derived physical symptoms (Schild & Dalenberg, 2012). Somatoform dissociation linked to child maltreatment consists of sensory and functional impairments such as physical pain or anaesthesias (Dietrich, 2003).

Prevalence of Dissociation. Prevalence rates for dissociation in trauma victims ranges from 4 to 34% (Martínez-Taboas, Canino, Wang, García, & Bravo, 2006; Yehuda et al., 1996). Twelve-month prevalence for dissociation following a trauma is 14.4% (Stein et al., 2013). Variability of the prevalence of dissociation may result from heterogeneity within the traumas experienced. Negative affect during trauma disclosure predicts greater amounts of dissociation in maltreated youth (Sayfan, Mitchell, Goodman, Eisen, & Qin, 2008).

Dissociation by Gender. The appraisal of a traumatic event leads to symptoms and gender differences in dissociation (Frans, Rimmö, Åberg, & Fredrikson, 2005). Males report additional dissociative symptoms for noninterpersonal traumas, whereas females report more dissociative symptoms for interpersonal traumas (Kerig & Bennett, 2013). Others indicate that the heightened rates of dissociative symptoms in females result from a higher frequency of assault by relationally close perpetrators (DePrince & Freyd, 2002; Tang & Freyd, 2012). Females generally endorse higher rates of peritraumatic and persistent dissociation than males (Hetzl-Riggin & Roby, 2013; Werner & Griffen, 2012). This relationship between females and dissociation remains true for adults and youth (Galovski, Blain, Chappuis, & Fletcher, 2013; Hulette, Freyd, & Fisher, 2011). Men showed increased risk for dissociation compared to women after exposure to emotional maltreatment (Braehler et al., 2013). Dissociative symptomatology may also differ between males and females. Males endorse heightened rates of numbing following a trauma (Kerig & Bennett, 2013).

Link between Maltreatment and Dissociation. Dissociation constitutes an adaptive response that defends youth against unavoidable maltreatment (Valentino, Cicchetti, Rogosch, & Toth, 2008). Researchers speculate that dissociation allows youth to manage daily life stress and promotes survival in traumatic situations (Nijenhuis, van der Hart, & Steele, 2010). Dissociation enables traumatized individuals to separate from the negative affect associated with the trauma

and from the trauma perpetrator (Bartosch, 2006). Dissociation following trauma results in difficulty maintaining attention, poor academic functioning, and decreased intelligence scores in maltreated youth (De Bellis, Woolley, & Hooper, 2013; Perzow et al., 2013; Schauer & Elbert, 2010).

Others speculate a biological origin to dissociative symptoms following trauma (Bob, 2012). Deficits in frontal lobe functioning correlate with dissociative symptoms (Cima, Merckelbach, Klein, Shellbach-Matties, Kremer, 2001). Dissociation also appears to increase activity in brain regions related to emotional regulation and inhibition (Carlson, Dalenberg, & McDade-Montez, 2012). The cerebellum correlates with dissociative symptoms pertaining to sense of time and perception of space (Ursano, Fullerton, & Benedek, 2007).

The degree of dissociation correlates with the level of trauma exposure (Carlson, Dalenberg, & McDade-Montez, 2012). Consistent with this theory, severe, early, and chronic maltreatment links to greater development of dissociative symptoms (Kirby, Chu, & Dill, 1993). The severity of dissociation correlates to the severity and intensity of an assault in sexually and physically maltreated victims (Kirby et al., 1993). High trauma exposure prior to PTSD development, childhood onset of PTSD, re-experiencing symptoms, previous diagnoses of phobias, separation anxiety disorder, and suicidality correlate with symptoms of PTSD with comorbid dissociation (Stein et al., 2013). Dissociation also correlates with emotional maltreatment in inpatient youth (Braehler et al., 2013). Multiple forms of maltreatment may pose higher risk for dissociation than single forms. For example, sexual maltreatment with neglect constitutes additional higher risk for dissociation than sexual maltreatment or neglect alone, or physical maltreatment with or without neglect (Hulette, Fisher, Kim, Ganger, & Landsverk, 2008).

Externalizing Behaviors

Maltreated youth with PTSD may express comorbid symptoms of oppositional defiant disorder, conduct disorder, attention-deficit/hyperactivity disorder and substance abuse (Danielson et al., 2009; Ford et al., 2000; Kearney, Wechsler, Kaur, & Lemos-Miller, 2010). Maltreated males generally exhibit more problematic externalizing behaviors than females (Ackerman, Newton, McPherson, Jones, & Dkyman, 1998). Approximately 35% of youth with histories of maltreatment and PTSD meet criteria for a diagnosis of attention-deficit/hyperactivity disorder (Linning & Kearney, 2004).

Polysubstance abuse correlates with maltreated youth (Rosenkranz, Muller, & Henderson, 2012). PTSD youth endorse heightened prevalence rates for cigarette (53%), alcohol (59%), and marijuana (34%) use (McCart et al., 2011). Exposure to multiple types of maltreatment results in increased severity of substance abuse problems (Danielson et al., 2009). Physically and sexually maltreated youth and youth in foster care endorse higher rates of substance abuse (Danielson et al., 2009; Keller, Salazar, & Courtney, 2010). Researchers hypothesize that impaired self-regulation mediates the relationship between maltreatment, PTSD, and substance abuse (Rosenkranz et al., 2012).

Anger commonly co-occurs with PTSD in youth (Saigh, Yasik, Oberfield, & Halamandaris, 2007). Youth with PTSD demonstrate increased anger expression and anger temperament (Saigh et al., 2007). Furthermore, repeated exposure to violence may increase violent behavior in youth (Bell & Jenkins, 1991; Kimonis, Ray, Branch, & Cauffman, 2011). Anger in maltreated youth with PTSD also correlates to lack of guilt and empathy (Kimonis et al., 2011).

Review of Maltreatment and PTSD

Youth with maltreatment and PTSD histories demonstrate increased risk for comorbid

depression and dissociation (Valentino, Cicchetti, Rogosch, & Toth, 2008; Yehuda et al., 1996). Researchers speculate that dissociation and trauma-related cognitions predict PTSD symptomatology, and are mediated by variables such as depression (Lemos-Miller & Kearney, 2006). Little is known, however, regarding the influence of resilience on PTSD symptomatology. A review of resilience and its relationship to maltreatment is provided below.

Resilience

The definition of resilience lacks consensus and remains highly debated (Klika & Herrenkohl, 2013; Luthar, Cicchetti, & Becker, 2000). Definitional uncertainty stems from variations in the sociocultural and historical contexts of research development (Fletcher & Sarkar, 2013). Furthermore, researchers disagree regarding what encompasses resilience to adversity (Fletcher & Sarkar, 2013). However, researchers generally agree that resilience requires an adverse situation and recovery or adaptation to that situation (Fletcher & Sarkar, 2013). These basic themes laid the foundation for the development of specific resilience definitions.

Resilience in adults has been defined as “the ability of adults in otherwise normal circumstances who are exposed to an isolated or potentially highly disruptive event, such as the death of a close relation or violent life-threatening situation, to maintain relatively stable, healthy levels of psychological and physical functioning” (Bonanno, 2008, p. 20). Resilience in youth has been defined as “a dynamic process encompassing positive adaptation within the context of significant adversity” (Luthar, Cicchetti, & Becker, 2000, p. 543). Others conceptualize resilience as competence (Masten et al., 1995). Competence refers to “the effectiveness and the quality of individual adaptation as it reflects the adaptive use of internal and external resources to enable the successful negotiation of developmentally salient issues” (Obradović, van Dulmen, Yates, Carlson, & Egeland, 2006; p. 858). Still others define resilience as adapting to adversity

(Kim-Cohen, 2007). Adaptability refers to one's ability to adapt by appropriately applying mental resources, shifting cognitive perspectives, balancing life domains, and using personal values to guide decisions in a changing environment (Kashdan & Rottenberg, 2010).

This study applies Connor and Davidson's (2003; p. 76) definition of resilience as "the personal qualities that enable one to thrive in the face of adversity." These personal qualities, or resilience factors, include demographic variables, individual characteristics, and social factors (Bonanno & Mancini, 2008; Cicchetti & Toth, 1997; Ungar, 2013b; Wolfe, 2013).

Resilience Factors

Key resilience factors include those that are enduring, malleable to interventions, relevant to the context of the adversity, and help support additional protective processes (Luthar, Sawyer, & Brown, 2006). For example, resilience factors include the role of close relationships, parenting practices, and unique positive attributes of the child (Egeland, 2007). Resilience factors influence an individual's response to adverse situations and increase an individual's ability to function and recover following adverse events (Kasler, Dahan, & Elias, 2008; Rutter, 1987). Resilience factors are multifaceted and occur across individual, family, and community levels (Sarkar & Fletcher, 2014; Zimmerman et al., 2013). The interaction of a large number of resilience variables best predicts positive outcomes, although the specific protective weight of each variable depends on context (Fletcher & Sarkar, 2013).

Resilience factors allow a person to "recover from or entirely avoid negative outcomes from unfavorable conditions that otherwise would inevitably lead to negative developmental pathways" (Leipold & Greve, 2009; p. 41). Leipold and Greve's (2009) definition also accounts for variations within outcomes. For example, a child may endorse symptoms of PTSD and remain resilient provided the presence of resilience factors reduces overall severity. The terms "resilience factor" and "protective factor" are often used interchangeably in the extant literature.

The term “resilience factor” is utilized here to refer to specific variables that reduce risk for psychopathology.

Theoretical Framework of Resilience

A transactional model of resilience stems from early research focusing on the interaction between an individual, stress exposure, and environmental context (Cash & Gardner, 2011; Lazarus & Folkman, 1984). This model accounts for an individual’s resources in relation to the demands of his environment (Cash & Gardner, 2011). Resilience within a transactional model results when environmental and biological risk and resilience factors interact and lead to varying degrees of susceptibility to psychopathology (Belsky & Pluess, 2013; Masten & Cicchetti, 2010; Rogosch, Oshri, & Cicchetti, 2010; Sameroff, 2009). For example, youth with an increased ability to regulate emotions demonstrate decreased risk for adult PTSD after a trauma (Kulkarni, Pole, & Timko, 2013). Emotional regulation therefore represents a personal characteristic that interacts with maltreatment, an environmental stressor, to determine outcome. Researchers have recently advanced this framework in youth by incorporating genetic contributions, neuroscience, and higher-level cognitive processes such as finding existential meaning (Kumpfer, Fenollar, Xie, & Dellinger, 2011).

The resilience factors chosen for this study include an individual’s sense of control or mastery of her environment, emotional reactivity, and sense of relations to others (Prince-Embury, 2007). These variables were chosen because they represent consistent themes throughout the resilience literature (e.g. Dang, 2014; Khanlou & Wray, 2014; Žunić-Pavlović, Pavlović, Kovačević-Lepojević, Glumbić, & Kovačević, 2013). Furthermore, these variables appear to meet Luthar and colleagues (2006) guidelines for identifying key resilience factors. A review of key resilience factor models is provided in the following section.

Resilience Factor Models

Researchers have expanded on the transactional models to include specific models that specify the role of resilience factors in reducing psychopathology. Multiple models of resilience examine the relationship between protective factors, adversity, and outcome (Gomez & McLaren, 2006). Four key models are reviewed below: risk-protective, protective-reactive, protective-stabilizing, and protective-protective.

Risk-Protective Model. Resilience factors mitigate risk factors to provide a buffer against adverse situations (Christiansen & Evans, 2005). Higher levels of a specific resilience factor will result in increased buffering effects compared to lower levels of the factor (McLaren, Gomez, Bailey, & Van Der Horst, 2007). For example, youth with higher optimism will show more resilience to adversity than youth with lower optimism (Brodhagen & Wise, 2008).

Protective-Reactive Model. The positive influence of resilience factors is increased when the risk factor is low and decreased when the risk factor is high (Brown, Wolchick, Tein, & Sandler, 2007). Furthermore, the relationship between the adverse situation and a negative outcome increases without the presence of a given resilience factor (Zolkoski & Bullock, 2012). For example, youth exposed to multiple traumas instead of isolated traumatic events may demonstrate increased risk for negative outcomes (Huang, Schwandt, Ramchandani, George, & Heilig, 2012). This relationship may remain especially strong in youth without a sense of hope or optimism for the future (Brodhagen & Wise, 2008).

Protective-Stabilizing Model. Resilience factors help stabilize an individual despite an increase in risk factors (Luthar, Cicchetti, & Becker, 2000). The presence of the resilience factor negates the association between risk and negative outcomes (Luthar et al., 2000). For example, youth with heightened emotional reactivity may demonstrate increased susceptibility to psychopathology following adversity (Shapiro et al., 2014). High social support, however, may

negate the risk by increasing emotional regulatory ability (Luszczynska & Cieslak, 2005; Shenk & Fruzzetti, 2011).

Protective-Protective Model. Resilience factors reduce the relationship between an adverse situation and subsequent negative outcomes (Hollister-Wagner, Foshee, & Jackson, 2001). Each additional resilience factor further weakens the relationship between adversity and negative outcomes, and individual protective factors can strengthen the buffering effects of other factors (Hollister-Wagner et al., 2001). For example, youth with advanced social skills and access to extracurricular activities may evidence increased resilience to adversity compared to youth with only one of those factors (Edward, 2005). The number of resilience factors remains prominent in the protective-protective model (Gomez & McLaren, 2006).

This study applied a protective-protective model of resilience conceptualization. This model was selected due to empirical support highlighting its application to adolescents (Donnon, 2010). Support also exists for the use of this model in predicting resilience to anxiety and depression (Gomez & McLaren, 2006). Furthermore, this model highlights the cumulative relationship between resilience factors. For instance, higher rates of self-esteem, sense of relation to others, and decreased emotional reactivity are expected to mediate the relationship between maltreatment and subsequent PTSD. The sum of these resilience factors together is expected to influence risk for PTSD symptoms more than individually. Other models of resilience, while empirically supported, account less for this cumulative effect of various resiliency factors. As a result, the protective-protective model presently stands as the most valid and applicable choice given the variables and direction of this present study. The following sections review resilience and psychopathology with an emphasis on maltreatment and PTSD.

Linking Resilience to Psychopathology

The interaction of individual risk factors, contextual factors, and protective resources

determine susceptibility for psychopathology (Rew, Thomas, Horner, Resnick, & Beuhring, 2001). Resilience factors may minimize the influence of risk factors and thus result in decreased rates of psychopathology and psychiatric hospitalization (Shrivastava, De Sousa, Shah, Campbell, & Berlemont, 2014). Resilience factors also allow youth to navigate difficult situations that increase risk for adverse outcomes (Reivich, Gillham, Chaplin, & Seligman, 2013). Furthermore, resilience factors may promote a pattern of responding to adverse situations that fosters additional resilience (Zoellner & Feeny, 2014).

Resilience and Internalizing Disorders. Resilience factors decrease risk for internalizing disorders (Lahat & Schmidt, 2013; Ng, Ang, & Ho, 2012; Willemen, Schuengel, & Koot, 2011). High social competence, increased socioeconomic status, and high levels of protective parenting decrease risk for internalizing problems in youth (Lansford et al., 2006). In addition, youth indicating a high sense of mastery over their environment, a high sense of relation to other people, and low emotional reactivity reported decreased emotional distress and a positive view of the self (Žunić-Pavlović, Pavlović, Kovačević-Lepojević, Glumbić, & Kovačević, 2013).

Several researchers highlight the role of cognitive factors in promoting resilience (Avci et al., 2013). For example, individuals applying positive cognitive appraisals to adverse situations show less risk for internalizing disorders related to negative emotions (Stone, Kennedy-Moore, & Neale, 1995). Decreased use of hostile cognitive attributions also decreases risk (Lansford et al., 2006). Increased problem-solving ability and accurate cognitive styles promote resilience in individuals at risk for anxiety and depression (Reivich, Gillham, Chaplin, & Seligman, 2013).

Positive social factors and social support consistently promote resilience (Zimmerman et al., 2013). Social competence through social-problem solving, affect and behavior regulation, and flexibility reduces risk for internalizing problems (Watson, Rich, Sanchez, O'Brien, & Alvord, 2014). Supportive and positive family and social relationships also contribute to

decreased risk for internalizing problems (Jackson, Sifers, Warren, & Velasquez, 2003; Zimmerman et al., 2013). For instance, resilience factors of family cohesion and social competence relate to less anxiety and depressive symptoms in adolescents (Kim et al., 2013; Skrove, Romundstad, & Indredavik, 2013). Parental warmth and teacher support increase resilience to internalizing problems (Brennan, Le Brocque, & Hammen, 2003; Davidson & Adams, 2013).

Resilience and Externalizing Disorders. Interactions between risk and resilience factors also influence externalizing behaviors (Calkins, Blandon, Williford, & Keane, 2007; Goldstein & Rider, 2013). Support for the protective influence of resilience variables exists for attention deficit hyperactivity disorder, oppositional defiant disorder, conduct disorder, and other conduct-related problems (Goldstein & Rider, 2005). Several resilience factors safeguard against the development of these behaviors. Positive peer relationships interact with family adversity to reduce risk for externalizing disorders in adolescents (Criss, Pettit, Bates, Dodge, & Lapp, 2002). Likewise, positive parenting practices such as limited use of corporal punishment decreases risk (Eisenberg, Chang, Ma, & Huang, 2009). Higher socioeconomic status, high parental monitoring, and less harsh discipline increase resilience rates to externalizing disorders (Lansford et al., 2006). Low family conflict also correlates to decreased rates of externalizing problems (Tschann, Kaiser, Chesney, Alkon, & Boyce, 1996)

Several internal child factors also relate to decreased rates of externalizing problems. A regulated and controlled temperament reduces risk for externalizing problems (Eisenberg et al., 2010). Furthermore, an inner sense of confidence also decreases risk of externalizing problems (Li, Nussbaum, & Richards, 2007). Self-perceived academic competence and academic success predicted resilient functioning in youth at risk for externalizing disorders (Mikami & Hinshaw, 2006; Steca, Alessandri, Vecchio, & Caprara, 2007).

Resilience and Psychotic Conditions. Resilience factors appear to reduce the risk of psychosis in individuals at high risk for psychotic conditions (Kim et al., 2013). Resilience factors may also help recovery following a psychotic episode (Randal et al., 2009; Tait, Birchwood, & Trower, 2004). A positive support system and problem-focused coping strategies correlate with resilience in youth at risk for schizophrenia (Herbert, Manjula, & Philip, 2013). Higher self-esteem and less stress decrease susceptibility to positive psychotic symptoms (Pruessner, Iyer, Faridi, Joobar, & Malla, 2011). Similarly, positive self-appraisals and adaptive coping styles link to decreased risk of suicide and psychosis (Johnson et al., 2010).

Limitations in Resilience and Psychopathology. Despite this increased interest in resilience, resilience factors are rarely examined within a model of psychopathology. This remains especially true for maltreated children at risk for PTSD. This study addresses this limitation by exploring transactions of key resilience variables in relation to PTSD symptomatology. A review of resilience in relation to child maltreatment and PTSD is provided in the following sections.

Resilience and Maltreatment

Most maltreated youth recover within weeks following a trauma despite significantly increased risk for psychopathology (Husain, 2012). Resilience represents a mechanism for positive recovery rather than a characteristic or trait of an individual (Dang, 2014; Masten, 2001). No specific maltreatment victim or perpetrator characteristic alone accounts for a resilient outcome (Masten & Wright, 1998). A child's maltreatment history may thus vary depending on complex transactions between risk and resilience factors (Dang, 2014; Masten & Wright, 1998). For many, resilience may represent a progressive trajectory towards healthy functioning (Bonanno, 2012). For example, resilience appears to emerge following improvement of a child's environment in maltreated youth (Masten, 2014). Others, however, may demonstrate

resilience in some domains of functioning yet struggle in other domains (Klika & Herrenkohl, 2013). Little is known, however, regarding what resilience variables remain central to a child demonstrating decreased symptoms soon after a maltreatment experience.

Characteristics of Resilient Maltreated Youth

Resilience following maltreatment results from a collection of internal and external resources (Skodal, 2010; Werner, 2000). Resilience factors facilitate the use of positive coping strategies that lead to optimal outcomes (Henry, 2001). These factors also allow a maltreated youth to respond in an adaptive manner to maltreatment (Mrazek & Mrazek, 1987). Key resilience factors across all forms of maltreatment include heightened intellectual functioning, connection with a supportive caregiver, and a positive view of the self (Orbke & Smith, 2013; Tedeschi & Kilmer, 2005). Resilient maltreated youth also evidence increased religious and community involvement (Goldstein, Faulkner, & Wekerle, 2013). These youth also evidence a decreased use of substances and decreased depressive symptoms following maltreatment (Goldstein et al., 2013; Wingo, Ressler, & Bradley, 2014).

Resilient youth show constructive and active approaches to solving life problems and demonstrate robust worldviews (Werner, 1984). Self-value, a sense of safety, and optimism for the future also correlate with resilience to maltreatment (Henry, 2001). Children with a positive temperament and increased cognitive ability demonstrate resilience following maltreatment (Luthar, 2006). A positive temperament allows a child to develop supportive relationships, and increased cognitive ability allows a child to process and learn from the maltreatment experience (Luthar, 2006; Orbke & Smith, 2013). Individuals who actively establish positive social relationships report increased rates of resilience (Werner, 1984). Resilient maltreated youth often exhibit relationship recruiting behaviors, agency, and reflectiveness that help foster resilience (Hauser & Allen, 2006). These youth also demonstrate positive coping strategies that

allow them to assimilate and accommodate within stressful environments (Leipold & Greve, 2009). Resilience correlates with decreased guilt cognitions, less exposure to domestic violence, and less motivation to seek revenge (Klasen et al., 2010).

Positive adolescent peer relationships, positive peer norms, and close bonds to peers buffer the harmful effects of maltreatment (Collishaw et al., 2007; Daud, af Klinteberg, & Rydelius, 2008; Shin, Daly, & Vera, 2007; Malindi & Theron, 2010). Warm and supportive peer environments predict resilience following maltreatment (Deater-Deckard, Ivy, & Smith, 2005). Youth's perception of sociability and communication ability towards peers predicts resilience (Arastaman & Balci, 2013). Involvement in extracurricular activities may further boost resilience (Ward, Martin, Theron, & Distiller, 2007). Supportive relationships may lower risk for maltreated victims becoming perpetrators in adulthood (Thornberry et al., 2013).

Family factors that influence resilience in maltreated youth include the variety of contexts within which a family operates, including ethnicity, culture, socioeconomic status, religion, and family roles (Hernández, 2002). Positive family environments facilitate resilience during adversity (Bradley, Davis, Wingo, Mercer, & Ressler, 2013). A positive family environment includes parent and sibling warmth and a positive home atmosphere (Bowes, Maughan, Caspi, Moffitt, & Arseneault, 2010). Emotionally responsive caregiving mediates the effects of maltreatment (Egeland, Carlson, & Sroufe, 1993). Warm and secure family relationships appear to predict resilience in maltreated youth (Heller, Larrieu, D'Imperio, & Boris, 1999). Family beliefs focusing on finding positive meanings within a trauma, flexible and connected organizational patterns within the family, access to economic and social resources, collaborative problem solving, and clear communication correlate with resilience despite a trauma (Hernández, 2002). High levels of stress within a family increase risk for maladaptive outcomes following maltreatment (Jaffee, Caspi, Moffitt, Polo-Tomás, & Taylor, 2007).

Prevalence of Resilience

Approximately 50-70% of youth display resilience following isolated incidences of maltreatment (Bell, Romano, & Flynn, 2013; Bonanno & Mancini, 2008). Others indicate that 33% of youth develop into healthy and capable adults following child maltreatment (Orbke & Smith, 2013). Furthermore, only 11% of nonresilient maltreated adolescents exhibit resilience in adulthood (DuMont, Widom, & Czaja, 2007). Few victims of child maltreatment demonstrate resilience across multiple domains of functioning (Bell, Romano, & Flynn, 2013; Topitzes, Mersky, Dezen, & Reynolds, 2013). Others report lower rates (22%) of resilience among maltreated children when accounting for success in numerous functional domains such as social activity, education, psychopathology, substance abuse, and others (McGloin & Widom, 2001). The majority of resilience research in maltreated youth focuses on resilient outcomes in adulthood (Bonanno, 2012).

Resilience and Gender

Few studies examine the prevalence of resilience by gender among maltreated youth. Subtle variations exist, however, regarding gender variations of resilience among maltreatment victims. For example, males maltreated during childhood with greater economic and academic support display more resilience than females (Campbell-Sills, Forde, & Stein, 2009). Females also demonstrate increased resilience to the neurological effects of maltreatment (Samplin, Ikuta, Malhotra, Szeszko, & DeRosse, 2013). Findings such as these indicate possible gender differences in resilience development among maltreated youth. Indeed, gender may have an effect on overall levels of resilience (Hartman, Turner, Daigle, Exum, & Cullen, 2009). Females endorse resilience more often than males and evidence resilience across a wider variety of functional domains (McGloin & Widom, 2001). Furthermore, males and females may utilize different resilience factors to mitigate adversity (Hartman et al., 2009). For example, female

youth demonstrate increased use of social skills with peers, increased positive relationships with parents, peers, and teachers, and increased aspirational goals (Sun & Stewart, 2007). Results remain mixed and continued investigation is needed to determine the moderating effects of gender on resilience and maltreatment.

Resilience and Age

A youth's developmental level influences the efficacy of certain resilience factors (Orbje & Smith, 2013). For example, in young children, social support most often occurs through parents and family (Leech & Littlefield, 2011). Adolescents, however, indicate increased involvement in a social network outside of the immediate family (Orbje & Smith, 2013; Zimmerman et al., 2013). This includes extracurricular activities, and community and church related functions that may help a youth develop additional coping skills and promote healthy development (Ungar, Liebenberg, Dudding, Armstrong, & van de Vijver, 2013; Zimmerman et al., 2013). Adolescents remain a substantial contributor in the shaping of their future and those around them (Theokas et al., 2005). Resilience in adolescents therefore relies heavily on increased interactions between interpersonal characteristics and environmental support that help foster additional resilience factors and support (Noor & Alwi, 2013; Theokas et al., 2005). High social support directly correlates to more resilience in adolescents (Sun, Guan, Qin, Zhang, & Fan, 2013). Social skills, self-efficacy, and positive peer relationships remain salient for resilience in adolescents (Fergus & Zimmerman, 2005; Narayanan & Betts, 2014). Research expansion is needed to fully determine the role of resilience across all ages of maltreated youth. At present, the number and variety of resilience variables examined among any specific age group remains minimal. This study expanded on this limitation by addressing resilience in middle childhood and adolescence across a wider range of resilience variables.

Resilience by Maltreatment Type and Quantity

Resilience in maltreated youth may vary depending on type and quantity of maltreatment exposure. Youth exposed to multiple traumas demonstrate lower rates of resilience and increased trauma symptoms, depression, and dissociation than youth exposed to single isolated traumas (Collin-Vézina, Coleman, Milne, Sell, & Daigneault, 2011; Kira et al., 2013). Victims of multiple forms of trauma report less individual, social, and community forms of resilience compared to youth endorsing isolated traumas (Collin-Vézina et al., 2011). Polyvictimization remains common in maltreated youth (Armour, Elklit, & Chistoffersen, 2014; Masten & Wright, 1998). Youth who experience more than one type of maltreatment trauma are at increased risk for negative outcomes compared to youth with single-type maltreatment (Armour et al., 2014). Despite these findings, many youth exposed to chronic maltreatment continue to develop normally without serious behavioral problems or mental disorder (Masten & Wright, 2010; Ungar, 2013b). The existing literature, however, fails to fully explain why many youth are able to develop normally and others remain at increased risk for psychopathology. A partial explanation exists vis-à-vis resilience levels. For example, individuals with different levels of resilience evidence differences in emotional regulation strategies and emotional states resulting in psychopathology (Xi, Zuo, & Wu, 2013). Individuals with high resilience engage in less rumination while experiencing negative emotions than individuals with low resilience (Xi et al., 2013). Resilience levels, however, remain underexplored within a maltreated population. This study investigated this question by examining reported levels of resilience among a maltreated sample with a specific focus on PTSD. The following sections expand on the relationship between resilience and maltreatment trauma types.

Resilience and Neglect. Resilience and neglect remain underresearched despite the overwhelming percentage of neglected youth in the maltreatment population (ACYF, 2012;

Tonmyr & Wekerle, 2013). Furthermore, a significant amount of neglected youth experience an additional type of maltreatment (Mennen, Kim, Sang, & Trickett, 2010). Young adults with childhood neglect indicate that strong impulse control, optimism, and increased emotional control correlate with improved adjustment and resilience (Choi et al., 2013).

Resilience and Sexual Maltreatment. Females are at significantly heightened risk for sexual maltreatment compared to males (Armour, Elklit, & Christoffersen, 2014). Sexually maltreated males, however, may face additional challenges related to sexual maltreatment and resilience (Kia-Keating, Sorsoli, & Grossman, 2010). These challenges include intimacy problems, difficulty managing long-term relationships, anger, alienation, and struggles related to developing masculinity (Kia-Keating et al., 2010). Therefore, youth interventions focused on developing a sense of belongingness and positive relationships may remain key in overcoming these challenges (Kia-Keating et al., 2010).

Individuals reporting positive self-esteem, self-control, and intellectual functioning demonstrate the greatest increase in resilience among youth exposed to sexual maltreatment (Barnes & Josefowitz, 2014). The availability of internal resources such as self-efficacy, the ability to tolerate negative emotions, reframing adversity as an opportunity for growth, sense of social support, and patience predict resilience and less depressive symptoms in adults who were sexually maltreated as youth (Goldstein, Faulkner, & Wekerle, 2013). Sexually maltreated youth with a strong relationship with a non-offending parent, fewer negative cognitive appraisals of the maltreatment, less aggressive coping behaviors, and lower levels of maltreatment-related stress show greater levels of resilience (Murray, Nguyen, & Cohen, 2014; Spaccarelli & Kim, 1995).

Resilience and Physical Maltreatment. Less early life stress, adolescent stress, and unilateral parental decision-making predict resilience in physically maltreated youth (Lansford et al., 2006). Youth with increased family and adult support, religiosity, involvement in

extracurricular activities, and a positive view of the future correlate with resilience in physically maltreated youth (Perkins & Jones, 2004). Positive peer interaction, a positive school climate, and high levels of family support reduce purging behaviors in physically maltreated youth (Fantuzzo, Coolahan, & Weiss, 1997; Perkins, Luster, & Jank, 2002; Perkins & Jones, 2004).

Resilience and Emotional Maltreatment. Few researchers examine emotional maltreatment in relation to resilience. This may stem from a lack of definitional clarity and consistency in defining emotional maltreatment (Shpiegel, Simmel, & Huang, 2013). Furthermore, identifying emotional maltreatment remains difficult without additional physical findings and few emotionally maltreated youth self-identify as maltreated (Goldsmith & Freyd, 2005; Hamarman, Pope, & Czaja, 2002). Emotionally maltreated children indicate that rigid and dysfunctional negative self-schemas, a lack of positive self-beliefs, and decreased self-esteem contribute to a reduction in resilience (Soffer, Gilboa-Schechtman, & Shahar, 2008). Healthy childhood experiences, sensitive and supportive care by a caretaker, secure attachment to a caregiver, an external attribution style, self-efficacy, and self-esteem increase resilience in emotionally maltreated youth (Iwaniec, Larkin, & Higgins, 2006). Schools that identify and refer emotional maltreatment to child protective services significantly enhance a child's resilience to the maltreatment (Doyle, 2003).

Resilience and Family Violence. Family violence often occurs with other forms of maltreatment (Zahradnik et al., 2010). Youth exposed to family and domestic violence demonstrate increased risk for potential injuries, distressed parents, inconsistent or overly harsh discipline, academic difficulties, and psychological distress (Burgess & Phifer, 2013). Resilience to family violence is enhanced when youth talk with peers about the violence, seek support in avoiding violence, increase emotional self-control, and express neutral or negative beliefs towards the use of aggression (Kassis, Artz, Scambor, & Moldenhauer, 2013). These

youth also endorse constructive social and personal relationships as significant predictors of resilience (Kassis et al., 2013). Academic settings further foster resilience in youth exposed to family violence by providing opportunities for appropriate emotional expression and develop positive peer relationships (Burgess & Phifer, 2013)

Limitations on Resilience and Maltreatment

Few studies explore variations in resilience by trauma type. Furthermore, studies in child maltreatment largely focus on sexual and physical maltreatment (Tonmyr & Wekerle, 2013). Research into neglect and emotional maltreatment remains sparse despite the large proportion of child neglect cases. Exposure to multiple forms of maltreatment remains common in a child maltreatment population, yet few researchers examine resilience in youth endorsing multiple traumas (Armour, Elklit, & Chistoffersen, 2014).

Definitional uncertainty continues to plague resilience and maltreatment research. In many studies, resilience is determined by a child meeting a specific set of criteria as determined by the researcher (Klika & Herronkohl, 2013). Few studies account for the interaction between risk factors and resilience across multiple domains of functioning (Walsh, Dawson, & Mattingly, 2010). Fewer still account for the influence of resilience factors on general symptoms related to experiencing a trauma. Furthermore, the extant literature abounds with retrospective accounts of resilient adults describing maltreatment experiences (Herrenkohl, Klika, Herrenkohl, Russo, & Dee, 2012; Smith, Park, Ireland, Elwyn, & Thornberry, 2013; Topitzes, Mersky, Dezen, & Reynolds, 2013); few examine resilience in youth shortly following an identified trauma. Research into resilience and trauma therefore is limited and necessitates expansion. The following section expands on this relationship by examining resilience as it intereracts with specific trauma reactions, namely PTSD.

Resilience and PTSD

Prevalence

Most individuals show a decrease in PTSD symptoms within a month after a traumatic event (Steenkamp, Dickstein, Salters-Pedneault, Hoffman, & Litz, 2012; Werner, 2013).

Approximately 50% of youth display resilience following isolated traumatic events (Bonanno & Mancini, 2008). Resilience factors may mitigate the development of PTSD following a trauma (Cicero, Noonan, & Sliva, 2011). Increased resilience leads to decreased risk for PTSD and increases potential for posttraumatic growth, or the occurrence of positive change resulting from adversity (Bensimon, 2012; Taku, 2011; Tedeschi, Park, & Calhoun, 1998). These studies, however, frequently define resilience as a global construct representing the absence of diagnosable psychopathology. Many youth may continue to experience variations of psychological symptoms despite failing to meet criteria for PTSD or other disorders.

Gender and Age Variations. Boys have less risk for PTSD than girls (Mueser & Taub, 2008). Females remain at risk for additional unique traumas that stem from unequal societal status, domestic violence, and sexual assault (Sanchez-Hucles & Gamble, 2006). Males also appear to demonstrate increased resilience following trauma. For instance, boys noted a reduction in PTSD symptoms compared to girls in youth exposed to a natural disaster (Sun, Fan, Zheng, & Zhu, 2012). This finding was replicated in war-related trauma (Kasler, Dahan, & Elias, 2008). Girls, however, endorse heightened resilience after receiving resilience-based interventions (Tol et al., 2010).

The age a child experiences a primary trauma such as maltreatment may influence PTSD symptom presentation (Contractor et al., 2013). For example, adolescents demonstrate greater severity in symptoms of re-experiencing, numbing, and dysphoric arousal, while preadolescents demonstrate heightened anxious arousal and avoidance (Contractor et al., 2013). Symptom

differences may reflect the heightened ability of adolescents to retain and retrieve memories (Contractor et al., 2013). Additional variables such as a child's age of entry into foster care may help increase future resilience (Smith, Park, Ireland, Elwyn, & Thornberry, 2013; Yates & Grey, 2012).

Ethnicity Variations. Results remain mixed regarding the influence of ethnicity on resilience following trauma (Goel, Amatya, Jones, & Ollendick, 2014). Minority ethnic groups retain additional risk factors that erode resilience. For instance, recent immigrants to the United States may face additional risk factors such as acculturative stress, prejudice, and poverty that decrease resilience following a trauma (Holleran & Jung, 2008, Nader, 2007). Other risk factors include racism, discrimination, xenophobia, and classism (Mirkin & Kamyra, 2008; Sorsoli, 2007). Researchers, however, often fail to account for these additional risk factors in ethnicity-resilience relationships (McGruder-Johnson, Davidson, Gleaves, Stock, & Finch, 2000).

African Americans, Latinos, and American Indians show higher rates of PTSD than European Americans (APA, 2013). Asian Americans evidence lower rates of PTSD than other ethnicities (APA, 2013). Hispanic ethnicity also correlates with PTSD and reduced resilience (Pietrzak et al., 2014). Hispanic Americans cite acculturation stress, prejudice, and identity development as additional stressors (Holleran & Jung, 2008). Hispanic youth show increased risk for alcohol use compared to African Americans and European Caucasians (Widom, Czaja, Wilson, Allwood, & Chauhan, 2013). African Americans cite increased unemployment, poverty, increased rates of incarceration, homelessness, violence, and substance abuse as additional stressors (Boyd-Franklin & Karger, 2012; Widom et al., 2013).

Despite these risk factors, ethnic minority groups also endorse multiple factors contributing to resilience development. Immigrants endorse individual traits and abilities, internal familial resources and support, passive appraisal coping styles, social support, family

stability, and family integration as key predictors in resilience (Greeff & Holtzkamp, 2007). The development of a unique cultural sense of identity, feelings of commitment, and purpose may also increase resilience (Wexler, 2014). The availability of cultural resources may also enhance resilience (Chao, 2010). For instance, a strong spiritual belief system, psychosocial gratitude, and familial support aid resilience (Fernando, 2012; Yee, DeBaryshe, Yuen, Kim, & McCubbin, 2007). Few studies, however, examine PTSD in relation to resilience factors across cultures.

Parenting Variations. The existence of a supportive caregiver, positive parenting practices, and positive parent-child communication may increase resilience in traumatized youth (Goodkind, LaNoue, Lee, Freeland, & Freund, 2012). Parental care and parental overprotection correlate with resilience in adolescents (Sun, Fan, Zheng, & Zhu, 2012). Children with families endorsing high resilience also endorse high personal resilience following a trauma (McDermott, Cobham, Berry, & Stallman, 2010). A lack of resilience factors at the familial level increased risk for mental health problems after youth trauma exposure (Somasundaram & Sivayokan, 2013).

Adults may also transmit risk for PTSD to youth via rearing practices (Smith-Osborne, Wilder, & Reep, 2013). For example, research findings on the children of Holocaust survivors indicate a higher prevalence of mental disorders, including PTSD (Smith, Park, Ireland, Elwyn, & Thornberry, 2013). Researchers speculate that parental PTSD limits appropriate modeling of emotional responses and decreases the effectiveness of familial problem solving-abilities (Davidson & Mellor, 2001). These deficits worsen family dysfunction and increase risk for PTSD and other mental disorders (Davidson & Mellor, 2001).

Sexual Minority Groups. Sexual minority youth may evidence decreased resilience following a trauma. Sexual minority and gender nonconforming youth exposed to a trauma demonstrate 1.6-3.9 times increased risk for PTSD compared to heterosexual youth (Roberts,

Rosario, Corliss, Koenen, & Austin, 2012). Youth who identify as a sexual minority also evidence increased risk of substance use, suicide, depression, and anxiety (DiFulvio, 2011). Risk may further increase in ethnic minority homosexual or bisexual youth (Triffleman & Pole, 2010). For example, sexual minority African Americans and Hispanic Americans endorse higher rates of PTSD than other ethnic groups (Alessi, Meyer, & Martin, 2013).

Resilience and Trauma Type

The type of trauma experienced influences symptom presentation, however, it remains unclear how resilience factors interact with trauma type. For instance, interpersonal and direct traumas such as maltreatment result in increased risk for psychopathological symptoms compared to noninterpersonal traumas such as vicarious trauma (Price, Higa-McMillan, Kim, & Frueh, 2013). The relation of resilience factors in these symptom presentations, however, is largely unknown. Furthermore, little is known regarding the relationship between resilience factors and number of trauma experiences. The following sections review resilience factors in a variety of traumas associated with PTSD.

Single versus Multiple Traumas. Youth exposed to a single traumatic experience indicate higher rates of resilience compared to youth exposed to multiple traumas (Nugent et al., 2009). A positive relationship with caregivers positively correlated with resilience in youth exposed to multiple traumas (Avci et al., 2013). Early-life trauma may also inoculate victims from future trauma-related distress following additional trauma exposure (Gray, Luna, & Seegobin, 2012).

Natural Disasters. Males and ethnic majority groups reported decreased symptoms of PTSD following exposure to a hurricane (La Greca, Lai, Joormann, Auslander, & Short, 2013). Youth with psychosocial support and cognitive ability indicated increased resilience following earthquake exposure (Fu, Leoutsakos, & Underwood, 2014). High social connectedness significantly reduces risk for PTSD following a natural disaster (McDermott, Berry, & Cobham,

2012). Others indicate an adolescent's positive appraisal of a natural disaster and its outcome results in increased resilience (Uttervall, Hultman, Ekerwald, Lindam, & Lundin, 2014).

War Trauma. Approximately 27.6 % of youth demonstrated resilience following significant war trauma (Klasen et al., 2010). Males exhibited reduced risk of distress compared to females following war trauma (Lavi, Green, & Dekel, 2013). The degree and type of violence exposure, availability of self-protection resources, and general life stress may impact resilience responses (Suarez, 2013). Adequate emotional expression, prosocial behaviors, positive peer relationships, and supportive family members predict resilience in war refugee youth (Daud, af Klinteberg, Rydelius, 2008). Resilient youth exposed to war trauma also seek maternal support more than nonresilient youth (Feldman & Vengrober, 2011). Increased resilience correlated with reduced exposure to domestic violence, less motivation to seek revenge, increased socioeconomic status, and decreased guilt cognitions in child soldiers (Klasen et al., 2010).

Community Violence. Community violence, high crime, and poverty exposure increase risk for PTSD (Fincham, Altes, Stein, & Seedat, 2009; Jones, 2007). Approximately 60-85% of youth demonstrate emotional resilience following exposure to community violence (Jain, Buka, Subramanian, & Molnar, 2012). Youth cite high levels of parent support, school support, and spirituality as key factors (Jones, 2007; O'Donnell, Schwab-Stone, & Muyeed, 2002). Supportive parenting practices, good parental mental health, good physical health, above-average cognitive ability, and good school performance predicted resilience in adolescents exposed to community violence (Punamäki, Qouta, Miller, & El-Sarraj, 2011).

Symptom Variations. Resilience may also moderate symptom severity for additional psychopathology such as PTSD and depression in youth exposed to trauma (Fincham, Altes, Stein, & Seedat, 2009; Murray, Nguyen, & Cohen, 2014; Wingo et al., 2010; Wrenn et al., 2011). Resilience factors mediated the relationship between trauma exposure and

symptomatology in youth by increasing positive coping patterns following a natural disaster (Chen, Wang, Zhang, & Shi, 2012). Resilience also decreases risk for depressive symptoms, internalizing symptoms, negative affect, and perceived stress by boosting positive affect and self-esteem and lowering avoidance behaviors (Carle & Chassin, 2004; Schachman & Lindsey, 2013; Steinhardt & Dolbier, 2008). Some PTSD symptoms may decrease the availability of resilience resources such as family or peer support. Emotional numbing may reduce access to resilience sources via loss of energy and decreased interpersonal interactions (Johnson, Palmieri, Jackson, & Hobfoll, 2007). Despite the link between resilience and symptom reduction, few studies examine the relationship between resilience factors and unique patterns of PTSD symptoms in youth.

PTSD Risk and Resilience Factors

Resilience and risk factors mediate the relationship of PTSD development following a trauma (Cicero, Nooner, & Silva, 2011). These factors are multifaceted and comprise environmental, psychological, developmental, biological, and social variables (Cicero et al., 2011). Furthermore, these factors include the circumstances surrounding the traumatic event (Cooper, Feder, Southwick, & Charney, 2007). Trauma severity, perceived threat, physical pain or injury, exposure to gross body disfigurement, and passive coping strategies decrease opportunities for resilient outcomes (Cooper et al., 2007). Others speculate that resilience stems from the ability to connect with others as well as courage, mutual empathy, and empowerment (Jordan, 2005). These growth-fostering connections significantly increase resilience following trauma (Jordan, 2005).

Positive psychological responses to trauma increase resilience (Bensimon, 2012; Edwards, Sakasa, & van Wyk, 2005). Increased negative emotionality, harm avoidance, novelty-seeking, self-transcendence, trait hostility and anger, trait anxiety, and neuroticism correlate with

increased PTSD symptoms (Jakšić, Brajković, Ivezić, Topić, & Jakovljević, 2012). Resilience positively correlates with conscientiousness, self-directedness, extraversion, hardiness, and optimism (Jakšić et al., 2012). Limited interest in engaging others correlates to PTSD with comorbid anxiety (Thomas et al., 2014). Extroverted and conscientious youth also demonstrate increased resilience (Campbell-Sills, Cohan, & Stein, 2006). Youth with greater emotional reactivity may demonstrate increased risk for psychopathology. Emotional reactivity moderates the relationship between trauma exposure and PTSD (Kaczmarek & Zawadzki, 2012).

The ability to perceive a traumatic event as a challenge to overcome may lead to resilience (Bensimon, 2012). Individuals who approach trauma with increased self-esteem and optimism demonstrate increased future positive adjustment (Grasso et al., 2012; Tseng, 2007). The capacity to reframe life events and minimize cognitive representations of prior traumatic experiences encourages resilient outcomes (Himelein & McElrath, 1996). Individuals able to endure a trauma with psychological flexibility and endorse a purpose in life exhibit resilience (Alim et al., 2008; Bonanno & Mancini, 2008).

Dissociative symptoms such as depersonalization and derealization positively correlate with symptoms of PTSD (Steuwe, Lanius, & Frewen, 2013). Temporary peritraumatic dissociation may allow a child to function and remain resilient during a traumatic event (McCaslin et al., 2009; Mrazek & Mrazek, 1987). Persistent dissociation, however, predicts the development and maintenance of PTSD (Werner & Griffin, 2012).

Limitations of PTSD and Resilience

Youth may mediate trauma effects by utilizing resilience factors, which promote positive coping strategies and decrease risk for maladaptive symptomatology (Chen, Wang, Zhang, & Shi, 2012). The use of resilience also correlates with the reduction of many symptoms typical of PTSD such as the perception of stress and avoidance behaviors (Schachman & Lindsey, 2013;

Steinhardt & Dolbier, 2008). Despite these links, however, few studies have examined these resilience patterns in maltreated youth and in relation to PTSD symptomatology. Furthermore, few studies have identified specific symptom variations in maltreated youth at risk for PTSD. This study expands on the previous findings by examining prominent resilience factors in relation to PTSD symptomatology across different types of maltreatment exposure.

Resilience, Maltreatment, and PTSD

Resilience may moderate the relationship between child maltreatment and PTSD (Fincham, Altes, Stein, & Seedat, 2009). Individual resilience factors include personality traits, self-perception, and cognition (Nasvytienė, Lazdauskas, & Leonavičienė, 2012). These individual resilience factors exert a stronger influence on a child's overall resilience than community factors (Nasvytienė et al., 2012). Social factors include relationships within and outside the family and community influences (Nasvytienė et al., 2012). Community resources include community involvement, high social cohesion within a community, and neighborhood advantage (DuMont, Widom, Czaja, 2007; Harvey, 2007; Jaffee, Caspi, Moffitt, Polo-Tomás, & Taylor, 2007). Resources available to maltreated youth following removal from home may also increase resilience (Wolfe, 2013).

Key Resilience Factors

Research into the moderating effects of resilience factors in relation to maltreated youth and PTSD symptoms remains in its infancy. These variables are reviewed in this section and include gender, parent-child relationships, social support, community support, and psychological factors. Key resiliency factors in the relationship between maltreatment and PTSD are examined below.

Gender. Males and females demonstrate few differences in resilient outcomes (Zeidner & Endler, 1996). Females endorse increased risk of sexual maltreatment and molestation, which

may lead to increased vulnerability to PTSD (Nemeroff et al., 2006; Pratchett, Pelcovitz, & Yehuda, 2010). Males, however, show greater resilience following adversity (Campbell-Sills, Forde, & Stein, 2009). These findings may partially be explained by gender variations in trauma appraisal and application of coping skills (Morano, 2010). The relationship between gender and resilience following trauma may also vary depending on the specific symptoms examined (Fergusson & Horwood, 2003). Females consistently endorse heightened levels of re-experiencing symptoms, avoidance, numbing, anxious arousal, and dysphoric arousal (Contractor et al., 2013). Females also indicate greater symptom intensity, increased difficulty feeling love or affection, anhedonia, and disturbed sleep (Reebye, Moretti, Wiebe, & Lessard, 2000). Differences in the cognitive mediation of the traumatic event and emotional responsiveness between males and females may lead to various resilience profiles (Pratchett, Pelcovitz, & Yehuda, 2010). Others indicate that the serotonin transporter polymorphism increases vulnerability in females by modulating early adversity, but not in males (Nemeroff et al., 2006). Females also exhibit increased resilience against the negative neurological effects of child maltreatment (Samplin, Ikuta, Malhotra, Szeszko, & DeRosse, 2013).

Parent-Child Relationships. Increased caregiver support and caregiver education and socioeconomic status correlated to increased resilience in sexually maltreated youth at risk for PTSD (Williams & Nelson-Gardell, 2012). Early emotional support from caregivers during the first year following maltreatment fostered overall resilience, decreased PTSD symptoms, and increased self-esteem (Rosenthal, Feiring, & Taska, 2003). Closer relationships with a caregiver and a safe and nurturing environment correlate to reduced clinical syndromes in maltreated youth (Lowenthal, 1998; Williams & Nelson-Gardell, 2012). The impact, however, of the quality of a caregiver relationship on resilience remains unclear (Williams & Nelson-Gardell, 2012). Despite these findings, age variations may determine overall gain from family support. For example,

young children indicate increased benefits from caregiver support while adolescents report increased satisfaction from peer support (Rosenthal et al., 2003).

Social Support. Social support promotes resilience in maltreated youth and correlates inversely with PTSD (Feldman, Conger, & Burzette, 2004; Horsch, McManus, & Kennedy, 2012). Positive social relationships may increase a youth's sense of belonging and relatedness to others (Harvey, 2007; McGloin & Widom, 2001). Lack of social support increases risk for depression and PTSD following a trauma (La Greca, Lai, Joormann, Auslander, & Short, 2013; Leech & Littlefield, 2011). This relationship appears specifically robust for female victims of child maltreatment (Powers, Ressler, & Bradley, 2009). Decreased social support results in greater PTSD symptomatology (McLean, Rosenbach, Capaldi, & Foa, 2013). Low socially-connected youth exhibit amplified PTSD symptom severity following trauma exposure compared to youth with heightened social connectedness (McDermott, Berry, & Cobham, 2012). Despite the apparent link between social support and resilience, research remains sparse regarding the relationship between social skills and resilience in maltreated youth.

Community Support. Communities enhance resilience by providing additional resources. Furthermore, a youth's involvement within a social community boosts resilience following adversity (Harvey, 2007). Communities, however, may also erode resilience by introducing additional stress factors (Chu, Pineda, DePrince, Freyd, 2011; DuMont, Ehrhard-Dietzel, & Kirkland, 2012; Tummala-Narra, 2007). Neighborhoods with high rates of crime and substance use, low social cohesion, and informal social control predicted less resilience in maltreated youth (Jaffee, Caspi, Moffitt, Polo-Tomás, & Taylor, 2007). Results remain mixed regarding the role of communities in resilience. For example, researchers indicate that neighborhood advantage fails to directly influence resilience but may moderate other resilience factors (DuMont, Widom, Czaja, 2007).

Psychological Factors. Self-regulation of emotions may also help foster resilience in maltreated youth at risk for PTSD (Ford, 2005). Exposure to stressful events such as maltreatment may impair neural circuits that contribute to emotional regulation and increase risk for PTSD and other disorders (Gillespie, Phifer, Bradley, & Ressler, 2009). Increased self-esteem may also contribute to resilience in maltreated youth at risk for PTSD. African American women with a history of child maltreatment identified increased self-esteem as a resilience factor protecting against the development of PTSD symptoms following maltreatment (Bradley, Schwartz, Kaslow, 2005). These researchers, however, focused primarily on retrospective accounts of adults victimized during childhood and who were presenting for additional psychological or physical problems (Bradley et al., 2005).

Cognitive factors such as intelligence and executive functioning correlate with key resilience factors (Avci et al., 2013; Breslau, Lucia, & Alvarado, 2006; Diamond, Muller, Rondeau, & Rich, 2001). Trauma survivors with a higher IQ report decreased symptoms of PTSD (Brandes et al., 2002). Resilience also correlates with better nonverbal memory (Herrenkohl, Herrenkohl, & Egolf, 1994; Wingo, Fani, Bradley, & Ressler, 2010). Nonverbal memory helps emotional learning, resulting in less emotional dysregulation (Wingo et al., 2010). Sexual maltreatment inversely correlates with verbal ability compared to other maltreatment types (De Bellis, Woolley, & Hooper, 2013). Cumulative trauma negatively affects multiple components of intelligence: verbal comprehension, perceptual reasoning, working memory, and processing speed (Kira, Lewandowski, Somers, Yoon, & Chiodo, 2012). Primary traumas such as maltreatment negatively affect IQ while secondary traumas such as parents involved in combat or war positively affect IQ (Kira et al., 2012).

Limitations on Resilience, Maltreatment, and PTSD

Research in resilience has broadened from specific resilience factors to an overall

resilience process (Luthar, Cicchetti, & Becker, 2000). Despite this increased focus on resilience, few studies examine the role of resilience in PTSD. Maltreated youth remain a particularly vulnerable population to PTSD (Pecora, White, Jackson, & Wiggins, 2009). Fortunately, the majority of youth demonstrate resilience despite significant trauma histories (Bonanno & Mancini, 2008; Masten & Wright, 2010; Ungar, 2013b). The question of what creates resilience among some youth and not others remains unclear. This present study hypothesized that a youth's overall resilience level facilitates this adaptation to trauma. While previous researchers herald the role of high levels of resilience (e.g. Fincham, Altes, Stein, & Seedat, 2009), no study to date has clearly defined and examined differing resilience factor levels across a sample of maltreated youth.

Key resilience factors include perceived social support, low emotional reactivity, and heightened self-esteem (Grasso et al., 2012; Leontopoulou, 2013; Skinner, Pitzer, & Steele, 2013; Tignor & Prince-Embury, 2013). These variables, however, have not been examined together in youth with maltreatment histories. Furthermore, the extant literature is sparse regarding specific resilience variables in relation to maltreatment trauma type. Resilience research commonly focuses on large samples following a mass traumatic event (Steenkamp, Dickstein, Salters-Pedneault, Hofmann, & Litz, 2012). Few, however, focus on large samples of youth who have experience isolated traumatic events such as maltreatment (Steenkamp et al., 2012). This present study expanded on these limitations by examining key resilience factors in a large and diverse sample of maltreated youth. Furthermore, this present study examined the link between resilience factors and PTSD symptomatology in light of the key mediating variables of maltreatment type and number of traumas.

Purpose of the Present Study

The current resilience framework involves a transactional perspective that accounts for

the relationship between risk and resilience factors (Cash & Gardner, 2011). This lens emphasizes psychological, sociological, and biological contributors to the development of psychopathology (Ozonoff, Pennington, & Solomon, 2006). Considerable variability exists regarding the types and influence of resilience factors; however, a review of the literature indicates several emerging themes. For instance, a sense of mastery over one's environment, sense of relatedness to others, and low emotional reactivity to stressful situations consistently predict resilience with respect to adverse situations (Dang, 2014; Khanlou & Wray, 2014; Prince-Embury, 2007; Žunić-Pavlović, Pavlović, Kovačević-Lepojević, Glumbić, & Kovačević, 2013). These factors therefore remain considerably important for resilience and posttraumatic growth (Vranceanu, Hobfoll, & Johnson, 2007; Yu et al., 2013).

Resilience models expand on the transactional perspective by specifying the role of resilience factors in the reduction of psychopathology. Resilience factors in a protective-protective model reduce the relationship between adverse situations and negative outcomes (Hollister-Wagner, Foshee, & Jackson, 2001). For example, the presence of either a sense of mastery or low emotional reactivity may interrupt a pathway from maltreatment to PTSD symptoms. Such interruption may be enhanced by the presence of multiple resilience factors (Gomez & McLaren, 2006; Hollister-Wagner et al., 2001). For example, a strong sense of mastery with a strong sense of relatedness to others may predict higher resilience together than individually. Other models of resilience include protective-stabilizing, protective-reactive, and risk-protective models (Brown, Wolchick, Tein, & Sandler, 2007; Christiansen & Evans, 2005; Luthar, Cicchetti, & Becker, 2000).

Despite considerable research support, very few researchers apply these resilience perspectives to PTSD in maltreated youth. For instance, the development of relevant trauma symptoms in light of resilience factors such as one's sense of mastery, emotional reactivity, and

relationships with other people remains largely unexplored (Sapienza & Masten, 2011). Furthermore, resilience research fails to account for variations within trauma experiences. Resilience may also be context-specific (Fergus & Zimmerman, 2005). For example, resilience factors may protect against the adverse effects of one maltreatment type (witnessing violence) but not another (sexual maltreatment). This, however, remains unexplored in youth.

The first aim of the present study was to evaluate the relationship between (1) factors commonly associated with resilience (i.e., sense of mastery and sense of relatedness to others) and (2) PTSD symptoms among maltreated youth (Leontopoulou, 2013; Skinner, Pitzer, & Steele, 2013; Tignor & Prince-Embury, 2013). This aim draws on the protective-protective model of resilience that postulates that the accumulation of factors result in the best clinical outcomes (Hollister-Wagner et al., 2001). Further support for this model is provided by evidence that high levels of resilience decrease risk for PTSD and other forms of psychopathology (Fincham, Altes, Stein, & Seedat, 2009). These studies, however, fail to define specific levels of resilience among maltreated youth assessed for PTSD. This study examined specified resilience levels and individual resilience factors across a range of trauma experiences in relation to PTSD symptoms. These factors were chosen because they represent attributes associated with decreased vulnerability to mental health problems following disruptive life events (Gilmore, Campbell, Shochet, & Roberts, 2013; Kumar, Steer, & Gulab, 2010; Prince-Embury, 2007). For instance, the link between a sense of mastery and resilience remains well documented in adults (Hildon, Smith, Netuveli, & Blane, 2008). A sense of mastery may reduce anxiety and PTSD symptoms following a trauma as well as buffer against additional future traumatic events (McWhirter, 2008; Mishra, Suar, & Paton, 2011; Osofsky, Cohen, & Drell, 1995; Shapiro, 2001). Similarly, a sense of relatedness to others correlates with adaptive functioning and resilience among sexually exploited youth (Gray, Luna, & Seegobin, 2012).

Despite these findings, few examine these factors among maltreated youth.

The second aim of this study was to evaluate if trauma type (i.e., neglect, physical maltreatment, sexual maltreatment, witnessing a trauma, and removal from home) affects the relationship between specific resilience factors and PTSD symptoms. Different maltreatment types may result in unique clinical profiles in youth (Jonkman, Verlinden, Bolle, Boer, & Lindauer, 2013; Kira, Lewandowski, Somers, Yoon, & Chiodo, 2012; Runyon, Deblinger, & Steer, 2013). For example, adolescents exposed to sexual or physical maltreatment endorsed higher rates of PTSD symptoms than those exposed to other maltreatment forms (Wechsler-Zimring & Kearney, 2011). Similarly, sexual maltreatment increases risk for adult depression, dissociation, PTSD, and emotional distress (Au, Dickstein, Comer, Salters-Pedneault, & Litz, 2013; Meston, Lorenz, & Stephenson, 2013; Schalinski, Elbert, & Schauer, 2011). Physical maltreatment, however, correlates with peritraumatic dissociation, depression, and PTSD (Komarovskaya et al., 2014). This study examined resilience factors with respect to different types of child maltreatment and trauma.

The third aim of this study was to explore whether exposure to multiple traumas influences the relationship between specific resilience factors and PTSD symptoms. This aim represented a preliminary investigation of the relationship between multiple traumatic experiences and resilience due to the overwhelming number of youth endorsing multiple maltreatment experiences (Mennen, Kim, Sang, & Trickett, 2010; Scher, Forde, McQuaid, & Stein, 2004). Youth exposed to multiple or chronic traumas endorse heightened rates of PTSD symptoms, increased levels of maladaptive functioning, and decreased resilience (Collin-Vézina, Coleman, Milne, Sell, & Daigneault, 2011; Ford, Wasser, & Connor, 2011; Kirby, Chu, & Dill, 1993). Additionally, youth exposed to severe or ongoing trauma remain at heightened risk for Complex PTSD (Siebler, 2004; Spitzer, Chevalier, Gillner, Freyberger, & Barrow, 2006). Those

endorsing multiple traumas also endorse heightened risk for depression, anxiety, anger-hostility, sexualized behavior, dissociation, and impulsivity (Ford, Wasser, & Connor, 2011). The role of resilience factors vis-a-vis negative outcomes such as PTSD, however, remains unknown in youth with multiple maltreatment exposures.

The fourth aim of this study was to examine the role and level of emotional reactivity vis-a-vis resilience and PTSD symptoms. Consistent with a transactional protective-protective model of resilience, this study aimed to investigate if the link between decreased PTSD symptoms and multiple resilience factors is moderated by emotional reactivity. Emotional reactivity increases risk for PTSD and PTSD symptom severity (Kaczmarek & Zawadzki, 2012). Heightened emotional reactivity also remains a risk factor for additional forms of psychopathology comorbid with PTSD, including borderline personality disorder, substance abuse, and additional anxiety disorders (Klanecky & McChargue, 2009; Limberg, Barnow, Freyberger, & Hamm, 2011; Strelau & Zawadzki, 2011). A further aim of this study is to investigate the role of emotional reactivity as a risk factor that may weaken the relationship between resilience factors and resilience to PTSD symptoms to lend support to the possible protective nature of a sense of mastery and relatedness. This study therefore planned to expand on the extant literature by examining the interaction of emotional reactivity with resilience, trauma type, and trauma chronicity.

Hypotheses 1-3: Resilience and PTSD Symptoms

Hypothesis 1 was that a resilience resource score would account for a significant amount of variance in PTSD symptoms. Resilience resource scores were expected to predict PTSD symptoms in an inverse manner. This effect was expected to be stronger for youth reporting above average resource score levels ($t > 60$) than youth reporting average ($t = 40-60$) or below average ($t < 40$) resource score levels. The *Resiliency Scale for Children and Adolescents*

(*RSCA*) was used to determine the resilience resource score, which was a combination of the *RSCA* subscales of sense of mastery and sense of relatedness. The *Children's PTSD Inventory* was used to assess PTSD symptoms. Post hoc regression analyses were conducted on subscales and individual items of significant resilience subtests. Support for Hypothesis 1 served as the basis for Hypotheses 2 and 3.

Hypothesis 2 was that trauma type would moderate the relationship between the *RSCA* resource score and total PTSD symptoms. Specifically, youth reporting “non-assault” related traumas (i.e., witnessing violence, removal from home, and other trauma) were expected to display significantly elevated resource scores and decreased PTSD symptoms than youth reporting “assault-related” traumas (i.e., physical and sexual maltreatment).

Hypothesis 3 was that total number of trauma exposures would moderate the relationship between the *RSCA* resource score and total PTSD symptoms. Specifically, youth reporting one traumatic experience were expected to display significantly elevated resource scores and decreased total PTSD symptoms than youth reporting more than one traumatic experience.

Hypotheses 4-6: Emotional Reactivity and PTSD Symptoms

Hypothesis 4 was that the emotional reactivity score would account for a significant amount of the variance in PTSD symptoms. The emotional reactivity score was expected to predict PTSD scores in a positive manner. This effect was expected to be stronger for youth reporting above average emotional reactivity score levels ($t > 60$) than youth reporting average ($t = 40-60$) or below average ($t < 40$) emotional reactivity score levels. The *RSCA* was used to assess emotional reactivity. Post hoc regression analyses were conducted on the subscales and individual items of emotional reactivity. Support for Hypothesis 4 served as the basis for Hypotheses 5 and 6.

Hypothesis 5 was that trauma type would moderate the relationship between emotional

reactivity and total PTSD symptoms. Specifically, youth reporting “assault-related” traumas (i.e., physical and sexual maltreatment) were expected to display significantly elevated emotional reactivity and PTSD symptoms compared to youth reporting “non-assault” related traumas (i.e., witnessing violence, removal from home, and other trauma).

Hypothesis 6 was that total number of trauma exposures would moderate the relationship between emotional reactivity and PTSD symptoms. Specifically, youth reporting more than one traumatic experience were expected to display significantly elevated resource scores and total PTSD symptoms compared to youth endorsing one traumatic experience.

Hypothesis 7: Emotional Reactivity as a Moderator of Resilience and PTSD Symptoms

Hypothesis 7 was that emotional reactivity would moderate the relationship between the RSCA resource score and total PTSD symptoms. Specifically, youth reporting average to above average levels of emotional reactivity were expected to demonstrate higher PTSD symptoms and lower resource scores than youth reporting low levels of emotional reactivity.

CHAPTER 3

METHODOLOGY

Participants

Participants included 70 youth aged 9-17 years in Department of Family Services custody (DFS). Youth ages ($M = 13.00$, $SD = 2.53$) spanned 9-11 years (26.8%), 12-14 years (35.2%), 15-17 years (26.8%), or was unknown (11.2%). These youth were identified through DFS-related sites in the Las Vegas area. Reasons for removal from home included physical and sexual maltreatment, neglect, physical or sexual maltreatment of a sibling, parental substance use, exposure to domestic violence, abandonment, failed foster placement, and runaway. Youth in this sample cited physical maltreatment (16.9%), sexual maltreatment (14.1%), witnessing a traumatic event (16.9%), removal from home (33.8%) and other/neglect (18.3%) as primary traumatic events. Youth in this sample consisted of males (40.8%), females (50.7%), and other/refused to say (8.5%). Youth were European American (29.6%), African American (16.9%), Hispanic (16.9%), multiracial (12.7%), Asian American (2.8%), or unknown (21.1%).

Measures

Demographic and Information Sheet. A demographic and information sheet requested information regarding a youth's gender, age, race/ethnicity, parental race/ethnicity, birthplace, parental marital status, primary language spoken in the home, family configuration, youth's experience of alcohol and drugs, and religious preferences. Additional questions assessed for a youth's understanding of the reason for removal and whether the youth was exposed to violence in and outside the home. Details regarding the nature of the maltreatment, including the maltreatment type, number of perpetrators, and frequency of the maltreatment were also assessed.

Children's PTSD Inventory (CPTSD-I) (Saigh, 1998; Saigh, Yasik, Oberfield, Green, Halamandaris, et al. 2000). The *CPTSD-I* assesses DSM-IV-TR PTSD symptoms using a semi-structured interview format (Saigh et al. 2000). The interview assesses youth aged 7-18 via 5 subtests that correspond to DSM criteria. Administration requires 15-20 minutes per youth reporting a single trauma. The subtests assess for exposure and reactivity to trauma (2 questions), reexperiencing symptoms (11 questions), avoidance and numbing symptoms (16 questions), increased arousal (7 questions), and psychological distress (5 questions). A dichotomous scale is used to score responses to categorize symptoms into 1 of 5 possible diagnoses. These diagnoses include PTSD Negative, Acute PTSD, Chronic PTSD, Delayed Onset PTSD, and No Diagnosis (Saigh et al., 2000). "No Diagnosis" is assigned to youth who refused to acknowledge a previously identified traumatic event (Saigh et al., 2000).

Researchers administered the *CPTSD-I* to traumatized and non-traumatized youth aged 6-17 years to test internal consistency (Saigh et al., 2000). Internal consistency was high for overall diagnosis (.95). Similarly, each subtest evidenced moderate estimates for internal consistency (.53 - .89) (Saigh et al., 2000).

Three members of the DSM-IV PTSD Work group established *CPTSD-I* content validity by independently rating the measure for correspondence with the current PTSD diagnostic criteria using a 0-100 Likert-type scale. Reviewers exhibited high levels of correspondence between the *CPTSD-I* and the DSM-IV diagnostic criteria with mean subtest ratings included 86.7 for Situational Reactivity, and 90 for all additional subtests (Saigh et al., 2000).

CPTSD-I validity was assessed in a sample of traumatized and non-traumatized youth aged 7-18 years (Yasik et al., 2001). *The Children's Depression Inventory (CDI)*; Kovacs, 1992), *Revised Children's Manifest Anxiety Scale (RCMAS)*; Reynolds & Richmond, 1985), and the *Junior Eysenck Personality Inventory (JEPI)*; Eysenck, 1963), were used to assess convergent

and discriminant validity of the *CPTSD-I*. *CDI* and *RCMAS* symptom endorsement and total *CPTSD-I* symptom endorsement significantly correlated, indicating high internal consistency (Yasik et al., 2001). Discriminant validity was evidenced by the absence of a relationship between the *CPTSD-I* and *JEPI* extraversion (Yasik et al., 2001). High concurrent validity was established by comparing the *CPTSD-I* to the Structural Clinical Interview for the DSM, Diagnostic Interview for Children and Adolescents-Revised PTSD module, and clinician derived diagnoses (Yasik et al., 2001).

The *CPTSD-I* boasts high estimates of interrater reliability with an overall interrater agreement of 98.1% (Saigh et al., 2000). Interrater agreement is excellent for each of the four subtests (.84-1.00) and overall diagnostic level (.96) (Saigh et al., 2000). Moderate interrater agreement was found for Situation Reactivity with a kappa coefficient of .66 (Saigh et al., 2000). Cronbach's α for the *CPTSD-I* for the present study was 0.82.

Resilience Scale for Children and Adolescents (RSCA) (Prince-Embury, 2007). The *RSCA* is a self-report inventory containing 64-items that assess core personal resiliency qualities in youth ages 9-18 years (Prince-Embury, 2007). The *RSCA* items require a 3rd grade reading level. *RSCA* scoring utilizes a Likert-type scale where "0 = Never" and "10 = Almost Always." The *RSCA* yields 5 primary scores, including two summative scores: a Resource Index Score, Vulnerability Index Score. Three additional scores highlight primary resilience domains: Sense of Mastery (MAS), Sense of Relatedness (REL), and Emotional Reactivity (REA). The *RSCA* requires approximately 15-20 minutes to complete.

Sense of Mastery refers to the personal attributes of optimism, self-efficacy, and adaptability (Prince-Embury, 2007). These attributes enable a child cope to adverse situations such as maltreatment (Prince-Embury, 2007). Sense of relatedness refers to sense of relationships with others, perceived access to social support, ability to trust others, tolerance of

diversity among others, and comfort with and around other people (Prince-Embury, 2007). A high sense of mastery and sense of relatedness enhance the opportunity for resilient outcomes. Emotional Reactivity refers to sensitivity to emotional stimuli, recovery time from emotionally laden events and interactions, and possible impairment in a youth's ability to function due to emotional arousal (Prince-Embury, 2007). High emotional reactivity remains a risk factor for psychopathology (Prince-Embury, 2007).

RSCA test-retest stability and internal reliability was examined among non-clinical youth aged 9-18 years (Prince-Embury, 2007). Test-retest reliability was indicated using Fisher's z transformation for Sense of Mastery (.84), Sense of Relatedness (.88), and Emotional Reactivity (.90) (Prince-Embury, 2007). The *RSCA* was administered a second time to 65 adolescents (aged 15-18) over a period of 3-23 ($\bar{x} = 8$) days following initial administration (Prince-Embury, 2007). Test-retest reliability again proved high for Sense of Mastery (.86), Sense of Relatedness (.88), and Emotional Reactivity (.77) (Prince-Embury, 2007). The *RSCA* also boasts high internal consistency for Sense of Mastery (.85-.95), Sense of Relatedness (.89-.95) and Emotional Reactivity (.90-.94).

RSCA construct validity was examined through confirmatory factor analysis (Prince-Embury, 2007). Prince-Embury tested 10 factors and identified 3 models of resilience. Model 3, which consisted of the sense of mastery, sense of relatedness, and emotional reactivity, best fit across gender and age groups (Prince-Embury, 2007). Convergent validity for each subtest was assessed through multiple correlational studies (Prince-Embury, 2007). The Sense of Mastery and Sense of Relatedness subscales positively correlated (.60) with scales on the *Piers-Harris Children's Self-Concept Measure*, Second Edition; a measure of a child's self-concept (Piers, 2002; Prince-Embury, 2007). The Sense of Mastery scale also correlated with the *Connors' Adolescent Symptoms Scale: Short Form (CASS:S)*; Connors, 1997; Prince-Embury, 2007).

Specifically, Sense of Mastery scores negatively correlated with cognitive problems (-.45), conduct problems (-.51), hyperactive-impulsivity (-.37), and attention-deficit hyperactivity disorder (ADHD) (-.60). This supports the *RSCA*'s proposition that it is a measure of resilience. Similarly, the Sense of Relatedness scale negatively correlated with cognitive problems (-.54), conduct problems (-.57), hyperactive-impulsivity (-.48), and ADHD (-.64) (Prince-Embury, 2007). The Emotional Reactivity scale positively correlated with cognitive problems (.59), conduct problems (.59), hyperactive-impulsivity (.48), and ADHD (.65) (Prince-Embury, 2007). This finding is consistent with increased levels of emotional reactivity predicting vulnerability to psychological disorders. Higher levels of emotional reactivity also positively correlated (.49) with vulnerability to bully victimization (Prince-Embury, 2007). Cronbach's α for the *RSCA* resource score for the present study was 0.88. Cronbach's α was also calculated for a sense of mastery (0.94), sense of relatedness to others (0.92), and emotional reactivity (0.80).

Procedure

Procedures followed Clark County Department of Family Services (DFS) and the University of Nevada, Las Vegas policies regarding research with human child participants. The UNLV Office for the Protection of Research Subjects, Institutional Review Board (IRB) and the Social and Behavioral Sciences committee approved protocol #1005-3485M on July 11, 2014. The approved interlocal contract by DFS and UNLV is in accordance with state and country laws regarding youth in protective custody.

Participants included youth identified from a DFS-affiliated site in the Las Vegas area. Youth were referred by DFS to the site for a psychological evaluation following removal from home to determine emotional, educational, and cognitive functioning, and to develop recommendations. All youth had histories of documented maltreatment either to themselves or others in their previous place of residence. No minimum length of placement in DFS custody

was used as a criterion for selection. All youth were in foster care at the time of the study. This study also included youth fostered with relatives and non-relatives.

Details of the research project and objectives were discussed with each child. Researchers also explained to the youth their rights as research participants, the limits of confidentiality, and research confidentiality before attaining assent to participate in the study. Participants were also encouraged to ask questions to the researcher, current caretaker, social worker, or clinician regarding the nature of the study. Participants were advised not to answer questions should they feel any level of discomfort and were notified that they may withdraw at the study at any time without consequences.

Youth completed a demographic and information form, the *CPTSD-I*, and the *RSCA*. Assessments occurred in a confidential environment without the presence of CPS staff. Youth were informed regarding the limits of confidentiality. A trained graduate researcher completed the demographic information sheet, *RSCA*, and the *CPTSD-I* with participants. The *RSCA* and demographic information sheet were administered prior to the *CPTSD-I* to help build rapport with the participant. Administration of the demographic information sheet, *RSCA*, and the *CPTSD-I* lasted approximately 30-45 minutes. The specific administration time varied depending on a youth's trauma history. If a youth failed to endorse a traumatic event ($n = 6$) or requested the interview end ($n = 1$), then the interview was discontinued and remaining measures not administered.

Youth were encouraged to take breaks if needed during the assessment process. If discomfort was noted during the course of the interview, a graduate student was available for support. Follow-up sessions were scheduled to complete the measures if fatigue was noted. An on-site supervisor was informed if youth endorsed intent to harm self or others. Researchers debriefed participants upon completion of the measures and answered any additional questions

participants may ask. Research forms and measures were kept confidential by coding each form with a number to ensure anonymity. De-identified research data is stored in a locked filing cabinet located in a university lab. Youth whose self-report tests contained inconsistent responses or were deemed invalid were excluded ($n = 2$).

Data Analysis

Statistical power was estimated using the G*Power program (Faul, Erdfelder, Buchner, & Lang, 2009). An a priori power analysis indicated that a sample size of 70 would be sufficient to detect a significant relationship between a sense of mastery, sense of relatedness, and emotional reactivity and total PTSD symptoms with a power of 0.81 and an alpha of .05. This analysis was conducted with a moderate estimated effect size, $r^2 = 0.15$ (Cohen, 1988).

Hypotheses 1-3: Resilience and PTSD Symptoms. Hypothesis 1 was that the *RSCA* resource score, defined by *t*-scores on the *RSCA*, would account for a significant amount of the variance in PTSD symptoms. The resource score level was also expected to differentially predict PTSD symptoms in an inverse manner that was stronger for youth reporting above average resource score levels ($t > 60$) than youth reporting average ($t = 40-60$) or below average ($t < 40$) resource score levels. The *RSCA* was used to determine the resilience resource score and the *CPTSD-I* was used to define total symptom score.

First, a regression equation was used to examine the specific strength of the relationship between the resource score and PTSD symptoms. The *RSCA* resource score was the predictor variable and the *CPTSD-I* total symptom score was the criterion variable. Second, a one-way analysis of variance (ANOVA) was used to investigate the variance of PTSD symptoms between above average ($t > 60$), average ($t = 40-60$), and below average ($t < 40$) resource levels. A Tukey HSD post hoc test was used to examine between group differences. Third, to explain the relationship between the level of resilience and PTSD symptoms, *RSCA* scales of a sense of

mastery and sense of relatedness were examined via a stepwise multiple regression equation. *RSCA* scales were the predictor variables and *CPTSD-I* total symptom scores were the criterion variable. Third, individual items and subtests were examined by a multiple regression and individual regression analyses.

Hypothesis 2 was that trauma type would moderate the relationship between the *RSCA* resource score and total PTSD symptoms. Trauma type was dummy coded into a dichotomous variable consisting of “assault-related” trauma and “non-assault” trauma. The *RSCA* resource score was predicted to account for a significant amount of the variance in *CPTSD-I* total PTSD scores differently across assault and non-assault traumas. A moderated multiple regression was used to investigate this hypothesis. The resource variable was centered by subtracting overall participant mean response on the variable from each individual value to avoid potential multicollinearity with the interaction term (Aiken & West, 1991). An interaction term between the resource score and trauma grouping was created and then added to the regression model. The resource center was the predictor variable and the total symptom score (*CPTSD-I*) was the criterion variable. Trauma type was the moderator.

Hypothesis 3 was that the total number of trauma exposures would moderate the relationship between the *RSCA* resource score and total PTSD symptoms. To conserve power, the number of traumatic experiences was dummy coded into a dichotomous variable consisting of a “single trauma” and “multiple traumas” (>1 trauma). The *RSCA* resource score was expected to differentially predict total PTSD scores between single versus multiple traumas. Furthermore, the relationship was expected to be strongest for youth exposed to single trauma exposures than youth endorsing multiple trauma exposures. The resource variable was centered to avoid potential multicollinearity with the interaction term (Aiken & West, 1991). An interaction term between the resource score and number of endorsed traumas was created and

then added to the regression model. A moderated multiple regression was used to investigate this hypothesis. The score on the *RSCA* were the predictor variable and the total symptom score (*CPTSD-I*) was the criterion variable.

Hypotheses 4-6: Emotional Reactivity and PTSD Symptoms. Hypothesis 4 was that emotional reactivity would account for a significant amount of the variance in PTSD symptoms. The *RSCA* was used to determine the emotional reactivity score and the *CPTSD-I* was used to define total symptom score. Emotional reactivity was also expected to differentially predict PTSD symptoms in a positive manner that was stronger for youth reporting above average emotional reactivity levels ($t > 60$) than youth reporting average ($t = 40-60$) or below average ($t < 40$) emotional reactivity levels. The *RSCA* was used to determine the emotional reactivity score and the *CPTSD-I* was used to define total symptom score. First, a regression equation was used to examine the specific strength of the relationship between the emotional reactivity and PTSD symptoms. The *RSCA* emotional reactivity score was the predictor variable and the *CPTSD-I* total symptom score was the criterion variable. Second, a one-way analysis of variance (ANOVA) was used to investigate the variance of PTSD symptoms between above average ($t > 60$), average ($t = 40-60$), and below average ($t < 40$) emotional reactivity levels. Third, individual subtests and items were examined by a multiple regression and individual regression analyses.

Hypothesis 5 was that trauma type would moderate the relationship between emotional reactivity and total PTSD symptoms. Trauma type was dummy coded into a dichotomous variable consisting of “assault-related” trauma and “non-assault” trauma. Emotional reactivity was predicted to account for a significant amount of the variance in *CPTSD-I* total PTSD scores differently across assault and non-assault traumas. A moderated multiple regression was used to investigate this hypothesis. Emotional reactivity was centered by subtracting overall participant

mean response on the variable from each individual value to avoid potential multicollinearity with the interaction term (Aiken & West, 1991). An interaction term between emotional reactivity and trauma type was created and then added to the regression model. The *RSCA* emotional reactivity centered score was the predictor variable and the total symptom score (*CPTSD-I*) was the criterion variable. Trauma type was the moderator.

Hypothesis 6 was that total number of trauma exposures would moderate the relationship between emotional reactivity and PTSD symptoms. To conserve power, the number of traumatic experiences was dummy coded into a dichotomous variable consisting of a “single trauma” and “multiple traumas” (>1 trauma). Emotional reactivity was expected to differentially predict total PTSD scores between single versus multiple traumas. Emotional reactivity was centered to avoid potential multicollinearity with the interaction term (Aiken & West, 1991). An interaction term between emotional reactivity centered and the number of endorsed traumas was created and then added to the regression model. A moderated multiple regression was used to investigate this hypothesis. The emotional reactivity score was the predictor variable and the total symptom score (*CPTSD-I*) was the criterion variable. Number of trauma exposures was the moderator.

Hypothesis 7: Emotional Reactivity as a Moderator of Resilience and PTSD Symptoms.

Hypothesis 7 was that emotional reactivity would moderate the relationship between the *RSCA* resource score and total PTSD symptoms. Emotional reactivity was dummy coded into a dichotomous variable consisting of average to above average emotional reactivity ($t > 40$) and low ($t < 40$) emotional reactivity. Average and above average emotional reactivity were combined to achieve equal samples sizes in each group and to conserve power. A moderated multiple regression was used to investigate this hypothesis. The resource variable was centered by subtracting overall participant mean response on the variable from each individual value to avoid potential multicollinearity with the interaction term (Aiken & West, 1991). An interaction

term between the resource score and emotional reactivity was created and then added to the regression model. The *RSCA* resource score was the predictor variable and the total symptom score (*CPTSD-I*) was the criterion variable. Emotional reactivity was the moderator.

In addition to the primary hypotheses, several post-hoc analyses were conducted to further examine the data. Post-hoc analyses included examining relationships between maltreatment types and resource scores. *RSCA* subtests were also examined in each maltreatment type. A one-way ANOVA also examined group differences between youth reporting maltreatment (neglect, physical and sexual maltreatment) and youth reporting removal from home and witnessing trauma as primary trauma experiences.

CHAPTER 4

RESULTS

Hypotheses 1-3: Resilience and PTSD Symptoms

Hypothesis 1 was that the *RSCA* resource score, a combination of a sense of mastery and sense of relatedness to others, would account for a significant amount of the variance of PTSD symptoms. A linear regression revealed that the *RSCA* resource score explained 15% ($R^2 = 0.15$) of the variance in *CPTSD-I* symptoms ($\beta = -0.39$, $t = -3.41$, $p < .01$). This part of Hypothesis 1 was supported.

The resource score level was also expected to differentially predict PTSD symptoms in an inverse manner that was stronger for youth reporting above average resource score levels ($t > 60$) than youth reporting average ($t = 40-60$) or below average ($t < 40$) resource score levels. An ANOVA indicated that resource score level differentially predicted *CPTSD-I* symptoms as expected ($F(2, 67) = 4.49$, $p < .05$). A post hoc Tukey HSD test indicated significant differences in *CPTSD-I* symptoms between the average and below average resource level (M Difference = 3.25, $p < .05$) (Table 1). Comparisons between the above average and below average resource levels and above average and average were not significant.

Table 1

Means and Standard Deviations for CPTSD-I Symptoms by Resource Level

	\bar{X}	SD
Above Average	8.60	4.09
Average	9.08	3.82
Below Average	12.33	5.43

A stepwise multiple regression indicated that sense of mastery significantly inversely predicted *CPTSD-I* symptoms ($\beta = -0.37$, $t = -3.18$, $p < .01$). The multiple correlation coefficient

was .38, so approximately 13.5% of the variance in *CPTSD-I* symptoms could be accounted for by a sense of mastery. Sense of relatedness to others, however, was not significant (Table 2).

This part of Hypothesis 1 was partially supported.

Table 2

Beta Values with Significance Tests for Independent Variables in the Stepwise Regression Analysis

	B	Std. Error	Beta	T	Sig.
Mastery	-0.11	0.03	-0.37	-3.18	<0.01
Relational	--	--	-0.03	-0.18	0.86

Post Hoc Analyses for Hypothesis 1

Post hoc regression analyses on sense of mastery subtests (optimism, self-efficacy, adaptability) and *CPTSD-I* symptoms revealed a significant, inverse linear relationship regarding optimism and PTSD symptoms, ($\beta = -0.33, t = -2.93, p < .01$). A significant inverse linear relationship was also found regarding self-efficacy and *CPTSD-I* symptoms ($\beta = -0.24, t = -2.80, p < .05$) as well as adaptability and *CPTSD-I* symptoms, ($\beta = -0.39, t = -3.59, p < .01$) (Table 3).

Table 3

Beta Values with Significance Tests for Optimism, Self-efficacy, and Adaptability

	B	Std. Error	Beta	T	Sig.
Optimism	-0.29	0.10	-0.33	-2.93	<0.01
Self-efficacy	-0.15	0.70	-0.24	-2.80	0.04
Adaptability	-0.68	0.19	-0.39	-3.58	<0.01

Optimism. Significant inverse linear relationships were found between optimism items and *CPTSD-I* symptoms with respect to “I can make good things happen,” ($\beta = -0.34, t = -2.97, p < .01$); “Good things will happen to me,” ($\beta = -0.25, t = -2.18, p < .05$); “My life will be happy,”

($\beta = -0.32, t = -2.76, p < .01$); and “No matter what happens, things will be all right,” ($\beta = -0.34, t = -2.97, p < .01$) (Table 4).

Table 4

Beta Values with Significance Tests for Optimism Subscale Items

	B	Std. Error	Beta	T	Sig.
Make happen	-1.32	0.45	-0.34	-2.97	<0.01
Will happen	-1.13	0.52	-0.25	-2.18	0.03
Will be happy	-1.41	0.51	-0.32	-2.76	<0.01
Will be alright	-1.46	0.49	-0.34	-2.97	<0.01

Self-efficacy. Significant inverse linear relationships were found between self-efficacy items and *CPTSD-I* symptoms with respect to “I do things well,” ($\beta = -0.37, t = -3.29, p < .01$); “I make good decisions,” ($\beta = -0.24, t = -2.07, p < .05$); “I can get past problems in my way,” ($\beta = -0.36, t = -3.16, p < .01$); “If I have a problem, I can solve it,” ($\beta = -0.37, t = -3.31, p < .01$); and “I can think of more than one way to solve a problem,” ($\beta = -0.27, t = -2.30, p < .05$) (Table 5).

Table 5

Beta Values with Significance Tests for Self-Efficacy Subscale Items

	B	Std. Error	Beta	T	Sig.
Do well	-1.60	0.49	-0.37	-3.29	<0.01
Good decisions	-1.15	0.55	-0.24	-2.07	0.04
Past problems	-1.61	0.51	-0.36	-3.16	<0.01
Solve it	-1.59	0.48	-0.37	-3.31	<0.01
More than one	-1.05	0.46	-0.27	-2.30	0.02

Adaptability. Significant inverse linear relationships were found between adaptability items and *CPTSD-I* symptoms with respect to “I can learn from my mistakes,” ($\beta = -0.35, t = -3.10, p < .01$); “I can ask for help when I need to” ($\beta = -0.38, t = -3.42, p < .01$); and “I can let others help me when I need to” ($\beta = -0.23, t = -1.99, p = .05$) (Table 6).

Table 6

Beta Values with Significance Tests for Adaptability Subscale Items

	B	Std. Error	Beta	T	Sig.
Learn mistakes	-1.58	0.51	-0.35	-3.10	<0.01
Ask for help	-1.68	0.49	-0.38	-3.42	<0.01
Others help	-1.07	0.53	-0.23	-1.99	0.05

Hypothesis 2 was that trauma type would moderate the relationship between *RSCA* resource score and *CPTSD-I* symptoms. The interaction term between resource and trauma type resulted in an overall model accounting for 23% ($R^2 = 0.23$) of the variance in *CPTSD-I* symptoms ($F(3, 65) = 6.5, p < .01$). The addition of the resource and trauma type interaction resulted in an incremental R^2 change of .032 ($p > .05$). The interaction term failed to account for a significant of the variance, suggesting that trauma type is not a moderator in this sample. Hypothesis 2 was not supported. The plot of the interaction for resource score, *CPTSD-I* symptoms, and trauma type is in Figure 1.

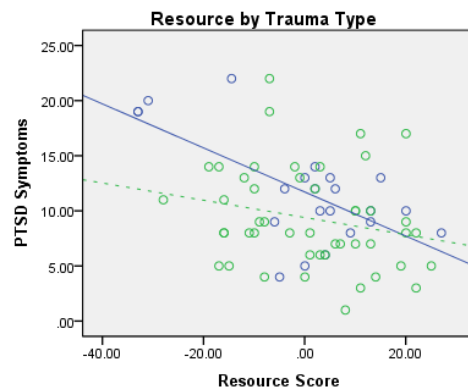


Figure 1: Interaction Between Resilience Resource Score and CPTSD-I Symptoms by Trauma Type

Hypothesis 3 was that number of trauma exposures would moderate the relationship between the resilience resource score and *CPTSD-I* symptoms. The interaction term between resource and number of traumas resulted in an overall model accounting for 21% ($R^2 = 0.21$) of

the variance in *CPTSD-I* symptoms ($F(3, 64) = 5.6, p < .01$). The addition of the resource and trauma type interaction resulted in an R^2 change of .03 ($p > .05$). The interaction term failed to account for a significant of the variance, suggesting that the number of traumas is not a moderator in this sample. Hypothesis 3 was not supported (Figure 2).

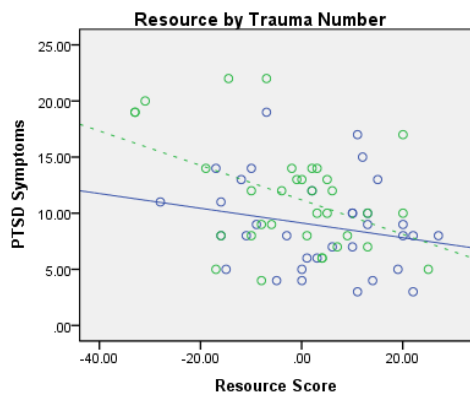


Figure 2: Interaction Between Resilience Resource Score and *CPTSD-I* Symptoms by Number of Traumas Experienced.

Hypotheses 4-6: Emotional Reactivity and PTSD Symptoms

Hypothesis 4 was that emotional reactivity would account for a significant amount of the variance in *CPTSD-I* symptoms in a positive manner. A linear regression revealed that emotional reactivity explained 7.0% ($R^2 = 0.07$) of the variance in *CPTSD-I* symptoms ($\beta = 0.28, t = 2.34, p < .05$).

The emotional reactivity score was also expected to differentially predict PTSD symptoms in a positive manner that was stronger for youth reporting above average emotional reactivity levels ($t > 60$) than youth reporting average ($t = 40-60$) or below average ($t < 40$) emotional reactivity levels. An ANOVA indicated that emotional reactivity level differentially predicted *CPTSD-I* symptoms as expected ($F(2, 65) = 4.19, p < .05$). A post hoc Tukey HSD test indicated significant differences in *CPTSD-I* symptoms between the above average and below average emotional reactivity level (M Difference = 4.70, $p < .05$) and between *CPTSD-I*

symptoms for the above average and average emotional reactivity level (M Difference = 4.92, $p < .05$) (Table 7). Average and below average emotional reactivity levels were not significant.

Thus, hypothesis 3 was partially supported.

Table 7

Means and Standard Deviations for CPTSD-I Symptoms by Emotional Reactivity Level

	\bar{x}	SD
Above Average	14.43	4.76
Average	9.51	4.42
Below Average	9.73	3.56

Post Hoc Analyses for Hypothesis 4

Post hoc regression analyses on emotional reactivity subtests (sensitivity, recovery, and impairment) and *CPTSD-I* symptoms revealed a significant, positive linear relationship regarding sensitivity and *CPTSD-I* symptoms, ($\beta = 0.32$, $t = 3.88$, $p < .01$) (Table 8). A significant positive linear relationship was also found regarding recovery and *CPTSD-I* symptoms ($\beta = 0.27$, $t = 2.32$, $p < .05$) as well as impairment and *CPTSD-I* symptoms ($\beta = 0.42$, $t = 3.85$, $p < .01$).

Table 8

Beta Values with Significance Tests for Sensitivity, Recovery, and Impairment

	B	Std. Error	Beta	T	Sig.
Sensitivity	0.55	0.14	0.43	3.88	<0.01
Recovery	0.40	0.17	0.27	2.32	0.02
Impairment	0.62	0.16	0.42	3.85	<0.01

Sensitivity. Significant positive linear relationships were found between sensitivity items and *CPTSD-I* symptoms with respect to “It is easy for me to get upset,” ($\beta = 0.40$, $t = 3.66$, $p < .01$); “I strike back when someone upsets me,” ($\beta = 0.27$, $t = 2.32$, $p < .05$); “I get very upset when things don’t go my way,” ($\beta = 0.24$, $t = 2.07$, $p < .05$); “I get very upset when people don’t

like me,” ($\beta = 0.28, t = 2.38, p < .05$); and “I can get so upset I can’t stand how I feel,” ($\beta = 0.37, t = 3.28, p < .01$) (Table 9).

Table 9

Beta Values with Significance Tests for Sensitivity Subscale Items

	B	Std. Error	Beta	T	Sig.
Easy upset	1.56	0.43	0.40	3.66	<0.01
Strike back	0.95	0.41	0.27	2.32	0.02
Don’t go way	0.30	0.14	0.24	2.07	0.04
Don’t like me	1.07	0.45	0.28	2.38	0.02
How I feel	1.40	0.43	0.37	3.28	<0.01

Recovery. Significant positive linear relationships were found between recovery items and *CPTSD-I* symptoms with respect to “When I get upset, I stay upset for several hours,” ($\beta = 0.31, t = 2.75, p < .01$); and “When I get upset, I stay upset the whole day,” ($\beta = 0.39, t = 3.47, p < .05$) (Table 10).

Table 10

Beta Values with Significance Tests for Recovery Subscale Items

	B	Std. Error	Beta	T	Sig.
Several hours	1.20	0.44	0.31	2.75	<0.01
Whole day	1.61	0.46	0.39	3.47	0.01

Impairment. Significant positive linear relationships were found between impairment items and *CPTSD-I* symptoms with respect to “I get so upset I lose control,” ($\beta = 0.29, t = 2.55, p < .05$); “When I get upset, I react without thinking,” ($\beta = 0.49, t = 4.61, p < .01$); “When I am upset, I do the wrong thing,” ($\beta = 0.29, t = 2.51, p < .05$); “When I am upset, I hurt someone,” ($\beta = 0.40, t = 3.60, p < .01$); and “When I am upset, I get mixed up,” ($\beta = 0.29, t = 2.41, p < .05$) (Table 11). This part of hypothesis 4 was also supported.

Table 11

Beta Values with Significance Tests for Impairment Subscale Items

	B	Std. Error	Beta	T	Sig.
Lose control	0.50	0.20	0.29	2.55	0.01
React	1.71	0.37	0.49	4.61	<0.01
Wrong thing	1.10	0.44	0.29	2.51	0.01
Hurt someone	2.49	0.69	0.40	3.60	<0.01
Mixed up	1.09	0.45	0.28	2.41	0.01

Hypothesis 5 was that trauma type would moderate the relationship between emotional reactivity and *CPTSD-I* symptoms. The interaction term between emotional reactivity and trauma type resulted in an overall model accounting for 12% ($R^2 = 0.12$) of the variance in *CPTSD-I* symptoms ($F(3, 64) = 2.89, p < .05$). The addition of the emotional reactivity and trauma type interaction resulted in an incremental R^2 change of .027 ($p > .05$). The interaction term failed to account for a significant of the variance, suggesting that trauma type is not a moderator in this sample. Hypothesis 5 was not supported. Figure 3 shows the plot of the interaction for emotional reactivity, *CPTSD-I* symptoms, and trauma type.

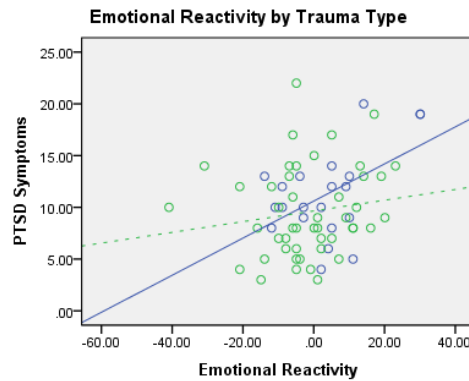


Figure 3: Interaction Between Emotional Reactivity and *CPTSD-I* Symptoms by Trauma Type

Hypothesis 6 was that the total number of trauma exposures would moderate the relationship between the emotional reactivity and *CPTSD-I* symptoms. The interaction term between emotional reactivity centered and number of traumas resulted in an overall model

accounting for 16% ($R^2 = 0.16$) of the variance in *CPTSD-I* symptoms ($F(3, 64) = 3.90, p < .01$). The addition of emotional reactivity centered and trauma type interaction resulted in R^2 of .000 ($p > .05$). The interaction term failed to account for a significant of the variance, suggesting that the number of traumas is not a moderator in this sample. Hypothesis 6 was not supported. Figure 4 shows the plot of the interaction for emotional reactivity, *CPTSD-I* symptoms, and number of traumas.

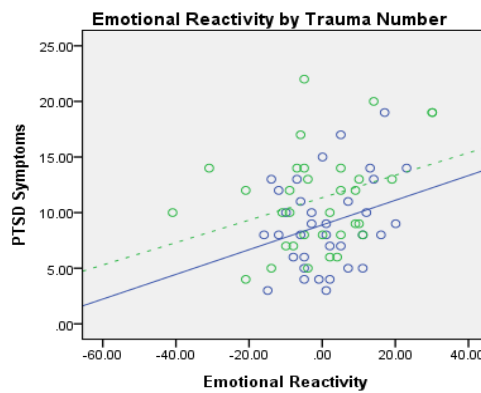


Figure 4: Interaction Between Emotional Reactivity and CPTSD-I Symptoms by Number of Traumas Experienced

Hypothesis 7: Emotional Reactivity as a Moderator of Resilience and PTSD Symptoms

Hypothesis 7 was that emotional reactivity would moderate the relationship between the *RSCA* resource score and *CPTSD-I* symptoms. The interaction term between the resource score and emotional reactivity resulted in an overall model accounting for 16% ($R^2 = 0.16$) of the variance in PTSD symptoms ($F(3, 63) = 3.65, p < .05$). The addition of the resource score and emotional reactivity interaction resulted in an R^2 change of .017 ($p < .05$). The interaction term accounted for a significant of the variance, suggesting that emotional reactivity moderates the relationship between the resource score and *CPTSD-I* symptoms. Figure 5 shows the plot of the interaction for the *RSCA* resource score, *CPTSD-I* symptoms, and emotional reactivity.

Hypothesis 7 was supported.

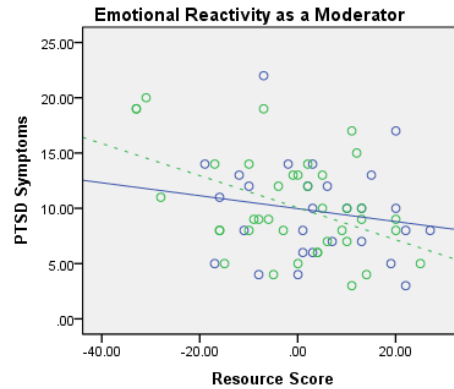


Figure 5: Interaction Between Resilience Resource Score and *CPTSD-I* Symptoms by Trauma Type for Average and High Emotional Reactivity

Additional Post-Hoc Analyses

Sexually maltreated youth evidenced an inverse relationship between the resource score and *CPTSD-I* symptoms ($\beta = -0.78, t = -3.55, p < .05$). Significant inverse relationships were also found for a sense of mastery ($\beta = -0.76, t = -3.30, p < .05$) and a sense of relatedness ($\beta = -0.79, t = -3.68, p < .05$). A positive relationship was found for emotional reactivity ($\beta = 0.70, t = 2.78, p < .05$). No significant findings were found with respect to resource score and *CPTSD-I* symptoms in youth reporting physical maltreatment and in youth reporting removal from home or witnessing a traumatic event.

An ANOVA regarding PTSD symptoms between maltreated youth and youth removed from home or witnessing a traumatic event was not significant ($F(1, 56) = 3.51, p = .07$). An ANOVA regarding the mean resource score between maltreated youth and youth removed from home or witnessing a traumatic event was not significant ($F(1, 56) = 0.16, p = .69$).

CHAPTER 5

DISCUSSION

The present study examined the relationship between sense of mastery, sense of relatedness to others, emotional reactivity, and PTSD symptoms in maltreated youth. Trauma type, number of traumas, and emotional reactivity were also investigated as potential moderators in these relationships. Individuals reporting average resilience displayed fewer PTSD symptoms than youth reporting below average resilience. This finding is consistent with previous studies demonstrating the protective nature of resilience in traumatized youth (Collin-Vézina, Coleman, Milne, Sell, & Daigneault, 2011; Gillespie, Phifer, Bradley, & Ressler, 2009; Zahradnik et al., 2010). No differences, however, were noted between youth reporting high levels of resilience and low levels of resilience. This may be explained by unequal sample sizes between the groups. The majority of the sample reported average to below average levels of resilience. Few youth reported an above average level of resilience, a finding that partly supports the necessity of fostering resilience in youth at risk for PTSD. A sense of mastery best predicted less PTSD symptoms compared to a sense of relatedness and low emotional reactivity.

A sense of mastery is an umbrella term to identify a youth's sense of self-efficacy, optimism, and ability to adapt to new situations (Prince-Embury, 2007). An elevated sense of mastery increases disaster preparedness, promotes long-term health and well-being, and decreases psychological distress (Dalgard, Mykletun, Rognerud, Johansen, & Zahl, 2007; Jang, Chiriboga, Lee, & Cho, 2009; Mishra, Suar, & Paton, 2011). A low sense of mastery may lead to perceptions of failure and negative self-perceptions of personal health (Pulkkinen, Kokkonen, & Mäkiäho, 1998). Sense of mastery subtests for self-efficacy, optimism, and adaptability were inversely related to PTSD symptoms, especially adaptability. Youth with a low sense of mastery

may thus struggle to adapt to new situations often associated with child maltreatment, perceive themselves as failures, have negative self-perceptions, and endorse more symptoms of PTSD.

Perceived relationships to others failed to predict PTSD symptoms in this study. This is contrary to findings from others that social relationships are important for fostering resilience (Kern & Friedman, 2010). One explanation is that, while perceived relationships to others may influence resilience, the relationship is weak and overshadowed by a sense of mastery. For instance, individual characteristics such as cognition, self-perception, and personality traits relate more to resilience than relationships with others (Nasvytienė, Lazdauskas, & Leonavičienė, 2012).

Another explanation for this finding is that perceived relations to others may vary depending on placement status and length of time in foster care (Ahrens et al., 2011; Farineau, Wojciak, & McWey, 2013; Storer, Barkan, Sherman, Haggerty, & Mattos, 2012). Some youth in this study may have experienced additional loss in relationships during the transition into a foster home compared to youth who remained with their family or who had been in foster care for prolonged periods. Other youth, however, may develop new relationships in foster care that did not exist previously.

Hypothesis 2. The second hypothesis was that maltreatment type would moderate the relationship between the resilience resource score and total PTSD symptoms. This hypothesis was not supported. Unequal sample size between groups as well as the specific groupings of maltreatment may explain the failure to find a moderating effect. Sexual and physical maltreatment were also grouped together due to the assaultive nature of both forms of victimization. Sexual and physical maltreatment may result in different clinical presentations, however, such as the severity of PTSD or depression (Danielson, de Arellano, Kilpatrick, Saunders, & Resnick, 2005). Reliance on youth retrospective accounts to determine primary

trauma type may also have contributed to the lack of moderation. This study assumes youth answered interviewer questions in an honest or genuine manner. Many youth, however, may have responded in a guarded manner due to failure to develop rapport, discomfort endorsing trauma, or fear of reprisal for disclosure.

Hypothesis 3. The third hypothesis was that the total number of trauma exposures would moderate the relationship between the resource score and PTSD symptoms. This hypothesis was not supported. This finding diverges from previous evidence that chronic or multiple traumas increase risk for complex PTSD, personality disturbances, and emotional dysregulation (Daud, af Klinteberg, & Rydelius, 2008; Ehring & Quack, 2010; Herman, 1995). One possibility is that trauma type and total number of trauma exposures interact to determine risk and resilience to PTSD symptoms. Youth citing removal from home and neglect may report less trauma symptoms than youth citing instances of sexual and physical maltreatment.

The cognitive appraisal of the traumatic event may also mediate the relationship between resilience, number of traumatic experiences, and PTSD symptoms in maltreated youth. Negative appraisals to a traumatic experience generally predict PTSD symptoms (Sherrer, 2011). Youth in this study, however, were not assessed for their appraisal of an event with respect to their PTSD symptoms. These appraisals may also vary by culture and ethnicity, variables that were not accounted for in this analysis (Jobson, & O’Kearney, 2009).

Hypothesis 4. The fourth hypothesis was that emotional reactivity would account for a significant amount of the variance in PTSD symptoms in a positive manner. Indeed, as emotional reactivity increased, symptoms of PTSD also increased. Individuals reporting above average emotional reactivity reported more PTSD symptoms than youth reporting below average and average emotional reactivity. These findings are consistent with previous literature that emotional reactivity increases risk for various psychological disorders (Kaczmarek & Zawadzki,

2012; Klanecky & McChargue, 2006; Strelau & Zawadzki, 2011). Item analysis also supported the notion that emotional reactivity and dysregulation relate to symptoms of PTSD.

Despite these findings, the relationships appeared to be weak. This is contrary to previous literature that demonstrates a relationship between high levels of emotional reactivity and elevated PTSD symptoms (Cavanagh, Fitzgerald, & Urry, 2014; Kaczmarek & Zawadzki, 2012). Studies such as these were limited to populations exposed to non-maltreatment-related trauma. One explanation may be the timing of clinical assessment. Symptoms of dissociation, emotional numbing, and disengagement from others frequently occur following a trauma (Feeny, Zoellner, Fitzgibbons, & Foa, 2000). This study failed to differentiate an acute trauma response from a general trait of low emotional reactivity.

The ability to regulate emotions may vary by age and represents an ongoing process involving brain maturation, personality, parental support, living environment, and culture of origin (Zhao, Zhang, & Zhou, 2014). Developmental differences may partially account for differences within emotional reactivity scores independent of PTSD symptoms. Younger children demonstrate external, behaviorally oriented, regulatory strategies while older youth exhibit more sophisticated internal and cognitive strategies (Rawana, Flett, McPhie, Nguyen, & Norwood, 2014). Younger adolescents also demonstrate fewer emotional regulatory strategies than older adolescents (Zimmerman & Iwanski, 2014).

Hypothesis 5. The fifth hypothesis was that trauma type would moderate the relationship between emotional reactivity and PTSD symptoms. This hypothesis was not supported. Unequal sample sizes and reliance on retrospective reports may have impacted the findings. Furthermore, emotional reactivity may remain independent of trauma type. Youth with high levels of emotional reactivity may have additional risk for PTSD irrespective of maltreatment type. For example, high levels of emotional reactivity associates with increased intensity and

duration of negative emotions and may increase susceptibility for psychopathology (Allen, Greenlees, & Jones, 2014).

Hypothesis 6. The sixth hypothesis was that the total number of trauma exposures would moderate the relationship between the emotional reactivity and PTSD symptoms. This hypothesis was not supported. The types of trauma experienced, the specific number of experienced traumas, and the cognitive appraisal of the event again may have impacted the nature of this result.

Hypothesis 7. The seventh hypothesis, that emotional reactivity would moderate the relationship between the *RSCA* resource score and total PTSD symptoms, was supported. Indeed, youth with average or above average emotional reactivity endorsed more PTSD symptoms than youth with low emotional reactivity. The inclusion of the interaction term, however, resulted only in slight transformations to the overall model. One explanation is that average and above average scores on emotional reactivity were combined into a single group to conserve power and equalize sample sizes between groups. The inclusion of individuals indicating average emotional reactivity may have significantly reduced the impact of emotional reactivity on PTSD symptoms. Many studies support the relationship between high emotional reactivity and internalizing symptoms (Morgan, Izard, & Hyde, 2014), but fewer examine the impact of average emotional reactivity on psychopathology.

Clinical Implications

Resilience continues to represent an important avenue of research to further understand the emergence and prevention of psychological disorders in vulnerable populations. This present study increases understanding of these factors and contains implications in the assessment, treatment, and prevention of psychological disorders. These areas of clinical focus are explored next.

Assessment. Resilience assessment is multidimensional in nature and identifies specific behavioral antecedents of resilient functioning (Pangallo, Zibarras, Lewis, & Flaxman, 2015). This study supports the usefulness of a multidimensional approach by examining a number of resilience factors and is consistent with recently developed assessment instruments. The *Resiliency Scale for Children and Adolescents* (Prince-Embury, 2007) embodies one such assessment instrument for use with children and is useful to guide future interventions.

The *Connor Davidson Resilience Scale (CD-RISC)* represents an alternative measure to assess resilience factors and is normed for multiple populations, including youth (Connor & Davidson, 2003). The *CD-RISC* is a self-report measure that consists of 25 questions measuring a variety of factors associated with resilience in the extant literature (Connor & Davidson, 2003). The *CD-RISC* contains items related to a sense of mastery, adaptability, coping behaviors, and positive cognitions (Connor & Davidson, 2003). These items closely mirror the findings in this study, which demonstrated a link between PTSD symptoms and sense of mastery subscales of adaptability and optimistic thoughts. The *CD-RISC* also comes in abbreviated versions useful for brief screening of resilience (Connor & Davidson, 2003).

A strengths-based approach to assessment modifies assessment findings in a way to engender hope, empathy, and foster rapport and collaboration (Levak, Siegel, Nichols, & Stolberg, 2011). In maltreated youth, this may include shifting findings away from a traumatic event, focusing on present resources and youth skillsets, and identifying ways to enhance quality of life. A strengths-based approach also allows for individual tailoring of clinical, behavioral, and educational interventions in youth (Nickerson & Fishman, 2013).

Treatment. Treatment targeting clinical skillsets associated with a sense of mastery may enhance resilience to PTSD. Sense of mastery improvements correlate to positive social and personal adjustment among maltreated youth (Lipschitz-Elhawi & Itzhaky, 2005). As a result,

interventions centered on optimism, adaptability, self-efficacy, and a sense of mastery should be a central treatment focus in working with maltreated youth (Prince-Embury, 2007).

Trauma-Focused Cognitive Behavioral Therapy (TFCBT) receives considerable attention for its strong empirical backing and efficacy in treating youth exposed to trauma (Diehle, Opmeer, Boer, Mannarino, & Lindauer, 2015). TFCBT appears to demonstrate increased efficacy in treating trauma over psychodynamic therapy, hypnotherapy, stress management, and non-directive therapy (Jiang, An, & Wu, 2014). TFCBT consists of eight elements to intervention: psychoeducation, parental skills, relaxation, affective modulation, cognitive coping, cognitive processing of the traumatic event, in-vivo exposure, and enhancing future safety (Cohen, Mannarino, & Deblinger, 2006). The addition of a module centered on enhancing resilient factors, such as an increased sense of mastery, may decrease risk of future exposures and trauma symptoms in maltreated youth. Specifically, interventions focused on enhancing optimistic thoughts, self-efficacy, and adaptability may foster resilience. These may include designing and empirically testing tasks that help children establish a sense of control within life problems, group activities geared for individual child success, reinforcement for success, and opportunities for positive constructive feedback.

This study also demonstrated that higher levels of emotional reactivity moderate the relationship between resilience factors and PTSD symptoms. Dialectical Behavior Therapy (DBT) lends itself to skills training and emotional regulation in adolescents exposed to trauma (Berk, Shelby, Avina, & Tangeman, 2014; Linehan, 1993). DBT combines cognitive behavioral therapy with mindfulness-based practices to aid in reductions of a distorted sense of self, emotional regulatory problems, and self harm in youth with PTSD symptoms (DeRosa & Rathus, 2013). DBT also fosters resilience by enhancing flexible problem-solving strategies, encouraging cognitive-focused coping, and reducing self-harming behaviors (Lang & Sharma-

Patel, 2011; Marra, 2011). This study revealed that added sensitivity to emotionally provoking stimuli and emotional impairment increase risk for PTSD symptoms. The coaching of DBT coping strategies may mediate this relationship by helping youth effectively manage distress and reduce impairment caused by emotional dysregulation. Longer recovery period from emotionally provoking events also predicted PTSD symptoms. Interventions on proactive use of emotional regulatory strategies may reduce emotional recovery time and help counteract negative trauma responses. Future treatments might integrate specific behavioral strategies, such as planning community activities designed build self-efficacy and reduce emotional reactivity, within a DBT framework.

Focus should also be directed to enhancing environmental antecedents that are predictive of a sense of mastery. Level of education and participation in athletic physical activities closely associate with developing a sense of mastery (Covey & Feltz, 1991; Dalgard, Mykletun, Rognerud, Johansen, & Zahl, 2007). Social support may also predict an increased sense of mastery (Gadalla, 2009). Treatment programs therefore should focus on assessing and developing interventions specifically targeting these environmental predictors of a strong sense of mastery.

Prevention. Prevention based practices significantly reduce risk for many common mental health disorders and represent a cost-effective approach to clinical practice (D'Arcy & Meng, 2014). A key strategy to prevention includes incorporating these practices early within the lifespan of individuals at risk for mental health disorders (D'Arcy & Meng, 2014). Findings from this study contribute to prevention by identifying salient variables that may reduce risk for mental health disorders.

Future studies should investigate the role of a sense of mastery and reduced emotional reactivity in aiding preventative efforts to psychopathology. Others have already identified

increasing a sense of mastery as a key intervention in disaster preparedness, social adjustment, and personal adjustment (Lipschitz & Itzhaky, 2005; Mishra, Suar, & Paton, 2011). A sense of mastery, however, remains underresearched within a maltreatment population. High levels of emotional reactivity may also predispose youth to developing psychopathology. Preventative efforts may therefore benefit by incorporating emotional regulation strategies in the prevention regimen.

Limitations

Several constraints limit the interpretability of these results. This study relied on a youth's self-report regarding the nature of the primary trauma. Self-report alone, however, introduces the possibility that youth may have responded in a guarded manner, refused to disclose maltreatment due to failure to develop adequate rapport with the investigator, or worried about the consequences of their disclosing trauma or maltreatment. In other cases, wording and prompts on the PTSD questionnaire may have prompted youth to endorse an event as traumatic even if cognitively appraised as non-traumatic. Reliability of youth self-report of maltreatment is mixed. Sexually maltreated youth evidenced low agreement in comparisons of child protective services records with youth self-report (Milne & Collin-Vézina, 2014). Others indicate that older youth may over-disclose instances of physical and emotional maltreatment compared to their case files while younger youth may over report sexual abuse (Hambrick, Tunno, Gabrielli, Jackson, & Belz, 2014).

Secondly, this study failed to account for time as a potential moderator of the relationship between a traumatic event and resilience. The majority of the sample used in this study consisted of youth removed from home approximately 1-month to a year prior to assessment. The specific time of trauma occurrence, however, was not accounted for. PTSD symptoms may decrease in time following removal from stressful or high-risk environments, exposure to new

sources of social support, and the development of new peer and community relationships.

Third, trauma type was not equally differentiated in this study and sample size remained small for each subtype of trauma exposure. Conducted analyses were limited to groupings based on similarities of trauma experience. For example, in this study physical and sexual maltreatment were combined and compared to removal from home, witnessing a traumatic event, and other trauma. These combinations attempted to mirror differences in clinical empirical findings between maltreatment types. Child sexual and physical maltreatment often correlate with added risk for PTSD symptoms compared to other maltreatment types (Kisiel et al., 2014; Spinhoven, Penninx, van Hemert, de Rooij, & Elzinga, 2014; Spitzer, Chevalier, Gillner, Freyberger, & Barnow, 2006). The relationship between PTSD and resilience may also vary based on differences within trauma subtypes. For instance, negative psychological effects of child sexual abuse fluctuate by the specific type of sexual maltreatment (penetration vs. no penetration), chronic maltreatment, and relationship to the perpetrator (Cantón-Cortés, Cortés, & Cantón, 2015).

Fourth, this study failed to account for additional transitional phases that often occur for youth in foster care. These key transitional phases may heighten vulnerability to additional mental health problems, including PTSD, in youth (Valdez, Bailey, Santuzzi, & Lilly, 2014). Transitional phases may include moving to a new foster home, starting middle or high school, starting a new school, separation from siblings or other family members, and others.

Fifth, this study relied on a correlational design. As a result, this study failed to account for additional vulnerability factors beyond maltreatment exposure and maltreatment type that might account for the reported findings. The victim's relationship to the perpetrator, delayed disclosure of maltreatment, level of self-blame at time of maltreatment, and the reaction from others regarding maltreatment disclosure may moderate risk for PTSD in maltreated individuals

(Ullman, 2007). Youth exposed to less severe traumatic experiences may also cite a greater perceived ability to handle their trauma, resulting in a correlation between a sense of mastery and PTSD symptoms. Each of these factors may moderate the relationship between trauma and PTSD symptoms.

Sixth, this study relied on a measure of posttraumatic stress designed according to DSM-IV standards. The introduction of the DSM-5 acknowledges advancements in the understanding of posttraumatic stress in youth. At the time of this study, no current valid and reliable measure for assessing PTSD in youth according to a DSM-5 conceptualization existed. As a result, this study was limited by focusing solely on symptoms of PTSD and remained unable to examine diagnosis.

Recommendations for Further Studies

Findings and limitations from this study provide a number of implications for future research directions. Future researchers, when possible, should attempt to gather data related to maltreatment from multiple informants such as the Department of Family Services, caretakers, and clinicians familiar with the child. Researchers should also account for youth who may be guarded or minimizing their maltreatment experience when conducting data analyses. Furthermore, an examination of a youth's perception and cognitions related to the traumatic event should occur. Some youth, despite meeting criteria for maltreatment, may perceive the event as non-traumatic or non-severe. These perceptions may moderate the relationship between resilience factors and PTSD symptoms.

A full understanding of the protective nature of resilience factors associated with maltreatment necessitates a longitudinal inquiry from the time of maltreatment to adulthood and beyond. Unfortunately, this method remains costly and is rarely conducted. The practice of identifying specific youth for reassessment remains difficult due to the nature of protected and

confidential information associated with child maltreatment, multiple foster home placement, and general attrition. Future studies should focus on identifying cost-effective methods for continued research on the nature and course of resilience over time.

This present study attempted to differentiate the role of maltreatment type in the relationship between resilience and PTSD. Small sample size among other limitations reduced the generalizability of the reported findings. Future studies should expand on this study by examining maltreatment type within a larger and diverse sample complete with separate analyses for each maltreatment type. Researchers may also consider examining ethnicity as a moderating variable between resilience factors and PTSD for each maltreatment type. Similarly, a number of additional moderating variables may affect the relationship between resilience and PTSD symptoms. For instance, researchers should examine how the perpetrator of the maltreatment, time of removal from home, and place of current residence, may affect the relationship between resilience and maltreatment. Consideration should also be given key transitional phases in a youth's upbringing. Future studies should examine the role of changes in school, new placements, and other transitions on youth resilience.

Future studies should also incorporate assessment measures conceptualizing PTSD within a DSM-5 framework. This includes acknowledging additional symptoms such as dissociation and including specific criteria of PTSD among different age groups. Finally, few studies examine the role of resilience factors in a treatment and prevention model. Future studies should examine factors such as a sense of mastery to determine efficacy in psychopathology and relapse prevention.

Conclusion

This study examined the resilience factors of a sense of mastery, sense of relatedness, and emotional reactivity within an ethnically diverse sample of maltreated youth. In addition, this

study examined trauma type and the degree of trauma exposure as moderators between resilience and PTSD symptoms. This study adds to the extant literature by acknowledging the role of resilience variables in predicting overall PTSD symptoms. Furthermore, this study lends support to a transactional protective-protective model of resilience. Youth in this sample exhibited decreased PTSD symptoms when endorsing resilience factors, however, this relationship was moderated by emotional reactivity. As a result, developing factors such as a sense of mastery, and teaching emotional regulatory skills may lead to further improvement in other areas of resilience (social skills, emotional regulation). Due to the relatively recent arrival of resilience research in the literature, considerable research is still required to understand role of resilience variables in predicting mental health outcomes.

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- Zolkoski, S. M., & Bullock, L. M. (2012). Resilience in children and youth: A review. *Children And Youth Services Review*, 34(12), 2295-2303. doi:10.1016/j.childyouth.2012.08.009
- Zoroglu, S.S., Tuzun, U., Sar, V., Ttkun, H., Savas, H.A., Ozturk, M., et al. (2003). Suicide attempt and self-mutilation among Turkish high school students in relation with abuse, neglect, and dissociation. *Psychiatry and Clinical Neurosciences*, 57, 119-126.
- Žunić-Pavlović, V., Pavlović, M., Kovačević-Lepojević, M., Glumbić, N., & Kovačević, R. (2013). The relationships between personal resiliency and externalising and internalising problems in adolescence. *Československá Psychologie*, 57(1), 1-14.

Curriculum Vitae

Name: Timothy Landan Day
E-mail: dayt8@unlv.nevada.edu

Education:

M.A. Psychology, University of Nevada, Las Vegas, May 2013

Thesis: *Resilience and Trauma in Maltreated Youth*

Committee Chair: Christopher A. Kearney, Ph.D.

B.A. Psychology, Whitworth University, May 2009

Senior Thesis: *Music's Influence on the Availability of Aggressive Constructs*

Advisor: Patricia Bruininks, Ph.D.

College Cumulative GPA 3.8

Predoctoral Clinical Training

Practicum

2015

Practicum Therapist: *Disability Regional Center. Community Mental Health*

Supervisors: Jamie Lee, Psy.D. and Lisa Linning, Ph.D.

Responsibilities: Provide psychological services to patients through group-based dialectical behavioral therapy program, consult in the Human Rights Committee and Behavioral Intervention Committee, and participate in a multidisciplinary treatment team.

Hours: Approximately 10 hours per week

2013-2015

Practicum Therapist: *Desert Willow Treatment Center. State Inpatient Facility*

Supervisors: Caron Whipple, Ph.D. & Robert Kutner, Psy.D.

Responsibilities: Provide psychological services to patients in an acute and residential inpatient setting. Services include individual, group, and family sessions to patients using cognitive behavioral, dialectical behavioral, acceptance and commitment, family behavioral, and motivational interviewing based interventions; conduct cognitive, personality, and academic evaluations; diagnosis; work as part of a multidisciplinary team with psychiatrists, physicians, nurses, social workers, rehabilitation therapist, school teachers, and family members; crisis management; and participate and conduct intakes and treatment planning with adolescent sexual perpetrators.

Hours: Approximately 20 hours per week

2012-2013

Practicum Therapist: *Desert Psychological. Community Mental Health*

Supervisors: Silvie Kendall, Ph.D. & Ayako Sakuragi, Psy.D.

Responsibilities: Provided psychological services to youth in Department of Family Services custody. Specialized in child trauma and maltreatment cases. Services included individual therapy using trauma-focused cognitive behavioral therapy and eclectic approaches; comprehensive evaluation of cognitive, academic, personality, visual motor, and developmental ability; diagnosis using symptom checklists; program development including the incorporation of a strength and resiliency based paradigm; and community outreach.

Hours: Approximately 20 hours per week

- 2011-2012 **Practicum Therapist: *The UNLV Child School Refusal and Anxiety Disorders Clinic. Departmental Sponsored Community Clinic***
Supervisor: Christopher A. Kearney, Ph.D.
Responsibilities: Provided psychological services to youth refusing school due to anxiety and conduct related problems. Services included symptom evaluations using self-reports, checklists, and structured clinical interviews; functional behavioral analysis; treatment planning; coordinating interventions with family and school districts using a cognitive behavioral approach consisting of exposure therapy, contingency management, and cognitive restructuring techniques; collecting data through the Las Vegas truancy court to aid future assessment and research, and presenting workshops to school district employees.
Hours: Approximately 15 hours/week
- 2010-2011 **Practicum Therapist: *Center for Individual, Couple, and Family Counseling. Departmental Sponsored Community Clinic***
Supervisors: Christopher A. Kearney, Ph.D. & Michelle Paul, Ph.D.
Responsibilities: Provided psychological services to youth and adults experiencing a wide variety of presenting concerns. Services included conducting intake interviews and treatment planning; case presentations, individual and family therapy sessions consisting of an eclectic and flexible approach with an emphasis on cognitive behavioral interventions; and comprehensive psychodiagnostic assessments.
Hours: Approximately 25 hours/week
- 2008-2009 **Undergraduate Field Placement: *Eastern State Hospital. Adult Psychiatric Hospital***
Supervisor: Susan Bordges
Responsibilities: Provided psychological services to adults in residential care. Services included co-facilitation of group therapy, and development of therapeutic exercises.
Hours: Approximately 10 hours per week

Provision of Supervision

- 2014 ***The Partnership for Research, Assessment, Counseling, Therapy and Innovative Clinical Education, Departmental Sponsored Community Clinic, Summer Term***
Requirements: Systematic training and coursework in supervision, tape review of supervision sessions with licensed psychologist, weekly “supervision of supervision” sessions with licensed psychologist, 11 hours of supervision with supervisee.
Supervisory Style: A collaborative process tailored to the supervisee’s developmental level and supervisee’s clients consisting of systematic feedback, guided reflection, and evaluation used to foster supervisee development and ensure client safety by integrating research and theory with practice.
Supervisory Responsibilities: Included individual weekly supervision of a junior

practicum student and video-review, continued assessment of the supervisee's development, and the application of cognitive behavioral based interventions as needed.

Select, Specialized Workshops Attended

SP2014	Dialectical Behavior Therapy for Families and Couples with Dr. Allen Fruzzetti
FA2013	Using Trauma-Focused Cognitive Behavioral Therapy with Dr. Caron Whipple
SP2012	Treating Adolescent Substance Abuse with Dr. Brad Donohue
FA2011	Couples Treatment, Nevada State Psychological Association with Dr. John Friel
FA2010	Acceptance and Commitment Therapy, Nevada State Psychological Association with Dr. Victoria Follette
FA2009	Positive Psychology, Nevada State Psychological Association, Dr. Wanda Bethea

Research Experience

Publications

- Day, T.L.** & Kearney, C.A. (2015). Relating to others, resilience and posttraumatic stress symptoms in maltreated youth. *Journal of Psychology and Psychotherapy Research*.
- Kearney, C.A., Ross, E.H., & **Day, T.L.** (in press). Posttraumatic stress disorder in maltreated youth. In C. Martin, V.R. Preedy, & V.B. Patel (Eds.), *Comprehensive guide to post-traumatic stress disorders*. New York: Springer.
- Barchard, K. A., Hurlburt, R. T., Westfall, R. S., Ullman, J., & **Day, T.** (2012). *Item bank for Comprehending Behavioral Statistics* (5th edition) by Russell Hurlburt. Contains 1586 items for 20 quizzes. Available as part of *Personal Trainer 5.0* from Russell Hurlburt, russ@unlv.nevada.edu
- Wechsler, A., Kearney, C.A., Kaur, H., & **Day, T.**, (2012) Posttraumatic Stress Disorder and Removal from Home as a Primary, Secondary, or Disclaimed Trauma in Maltreated Adolescents. *Journal of Family Violence*, 27 (8). 813-818
- Kearney, C.A., Haight, C., & **Day, T.L.** (2011). Selective mutism. In D. McKay & E. Storch (Eds.), *Handbook of child and adolescent anxiety disorders* (pp. 275-287). New York: Springer.
- Kearney, C.A., Gauger, M., Schafer, R., & **Day, T.** (2011). Social and performance anxiety and oppositional and school refusal behavior in adolescents. In C.A. Alfano & D.C. Beidel (Eds.), *Social anxiety disorder in adolescents and young adults: Translating developmental science into practice* (pp. 125-141). Washington, DC: American Psychological Association.

Conference Presentations:

Workshops:

- Day, T.L.**, Kearney, C. (2013, March). *Assessment of School Refusal*. Presented at the annual meeting of the School Social Work Association, San Diego, CA.
- Day, T.L.**, Ross, E. (2013, February). *Posttraumatic Stress Disorder in Maltreated Youth*. Presented at a staff development continuing education conference for Las Vegas social workers, Las Vegas, NV.
- Day, T.L.**, Kearney, C. (2011, November). *Selective Mutism: Characteristics, Assessment, and Treatment*. Presented at a staff development continuing education conference for Las

Vegas social workers, Las Vegas, NV.

Day, T.L., Kearney, C. (2011, October). *School Refusal Behavior: Characteristics, Assessment, and Treatment*. Presented at a staff development continuing education conference for Las Vegas social workers, Las Vegas, NV.

Research Presentations:

Day, T.L. (2011, March). *Posttrauma Cognitive Functioning as a Predictive Factor of the Severity of PTSD in Maltreated Youth*. Research presented at the annual meeting of the Anxiety Disorders Association of America, New Orleans, LA.

Day, T.L. (2011, March). *Active Imagination and Level of Absorption as Predictors of PTSD in Maltreated Youth*. Research presented at the annual meeting of the Anxiety Disorders Association of America, New Orleans, LA.

Poster Presentations:

Wilks, C., Fayeghi, J., Kaur, H., **Day, T.**, Wechsler, A., & Kearney, C. (2012, April). Low self-esteem as a risk factor of PTSD in a sample of maltreated youth. Poster to be presented at the annual convention at The Anxiety Disorder Association of America in Washington D.C.

Fayeghi, J., Wilks, C., Kaur, H., **Day, T.**, Wechsler, A. & Kearney, C. (2012, April). The relationship between family conflict and PTSD in maltreated youth. Poster to be presented at the annual convention of The Anxiety Disorder Association of America in Washington D.C.

Day, T., Wechsler, A., Kaur, H., Kearney, C.A. (2011, April). Examining Optimism as a Resilience Factor in Traumatized Maltreated Youth. Poster presented at the annual meeting of the Western Psychological Association, Los Angeles, CA.

Day, T.L., Kaur, H., Wechsler, A., & Kearney, C.A. (2010, November). *Ethnic Identity as a Protective Factor in Maltreated Youth in a Minority Population*. Poster presented at the annual meeting of the Association for Behavioral and Cognitive Therapies, San Francisco, CA.

Wechsler, A., Kaur, H., **Day, T.L.**, & Kearney, C.A. (2010, November). *Risk and Resiliency Factors in Posttraumatic Stress Disorder in Maltreated Youth*. Poster presented at the annual meeting of the Association for Behavioral and Cognitive Therapies, San Francisco, CA.

Kaur, H., Wechsler, A., **Day, T.L.**, & Kearney, C.A. (2010, November). *Cognitive Functioning as a Predictor for the Onset of PTSD Symptoms Following Child Maltreatment*. Poster presented at the annual meeting of the Association for Behavioral and Cognitive Therapies, San Francisco, CA.

Day, T.L., & Bruininks, P. (2009, October). *Distinguishing Hope and Optimism*. Poster presented at 2009 Nevada Psychological Association Positive Psychology Workshop, Las Vegas, NV.

Bruininks, P., **Day, T. L.**, Furber, C., & Bellwood, C. (2009, April). *Hope: A nonpartisan emotion*. Poster presented at the annual meeting of the Western Psychological Association, Portland, OR.

Day, T.L., Bruininks, P. (2009, April). *Hope and Optimism: The Influence of Appraisals on Positive-Anticipatory Emotions*. Poster presented at the annual meeting of the Western Psychological Association, Portland, OR.

- Day, T.L.** (2009, April). *Music and Effects on the Availability of Aggressive Constructs*. Poster presented at the annual meeting of the Western Psychological Association, Portland, OR.
- Day, T.L., Rylaarsdam, S., Schwarz, M., Carlson, A., Hamilton, T.** (2008, December). *The Representation of Self Among Online Social Communities*. Poster presented at the Annual Whitworth Psychology Conference, Spokane, WA.

Research Positions:

- 2009-Present **Graduate Research Assistant:** University of Nevada, Las Vegas, Department of Psychology. Topics: *Child and Adolescent Posttraumatic Stress Disorder*. Principle Investigator: Christopher A. Kearney, Ph.D.
- Summer 2010 **Graduate Research Assistant:** University of Nevada, Las Vegas, Department of Psychology. Topics: *Treating Math Anxiety with Cognitive-Behavioral Therapy*. Principle Investigator: Mark A. Ashcraft, Ph.D.
- 2009-2010 **Graduate Research Assistant:** University of Nevada, Las Vegas, Department of Psychology. Topics: *School Refusal in Child and Adolescents*. Principle Investigator: Christopher A. Kearney, Ph.D.
- Spring 2009 **Research Assistant:** Whitworth University, Department of Psychology. Topics: *Assessing Public Relations with Local Law Enforcement*. Principle Investigator: Adrian Teo, Ph.D.
- 2008-2009 **Research Assistant:** Whitworth University, Department of Psychology. Topics: *Hope and Optimism, Influence of Appraisals*. Principle Investigator: Patricia Bruininks, Ph.D.
- 2008-2009 **Research Assistant:** Whitworth University, Department of Psychology. Topics: *Social networking, online communities, personality*. Principle Investigator: Noel Wescombe, Ph.D.

Teaching Experience

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- SP2015 **Instructor:** Psychology 360: Social Psychology, 2 sections, University of Nevada, Las Vegas
- FA2014 **Instructor:** Psychology 360: Social Psychology, 2 sections, University of Nevada, Las Vegas
- SP2014 **Instructor:** Psychology 438: Child Behavior Disorders, 1 section, University of Nevada, Las Vegas
- SP2014 **Instructor:** Psychology 360: Social Psychology, 1 section, University of Nevada, Las Vegas
- FA2013 **Instructor:** Psychology 341: Abnormal Psychology, 1 section, University of Nevada, Las Vegas
- FA2013 **Instructor:** Psychology 341: Social Psychology, 1 section, University of Nevada, Las Vegas
- SP2013 **Instructor:** Psychology 101, 1 section, University of Nevada, Las Vegas
- SP2013 **Instructor:** Psychology 438: Child Behavior Disorders, 1 section, University of Nevada, Las Vegas
- FA2012 **Instructor:** Psychology 438: Child Behavior Disorders, 1 section, University of Nevada, Las Vegas
- FA2011 **Instructor:** Psychology 101, 2 sections, University of Nevada, Las Vegas
- Average course evaluation ratings: 3.8/4.0

Awards and Recognition

- 2009 3rd Place Runner-Up Student Poster Award, Nevada Psychological Association.
- 2009 Magna Cum Laude, Whitworth University
- 2009 Whitworth University Laureate Society Member
- 2008 Whitworth University Psychology Department Scholarship
- 2009 Weyerhaeuser Younger Scholar Fellowship Scholarship, Whitworth University
- 2009 Whitworth University Student Academic Scholarship
- 2008 Psi Chi Honor Society, Whitworth University
- 2008 Whitworth University Student Academic Scholarship
- 2007 Whitworth University Student Academic Scholarship
- 2005 Dollars for Scholars Medical Scholarship

Service and Leadership Positions

- 2015 Volunteer, Nevada Psychology Legislative Committee
- 2012 Volunteer, Treating Adolescent Substance Abuse with Dr. Brad Donohue
- 2011-2012 Cohort Representative, Clinical Student Committee, UNLV
- 2010-2015 Incoming Graduate Student Mentor, UNLV Department of Psychology
- 2009-2015 Graduate Student Mentor to Minority Undergraduate Students at UNLV, Outreach Undergraduate Mentoring Program (OUMP)
- 2009 Volunteer, National Alliance of Professional Psychology Providers Conference
- 2005-2006 Volunteer, Overcomer Outreach

Professional Memberships

- 2009-Present American Psychological Association (student affiliate)
- 2009-Present Nevada State Psychological Association (student affiliate)