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# Childhood Maltreatment and Posttraumatic Stress Symptom Clusters: The Mediating Role of Early Maladaptive Schemas

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# CHILDHOOD MALTREATMENT AND POSTTRAUMATIC STRESS SYMPTOM CLUSTERS: THE MEDIATING ROLE OF EARLY MALADAPTIVE SCHEMAS

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## ABSTRACT

The current study tested a structural equation model to examine the associations between types of childhood maltreatment (i.e., neglect, punishment, and sexual abuse), Jeffrey Young's early maladaptive schemas (EMSs), and posttraumatic stress disorder (PTSD) symptom clusters (i.e., avoidance, hyperarousal, intrusion, and negative alterations in cognitions and mood) in a sample of college students. Childhood maltreatment is a pervasive problem in the United States of America and has several short- and long-term physical and psychological consequences. Of note, victims of childhood maltreatment are at an elevated risk of developing PTSD. Further, childhood maltreatment and PTSD are associated with negative alterations in cognitive and emotional patterns. Early maladaptive schemas are relatively stable, negative cognitive, emotional, and behavioral patterns that emerge from abuse, neglect, or at-risk parenting styles. Individuals with a history of abuse and neglect have elevated levels of early maladaptive schemas across several schema domains. Although relatively sparse, studies have also shown EMSs to predict PTSD status and severity; however, the role of specific schemas in the association between childhood maltreatment types and PTSD symptom clusters requires further investigation. To address this, the current study tested the mediating role of early maladaptive schemas in the association between childhood maltreatment types and PTSD symptom clusters. Results showed significant direct and indirect associations. Neglect was positively and significantly associated with mistrust, insufficient self-control, vulnerability to harm, and self-sacrifice; however, no such associations were found for punishment or sexual abuse. Further, indirect paths were found leading to the PTSD symptom clusters via EMSs. For instance, neglect was associated with hyperarousal via vulnerability to harm and, similarly, with intrusion via vulnerability to harm. Further, neglect exhibited an indirect path to avoidance through the EMS of mistrust. Finally, neglect had an indirect path to negative cognitions and mood through self-sacrifice. There were no significant indirect paths leading from punishment and sexual abuse. Results emphasize the impact of childhood neglect and highlight the mediating role of several early maladaptive schemas in developing specific PTSD symptom clusters.


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## Introduction

Childhood maltreatment is a notable problem in the United States of America and impacts millions of children and families each year. By definition, childhood maltreatment is abuse (i.e., physical, sexual, emotional) and neglect that occurs to a child under 18 years old and is inflicted by a primary caretaker or individual in a custodial role (U.S. Department of Health & Human Services, 2020). In 2021, around four million child maltreatment referral reports were received through Child Protective Services (CPS), including over seven million children (U.S. Department of Health and Human Services, 2021). It is estimated that a report is made every 10 seconds in the United States (Child Welfare Information Gateway, 2021). Most reported childhood maltreatment cases involve neglect (76%), followed by physical abuse (16%), sexual abuse (10.1%), and emotional abuse (6.4%) (American Society of the Positive Care of Children, 2021). Further, children within low-income families are more at risk of experiencing abuse and neglect, with rates up to five times higher in families with low socioeconomic status (Sedlak et al., 2010). It is important to note that statistics of childhood maltreatment may be underestimated. For example, child abuse and neglect may go unnoticed and unreported in healthcare settings, perhaps due to lack of knowledge and training (Eads, 2013). Thus, instances of childhood maltreatment in the United States may be higher than the current statistics reflect.

Childhood maltreatment is associated with numerous short- and long-term physical and psychological problems, making it a significant public health concern. Dating back to the Kaiser Permanente's Adverse Childhood Experiences (ACEs) study, childhood maltreatment has been observed to be associated with several health problems (Felitti, 2002; Felitti et al., 1998). Broadly, abuse and neglect in childhood are linked to inflammatory diseases, lung disease, heart attack, high blood pressure, diabetes, liver disease, and cancer, among several other health-

related issues (Felitti et al., 1998; Afifi et al., 2016; Monnat & Chandler, 2015; Widom et al., 2012). Further, abuse and neglect are associated with functional deficits and underdevelopment in several brain regions, such as the amygdala, hippocampus, cerebellum, and orbitofrontal cortex, impacting typical neurodevelopment (Bick & Nelson, 2016). Importantly, individuals who reported six or more adverse or traumatic experiences in childhood have an average life expectancy of almost two decades shorter than those who experienced fewer or no traumatic experiences in childhood, thus, contributing to premature death (Brown et al., 2009). Consequently, childhood maltreatment is detrimental to physical health.

In addition to physical health problems, survivors of childhood maltreatment are at an elevated risk for developing psychopathology, including several externalizing (e.g., substance use disorders, antisocial behaviors) and internalizing disorders (e.g., major depressive disorder, anxiety disorders; Hunt et al., 2017; Muniz et al., 2019). For instance, individuals with a history of childhood maltreatment experience high rates of depression and exhibit more suicidal ideation and behavior than those without a history (Nelson et al., 2017; Hoertel et al., 2015; Angelakis et al., 2020; Calvete, 2014; Gardner et al., 2019). Similarly, these individuals experience a more difficult trajectory and poorer response to treatment (Nelson et al., 2017; Nanni et al., 2012; William et al., 2016). Rates of anxiety are also quite notable among individuals with a history of childhood maltreatment (Gardner et al., 2019). Particularly, victims of childhood maltreatment appear to be more likely to have social anxiety and anxious attachment styles (Simon et al., 2009; Calvete, 2014; Lui et al., 2023). Among the many adverse consequences, childhood maltreatment is also considered a significant risk factor for posttraumatic stress disorder (PTSD; Rameckers et al., 2021; Messman-Moore et al., 2017; Goldberg & Garno, 2005).

Posttraumatic stress disorder is a complex disorder that can manifest after experiencing a traumatic event, witnessing a traumatic event, or learning about a traumatic event occurring to a close family member or friend (American Psychiatric Association, 2022). The Diagnostic and Statistical Manual for Mental Health Disorders (DSM-5-TR) definition of "trauma" includes exposure to actual or threatened death, sexual violence, or serious injury (American Psychiatric Association, 2022). The current conceptualization of PTSD encompasses four symptom clusters including: intrusion (e.g., reoccurring memories related to the event; dissociative reactions), avoidance (e.g., avoiding distressing memories, thoughts, or emotions; avoiding external stimuli), negative alterations in cognitions and mood (e.g., persistent and exaggerated negative beliefs; feeling detached or estranged from others; loss of interest), and alterations in arousal and reactivity (e.g., hypervigilance; increased startle response; difficulties sleeping; difficulties concentrating; American Psychiatric Association, 2022). The symptoms associated with PTSD can cause significant impairment (e.g., social, health, occupational, academic, and financial; Campbell & Renshaw, 2018; Charuvastra & Cloitre, 2008; Christie et al., 2019; Pereira et al., 2018; Smith et al., 2005; Nichter et al., 2019). Further, PTSD is a challenging clinical presentation that often co-occurs with other disorders (e.g., substance use disorders) and can be difficult to treat (Flanagan et al., 2016; Najavits & Hien, 2013; Konrad et al., 2016). There are several mechanisms by which posttraumatic stress can occur, and although relatively few people develop PTSD, victims of childhood maltreatment are at a particularly heightened risk.

Childhood maltreatment is also associated with maladaptive cognitive, emotional, and behavioral patterns (Gibb, 2002; Jaffee, 2017; Young et al., 2003). Specifically, Jeffrey Young posited that adverse childhood experiences and at-risk parenting styles contribute to the development of dysfunctional cognitive, emotional, and behavioral "themes" called early

maladaptive schemas (EMSs; Young et al., 2003). Schemas act as a filtration system by which an individual experiences the world; in other words, schemas impact how one processes information related to themselves, others, and their experiences. Because early maladaptive schemas form in childhood, they remain relatively stable throughout life (e.g., "trait-like"), and are often reinforced or further elaborated throughout life. The current conceptualization of the EMSs includes 18 schemas that can be further condensed into domains. Originally, Young proposed a five-domain model that encompassed the schema domains of Disconnection and Rejection, Impaired Autonomy and Performance, Impaired Limits, Other-Directedness, and Over-Vigilance and Inhibition (Young et al., 2003); however, the second-order structure of the EMSs has since been examined by several other studies (Aloi et al., 2020; Bach et al., 2018; Calvete et al., 2013; Saritaş & Gençöz, 2011; Soygüt et al., 2009; Hoffart et al., 2005; Cui et al., 2011; Sperb et al., 2019). Importantly, childhood maltreatment has been associated with several EMSs, such as mistrust, vulnerability to harm, defectiveness/shame, social isolation, failure, dependence/incompetence, enmeshment, emotional deprivation, emotional inhibition, insufficient self-control, self-sacrifice, and subjugation (Calvete, 2014; Harding et al., 2012; Lumley & Harkness, 2007; Pilkington et al., 2021; Roemmele & Messman-Moore, 2011).

Studies have also examined the associations between early maladaptive schemas and posttraumatic stress. Namely, individuals with a trauma history and PTSD have elevated EMSs across several schema domains compared to those without, and in some cases, EMSs mediate the relationship between childhood trauma and posttraumatic stress (Ahmadian et al., 2015; Cockram et al., 2010; Harding et al., 2012; Karatzias et al., 2016; Vasilopoulou et al., 2020; Zaman et al., 2021; Estevez et al., 2019; Lumley & Harkness, 2007). EMSs that develop because of maltreatment may increase the likelihood of developing PTSD. Early maladaptive

schemas may also contribute to maintaining PTSD or share similarities with PTSD symptoms (e.g., negative alterations in cognition and mood). Notably, the schemas of defectiveness/shame, dependence/incompetence, enmeshment, failure, mistrust/abuse, vulnerability to harm, social isolation, insufficient self-control, and emotional deprivation are associated with PTSD diagnostic status and severity (Ahmadian et al., 2015; Harding et al., 2012; Karatzias et al., 2016; Price, 2007; Lian et al., 2023). Interestingly, Schema Therapy (ST) has also been shown to be effective in samples of veterans with PTSD (Cockram et al., 2010; Tapia et al., 2018), providing more evidence highlighting the association between early maladaptive schemas and PTSD.

Further, few studies have investigated the association between early maladaptive schemas and specific PTSD symptom clusters; however, initial evidence indicates that certain schemas and schema domains are uniquely associated with PTSD clusters. Specifically, the schema domain of Impaired Autonomy and Performance has been found to be associated with the intrusion and hyperarousal symptom clusters of PTSD (Karatzias et al., 2016; Kachadourian et al., 2013). Karatzias and colleagues (2016) found the specific schema of vulnerability to harm/ illness (within the domain of Impaired Autonomy and Performance) to predict intrusion and hyperarousal (Karatzias et al., 2016). Price (2007) also found the schemas of dependence/incompetence, defectiveness/shame, and enmeshment to predict intrusion symptoms (Price, 2007). Self-sacrifice, a schema in the domain of Excessive Responsibility and Standards, was also found to be associated with trauma-related negative cognitions (Reis et al., 2016). Finally, the domain of Disconnection and Rejection mediated the relationship between childhood maltreatment and avoidance, while failure was found to predict avoidance (Kaya Tezel et al., 2015; Rezaei et al., 2016; Price, 2007).

These studies provide initial support for the hypothesis that different schemas may be uniquely relevant to distinct PTSD symptom clusters and that schema domains may mediate associations between childhood maltreatment and the PTSD clusters. However, this area requires significantly more systematic research. Specifically, it is important to expand upon existing research and further explore specific types of abuse (e.g., neglect, punishment, sexual abuse) in relation to early maladaptive schemas. A caveat to current literature exploring childhood maltreatment and EMSs is the tendency to be narrow, such that studies will focus on one type of abuse in a specific sample (e.g., sexual abuse in a female sample) or seldom control for the effects of other types of abuse. Thus, there is room for expansion. In addition to further exploring types of childhood maltreatment, there is a need to further investigate the role of early maladaptive schemas in developing specific PTSD symptom clusters, as the current literature is limited.

Thus, the current study tested a structural equation model to further examine the associations between types of childhood maltreatment, early maladaptive schemas, and posttraumatic stress symptoms. Initially, the authors planned to utilize the schema domains by a) conducting confirmatory factor analyses to compare Young's original five-domain model (Young et al., 2003) to a newly proposed four-domain model (Bach et al., 2018) and b) choosing the best-fit model and utilizing parceling to examine the 18 early maladaptive schemas within the chosen model. However, due to the inadequate fit of the second-order structure of the EMSs in the current sample, the authors had to examine specific schemas and thus chose four schemas from the four-domain model: mistrust, self-sacrifice, insufficient self-control, and vulnerability to harm, each of which from different domains. Therefore, the final model included childhood sexual abuse, punishment, and neglect, the four chosen early maladaptive schemas, and the four

PTSD symptom clusters of intrusion, avoidance, negative alterations in cognitions and mood, and hyperarousal.

The following literature review will first highlight the relationship between a history of childhood maltreatment and the development of posttraumatic stress. Second, it will describe how the conceptualization of posttraumatic stress has evolved and briefly introduce theoretical models of PTSD. Subsequently, it will introduce the relationship between childhood maltreatment and early maladaptive schemas. Lastly, the literature review will discuss associations between early maladaptive schemas and posttraumatic stress.

## Literature Review

### Childhood Maltreatment and Posttraumatic Stress

Childhood maltreatment is a pervasive problem in the United States of America. Childhood maltreatment encompasses physical, sexual, and emotional abuse, as well as physical and emotional neglect. It is typically inflicted by a primary caretaker (e.g., parent) but can also occur from an individual in another custodial role, like a teacher, coach, religious leader, or babysitter (U.S. Department of Health and Human Services, 2020). The rates of childhood maltreatment in the United States are alarming, as it is estimated that one in seven children have experienced abuse or neglect in the past year, and around five children die from abuse and neglect each day (Finkelhor et al., 2015; U.S. Department of Health and Human Services, 2021). Of note, these statistics are likely underestimated due to underreporting issues in places such as healthcare settings (Eads, 2013). There are several important factors related to childhood maltreatment, such as age, gender, socioeconomic status, and ethnicity. First, children from birth to one year appear to be most at-risk, with a victimization rate of 25.1 per 1,000 children (U.S. Department of Health and Human Services, 2020). Concerning gender, rates of abuse appear to

be higher among girls (8.9 per 1,000 girls compared to 7.9 per 1,000 boys). Girls are more likely to experience more severe sexual abuse; however, boys are more likely to die as a result of physical abuse (2.99 per 100,000; U.S. Department of Health and Human Services, 2020; National Children's Alliance, 2021). Further, children from low-income families are at a higher risk of experiencing abuse and neglect than middle- and high-income families, potentially due to high stress levels (Sedlak et al., 2010). Finally, American-Indiana and Alaskan Native children experience the highest rates of child maltreatment, with a victimization rate of 15.2, followed by African American and Hispanic children (U.S. Department of Health and Human Services, 2020; National Children's Alliance, 2021).

Childhood maltreatment is detrimental to a child's physical well-being. Aside from more obvious and immediate physical injuries (i.e., bruising, broken bones), childhood maltreatment is associated with several long-term health problems. Beginning with the introduction of the Kaiser Permanente's Adverse Childhood Experiences (ACEs) study in the 1990s (Felitti et al.1998, Felitti, 2002), childhood maltreatment has been linked to diabetes, arthritis, lung disease, heart disease, obesity, migraines, stroke, cancer, and inflammatory diseases, among several other diseases (Afifi et al., 2016; Monnat & Chandler, 2015; Widom et al., 2012; Felitti et al.1998). Similarly, childhood maltreatment impacts healthy brain development, impeding growth in the amygdala, cerebellum, orbitofrontal cortex, and corpus callosum (Bick & Nelson, 2016). Types of abuse also appear to uniquely impact health problems. For example, neglect is associated with an increased risk for diabetes, poor lung function, and oral and visual health problems. In contrast, physical abuse has been associated with diabetes and poor nutrition. Children who have experienced sexual abuse are also more likely to contract HIV and Hepatitis C (Widom et al., 2012). Importantly, childhood maltreatment has been linked to shorter life expectancy, such that

individuals who have experienced six or more adverse life experiences or traumatic events have a life expectancy of about 20 years less than those with fewer or no instances of trauma (Brown et al., 2009). Although several underlying mechanisms might influence the development of such diseases, research on epigenetics has demonstrated that childhood maltreatment can influence temporary and permanent gene expression associated with the development of physical health problems (Cicchetti et al., 2016).

Further, childhood maltreatment has a substantial impact on psychological health and functioning. Childhood maltreatment is a risk factor for several psychiatric problems, including depression, anxiety, disordered eating, personality disorders, and attachment and social difficulties (Christ et al., 2019; Hunt et al., 2017; Muniz et al., 2019; Nelson et al., 2017; Hoertel et al., 2015; Angelakis et al., 2020; Calvete, 2014; Gardner et al., 2019; Simon et al., 2009; Calvete, 2014; Lui et al., 2023; Waxman et al., 2014; Molendijk et al., 2017; Humphreys et al., 2021; Doyle & Cicchetti, 2017). For instance, childhood maltreatment has been linked to high levels of depression and symptom severity, with emotional abuse and neglect exhibiting the highest associations (Calvete, 2014; Humphreys et al., 2021). Depression also appears to develop earlier and be treatment-resistant in individuals who have experienced maltreatment (Nelson et al., 2017; Williams et al., 2016). Suicide attempts are high among survivors of childhood maltreatment, with rates up to two to three times higher, particularly in those that have experienced childhood sexual abuse (Angelakis et al., 2020). Further, childhood maltreatment often encompasses unstable environments and erratic or inconsistent parenting, which are associated with subsequent anxiety disorders (Simon et al., 2009; Calvete, 2014). Similarly, such environments often foster attachment difficulties, as children may have disruptions in early

caregiving, negatively impacting their ability to navigate interpersonal and romantic relationships throughout their life (Doyle & Cicchetti, 2017).

Behaviorally, there are several consequences associated with childhood maltreatment. Research suggests that children who have experienced abuse are more likely to engage in risky sexual practices as they reach adolescence, including having a higher number of sexual partners, engaging in early initiation of sexual activity, and having an increased likelihood of contracting sexually transmitted diseases (Thompson et al., 2017). In addition, these children tend to engage in problematic behavior, such as substance use and antisocial behaviors, often leading to legal issues. Namely, physical and emotional abuse have been linked to antisocial behavior, and this is particularly observed among boys, as they tend to externalize more than girls (Degli Esposti et al., 2020; Herrenkohl et al., 2017; Cicchetti & Handley, 2019; Afifi et al., 2019). One of the most critical behaviors observed in childhood maltreatment is the future perpetuation of abuse. Although the percentage of maltreated children that abuse or neglect their own children is relatively low, it is higher than in those that did not experience childhood maltreatment (Yang et al., 2018). Thus, this can be an unfortunate byproduct of abuse and a means of intergenerational transmission of trauma, as some children perpetuate unhealthy parenting styles learned through their own experiences (Greene et al., 2020).

In addition to the several physical and psychological problems discussed, childhood maltreatment plays a substantial role in the development of posttraumatic stress disorder (PTSD; Goldberg & Garno, 2005; Rameckers et al., 2021; Messman-Moore et al., 2017). Currently, the Diagnostic and Statistical Manual for Mental Health Disorders (DSM-5-TR) conceptualizes posttraumatic stress as having four symptom clusters. These clusters consist of intrusion (e.g., reoccurring and distressing memories about the event; dissociative reactions), avoidant behavior

(e.g., avoiding painful memories or emotions; avoiding external stimuli), negative alterations in cognitions and mood (e.g., persistent and exaggerated negative beliefs; feeling detached or estranged from others; loss of interest), and alterations in arousal and reactivity (e.g., hypervigilance; increased startle response; trouble concentrating; American Psychiatric Association, 2022). The rates of PTSD in individuals that have experienced childhood maltreatment vary, ranging from 1-15%, while other sources suggest rates as high as 37% (Widom, 1999; U.S. Department of Health and Human Services, 2021). It has been suggested that current percentages of PTSD related to childhood maltreatment may be underestimated. For example, the first criterion (Criterion A) for diagnosing PTSD includes exposure to actual or threatened death, sexual violence, or serious injury. Although physical and sexual abuse fall into this criterion, interpersonal trauma (i.e., neglect and emotional abuse) generally does not (Rameckers et al., 2021; Foster et al., 2019). Thus, rates of PTSD should be interpreted with some caution.

There are several risk factors associated with the development of PTSD. Namely, the age at which abuse occurs is important. For instance, abuse that occurs between the ages of three and five has been associated with PTSD in retrospective studies; similarly, sexual and physical abuse before the age of 11 was found to be highly predictive of developing PTSD (Dunn et al., 2017). Additionally, the age of onset plays an important role in the child's perception of their abuse. Before age five, children generally have a limited capacity to ruminate or think about their abuse while it is not occurring; thus, they have limitations in their cognitive abilities due to their developmental stage. The inability to think about the abuse makes it less predictable for the child, thus, leading to subsequent symptoms (Conte & Schuerman, 1987; Carlson et al., 1997; Cicchetti et al., 2010). Similarly, it may increase attention to threats, even in the presence of non-

threatening cues, further exacerbating symptoms (Shackman et al., 2007). Finally, several other problems accompany abuse that occurs at a very young age, such as fewer skills to regulate emotions and a lack of communicative ability to verbalize the abuse to trusted adults (Cicchetti et al., 2010).

In addition to age, the type and severity of childhood maltreatment are significant risk factors for developing PTSD. There are mixed findings regarding the types of abuse. For instance, Rameckers and colleagues (2021) found emotional abuse to be the only type of abuse related to PTSD severity, as well as severity related to specific PTSD symptom clusters (Rameckers et al., 2021); while another study found emotional abuse and neglect to be associated with severity (Hoeboer et al., 2020). Conversely, physical abuse has been found to predict greater trauma symptoms, particularly in women (Evans et al., 2013). Further, children who experience several types of maltreatment (e.g., both physical and emotional abuse) have greater impairment than children who experience a single type of abuse or neglect (Higgins & McCabe, 2001; Shi, 2013). The severity of abuse, including the pain and injury inflicted, frequency (e.g., daily occurrence versus infrequent), and duration of abuse are also impactful in the development of PTSD (Clemmons et al., 2007; Evans et al., 2013).

The resources available to children are also important in the development of PTSD. Specifically, social support has important implications for the development of PTSD. For example, Hyman and colleagues (2003) found that perceived social support, particularly support related to self-esteem and appraisal, "buffered" the development of PTSD in survivors of childhood sexual abuse (Hyman et al., 2003). Access to appropriate treatment, or rather lack thereof, is also pivotal. However, many children do not have access to treatment for several reasons, such as systemic issues, location, or socioeconomic status, to name just a few examples

(Lambert et al., 2017). Community support may also offer protective factors against the development of PTSD; it can increase social engagement or provide access to other adults that may contribute to reporting and intervening in abuse (e.g., teachers, healthcare professionals). Thus, living in an unsupportive community with few resources can contribute to the perpetuation of abuse and the development of PTSD (Meng et al., 2018).

Interestingly, there also appear to be transgenerational risks for developing PTSD. For example, parental PTSD is associated with trauma and PTSD in offspring in several ways. First, parents who have undergone trauma and exhibit symptoms of PTSD may perpetuate the cycle of abuse with their own children. As mentioned, the percentage of abused parents who abuse their children is low but still notably higher than the general population (Greene et al., 2020; Yang et., 2018). Further, children of parents with PTSD appear to have cortisol and catecholamine level abnormalities. Cortisol is a steroid hormone and one of the essential chemicals of the "fight-or-flight" response. Childhood maltreatment has also been linked to unique genomic and epigenetic profiles in individuals with PTSD. Thus, abnormalities in biochemical systems may be a risk factor for the offspring of parents with trauma histories (Yehuda et al., 2001; Yehuda et al., 2002; Mehta et al., 2013).

The impact of PTSD is notable and is associated with significantly impaired functioning in adults. Areas of functioning that appear to be impacted are social (e.g., interpersonal and romantic relationships), parental, occupational (e.g., academic, career, and financial), and overall health and self-care (Jellestad et al., 2021). Specific to relationships, symptoms of PTSD may contribute to impairment. For instance, avoidance may influence individuals to distance themselves from loved ones, miss out on important social events, and avoid talking about their experiences with family or close friends (Birkley et al., 2016; Campbell & Renshaw, 2018).

Similarly, due to feelings of being "on edge" that accompany hyperarousal, these individuals may be prone to aggression, irritability, or reckless behavior, further straining relationships (Birkley et al., 2016; Campbell & Renshaw, 2018). Consequently, individuals with PTSD have high rates of divorce (Gros et al., 2019). PTSD also impacts parenting and relationships with children, as there is an overall decrease in parenting satisfaction, impaired attachment with children, and inconsistent parenting (e.g., poor supervision and inconsistent discipline; Christie et al., 2019).

Concerning employment and academics, PTSD symptoms also negatively affect work and academic performance. For example, individuals with PTSD have more difficulty following through with work-related tasks, experience more absenteeism, have problems with attention, concentration, and processing speed, have lower job satisfaction, and have more issues with co-workers (Pereira et al., 2018; Smith et al., 2005). Similarly, PTSD negatively impacts academic performance (e.g., GPA; Shirley et al., 2022; Pereira et al., 2018). Consequently, those with PTSD are more likely to work part-time or not at all (Smith et al., 2005), which can influence financial problems. Financial strain can be exacerbated by unhealthy and costly coping mechanisms such as substance use (e.g., tobacco, alcohol, illicit drugs). Further, there are high levels of PTSD among the homeless, and although traumatic events are prevalent among homeless individuals, Brown (1993) suggested that a high percentage of homeless individuals experienced PTSD symptoms prior to losing their housing (Brown, 1993).

Thus, childhood maltreatment is followed by several physical and psychological problems that impact an individual's ability to function, most notably being posttraumatic stress. Given the sheer impact of childhood maltreatment and its role in developing subsequent

posttraumatic stress, further investigation of childhood maltreatment and PTSD is of great clinical importance, as research efforts can further inform prevention and intervention efforts.

**Traumatic Stress: Overview and Conceptualization**

The conceptualization and understanding of posttraumatic stress have evolved greatly over the years. Symptoms of traumatic stress have consistently been observed and documented throughout history. The Epic of Gilgamesh, a literary work dating back to 2100 B.C., described symptoms of intrusion (e.g., reoccurring memories, nightmares) after Gilgamesh witnessed the death of a friend (Sandars, 1972). In the 1600s, Swiss physician Dr. Johannes Hofer used the term "nostalgia" to describe his observation of soldiers' anxieties and difficulties sleeping after exposure to the violence of war (Battesti, 2016). Fast forward to the era of World War I, where medical journals highlighted severe symptoms of anxiety, nightmares, and impaired senses after exposure to battle, referred to as "shell shock" or "war neurosis" (Crocq & Crocq, 2022). Of note, the American Psychiatric Association (APA) did not add PTSD into the diagnostic manual until the late 1980s, where it made its first appearance in the third version of the Diagnostic and Statistical Manual for Mental Health Disorders (DSM-3; American Psychiatric Association, 1980).

Several revisions have been made to the criteria of PTSD throughout the versions of the DSM. First, the definition of trauma has evolved throughout the years to include not only the experience of trauma, but also witnessing, being threatened by, and learning that it has happened to someone close to you (e.g., close family member or friend). Symptom clusters have also been expanded upon. Originally, PTSD encompassed three symptom clusters: re-experiencing, numbing, and arousal and avoidance. In the DSM-3, there was no specified duration in which symptoms must develop or be maintained. The DSM-3-R, DSM-4, and DSM-4-TR increased the

number of symptoms from 13 to 17 and reorganized the clusters into re-experiencing, avoidance/numbing, and hyperarousal. These versions also included more information about the duration of symptoms (American Psychiatric Association, 1980, 1994, 2000). In the DSM-5 and DSM-5-TR, there are now 20 symptoms and four symptom clusters: intrusion/re-experiencing, avoidance, altered cognitions and mood, and altered arousal and reactivity. Further, changes have been made to specifiers over time to include delayed onset and the presence of dissociative symptoms (American Psychiatric Association, 1980, 1994, 2000, 2013, 2022; North et al., 2016). Finally, the current conceptualization differs from acute stress disorder (i.e., trauma-related symptoms that exist for less than a month), and an adjustment disorder (American Psychiatric Association, 2022). The International Classification System (ICD-11) also includes complex posttraumatic stress disorder (CPTSD). CPTSD is a more severe form of PTSD brought on by repeated, cumulative traumas early in life, particularly in childhood (World Health Organization, 2019).

Several theories have been introduced that have contributed to the current conceptualization and understanding of PTSD. Horowitz (1976) first proposed a stress response theory to trauma, rooted in psychodynamics. Horowitz posited that trauma brings about two opposing responses: one response that brings trauma-related information to the conscious (e.g., intrusion), and one that suppresses information and memories related to the trauma (e.g., avoidance); an individual fluctuates between these two conflicting responses. Additionally, Horowitz identified that trauma has an impact on cognitive and memory processing and that trauma-related memories are difficult to integrate. Horowitz's theory has been quite influential, as it is one of the first to emphasize the global impact of trauma on one's sense of self and beliefs

about the self, the world, and the future. This theory has also been referred to as being "social-cognitive" (Horowitz, 1975, 1976, 1986).

Conditioning theories, also known as learning theories, have also been developed regarding PTSD. In essence, such theories broadly posit that individuals develop a conditioned fear response after experiencing a traumatic event. The fear response is expressed to both unconditioned (e.g., traumatic event) and conditioned (e.g., cognitive, emotional, physiological, and environmental cues) stimuli related to the trauma event or events (VanElzakker et al., 2014). Thus, several cues can become associated with the traumatic experience(s), forming solid sensory memories. This can be observed in the Little Albert experiment, for example, where a fear-inducing stimulus (e.g., loud noise) was paired with the presence of a white laboratory rat, resulting in a conditioned fear response to the rat, the conditioned stimulus (Watson & Raynor, 1920). Thus, the originally neutral rat became associated with a fear-inducing event. Similarly, this has been observed in survivors of large-scale traumatic events (e.g., 9/11, school shootings), where previously neutral stimuli (e.g., loud noises, the sound or sight of airplanes) become part of the individual's trauma cues (Neria et al., 2011; Littleton et al., 2011). Further, these theories suggest disruptions in the neural circuitry related to the acquisition and extinction of the conditioned or learned fear. Such conditioning theories emphasize insufficient exposure (i.e., avoidance) to trauma-related cues necessary to eradicate or extinguish the conditioned fear (Milad et al., 2009).

Additionally, information-processing theories have been introduced (Lang, 1977, 1978, 1979, 1983). These theories focus on the traumatic event and memory rather than the trauma's personal or social context. Information-processing theories suggest that trauma memories are unique and must be adequately processed; a lack of processing will result in subsequent

psychopathology. Thus, trauma-related information must be effectively integrated into the memory system, a network of interconnected nodes. Further, Lang (1977, 1978, 1979, 1983) suggested that traumatic events are represented within memory as interconnections between nodes within the memory network. A fear memory consists of interconnections between several nodes representing information about the event (e.g., sounds, sights), emotional and physiological responses to the event, and the degree of threat. Lang suggested that these fear memories are stable and can be activated by ambiguous stimuli (e.g., stimuli that resembled the trauma event, cues), contributing to subsequent arousal and distress (Lang, 1977, 1978, 1979, 1983).

Foa and Kozak (1985, 1986) later introduced an updated version of the fear network approach called the emotional processing theory. This theory distinguishes between a normal fear response and a pathological fear response. A typical fear response is adaptive, as it accurately reflects reality (e.g., the caliber of the danger of the situation), leading to activation of the fear structure and subsequent behavior to avoid or manage the threat. However, a maladaptive or pathological fear structure contains associations that distort the reality of the perceived danger, leading to excessive or disproportionate responses (e.g., avoidance of non-threatening situations, safety behaviors). Further, this model emphasized that traumatic events are particularly impactful because they unearth previously held beliefs about safety. Thus, stimuli that were once deemed safe now become components (e.g., nodes) in the fear network. For the fear network to be adequately integrated into the rest of the memory system, the individual would have to activate the fear network and reduce the associations through certain exercises, such as in vivo exposure (i.e., facing the threat). Thus, the emotional processing theory

underlies current treatment approaches to PTSD, specifically Edna Foa's Prolonged Exposure (Foa & Kozak, 1985, 1986; Foa et al., 2007).

More recently, Ehlers and Clark (2000) introduced a cognitive model of PTSD. This model suggests two important components of PTSD: negative appraisals and memory disturbances. First, individuals may experience several types of appraisals related to their trauma, one being overgeneralization of the traumatic event(s), with thoughts such as "I'm not safe anywhere" and "Things like this always happen to me." These negative appraisals contribute to prolonged fear and threat, as they influence the individual to believe that the threat may re-occur, that they are to blame for the event, and that there are irrevocable consequences, for example. Thus, these individuals fail to see trauma as a time-limited event but as an event that will have continuous implications for their life and future. In addition to excessively negative appraisals, there is a disturbance in autobiographical memory, as there are disruptions in memory elaboration and integration (Ehlers & Clark, 2000).

These theoretical models have significantly contributed to understanding the etiology and maintenance of posttraumatic stress and have informed modern conceptualization and treatment approaches. Although the conceptualization and treatment of PTSD have improved significantly, it remains a challenging clinical presentation. Thus, further examining the mechanisms by which PTSD develops is advantageous.

## Childhood Maltreatment and Early Maladaptive Schemas

### *EMSs: Development and Measurement*

Adverse childhood experiences, such as childhood maltreatment, can lead to the formation of negative cognitive styles (Gibb, 2002). Jeffrey Young posited that individuals may develop dysfunctional cognitive, emotional, and behavioral patterns from childhood experiences,

such as abuse, neglect, rejection, and abandonment (Young et al., 2003). These patterns remain relatively stable (e.g., "trait-like") throughout life and are referred to as early maladaptive schemas (EMS). Thus, EMSs act as a lens by which an individual interprets their life experiences, and how they integrate the beliefs about oneself, others, and the world. Further, EMSs are considered the most profound and deeply rooted structures by which knowledge of oneself, others, and the world is represented. Although not all schemas formed in childhood are maladaptive, negative schemas impact an individual's ability to adapt and function throughout adulthood (Riso et al., 2006; Young et al., 2003; Pilkington et al., 2021).

Young proposed five overarching schema domains encompassing 18 early maladaptive schemas, including Disconnection and Rejection, Impaired Autonomy and Performance, Impaired Limits, Other-Directness, and Over-Vigilance and Inhibition. The Disconnection and Rejection domain includes the schemas of abandonment, mistrust/abuse, emotional deprivation, defectiveness/shame, and social isolation. The overarching belief within the domain of Disconnection and Rejection is the expectation that one's needs will not be adequately met. The Impaired Autonomy and Performance domain reflects a lack of self-agency and the lack of a stable perception of self and is composed of the schemas of dependence/incompetence, vulnerability to harm/illness, enmeshment/undeveloped self, and failure. Impaired Limits reflects difficulties in controlling impulses and engaging in goal-directed behaviors; it is composed of the schemas of entitlement/grandiosity and insufficient self-control/self-discipline. The domain of Other-Directedness includes the schemas of subjugation, self-sacrifice, and approval/recognition-seeking. The underlying belief within Other-Directedness is that love and affection are conditional and that one must satisfy the needs of others to be accepted. The final domain is Over-Vigilance and Inhibition, which reflect strict internal rules and the suppression of

emotional responses. It is composed of the schemas of negativity/pessimism, emotional inhibition, unrelenting standards, and punitiveness (Young et al., 2003).

Although the five-domain model of early maladaptive schemas is commonly referred to, it has been evaluated by several exploratory and confirmatory factor analyses. The current literature is mixed such that several studies have suggested three, four, or five-domain models. For example, Calvete and colleagues (2005, 2013) found a three-domain model to best conceptualize EMSs in a Spanish sample of college students, consisting of Disconnection and Rejection, Impaired Autonomy and Performance, and a domain that essentially collapsed Over-vigilance, Impaired Limits, and Other-Directedness (Calvete et al., 2005, 2013). Similarly, a few other studies have confirmed three-domains in Chinese and Turkish samples (Cui et al., 2011; Saritaş & Gençöz, 2011). However, studies have also supported a four-domain model of EMSs (Bach et al., 2018; Hoffart et al., 2005; Aloi et al., 2020; Sakulsriprasert et al., 2016; Yalcin et al., 2020). Notably, Bach and colleagues (2018), including Jeffrey Young, suggested a new, four-domain organization of the domains, including Disconnection and Rejection, Impaired Autonomy and Performance, Impaired Limits, and a new domain named Excessive Responsibility and Standards. This model acknowledged potential secondary domain affiliations, highlighting schemas with strong factor loadings that theoretically fit with other domains, allowing some flexibility. Further, Soygüt and colleagues (2009) supported the five-domain model in a Turkish sample (Soygüt et al., 2009), while others suggest that a first-order structure was best (Sperb et al., 2019). Thus, there are inconsistent findings regarding the factor structure of the EMSs and whether they can adequately be condensed into schema domains.

### *Types of Abuse and EMSs*

Several types of abuse are associated with the early maladaptive schemas. First, emotional and psychological abuse are associated with several schemas, such as mistrust/abuse, abandonment, dependence/incompetence, social isolation, enmeshment, vulnerability to harm/illness, emotional deprivation, defectiveness/shame, failure, self-sacrifice and subjugation (Lumley & Harkness, 2007; Pilkington et al., 2021; Roemmele & Messman-Moore, 2011; Boyda et al., 2018). These samples were diverse and included clinical (e.g., depressed adolescents) and non-clinical (e.g., female university students). Of note, differences in emotional abuse from a child's mother or father, or male or female primary caretaker, have been observed. For example, emotional abuse perpetrated by a mother has exhibited medium correlations with emotional deprivation and social isolation and small correlations with abandonment, mistrust/abuse, defectiveness/shame, failure, vulnerability to harm/illness, self-sacrifice, and subjugation (Pilkington et al., 2021). Paternal emotional abuse, on the other hand, has shown medium correlations with emotional deprivation, mistrust/abuse, defectiveness/shame, and social isolation and small correlations with abandonment, failure, dependence/incompetence, vulnerability to harm/illness, and subjugation (Pilkington et al., 2021).

Regarding childhood sexual abuse, there also appears to be unique associations with the schemas of abandonment, mistrust/abuse, defectiveness/shame, social isolation, subjugation, dependence/incompetence, vulnerability to harm/illness, failure, enmeshment, and emotional deprivation (Harding et al., 2012; Roemmele & Messman-Moore, 2011; Pilkington et al., 2021; Boyda et al., 2018). Further, studies have found associations between physical abuse and emotional deprivation, mistrust/abuse, social isolation, defectiveness/shame, vulnerability to harm/illness, subjugation, and failure (Lumley & Harkness, 2007; Pilkington et al., 2021).

Emotional neglect also exhibits associations with several early maladaptive schemas, and like emotional abuse, there are differences between maternal and paternal neglect. First, maternal emotional neglect strongly correlates with emotional deprivation, has medium correlations with social isolation, and has small correlations with mistrust/abuse, defectiveness/shame, failure, subjugation, and insufficient control. Further, emotional neglect inflicted by a father or male caretaker has shown small correlations with inadequate self-control. Emotional neglect by a parent or other attachment figure, in general, has been associated with emotional deprivation, mistrust/abuse, emotional inhibition, defectiveness/shame, failure, dependence/incompetence, social isolation, vulnerability to harm/illness, and self-sacrifice (Calvete, 2014; Lumley & Harkness, 2007; Pilkington et al., 2021). Thus, there appears to be important and unique associations between types of childhood maltreatment and several early maladaptive schemas.

***EMSs and Psychopathology***

Further, childhood maltreatment and early maladaptive schemas are linked to subsequent mental health difficulties such as depression, anxiety disorders, substance use, and personality pathology (Balsamo et al., 2015; Flink et al., 2018; Lumley & Harkness, 2007; Shorey et al., 2012-2015; Pinto-Gouveia et al., 2006; Calvete, 2014; Bishop et al., 2022; Renner et al., 2012; Tariq et al., 2021). For example, Bishop and colleagues (2022) conducted a meta-analysis that uncovered positive correlations between depression and all 18 early maladaptive schemas (Bishop et al., 2022). Further, early maladaptive schemas are related to depressive symptom severity, particularly abandonment/instability, emotional deprivation, and failure, and are also associated with treatment outcomes (Renner et al., 2012). Additionally, EMSs have strong associations with anxiety, namely the schema domains of Disconnection and Rejection, Impaired Autonomy and Performance, and Other-Directedness (Tariq et al., 2021). Specific to social

anxiety, or the fear of being rejected or negatively evaluated in social situations, the EMSs of mistrust/abuse, defectiveness/shame, entitlement, emotional deprivation, and unrelenting standards appear to be most prevalent (Pinto-Gouveia et al., 2006). Regarding substance use, Shorey and colleagues (2013) found several elevated schemas in a sample of substance users and found that EMSs appear to decrease throughout abstinence (Shorey et al., 2013). Of note, in an alcohol-dependent sample, women appeared to have more severe levels of EMSs (Shorey et al., 2012). Similarly, EMSs may contribute to co-morbid mental health problems in the substance-using population (Shorey et al., 2015).

Early maladaptive schemas are also predictive of personality pathology. In fact, Jeffrey Young introduced Schema Therapy with the intention of targeting deeply rooted and difficult-to-treat presentations such as personality disorders (Young & Klosko, 1993; Young et al., 2003). Interestingly, EMSs are particularly associated with borderline personality disorder (BPD; Barazandeh et al., 2016; Flink et al., 2018). Individuals with borderline personality disorder often exhibit maladaptive behaviors, including impulsivity (e.g., substance use), self-harm and suicide attempts, and intense and unstable interpersonal relationships (e.g., physical altercations, emotionally volatile relationships; American Psychiatric Association 2022). The schemas of abandonment, mistrust/abuse, social isolation, emotional deprivation, defectiveness/shame, dependence/incompetence, and insufficient self-control are most prevalent in BPD (Barazandeh et al., 2016; Esmaeilian et al., 2019; Jovev & Jackson, 2004), and the schema domains of Impaired Autonomy and Performance and Over-Vigilance also appear to be associated with BPD (Shorey et al., 2013). Further, individuals with BPD have higher schema endorsement than other personality disorders and are more likely to experience physical and emotional abuse than those with other personality disorders (Barazandeh et al., 2016). Additionally, avoidant, dependent,

and obsessive-compulsive personality traits are also partially characterized by specific EMSs (e.g., the domain of Over-vigilance showed significant associations with obsessive-compulsive personality; Kunst et al., 2020; Jovev & Jackson, 2004). Thus, there appears to be an important relationship between personality pathology and the EMSs.

## Early Maladaptive Schemas and Posttraumatic Stress

### *EMSs and PTSD Diagnostic Status and Severity*

There is some evidence linking early maladaptive schemas and posttraumatic stress. First, a small body of literature has focused on the relationship between EMSs and PTSD status and severity. For instance, Ahmadian and colleagues (2015) investigated the role of early maladaptive schemas in chronic and acute posttraumatic stress disorder in a veteran population. Previously, the DSM-4-TR conceptualized PTSD as either chronic or acute, with acute being symptoms that persist for up to three months and chronic symptoms surpassing three months (American Psychiatric Association, 2000). It was found that, compared to a control group, individuals with acute and chronic PTSD had higher scores across all EMSs. Further, veterans with chronic PTSD, compared to those with acute PTSD, had greater impaired schemas, particularly in insufficient self-control, social isolation, and vulnerability to harm/illness (Ahmadian et al., 2015). Although it did not use Young's Schema Questionnaire, another study found associations between schemas and types of trauma (e.g., sexual trauma, nonsexual trauma) in a sample of women. This study used the Traumatic Stress Institute Belief Scale (TSIB), which focuses on the schemas of safety, trust, intimacy, control, and esteem. Elevations in these trauma-related schemas were associated with PTSD status, and the schemas partially mediated the relationship between sexual trauma and the development of PTSD (Wright et al., 2010). Further, the schemas of mistrust, vulnerability to harm, and emotional deprivation have been

found to predict PTSD diagnostic status (Harding et al., 2010). Finally, individuals with PTSD have demonstrated higher scores on most EMSs such as emotional deprivation, abandonment, social isolation, mistrust/abuse, vulnerability to harm or illness, emotional inhibition and insufficient self-control when compared to other groups (Naderi et al., 2015).

Similarly, studies have examined the relationship between early maladaptive schemas and PTSD symptom severity. Harding and colleagues (2012) identified three clusters of EMS severity in a sample of 127 female survivors of sexual trauma: low-EMS, moderate-EMS, and high-EMS elevation. Women in the high-EMS cluster (i.e., vulnerability to harm, mistrust/abuse) had greater PTSD symptom severity (Harding et al., 2012). An additional study examined trauma survivors who had experienced significant injuries (e.g., orthopedic injuries, traumatic brain injuries, or multiple injuries). Trauma survivors with adaptive schema modes had less severe PTSD symptoms, while those with maladaptive schemas had the most severe PTSD symptoms. Notably, female survivors in this sample had greater levels of both maladaptive schemas and PTSD symptoms (Zaman et al., 2021). Similarly, complex posttraumatic stress (CPTSD) has also been examined. CPTSD is recognized by the International Classification of Diseases (ICD-11) and differs from PTSD as it is brought about by cumulative trauma or repeated traumatic events (World Health Organization, 2019). Total scores of early maladaptive schemas mediated the relationship between childhood trauma and CPTSD. Specifically, the Disconnection and Rejection and Impaired Autonomy and Performance schema domains mediated the relationship between childhood trauma and CPTSD symptom severity (Vasilopoulou et al., 2020). Finally, EMSs have been found to mediate the relationship between PTSD symptom severity and substance use (Lecign & Tapia, 2018).

### *EMSs and PTSD Symptom Clusters*

Few studies have examined the role of early maladaptive schemas in relation to specific posttraumatic stress symptoms or symptom clusters. Karatzias and colleagues (2016) used the PCL-C and YSQ-S2, since outdated versions of both questionnaires, to determine whether certain schemas uniquely relate to the PCL-C symptoms of intrusion, avoidance, and hyperarousal. First, there were strong associations between the schema domains of Disconnection and Rejection and Impaired Autonomy and Performance, and the PCL total score. Further, vulnerability to harm/illness, belonging to the domain of Impaired Autonomy and Performance, significantly predicted the PCL-C intrusion symptoms (i.e., re-occurring memories of the traumatic event, dissociative reactions, and physiological reactions to reminders). Impaired Autonomy and Performance also predicted hyperarousal symptoms, i.e., hypervigilance, irritability, startle response, and impulsive or reckless behavior (Karatzias et al., 2016). Similarly, Price (2007) found the schemas of dependence/incompetence, defectiveness, and enmeshment, belonging to Impaired Autonomy and Performance, to predict the PTSD symptom cluster of intrusion/re-experiencing (Price, 2007).

Further, unique associations exist between EMSs and the hyperarousal symptom cluster of PTSD. First, in a study by Kachadourian and colleagues (2013), the domain of Impaired Autonomy and Performance was associated with hyperarousal symptoms in a sample of African American men, potentially perpetuating aggression and intimate partner violence (Kachadourian et al., 2013). Further, an additional study found vulnerability to harm to predict symptoms of hyperarousal (Karatzias et al., 2016). Results of these findings suggest that problematic dependency, an undeveloped sense of self, and feelings of lack of autonomy/control contribute to more severe re-experiencing of trauma and difficulties controlling changes in arousal (e.g.,

anger, aggression). In summary, there is precedent for an association between the Impaired Autonomy and Performance domain and intrusion/re-experiencing and hyperarousal symptoms.

Concerning the avoidance cluster, the domain of Disconnection and Rejection mediated the relationship between childhood maltreatment and "experimental" avoidance in a Persian sample (Rezaei et al., 2016). Experimental avoidance in this study included an aspect of emotional avoidance and life control. Further, Kaya Tezel and colleagues (2015) found that the domain of Disconnection and Rejection mediated the relationship between childhood traumatic experiences (i.e., emotional and physical abuse, neglect) and emotionally avoidant and avoidant interpersonal styles (Kaya Tezel et al., 2015). Finally, the schema of failure predicted the avoidance PTSD symptom cluster (Price, 2007).

Self-sacrifice, albeit measured via the Dimensional Clinical Personality Inventory rather than as a schema, appears to be associated with posttraumatic beliefs (i.e., negative cognitions about the self and the world, and self-blame; Reis et al., 2016). Further, there are studies that have highlighted associations between self-sacrifice and components of negative cognitions and mood, although perhaps not the specific PTSD symptom cluster. For instance, self-sacrifice has been found to predict anger (Askari, 2019), and depression severity (Calvete et al., 2005). However, this is an area that requires significantly more investigation.

Although significantly more research is required, targeting early maladaptive schemas in the treatment for PTSD may be an effective approach. Cockram and colleagues (2010) conducted a study to determine the efficacy of targeting maladaptive schemas in a sample of Vietnam veterans. The first portion of this study assessed the role of adverse parenting and EMSs in the development of PTSD in 220 Vietnam veterans. Veterans diagnosed with PTSD had higher levels of early maladaptive schemas and higher scores on a measure of at-risk parenting

behavior. The second portion of the study observed the treatment progress of 54 veterans who participated in a PTSD group program with a component of schema-focused therapy. Compared to 127 veterans who underwent a manualized cognitive behavioral treatment program, the veterans in the schema-focused group had more significant improvements in PTSD (Cockram et al., 2010). Subsequently, Tapia and colleagues (2018) examined the combined efficacy of Schema Therapy (ST) and EMDR on individuals with co-morbid PTSD and substance use. This study was conducted in two phases: phase A used eight sessions of ST and EMDR focused on reprocessing trauma history, and phase B used eight sessions of ST and EDMR focused on reprocessing addictive memory. Notably, phase A significantly reduced PTSD symptoms and the number of EMSs (Tapia et al., 2018).

In summary, there appears to be an important relationship between early maladaptive schemas and posttraumatic stress. As discussed, early maladaptive schemas contribute to PTSD status and severity. Further, specific schema domains appear to have a relationship with PTSD symptom clusters, and although sparse, there is evidence that targeting early maladaptive schemas may be efficacious in PTSD treatment.

**Gender Differences in Childhood Maltreatment, EMSs, and PTSD**

As mentioned, girls appear to be slightly more at risk of experiencing abuse than boys, while gender also plays a role in the type and severity of abuse. For instance, females are more likely to experience childhood sexual abuse, while males are more likely to experience physical abuse, contributing to higher mortality rates among boys (U.S. Administration for Children, 2020; National Children's Alliance, 2021). Gender also contributes to differences in the development of early maladaptive schemas. For instance, in a sample of treatment-seeking men and women, women had higher rates in 14 of the 18 EMS, and although levels of EMSs were

high in both men and women, women endorsed greater severity (Shorey et al., 2012). Because there appears to be a unique association between early maladaptive schemas and types of abuse, females may be more likely to develop the schemas of emotional deprivation, mistrust/abuse, social isolation, failure, defectiveness/shame, enmeshment, and subjugation than males, while males may be more likely to develop vulnerability to harm/illness from physical abuse (Pilkington et al., 2021). Finally, Irkörücü (2016) found significant gender differences between emotional deprivation, social isolation, and defectiveness, such that women had higher elevations in these early maladaptive schemas (Irkörücü, 2016).

Further, there are gender differences in the development and presentation of PTSD and trauma-related symptoms. First, females appear to have higher rates of posttraumatic stress, up to two to three times higher than men. This may be due, in part, to women experiencing high-impact trauma at a younger age, such as sexual trauma (Olff, 2017). Further, there are unique differences in the presentation of PTSD symptoms. Although it is dependent on the type of trauma, a veteran sample of women had more difficulties in concentration and experienced more distress from trauma-related reminders; men, on the other hand, reported having more nightmares, emotional numbing, and hypervigilance (King et al., 2013). Thus, there are observable gender differences in the experience of childhood maltreatment, the presentation of early maladaptive schemas, and the development of posttraumatic stress. Hence, gender will be a covariate in the present study.

**Current Study Overview**

The current study investigated the relationship between childhood maltreatment, early maladaptive schemas, and posttraumatic stress in a sample of 465 young adults. Specifically, we used structural equation modeling to examine the mediating effects of early maladaptive schemas

between types of childhood maltreatment and PTSD symptom clusters. Initially, early maladaptive schemas were represented as latent factors corresponding to schema domains, and the schemas were to be parceled within each schema domain. Although Young's theory originally posited five schema domains, subsequent studies have not supported the five-domain model. Thus, the current study first used confirmatory factor analyses (CFA) to compare the original five-domain model to a newly proposed four-domain model (Young et al. 2003; Bach et al., 2018). Based on the results of the CFA (i.e., which model is a more ideal fit to the data), the schemas were to be parceled accordingly. However, the results of the CFAs suggested that the second-order structure of the EMSs was not optimal, and parceling the schemas to corresponding domains was no longer warranted. Consequently, individual schemas were chosen based on theory and existing literature highlighting associations between types of childhood maltreatment, EMSs, and PTSD.

Thus, the current study included three types of childhood maltreatment (i.e., neglect, punishment, and sexual abuse), four selected early maladaptive schemas, and the PTSD symptom clusters of intrusion, avoidance, negative cognitions and mood, and hyperarousal. The selected schemas included mistrust, self-sacrifice, vulnerability to harm/illness, and insufficient self-control. These schemas correspond to the domains of Disconnection and Rejection, Excessive Responsibility and Standards, Impaired Autonomy and Performance, and Impaired Limits, respectively, which are the newly proposed domains by Bach, Lockwood, and Young (2018).

Namely, it was hypothesized that certain early maladaptive schemas (mistrust, self-sacrifice, vulnerability to harm/illness, and insufficient self-control) would uniquely mediate the relationships between specific types of childhood maltreatment (neglect, punishment, and sexual

abuse) and different PTSD symptom clusters (intrusion, avoidance, hyperarousal, and negative alterations in cognitions and mood).

### *Neglect and PTSD Clusters*

Specifically, it was hypothesized that vulnerability to harm would partially mediate the association between neglect and the intrusion symptom cluster. Further, self-sacrifice would partially mediate the association between neglect and negative alterations in cognitions and mood, and mistrust would mediate the association between neglect and avoidance. Finally, the association between neglect and hyperarousal was hypothesized to be mediated by two schemas: vulnerability to harm and insufficient self-control.

### *Punishment and PTSD Clusters*

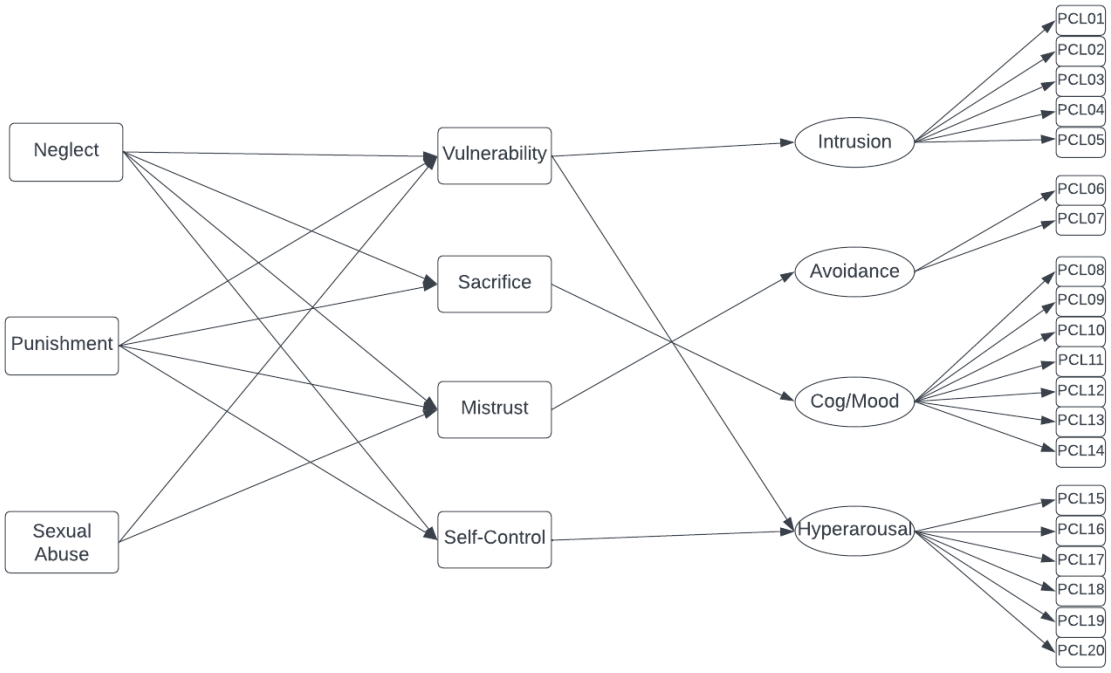
Further, it was hypothesized that punishment would be associated with intrusion via vulnerability to harm. Mistrust will mediate the association between punishment and avoidance. Punishment and hyperarousal are hypothesized to be associated via two schemas: vulnerability to harm and insufficient self-control. Finally, punishment and negative alterations in cognitions and mood will be associated via self-sacrifice.

### *Sexual Abuse and PTSD Clusters*

Finally, it was hypothesized that sexual abuse would be associated with intrusion and hyperarousal via vulnerability to harm. Mistrust will mediate the association between sexual abuse and avoidance. See Figure 1 below for the hypothesized model.

**Figure 1**

*Hypothesized Structural Equation Model*




*Note.* Gender was included as a covariate with paths to all endogenous variables but was omitted from the model for clarity.

## Methods

### Participants

This study used archival data collected by the author's advisor between 2015 and 2016. Four hundred and sixty-five participants initially completed the online survey. Frequent issues with online surveys include participants completing the survey who do not fall within the desired age and participants who complete the survey too quickly (i.e., suggesting random or careless responses). Thus, 26 participants were excluded for being younger than 18 or older than 26. Further, 25 additional participants were excluded for completing the survey in less than five minutes. The final sample used for analysis consisted of 414 undergraduate students between the ages of 18 and 26 ($M$ = 19.32, $SD$ = 1.42) from a Midwestern university. The sample was primarily female (73%). The sample consisted of White (88%), African American (3.6%), Native American or Alaskan Native (1.7%), Asian or Asian American (1.5%), Hawaiian or other Pacific Islander (<1%), and multiracial (<1%) participants. Three participants chose "Other" or chose not to respond regarding their race. Around 3.4% of the sample identified as Hispanic or Latino.

### Measures

#### *History of Childhood Trauma*

The Child Abuse and Trauma Scale (CATS; Sanders & Becker-Lausen, 1995) is a 38-item self-report inventory that assesses childhood maltreatment and neglect inflicted by a parent or primary caretaker. Specifically, the CATS consists of three subscales related to neglect, punishment, and sexual abuse. Questions from the three subscales include: "As a child, did you feel unwanted or emotionally neglected?," "When you were punished as a child or teenager, did you feel the punishment was deserved?," and "Before you were 14, did you engage in any sexual activity with an adult?," respectively. The CATS uses a 5-point Likert scale (1= "never" to 5=

"always") to determine the degree to which respondents experienced maltreatment. The CATS demonstrated adequate internal consistency in the current sample, with an overall Cronbach's alpha of 0.94. The subscales of neglect and sexual abuse demonstrated adequate internal consistency (NEG $\alpha = 0.94$; SA $\alpha = 0.91$), but the subscale of punishment did not ($\alpha = 0.68$). Thus, three items were added to the punishment subscale, including the following questions: "Do you feel safe living at home?," "Did your parents yell at you?," and "Did your parents blame you for things you didn't do?" This increased the internal consistency ($\alpha = 0.78$).

***Early Maladaptive Schemas***

The Young Schema Questionnaire: Short Form (YSQ-S3; Young et al., 2005) is a 90-item self-report inventory used to assess the 18 early maladaptive schemas. Each item encompasses a cognition, behavior, or emotion that corresponds to a specific schema. The YSQ-S3 uses a 6-point Likert scale (1= "completely untrue of me" to 6= "describes me perfectly"). The YSQ-S3 corresponds to the original five-domain model of the early maladaptive schemas proposed by Young, which includes the domains of Disconnection and Rejection, Impaired Autonomy and Performance, Impaired Limits, Other-Directness, and Over-Vigilance and Inhibition. Further, each domain has corresponding early maladaptive schemas, all of which have five items. For the purpose of this study, the early maladaptive schemas of vulnerability to harm, self-sacrifice, mistrust, and insufficient self-control were used. Example questions for these early maladaptive schemas include: "I can't seem to escape the feeling that something bad is about to happen," "I'm the one who usually ends up taking care of the people I'm close to," "I feel that people will take advantage of me," and "I can't seem to discipline myself to complete most routine or boring tasks," respectively. Average scores were calculated. The subscales have

adequate internal consistency (vulnerability to harm α = 0.77; mistrust α = 0.88; self-control α = 0.82; self-sacrifice α = 0.82) in the current study.

***Symptoms of Posttraumatic Stress Disorder***

The PTSD Checklist for DSM-5 (PCL-5; Blevins et al., 2015) is a 20-item self-report inventory used to assess the DSM-5 diagnostic criteria for posttraumatic stress disorder. The PCL-5 has clinical utility for several reasons, as it can be used for screening and diagnostic considerations and is often used in measurement-based care to monitor treatment progress. There are three versions available: the PCL-M (military), PCL-S (specific), and PCL-C (civilian). Further, the PCL-5 corresponds to the PTSD symptom clusters of intrusion, avoidance, negative cognitions and mood, and hyperarousal. Each item is on a 5-point Likert scale (1= "Not at all" to 5= "Extremely"). Symptom cluster severity scores can be obtained by summing the items within a cluster. Items correspond to the clusters as follows: cluster B (items 1-5), cluster C (items 6-7), cluster D (items 8-14), and cluster E (items 15-20). The average score was calculated for each cluster. Each cluster subscale demonstrated adequate internal consistency (intrusion α= 0.91; avoidance α= 0.86; negative cognitions and mood α= 0.93; hyperarousal α= 0.88).

**Procedure**

All participants were recruited online via the university's online research participation program. Participants were rewarded with course credit upon completion of the study. All participants provided informed consent. Their responses were anonymous and collected online. Study procedures were approved by the university's institutional review board (IRB). Participants between the ages of 18 and 26 who were university students were eligible to participate.

# Results

## Data Handling and Preparation

Data inspection was conducted in Stata 17 (StataCorp, 2020). The data was assessed for normality by observing skewness and kurtosis. Ideally, skewness would fall within |3|) and kurtosis within |10|. See Table 1 for descriptive statistics. The data was relatively normal overall. However, 75.9% of participants reported no sexual abuse, and thus, this variable was dichotomized to reflect whether an individual did or did not experience sexual abuse. Further, the data was inspected for potential univariate and multivariate outliers (Kline, 2016). Values above 3.29 standard deviations suggest the presence of outliers (Tabachnick & Fidell, 2013). These examinations did not uncover any significant univariate or multivariate outliers. Scatterplots were examined for linearity. A correlation matrix and scatterplots were utilized to assess singularity and multicollinearity. See Table 2 and Table 3 for correlations.

## Descriptive Statistics

Descriptive statistics were calculated using Stata 17 (StataCorp, 2020). Descriptive statistics are presented in Table 1, and bivariate correlations are shown in Table 2 and Table 3. As expected, there were significant positive correlations between neglect, punishment, and sexual abuse. The correlations between types of abuse were strong. Similarly, all the schemas included in analysis were significantly and positively correlated with one another. These correlations ranged from moderate to strong, with the strongest correlation occurring between mistrust and vulnerability to harm. Regarding all of the 18 early maladaptive schemas, similarly, all of the schemas were correlated, ranging in strength from weak to strong. Interestingly, there appeared to be the weakest correlations in relation to the schema of unrelenting standards. Further, the types of abuse and early maladaptive schemas had positive, significant correlations,

except for the correlation between sexual abuse and the EMS of self-sacrifice. The correlations between the types of abuse and EMSs appeared to vary from weak to moderate, ranging from around 0.22 to 0.46. The strongest correlation appeared between neglect and mistrust. Further, there were quite strong correlations between the symptom clusters of PTSD. All types of childhood maltreatment were positively and significantly correlated with each of the PTSD symptom clusters, ranging in strength from weak to moderate; similar correlations were found between PTSD and the EMSs. Interestingly, female gender, when compared to male gender, was only significantly correlated with self-sacrifice, although weakly.

## Measurement Model

### *Early Maladaptive Schemas*

Two confirmatory factor analyses were conducted to test the original five-factor model of the early maladaptive schemas (Young, 2003), and the newly proposed four-factor model by Bach and colleagues (2018). The models were tested in Mplus 8.8 (Muthén & Muthén, 2022) using maximum likelihood estimation with robust standard errors (MLR). For the five-domain model, the measurement model contained five latent factors (i.e., Disconnection and Rejection, Impaired Autonomy and Performance, Impaired Limits, Other-Directedness, and Over-Vigilance and Inhibition), with respective indicators representing the 18 early maladaptive schemas. See Figure 2 for the proposed five-domain factor structure. The four-domain model included four latent factors (i.e., Disconnection and Rejection, Impaired Autonomy and Performance, Excessive Responsibility and Standards, and Impaired Limits). Again, the measurement model included 18 indicators representing the conceptualization by Bach, Lockwood, and Young (2018). See Figure 3 for the proposed four-domain model.

For fit indices, it has been suggested that a cutoff value of .95 is acceptable for CFI, a cutoff value around .06 for RMSEA (with 90% confidence intervals between 0 and .10) is acceptable, and a cutoff value of SRMR < .08 suggests an acceptable fit (Hu & Bentler, 1999). For the five-domain model, the model fit indices of the CFA were not ideal: $\chi 2$ (125, $N$ = 391) = 815.65, $p$ < 0.001, CFI = 0.84, RMSEA = 0.12 90% CI [0.11, 0.13], SRMR = 0.06. Modification indices suggested several changes to the model. Three residual correlations were added iteratively: mistrust with abandonment, defectiveness with emotional deprivation, and punitiveness with unrelenting standards. The final five-domain model was still not acceptable after these modifications: $\chi 2$ (122, $N$ = 391) = 717.26, $p$ < 0.001, CFI = 0.87, RMSEA = 0.11 90% CI [0.10, 0.12], SRMR = 0.06. Other suggested modifications were not made, as they did not seem to make theoretical sense and would have made the factor model highly multi-dimensional. See Figure 2 for the proposed five-domain CFA.

For the four-factor model, the fit indices of the CFA were also less than ideal: $\chi 2$ (129, $N$= 391) = 755.47, $p$ < 0.001, CFI = 0.86, RMSEA = 0.11 90% CI [0.10, 0.12], SRMR = 0.06. As with the five-domain model, the modification indices suggested several changes to the model. Three pairs of correlated residuals were added iteratively: enmeshment with dependence, dependence with failure, and unrelenting standards with self-sacrifice. Unfortunately, these modifications did not substantially improve model fit: $\chi 2$ (126, $N$= 391) = 679.56, $p$ < 0.001, CFI = 0.87, RMSEA = 0.10 90% CI [0.10, 0.11], SRMR = 0.06. Additional modifications were not made as they would result in a more multidimensional structure. See Figure 3 for the proposed four-domain CFA.

The second-order structure of the EMSs is a topic of debate, as several studies have found conflicting results. To date, a few studies have supported the four-domain model of the EMSs

(using the YSQ-S3); however, one utilized an exploratory factor analysis (Bach et al., 2018), while Aloi and colleagues supported the four-domain in an Italian sample (Aloi et al., 2020). Hoffart and colleagues also supported the utility of a four-domain model, although it used a previous version of the YSQ with only 16 schemas (Hoffart et al., 2005). Further, several other studies have challenged the five-domain model and have offered several other structures (e.g., three-domains, no second-order structure; Calvete et al., 2005; Bouvard et al., 2018; Cui et al., 2011; Sperb et al., 2019; Sakulsriprasert et al., 2016; Saritaş & Gençöz, 2011), while Soygüt and colleagues supported the original five-domain model (Soygüt et al., 2009). Thus, there appears to be a lack of consensus regarding the ideal factor structure of the early maladaptive schemas, and due to this, this study will not use the second-order structure but will instead use specific early maladaptive schemas from the newly proposed domain structure from Bach, Lockwood, and Young (2018; e.g., one schema from each of the four domains). Specifically, the schemas of mistrust, vulnerability to harm, self-sacrifice, and insufficient self-control, belonging to the domains of Disconnection and Rejection, Impaired Autonomy and Performance, Excessive Responsibility and Standards, and Impaired Limits, respectively, were chosen based on theory and existing associations with both childhood maltreatment and PTSD.

***PTSD Clusters***

Subsequently, another measurement model examining the factor structure of the PCL-5 was tested in Mplus 8.8 (Muthén & Muthén, 2022) using the weighted least squares with mean and variance adjustment (WLSMV) estimator. There were four latent variables representing the four symptom clusters of the PCL-5. Each latent variable had several indicators reflecting the respective items of the PCL-5 (e.g., intrusion included items 1-5). The model was not an optimal fit to the data: $\chi 2$ (164, $N = 377$) = 513.80, $p < 0.001$, CFI = 0.98, RMSEA = 0.08 90% CI [0.07,

0.08], SRMR = 0.03. Several modification indices were suggested. Three residual correlations were added iteratively: PCL items 19 and 20, items 1 and 2, and items 4 and 6. This improved fit of the model to the data: $\chi 2$ (161, $N = 377$) = 405.64, $p < 0.001$, CFI = 0.99, RMSEA = 0.06 90% CI [0.06, 0.07], SRMR = 0.03. Although the chi-square was still significant, modification indices were examined closely, and model fit was deemed adequate. See Table 4 for the standardized factor loadings of the measurement model.

**Structural Model**

The structural model was tested in Mplus 8.8 (Muthén & Muthén, 2022) using the weighted least squares with mean and variance adjustment (WLSMV) estimator. The model included the three subscales of childhood maltreatment: sexual abuse, neglect, and punishment. Further, four early maladaptive schemas were chosen as mediators in the model: mistrust, vulnerability to harm, insufficient self-control, and self-sacrifice. Disturbance terms were correlated. Finally, the four PTSD symptom clusters with their respective indicators were included in the model. Gender was included as a covariate. The model had an adequate fit: $\chi 2$ (146, $N = 383$) = 618.25, $p < 0.001$, CFI = 0.98, RMSEA = 0.05 90% CI [0.04, 0.06], SRMR = 0.08. See Figure 4 for the final structural equation model. The significance of indirect and total effects was determined based on bias-corrected bootstrap confidence intervals using 10,000 replications (MacKinnon et al., 2004). The direct and indirect effects are summarized in Table 5 and Table 6, respectively.

**Direct Effects**

Several direct effects were uncovered in the current study. First, there were direct effects from types of childhood maltreatment to the early maladaptive schemas. Namely, as hypothesized, neglect was directly and positively associated with self-sacrifice, vulnerability to

harm/illness, insufficient self-control, and mistrust/abuse. There were no significant direct associations between punishment or sexual abuse and the EMSs, incongruent with the hypothesis. Further, three direct associations existed between the EMSs and PTSD symptom clusters. First, there was a significant and positive direct path from the EMS of mistrust to the avoidance symptom cluster of PTSD. Second, there was also a significant and positive association between the EMS of self-sacrifice and the PTSD symptom cluster of negative cognitions and mood. Similarly, there was a significant and positive direct association between vulnerability to harm and intrusion. These paths aligned with the original hypothesis. There was no direct path leading to hyperarousal. Finally, female gender was significantly associated with self-sacrifice.

**Indirect Effects**

First, as hypothesized, there was a significant indirect path from neglect to hyperarousal through vulnerability to harm/illness; thus, the EMS of vulnerability to harm appears to mediate the relationship between neglect and the hyperarousal symptom cluster of PTSD. Similarly, there was a significant indirect path from neglect to intrusion via vulnerability to harm, in line with the hypothesis. Additionally, mistrust mediated the relationship between neglect and the avoidance PTSD cluster. Finally, as hypothesized, there was an indirect path from neglect to negative cognitions and mood through the EMS of self-sacrifice. All the described paths were positive, suggesting that more childhood maltreatment influences higher levels of maladaptive schemas and in turn, influencing more PTSD symptoms. Incongruent with the original hypothesis, there were no indirect paths leading from punishment and sexual abuse.

## Discussion

The current study examined the associations between types of childhood maltreatment (i.e., punishment, neglect, sexual abuse), Jeffrey Young's early maladaptive schemas of mistrust, vulnerability to harm/illness, self-sacrifice, and insufficient self-control, and the four PTSD symptom clusters. This study uncovered several important direct and indirect associations between neglect, several EMSs, and the four PTSD symptom clusters. These will be discussed in subsequent sections.

### Direct Associations

First, neglect appeared to be particularly impactful in the current study and is directly associated with all four early maladaptive schemas. Notably, when neglect is included the model, the effects of punishment and sexual abuse become insignificant. The associations between neglect and the four schemas were positive, indicating that higher levels of neglect were associated with more maladaptive emotional, behavioral, and cognitive patterns. Namely, neglect was associated with mistrust, or the belief that others will inevitably and intentionally hurt, cheat, humiliate, or take advantage. Both physical and emotional neglect are rooted in a caregiver's failure to respond consistently to a child's needs, leading to suspicion and wariness of the intentions and actions of others. Erik Erikson's psychosocial development theory suggests that the first developmental stage, and one of the most important stages, is trust vs. mistrust, i.e., a child learning whether their caretakers and environment are reliable, attentive, and safe (Munley, 1975). Thus, inconsistencies in caregiving, or complete failure to meet a child's needs, teaches children that people are unreliable and untrustworthy. It also impacts a child's ability to trust themselves to be effective in getting their needs met. Previous literature has highlighted

associations between neglect, mainly emotional neglect, and the early maladaptive schema of mistrust (Pilkington et al., 2021).

Additionally, vulnerability to harm, defined as the belief that catastrophe is bound to occur (e.g., medical, emotional, external), was also significantly predicted by neglect, in line with previous findings (Pilkington et al., 2021; Lumley & Harkness, 2007). Neglect appears to impact how children process information about their surroundings and future and, thus, see the world as an unpredictable place in which suffering is certain to occur. Specific to neglect, this may have emerged from several avenues, such as a lack of emotional soothing (i.e., fear), or failure to address basic needs associated with discomfort (i.e., hunger). Interestingly, both physical and emotional neglect have been found to be associated with vulnerability to harm, albeit weakly (Pilkington et al., 2020); thus, failure to meet both physical and emotional needs influences perceived catastrophe or suffering in the future.

Neglect also predicted self-sacrifice, or the excessive focus on meeting the needs of others to prevent conflict or feelings of selfishness or guilt. Excessive efforts to meet the needs of others have been documented as a trauma response and have been included in some newer models of the fight or flight response, which include the "fawn" response, although there is some debate about this addition. The "fawn" response includes co-dependency, lack of boundaries, and "people pleasing," which may serve a purpose in a neglectful or abusive situation (Gaba, 2020). For example, concerning neglect, self-sacrifice may act as a compensatory means of "earning" affection or having needs met. In abusive situations, it may decrease conflict and instances of physical violence. Neglect may also teach children that their needs are not important, and that other's needs must come before theirs.

Finally, insufficient self-control, or excessive expression of one's emotions or impulses, was also positively associated with neglect, again suggesting that higher levels of neglect predict more impulsive, uninhibited behaviors. As mentioned earlier, neglect is rooted in inconsistent parenting and instability, and such environments have been shown to contribute to subsequent impulsive behavior, including criminal activity, self-harm, substance use, and sexual activity (Shin et al., 2018; Lui, 2019). It is possible that this develops for several different reasons, such as a maladaptive means of coping with distress, through observation of modeled behavior, or due to a lack of learned emotion regulation, as just a few possible examples. This also aligns with previous findings that demonstrated positive associations between neglect and insufficient self-control (Pilkington et al., 2021; Lumley & Harkness, 2007).

In summary, there were significant, positive associations between neglect and all four examined early maladaptive schemas. Thus, these findings suggest that failure to meet the needs of a child impacts the development of firmly held negative cognitive, emotional, and behavioral patterns. In this study, neglect was associated with maladaptive schemas related to distrust towards others, catastrophic beliefs about one's future, difficulties managing emotions and controlling one's impulses, and an excessive focus on meeting the needs of others. Previous studies have also emphasized the significant impact of neglect, sometimes surpassing that of physical forms of abuse (Calvete et al., 2014; Gong & Chan, 2018); thus, these results are warranted.

Surprisingly, no direct associations were found between punishment or sexual abuse and the four early maladaptive schemas. Previous literature has suggested that forms of punishment (i.e., physical abuse, verbal abuse) are associated with several early maladaptive schemas, including mistrust, social isolation, defectiveness/shame, vulnerability to harm, subjugation,

emotional deprivation, and failure (Lumley & Harkness, 2007; Pilkington et al., 2021), albeit some correlations were quite small. Similarly, sexual abuse has been associated with the schemas of abandonment, mistrust/abuse, defectiveness/shame, social isolation, subjugation, dependence/incompetence, vulnerability to harm/illness, failure, enmeshment, and emotional deprivation in prior studies (Harding et al., 2012; Roemmele & Messman-Moore, 2011; Pilkington et al., 2021; Boyda et al., 2018). However, Harding and colleagues (2012) and Roemmele and Messman-Moore (2011) only examined sexual abuse in an all-female sample. Boyda and colleagues (2018) found both emotional and sexual abuse to be significantly associated with dependency and enmeshment; however, this study had a larger representation of sexual abuse than the current study. Thus, current results may have been null for several reasons, including examining several types of maltreatment or underrepresenting certain types of traumas in the sample (e.g., sexual abuse). Although some research has suggested that emotional abuse and neglect are more predictive of the development of EMS than other types of maltreatment (Calvete et al., 2014; Gong & Chan, 2018), our null findings were slightly unanticipated. However, these results continue to emphasize the negative impact of childhood neglect.

Further, female gender had a significant direct association with self-sacrifice but no other early maladaptive schema. Specifically, women, but not men, tend to meet the needs of others, often at their own expense. This is not entirely surprising and could be explained by several factors. For example, this may be influenced by gender socialization, or the process by which individuals are taught to behave socially based on gender. Broadly, biological women are socialized to be more nurturing and are often taught to put partners, children, and family first, sometimes sacrificing their own needs (Stockard, 2006). These gender roles may continue to be firmly held, or even further reinforced, in abusive or neglectful circumstances. Similarly, self-

sacrifice may develop to "earn" affection or avoid further abuse. Indeed, gender differences have been observed in the presentation of early maladaptive schemas. For instance, Shorey and colleagues (2012) found women to have higher levels and more severe presentations of 14 of 18 of the early maladaptive schemas in an alcohol-dependent sample, including the schemas of self-sacrifice, vulnerability to harm, mistrust, and insufficient self-control (Shorey et al., 2012). Interestingly, self-sacrifice had a more significant mean difference in women than the other three schemas, again suggesting the association between female gender and self-sacrifice, while vulnerability had the least. Additionally, Irkörücü (2016) found significant gender differences between emotional deprivation, social isolation, and defectiveness, such that women had higher elevations in these early maladaptive schemas (Irkörücü, 2016). In sum, our findings highlighted gender differences in the development of the early maladaptive schema of self-sacrifice but not the schemas of mistrust, self-control, or vulnerability to harm.

**Indirect Associations**

***Neglect to Hyperarousal via Vulnerability to Harm***

Further, there were several indirect paths highlighted in the current study. First, a significant and positive indirect path led from neglect to vulnerability to harm, continuing to the hyperarousal symptom cluster of PTSD. Hence, the association between neglect and hyperarousal was mediated, in part, by vulnerability to harm. Thus, childhood neglect is associated with increases in the deeply rooted belief that something catastrophic or harmful is bound to occur, in turn leading to greater symptoms of hyperarousal (i.e., increased startle response, difficulties concentrating, feeling on edge, difficulties falling asleep, hypervigilance, or anger with little or no provocation). As mentioned previously, neglect appears to impact how children process information about their surroundings and future and, thus, see the world as an

unpredictable place in which suffering is certain to occur. Specific to neglect, these beliefs may have emerged from several avenues, such as a lack of emotional soothing (i.e., fear), or failure to address discomfort or pain (e.g., hunger). Consequently, this reoccurring belief that disaster is bound to occur appears to influence symptoms consistent with hyperarousal, such as feeling on edge, a heightened startle response, and irritability, likely in preparation for potential harm.

These findings are important for several reasons. First, these results emphasize the development of hyperarousal, a symptom cluster perpetuated by an overactive fight-or-flight response, to a non-violent form of childhood maltreatment. Further, it pinpoints the mediating role of distorted beliefs about one's future (i.e., something bad is destined to occur) in the development of such symptoms. These findings are in line with previous literature. For instance, the domain of impaired Autonomy and Performance (including the schema of vulnerability to harm) was associated with the hyperarousal symptoms of posttraumatic stress in a sample of African American men (Kachadourian et al., 2013). Vulnerability to harm also predicted symptoms of hyperarousal in other research (Karatzias et al., 2016), suggesting direct associations between this EMS and hyperarousal. Although the literature has highlighted that childhood abuse predicts PTSD, a more recent study found emotional neglect to have more of an impact on hyperarousal symptoms than other types of childhood maltreatment (Schalkwijk et al., 2023). Thus, there appears to be an important association between neglect and the development of hyperarousal symptoms, and this relationship is explained, in part, by beliefs about vulnerability to harm.

***Neglect to Intrusion via Vulnerability to Harm***

Similarly, there was a significant and positive indirect path from neglect to the intrusion symptom cluster of PTSD via vulnerability to harm. Namely, the association between childhood

neglect and intrusion is explained, in part, by beliefs surrounding vulnerability to harm. Thus, childhood neglect is associated with increased beliefs about future disaster and, in turn, is associated with more intrusion symptoms (i.e., distressing memories related to the trauma, dissociative reactions, and nightmares). Again, inconsistent parenting and failure to meet the needs of a child are associated with concern about future suffering and catastrophe. Although this relationship should be examined further, it is possible that individuals who have experienced adverse childhood experiences, such as neglect, ruminate about their experiences due to their belief that similar events are bound to occur, and thus, perpetuate symptoms of intrusion such as unwanted thoughts and nightmares. Karatzias and colleagues (2016) also found the schema of vulnerability to harm to uniquely predict PTSD intrusion symptoms. Intrusion also includes the experience of dissociative reactions (i.e., flashbacks; Karatzias et al., 2016). Khosravi (2020) explored the associations between childhood maltreatment, EMSs, and dissociation in individuals with borderline personality and found that vulnerability to harm and defectiveness predicted scores on the Dissociative Experiences Scale (Khosravi, 2020). Although this is not specific to the dissociative reactions of PTSD, it suggests evidence for vulnerability to harm being further associated with intrusion symptoms and supports the current findings.

***Neglect to Avoidance via Mistrust***

Further, there was a significant and positive indirect path leading from neglect to the schema of mistrust, or the firmly held belief that others intentionally cause harm, lie, manipulate, or take advantage, further leading to the avoidance symptom cluster of PTSD (i.e., avoidance of external reminders, memories, thoughts, or feelings). Mistrust mediated, in part, the association between neglect and the avoidance cluster. Thus, more childhood neglect is associated with mistrust towards the intentions of others and beliefs that others intentionally cause harm, in turn

increasing symptoms of avoidance. Neglect is rooted in inconsistent caregiving and failure to meet the basic needs, both physically and emotionally, of a child. These inconsistencies in caregiving, or complete failure to meet a child's needs, teach the child that people are unreliable and untrustworthy. Consequently, individuals appear to exhibit avoidant behavior, which can include avoidance of memories, thoughts, and feelings, as well as specific people, places, and situations. This likely occurs as a mechanism to avoid distress, but also to avoid the possibility of subsequent maltreatment. Further, previous studies have found associations between the domain of Disconnection and Rejection and avoidance. For instance, Rezaei and colleagues (2016) found that the domain of Disconnection and Rejection mediated the relationship between childhood maltreatment and "experimental" avoidance in a Persian sample (Rezaei et al., 2016). Experimental avoidance in this study included an aspect of emotional avoidance and life control. Further, the domain of Disconnection and Rejection mediated the relationship between childhood traumatic experiences (i.e., emotional and physical abuse, neglect) and emotionally avoidant and avoidant interpersonal styles in another study (Kaya Tezel et al., 2015). Thus, the current results build upon previous research and highlight the mediating role of mistrust between neglect and avoidance symptoms.

***Neglect to Negative Cognitions and Mood via Self-Sacrifice***

Finally, a significant and positive indirect path went from neglect to the early maladaptive schema of self-sacrifice and further leading to the PTSD symptom cluster of negative alterations in cognitions and mood. The schema of self-sacrifice revolves around the excessive focus on meeting the needs of others to avoid guilt, or to maintain a connection. Thus, more instances of childhood neglect are associated with higher levels of self-sacrifice, in turn leading to more negative cognitions and mood (i.e., difficulties remembering parts of the trauma,

distorted beliefs, a sense of blame, persistent negative emotional state, feeling detached from others, or loss of interest). The tendency to put other's needs first, often at the expense of oneself, may develop from neglect for several reasons. First, it may emerge as a compensatory behavior in which people feel that they need to "earn" the affection or attention of others or as a means to reduce further maltreatment. It may also have been learned as a byproduct of not having one's needs met or being shown that other's needs are more important. Consequently, the lack of focus on one's needs appears to lead to negative affect, diminished interest in activities, detachment from others, and difficulties experiencing positive emotions.

There is a gap in the literature exploring the association between the schema of self-sacrifice and trauma-related symptoms; however, one study found self-sacrifice to be associated with posttraumatic beliefs, i.e., negative cognitions about the self and the world, and self-blame (Reis et al., 2016). Further, some studies have highlighted associations between negative cognitions and mood, although perhaps not the specific PTSD symptom cluster. For instance, self-sacrifice is predictive of anger (Askari, 2019), and is associated with depression severity (Calvete et al., 2005), both of which are negative cognitions and mood components. However, this study expands upon this by highlighting the mediating role of self-sacrifice between neglect and PTSD symptoms.

**Insignificant Associations**

Several of the hypothesized indirect effects were insignificant. For instance, the model proposed an indirect path from sexual abuse to avoidance via the early maladaptive schema of self-sacrifice; however, this path, as well as all paths leading from sexual abuse and punishment, were insignificant. As discussed further in the limitations section, this could have occurred for several reasons, such as a small number of individuals identifying sexual abuse, a lack of

statistical power, or suppression effects. Further research is warranted to explore the relationship between punishment and sexual abuse, EMSs, and PTSD symptoms; however, current findings emphasize the significant impact of neglect during childhood.

**Strengths**

The current study has several strengths. First, it expands the limited literature examining the associations between types of childhood maltreatment, Jeffrey Young's early maladaptive schemas, and the symptom clusters of PTSD. Significant associations were uncovered between neglect, the EMSs, and PTSD symptoms, highlighting the importance of childhood neglect (both emotional and physical). Similarly, information was gathered about specific types of "trait-like" cognitive, emotional, and behavioral patterns that emerge from childhood maltreatment and their relationship to subsequent psychopathology. This information could be important to implementing early interventions and informing assessment and treatment approaches to PTSD, as well as other psychopathology that develops from childhood maltreatment. Additionally, although difficulties in determining an appropriate factor structure of the Young Schema Questionnaire were unexpected, these results add to the current literature questioning the utility of the second-order structure of the YSQ.

**Limitations**

There are several limitations in the current study. First, due to the study's cross-sectional design, causal inference cannot be made, and the hypothesized temporal pattern of the indirect pathways is uncertain. Due to issues determining and utilizing the second-order structure of the EMSs, schemas were individually chosen based on existing literature. Although the four EMSs included in the study have shown existing relationships with childhood maltreatment and PTSD, it is possible that several of the remaining 14 EMSs could also account for the relationship

between childhood maltreatment and PTSD, or better account for such relationships. There are also limitations in using the CATS questionnaire, as it only asks about abuse from a parent or primary caretaker, while abuse can also occur from individuals in other custodial roles (i.e., coaches, teachers, babysitters). Further, it is possible for participants in the study to experience other traumatic events throughout their lives (e.g., sexual assault, domestic violence), and thus, it is possible that the development of PTSD symptoms is better explained by subsequent trauma in addition to or opposed to childhood trauma. In addition, the sample was a non-clinical sample and contained a very small percentage of individuals who endorsed experiencing childhood sexual abuse (i.e., ~76% denied experiencing childhood sexual abuse), and it is possible that sexual abuse did not exhibit significant associations with EMSs and PTSD because of how infrequently it presented in the current sample. Finally, it is possible that suppression effects were observed in the current sample, as many of the hypothesized paths were found to be insignificant (i.e., paths from sexual abuse and punishment), particularly because associations were observed at the bivariate but not multivariate level. Thus, the current results should be interpreted with some caution, and further investigation is warranted.

**Future Directions**

Several future avenues exist to further explore the associations between childhood maltreatment, early maladaptive schemas, and PTSD symptoms. Mainly, it would be informative to replicate this study with a larger and more clinical sample due to issues with power and a lack of variability in the presentation of childhood maltreatment types. This would allow the ability to flexibly examine the 18 EMSs rather than having to choose several, and it may allow for a more accurate reflection of childhood maltreatment, as well as diversity in types of maltreatment (e.g., sexual abuse). Further, due to the limitations of a cross-section study design and retrospective

reports of childhood maltreatment, future studies would benefit from utilizing a longitudinal study design to better understand temporal sequencing and the stability of observed relationships.

Finally, further exploration is warranted regarding the second-order structure of the early maladaptive schemas. There is a mix in the literature ranging from three to five schema domains, as well as literature that suggests no utility in a second-order structure. The current results further question the utility of the second-order structure, as neither four nor five domains adequately fit the data in the current sample.

**Clinical Implications**

The current results have some clinical implications. Of note, it is quite interesting that neglect was associated with the development of PTSD symptoms in the current study, as neglect does not currently meet the DSM-5-TR's conceptualization (i.e., criterion A) of trauma, which describes trauma as "exposure to actual or threatened death, serious injury, or sexual violence" (American Psychiatric Association, 2022). Although current research has pinpointed associations between neglect and PTSD symptoms, it is seldom considered a criterion A event, suggesting that some individuals may experience PTSD or significant trauma-related symptoms but would not meet diagnostic criteria. Thus, these findings emphasize the importance of considering neglect in the assessment of PTSD, or considering other approaches to diagnosis (i.e., ICD-11's CPTSD). Further, although the literature is sparse, Schema Therapy (ST) has been shown to be an effective treatment for PTSD. For instance, ST was found to be effective in conjunction with EMDR, as well as in a PTSD group program with a component of schema-focused therapy, in samples of veterans (Cockram et al., 2010; Tapia et al., 2018). Thus, considering the role of schemas in the development of PTSD symptoms, as well as treatments that specifically focus on early maladaptive schemas, could be advantageous.

## Summary and Conclusion

In summary, the current study uncovered several significant associations between childhood maltreatment, Jeffrey Young's early maladaptive schemas, and the symptom clusters of PTSD. Namely, neglect had several significant associations, with several indirect paths leading to vulnerability to harm, self-sacrifice, and self-control, and further to the intrusion, hyperarousal, negative alterations in cognitions and mood, and avoidance symptom clusters of PTSD. Several hypothesized paths from punishment and sexual abuse were insignificant in the current study. These results highlight the importance of neglect in the development of PTSD symptoms, which is particularly insightful because neglect is not generally considered "trauma" in the current diagnostic criteria of PTSD. This study also emphasized the importance of firmly held schemas, or "trait-like" patterns of thoughts, emotions, and behaviors, as they were shown to mediate the relationship between neglect and the PTSD symptom clusters. Thus, the current results contribute to the understanding of the relationship between types of childhood maltreatment, maladaptive schemas, and the development of specific PTSD symptoms.

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**Table 1**

*Descriptive Statistics*

| Variables | *N* | *M* | *SD* | Skewness | Kurtosis | Range |
|---|---|---|---|---|---|---|
| Vuln. to Harm | 373 | 2.10 | 0.94 | 0.80 | -0.11 | 1-5.2 |
| Self-Sacrifice | 373 | 3.09 | 1.40 | 0.14 | -0.51 | 1-6 |
| Mistrust | 373 | 2.42 | 1.44 | 0.77 | -0.06 | 1-6 |
| Self-Control | 373 | 2.36 | 0.99 | 0.53 | -0.17 | 1-6 |
| Punishment | 383 | 2.32 | 0.38 | 0.58 | -0.31 | 1.1-4.3 |
| Sexual Abuse | 383 | 0.24 | 0.18 | 1.20 | -0.56 | 0-1 |
| Neglect | 383 | 1.71 | 0.45 | 1.46 | 1.71 | 1-4.5 |
| | *N* | Female | Percent | Male | Percent | |
| Gender | 414 | 304 | 73 | 110 | 27 | |

*Note*. *N*'s vary due to missing data.

**Table 2**

*Correlation Matrix*

| | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Neglect | - | | | | | | | | | | |
| 2. Punishment | 0.74*** | - | | | | | | | | | |
| 3. Sexual Abuse | 0.66*** | 0.47*** | - | | | | | | | | |
| 4. Mistrust | 0.46*** | 0.37*** | 0.22*** | - | | | | | | | |
| 5. Vuln. to Harm | 0.43*** | 0.31*** | 0.35*** | 0.74*** | - | | | | | | |
| 6. Self-Control | 0.34*** | 0.24*** | 0.22*** | 0.64*** | 0.68*** | - | | | | | |
| 7. Self-Sacrifice | 0.31*** | 0.29*** | 0.08 | 0.58*** | 0.45*** | 0.44*** | - | | | | |
| 8. Intrusion | 0.37*** | 0.28*** | 0.29*** | 0.35*** | 0.39*** | 0.28*** | 0.23*** | - | | | |
| 9. Avoidance | 0.33*** | 0.25*** | 0.21** | 0.34*** | 0.35*** | 0.28*** | 0.21*** | 0.88*** | - | | |
| 10. Cog/Mood | 0.43*** | 0.31*** | 0.31*** | 0.42*** | 0.43*** | 0.36*** | 0.25*** | 0.90*** | 0.87*** | - | |
| 11. Hyperarousal | 0.42*** | 0.32*** | 0.33*** | 0.37*** | 0.40*** | 0.33*** | 0.21*** | 0.88*** | 0.83*** | 0.93*** | - |
| 12. Gender | 0.03 | -0.01 | 0.08 | -0.02 | 0.01 | 0.07 | -0.14** | -0.03 | -0.05 | -0.01 | 0.01 |

*Note.* Gender coded 1 (male) and 0 (female). PTSD symptoms are latent factors. *$p < .05$. **$p < .01$ ***$p < .001$

**Table 3**

*Additional Correlation Matrix of the 18 Early Maladaptive Schemas*

| | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. | 14. | 15. | 16. | 17. | 18. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Emo. Dep. | - | | | | | | | | | | | | | | | | | |
| 2. Aband. | 0.61*** | - | | | | | | | | | | | | | | | | |
| 3. Mist. | 0.68*** | 0.82*** | - | | | | | | | | | | | | | | | |
| 4. Soc. Is. | 0.68*** | 0.78*** | 0.79*** | - | | | | | | | | | | | | | | |
| 5. Defect. | 0.76*** | 0.71*** | 0.72*** | 0.78*** | - | | | | | | | | | | | | | |
| 6. Fail. | 0.64*** | 0.69*** | 0.62*** | 0.68*** | 0.80*** | - | | | | | | | | | | | | |
| 7. Depend. | 0.57*** | 0.62*** | 0.61*** | 0.61*** | 0.68*** | 0.77*** | - | | | | | | | | | | | |
| 8. Vuln. | 0.58*** | 0.68*** | 0.74*** | 0.69*** | 0.72*** | 0.73*** | 0.73*** | - | | | | | | | | | | |
| 9. Enmesh. | 0.54*** | 0.53*** | 0.54*** | 0.53*** | 0.58*** | 0.59*** | 0.71*** | 0.69*** | - | | | | | | | | | |
| 10. Subj. | 0.69*** | 0.75*** | 0.77*** | 0.74*** | 0.77*** | 0.72*** | 0.74*** | 0.76*** | 0.66*** | - | | | | | | | | |
| 11. Sacr. | 0.41*** | 0.56*** | 0.58*** | 0.52*** | 0.43*** | 0.43*** | 0.41*** | 0.45*** | 0.41*** | 0.61*** | - | | | | | | | |
| 12. Adm. Seek. | 0.47*** | 0.61*** | 0.57*** | 0.54*** | 0.47*** | 0.50*** | 0.56*** | 0.58*** | 0.55*** | 0.63 | 0.51*** | - | | | | | | |
| 13. Emo. Inh. | 0.73*** | 0.63*** | 0.72*** | 0.74*** | 0.74*** | 0.65*** | 0.58*** | 0.65*** | 0.54*** | 0.77*** | 0.57*** | 0.49*** | - | | | | | |
| 14. Unr. Stand. | 0.29*** | 0.40*** | 0.43*** | 0.38*** | 0.26*** | 0.24*** | 0.28*** | 0.36*** | 0.28*** | 0.40*** | 0.64*** | 0.49*** | 0.47*** | - | | | | |
| 15. Pessi. | 0.63*** | 0.76*** | 0.78*** | 0.71*** | 0.69*** | 0.70*** | 0.65*** | 0.79*** | 0.59*** | 0.73*** | 0.58*** | 0.64*** | 0.68*** | 0.47*** | - | | | |
| 16. Puniti. | 0.49*** | 0.57*** | 0.61*** | 0.57*** | 0.57*** | 0.51*** | 0.55*** | 0.61*** | 0.47*** | 0.62*** | 0.52*** | 0.52*** | 0.58*** | 0.61*** | 0.67*** | - | | |
| 17. Entit. | 0.45*** | 0.53*** | 0.53*** | 0.51*** | 0.44*** | 0.43*** | 0.54*** | 0.55*** | 0.57*** | 0.57*** | 0.50*** | 0.74*** | 0.50*** | 0.57*** | 0.60*** | 0.58*** | - | |
| 18. Self. Cont. | 0.59*** | 0.63** | 0.64*** | 0.66*** | 0.69*** | 0.69*** | 0.72*** | 0.68*** | 0.65*** | 0.72*** | 0.44*** | 0.72*** | 0.66*** | 0.35*** | 0.72*** | 0.57*** | 0.69*** | - |

*Note.* $p < .05$. $^{**}p < .01$ $^{***}p < .001$

**Table 4**

*Standardized Factor Loadings of Measurement Model*

| | Estimate | Standard Error |
|---|---|---|
| Intrusion | | |
| PCL01 | 0.87 | 0.02 |
| PCL02 | 0.88 | 0.02 |
| PCL03 | 0.88 | 0.02 |
| PCL04 | 0.89 | 0.02 |
| PCL05 | 0.89 | 0.02 |
| Avoidance | | |
| PCL06 | 0.89 | 0.02 |
| PLC07 | 0.93 | 0.02 |
| Cognitions/Mood | | |
| PCL08 | 0.83 | 0.03 |
| PCL09 | 0.85 | 0.02 |
| PCL10 | 0.87 | 0.02 |
| PCL11 | 0.90 | 0.02 |
| PCL12 | 0.87 | 0.02 |
| PCL13 | 0.90 | 0.02 |
| PCL14 | 0.91 | 0.02 |
| Hyperarousal | | |
| PCL15 | 0.89 | 0.02 |
| PCL16 | 0.80 | 0.03 |
| PCL17 | 0.85 | 0.02 |
| PCL18 | 0.85 | 0.02 |
| PCL19 | 0.85 | 0.02 |
| PCL20 | 0.77 | 0.04 |

*Note.* All estimates significant at $p < .001$

**Table 5**

*Unstandardized Direct Effects of Final Structural Equation Model*

| Outcome/Predictor | Std. Coefficient | Std. Error | 95% CI |
|---|---|---|---|
| ***Avoidance*** | | | |
| Mistrust | **0.40** | **0.05** | **[0.29, 0.49]** |
| Gender | -0.11 | 0.12 | [-0.34, 0.12] |
| ***Hyperarousal*** | | | |
| Vuln. to Harm | 0.59 | 0.40 | [-0.58, 1.10] |
| Self-Control | 0.03 | 0.39 | [-0.72, 0.94] |
| Gender | 0.05 | 0.12 | [-0.20, 0.31] |
| ***Intrusion*** | | | |
| Vuln. to Harm | **0.59** | **0.06** | **[0.46, 0.70]** |
| Gender | -0.08 | 0.11 | [-0.31, 0.14] |
| ***Cognitions/Mood*** | | | |
| Self-Sacrifice | **0.64** | **0.10** | **[0.48, 0.86]** |
| Gender | 0.17 | 0.13 | [-0.08, 0.42] |
| ***Vuln. to Harm*** | | | |
| Punishment | 0.20 | 0.15 | [-0.08, 0.50] |
| Neglect | **0.75** | **0.15** | **[0.47, 1.05]** |
| Sexual Abuse | 0.10 | 0.19 | [-0.24, 0.48] |
| Gender | 0.01 | 0.10 | [-0.18, 0.21] |
| ***Self-Sacrifice*** | | | |
| Punishment | 0.24 | 0.16 | [-0.06, 0.57] |
| Neglect | **0.79** | **0.17** | **[0.48, 1.14]** |
| Gender | **-0.32** | **0.12** | **[-0.57, -0.08]** |
| ***Mistrust*** | | | |
| Punishment | 0.18 | 0.15 | [-0.13, 0.48] |
| Neglect | **0.85** | **0.16** | **[0.55, 1.18]** |
| Sexual Abuse | -0.17 | 0.19 | [-0.55, 0.19] |
| Gender | 0.03 | 0.12 | [-0.27, 0.20] |
| ***Self-Control*** | | | |
| Punishment | 0.04 | 0.15 | [-0.25, 0.32] |
| Neglect | **0.54** | **0.15** | **[0.26, 0.84]** |
| Gender | 0.16 | 0.11 | [-0.07, 0.38] |

*Note.* All effects are unstandardized. Bias-corrected bootstrap CI were used to determine the significance of the effects (Mackinnon et al., 2004). Bolded statistics are significant based on the 95% bias corrected confidence interval.

**Table 6**

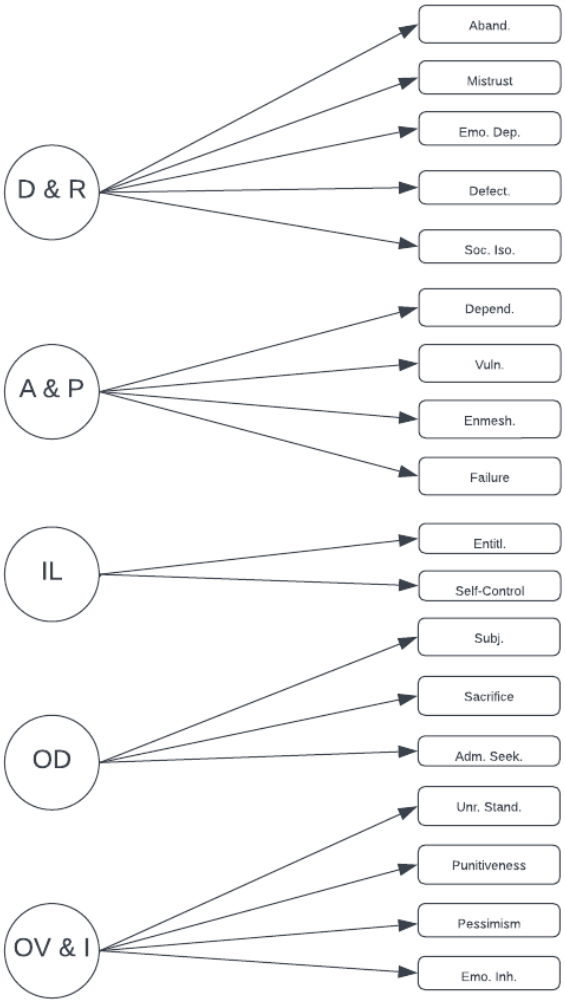
*Standardized Coefficients and Indirect Effects with Bias Corrected Bootstrapped Confidence Intervals*

| Variable/Path | Std. Coefficient | Std. Error | 95% CI |
|---|---|---|---|
| Sexual Abuse→ Vuln. to Harm→ Hyperarousal | 0.03 | 0.06 | [-0.12, 0.12] |
| **Neglect→ Vuln. to Harm→ Hyperarousal** | **0.31** | **0.21** | **[0.10, 0.93]** |
| Neglect→ Self-Control→ Hyperarousal | 0.01 | 0.15 | [-0.18, 0.55] |
| ***Total Indirect*** | **0.32** | **0.09** | **[0.18, 0.54]** |
| Punishment→ Vuln. to Harm→ Hyperarousal | 0.08 | 0.07 | [-0.07, 0.21] |
| Punishment→ Self-Control→ Hyperarousal | 0.001 | 0.04 | [-0.04, 0.08] |
| *Total Indirect* | 0.08 | 0.06 | [-0.05, 0.20] |
| Sexual Abuse→ Mistrust→ Avoidance | -0.03 | 0.04 | [-0.11, 0.04] |
| **Neglect→ Mistrust→ Avoidance** | **0.25** | **0.06** | **[0.15, 0.36]** |
| Punishment→ Mistrust→ Avoidance | 0.05 | 0.04 | [-0.03, 0.14] |
| **Neglect→ Self-Sacrifice→ Cognitions/Mood** | **0.38** | **0.08** | **[0.22, 0.53]** |
| Punishment→ Self-Sacrifice→ Cognitions/Mood | 0.11 | 0.07 | [-0.03, 0.24] |
| Sexual Abuse→ Vuln. to Harm→ Intrusion | 0.03 | 0.05 | [-0.07, 0.13] |
| **Neglect→ Vuln. to Harm→ Intrusion** | **0.32** | **0.07** | **[0.20, 0.46]** |
| Punishment→ Vuln. to Harm→ Intrusion | 0.08 | 0.06 | [-0.03, 0.20] |

*Note.* All effects are standardized. Bias-corrected bootstrap CI were used to determine the significance of the effects (Mackinnon et al., 2004). Bolded statistics are significant based on the 95% bias corrected confidence interval.

**Figure 2**

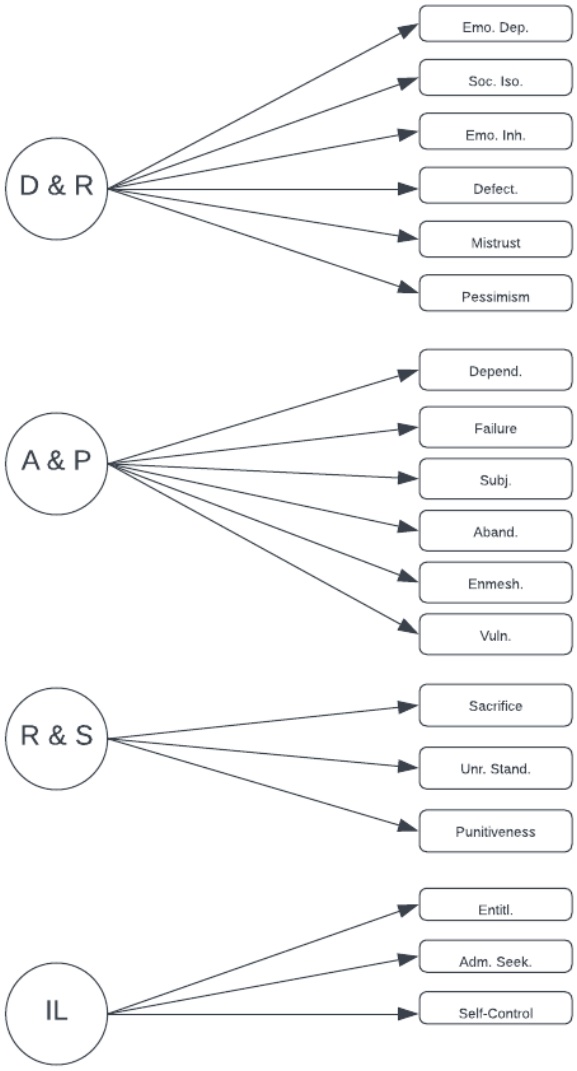
*Proposed Five-Domain Model by Young (2003)*




*Note.* D&R= Disconnection and Rejection; A&P= Impaired Autonomy and Performance; IL= Impaired Limits; OD= Other-Directedness; OV&I= Over-Vigilance and Inhibition. Domains are correlated.

**Figure 3**

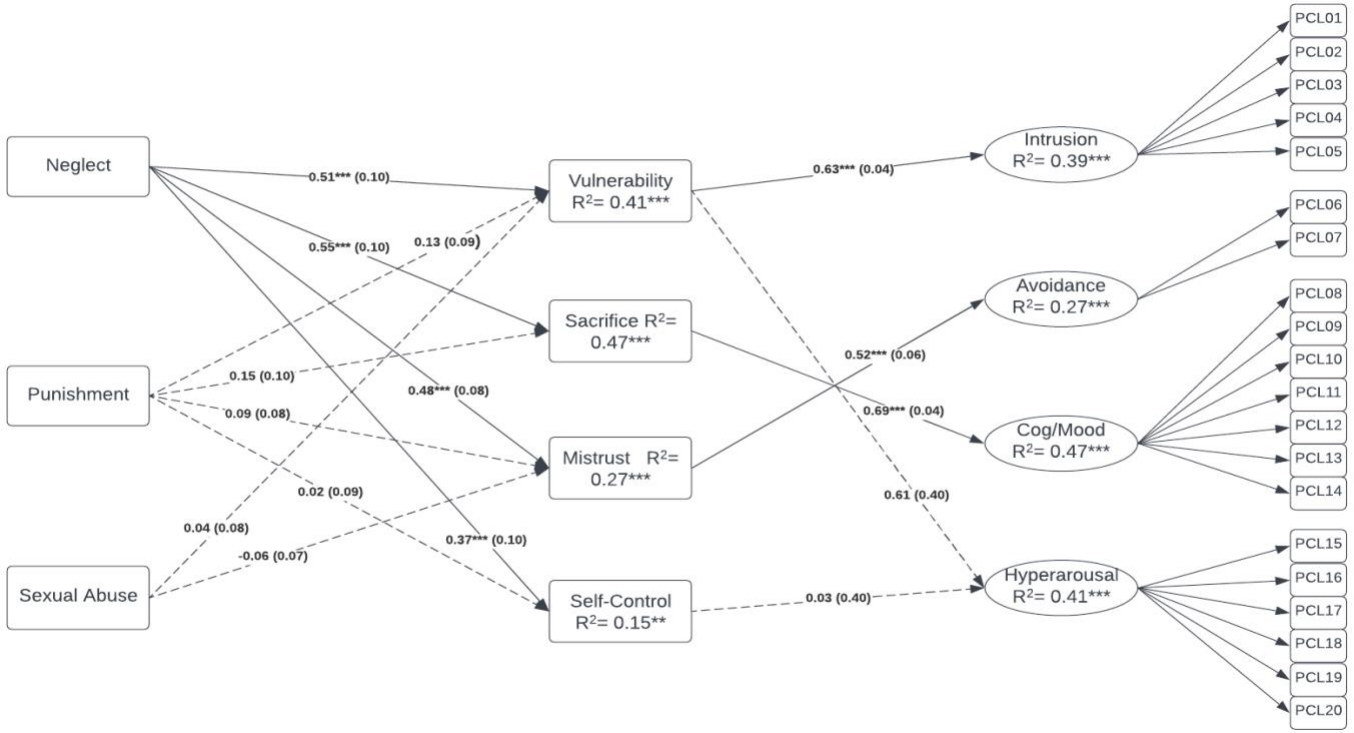
*Proposed Four-Domain Model by Bach and Colleagues (2018)*




*Note.* D&R= Disconnection and Rejection; A&P= Impaired Autonomy and Performance; R&S= Excessive Responsibility and Standards; IL= Impaired Limits. Domains are correlated.

**Figure 4**

*Final Structural Equation Model*




*Note.* All values are standardized coefficients. Standardized errors are in parentheses. The error terms of each of the early maladaptive schemas have been allowed to covary. The error terms of PCL items 19 and 20, items 1 and 2, and items 4 and 6 have been allowed to covary. Gender was included as a covariate with paths to all endogenous variables but was omitted from the model for clarity. Statistics representing solid lines and variance accounted for (i.e., $R^2$) are significant at $p < .05$. Dashed lines represent non-significant paths. The standardized coefficients and standard errors of the PCL items have been omitted from the model for clarity; however, all were significant (p<0.001). *$p < .05$. **$p < .01$ ***$p < .001$

# Appendix A

# Informed Consent

**INFORMED CONSENT**

**The University of South Dakota**

**TITLE: Life Experiences and Emotions**

**FACULTY DIRECTOR:** *Raluca Simons, Ph.D.*

**PHONE #:** *605-677-5353*

**Department:** *Clinical Psychology*

**STUDENT INVESTIGATORS:** *Elise Hocking, B.S. & Renata Surette, B.A.*

**STATEMENT OF RESEARCH**

It is a basic ethical principle that a subject who is to participate in research must give his or her informed consent to such participation. This consent must be based on the understanding of the nature and risk of the research. This document provides information important for this understanding. If you have any questions, please ask. Research projects include only subjects who choose to take part. Please take your time and make your decision, and if you have questions at any time, please ask.

**WHAT IS THE PURPOSE OF THIS STUDY?**

You are invited to be in a research study about different life experiences you may have had and your emotions. You were selected as a possible participant because you are a USD student. The purpose of this research study is to learn more about different life experiences, emotions, and behaviors.

**HOW MANY PEOPLE WILL PARTICIPATE?**

Approximately 500 people will take part in this study.

**HOW LONG WILL I BE IN THIS STUDY?**

Your participation in this portion of the study will last approximately 50 minutes.

**WHAT WILL HAPPEN DURING THIS STUDY?**

You will be asked to take a series of questionnaires about your childhood experiences and current life experiences, emotions, and behaviors you may engage in. You are free to skip any questions that you would prefer not to answer and stop reading the story at any time.

**WHAT ARE THE RISKS OF THE STUDY?**

You may experience frustration that is often experienced when completing surveys. However, some questions asked as a part of this study may be of a sensitive nature, and you could become upset as a result. Although these risks are not viewed as being in excess of "minimal risk," you should be sure to complete these questionnaires in a private place, where other individuals are unable to view your responses.

If you become upset by questions, you may stop at any time or choose not to answer a question. If you would like to talk to someone about your feelings regarding this study or any behavior that this study inquires about, you are encouraged to contact The University of South Dakota's Student Counseling Center at 605-677-5777 or the Psychological Services Center at 605-677-5354. .

**WHAT ARE THE BENEFITS OF THIS STUDY?**

You may not benefit personally from being in this study. However, we hope that, in the future, students might benefit from this study because the results will help us better understand behavior.

**WHAT ARE THE ALTERNATIVES TO PARTICIPATING IN THIS STUDY?**

You may choose not to participate in this study.

**WILL IT COST ME ANYTHING TO BE IN THIS STUDY?**

You will not have any costs for being in this research study.

**WILL I BE PAID FOR PARTICIPATING?**

You will not be paid to take part in this study. You can receive up to 5 SONA course credits for completing the following questionnaires.

**ARE MY RECORDS CONFIDENTIAL?**

If you decide to take part in this research study, you will be asked to give us information about your childhood and current life experiences, emotions, and behaviors. Confidentiality will be maintained by means of identifying protocols by code only. Thus, no information that can identify you will be associated with any of your responses. A master list linking names to codes will be kept in a separate location accessible only to designated research staff. This master list will be kept for only purposes of contacting participants if needed, and for granting participants course credit for participation. This list will be destroyed at completion of the study. All data will be kept in a secure file accessible only to primary research personnel. If we write a report or article about this study, we will describe the study results in a summarized manner so that you cannot be identified.

**IS THIS STUDY VOLUNTARY?**

Your participation is voluntary. You may choose not to participate or you may discontinue your participation at any time without penalty or loss of benefits to which you are otherwise entitled. Your decision about whether or not to participate will not affect your current or future relations with the University of South Dakota.

## Appendix B

## Demographic Information

**1.** What is your age please? (Please enter numbers only)

**2.** What is your gender?

- **a.** Male
- **b.** Female

**3.** Please choose on racial group that best describes you.

- **a.** White or Caucasian
- **b.** Black or African American
- **c.** Native American or Alaskan Native
- **d.** Asian or Asian American
- **e.** Hispanic or Latino
- **f.** Native Hawaiian or other Pacific Islander
- **g.** Multiracial
- **h.** Do not wish to respond
- **i.** Other (please specify)

**4.** Please indicate your current marital status (please select only one response).

- **a.** Married and living together
- **b.** Married but living apart (not legally separated)
- **c.** Legally separated
- **d.** Divorced
- **e.** Widowed
- **f.** Never married
- **g.** Do not wish to respond

**5.** If you are not married, please select the response that best describes your relationship status.

- **a.** Not in a relationship
- **b.** Casually dating (I date other people as well)
- **c.** Seriously dating (I do not date other people)
- **d.** Engaged
- **e.** Do not wish to respond

**6.** Do you currently live with your partner?

- **a.** Yes
- **b.** No
- **c.** Do not wish to respond

# Appendix C

## Childhood Abuse and Trauma Scale (CATS)

This questionnaire seeks to determine the general atmosphere of your home when you were a child or a teenager and *how you felt you were treated by your parents or your principal caretaker*. (If you were not raised by one or both of you biological parents, please respond to the question below in terms of the person or persons who had the primary responsibility for your upbringing.)

Where a question inquires about the behaviour of both your parents and your parents differed in their behaviour, *please respond in terms of the parent whose behaviour was the more severe or worse.*

Answer each item using the following codes. Please circle a number for every item to indicate your response, where:

| | | 0 = never<br>1 = rarely<br>2 = sometimes<br>3= very often<br>4 = always |
|---|---|---|
| 1. | Did your parents ridicule you? | 0 1 2 3 4 |
| 2. | Did you ever seek outside help or guidance because of problems in your home? | 0 1 2 3 4 |
| 3. | Did your parents verbally abuse each other? | 0 1 2 3 4 |
| 4. | Were you expected to follow a strict code of behaviour in your home? | 0 1 2 3 4 |
| 5. | When you were punished a child or teenager, did you understand the reason you were punished? | 0 1 2 3 4 |
| 6. | When you didn't follow the rules of the house, how often were you severely punished? | 0 1 2 3 4 |
| 7. | As a child did you feel unwanted or emotionally neglected? | 0 1 2 3 4 |
| 8. | Did your parents insult you or call you names? | 0 1 2 3 4 |
| 9. | Before you were 14, did you engage in any sexual activity with an adult? | 0 1 2 3 4 |
| 10 | Were your parents unhappy with each other? | 0 1 2 3 4 |
| 11. | Were you parents unwilling to attend any of your school-related activities? | 0 1 2 3 4 |
| 12. | As a child were you punished in unusual ways (e.g., being locked in a closet for a long time or being tied up). | 0 1 2 3 4 |
| 13. | Were there traumatic or upsetting sexual experiences when you were a child or teenager that you couldn't speak about to adults? | 0 1 2 3 4 |
| 14. | Did you ever think that you wanted to leave your family and live with another family | 0 1 2 3 4 |
| 15. | Did you ever witness the sexual mistreatment of another family member? | 0 1 2 3 4 |

| | | 0 = never<br>1 = rarely<br>2 = sometimes<br>3= very often<br>4 = always |
|---|---|---|
| 16. | Did you ever think seriously of running away from home? | 0 1 2 3 4 |
| 17. | Did you witness the physical mistreatment of another family member? | 0 1 2 3 4 |
| 18. | When you were punished as a child or teenager, did you feel the punishment was deserved? | 0 1 2 3 4 |
| 19. | As a child or teenager, did you feel disliked by either of your parents? | 0 1 2 3 4 |
| 20. | How often did your parents get really angry with you? | 0 1 2 3 4 |
| 21. | As a child did you feel that your home was charged with the possibility of unpredicted physical violence? | 0 1 2 3 4 |
| 22. | Did you feel comfortable bringing your friends home to visit? | 0 1 2 3 4 |
| 23. | Did you feel safe living at home? | 0 1 2 3 4 |
| 24. | When you were punished as a child or a teenager, did you feel the punishment fit the crime? | 0 1 2 3 4 |
| 25. | Did your parents ever verbally lash out to you when you did not expect it? | 0 1 2 3 4 |
| 26. | Did you have traumatic sexual experiences as a child or teenager? | 0 1 2 3 4 |
| 27. | Where you lonely as a child? | 0 1 2 3 4 |
| 28. | Did your parents yell at you? | 0 1 2 3 4 |
| 29. | When either of your parents was intoxicated, were you ever afraid of being sexually mistreated? | 0 1 2 3 4 |
| 30. | Did you ever wish for a friend to share your life? | 0 1 2 3 4 |
| 31. | How often were you left alone as a child? | 0 1 2 3 4 |
| 32. | Did your parents ever blame you for things that you didn't do? | 0 1 2 3 4 |
| 33. | To what extent did either of your parents drink heavily or abuse drugs? | 0 1 2 3 4 |
| 34. | Did your parents ever hit or beat you when you did not expect it? | 0 1 2 3 4 |
| 35. | Did your relationship with your parents ever involve a sexual experience? | 0 1 2 3 4 |
| 36. | As a child, did you have to take care of yourself before you were old enough? | 0 1 2 3 4 |
| 37. | Were you physically mistreated as a child or a teenager? | 0 1 2 3 4 |
| 38. | Was your childhood stressful? | 0 1 2 3 4 |

# Appendix D

## Young Schema Questionnaire: Short Form 3 (YSQ-S3)

**Instructions:** Listed below are statements that people might use to describe themselves. Please read each statement, then rate it based on how accurately it fits you over the past year. When you are not sure, base your answer on what you emotionally feel, not on what you think to be true.

A few of the items ask about your relationships with your parents or romantic partners. If any of these people have died, please answer these items based on your relationships when they were alive. If you do not currently have a partner but have had partners in the past, please answer the item based on your most recent significant romantic partner.

Choose a score from 1-6 on the rating scale below that best describes you, then write your answer on the line before each statement.

**RATING SCALE**

| | |
|---|---|
| **1 = Completely untrue of me** | **4 = Moderately true of me** |
| **2 = Mostly untrue of me** | **5 =Mostly true of me** |
| **3 = Slightly more true than untrue** | **6 = Describes me perfectly** |

1. ____ I haven't had someone to nurture me, share him/herself with me, or care about everything that happens to me.
2. ____ I find myself clinging to people I'm close to because I'm afraid they'll leave me.
3. ____ I feel that people will take advantage of me.
4. ____ I don't fit in.
5. ____ No man/woman I desire could love me once he or she saw my defects or flaws.
6. ____ Almost nothing I do at work (or school) is as good as other people can do.
7. ____ I do not feel capable of getting by on my own in everyday life.
8. ____ I can't seem to escape the feeling that something bad is about to happen.
9. ____ I have not been able to separate myself from my parent(s) the way other people my age seem to.
10. ____ I think that if I do what I want, I'm only asking for trouble.
11. ____ I'm the one who usually ends up taking care of the people I'm close to.
12. ____ I am too self-conscious to show positive feelings to others (e.g., affection, showing care).
13. ____ I must be the best at most of what I do; I can't accept second best.
14. ____ I have a lot of trouble accepting "no" for and answer when I want something from other people.
15. ____ I can't seem to discipline myself to complete most routine or boring tasks.
16. ____ Having money and knowing important people makes me feel worthwhile.
17. ____ Even when things seem to be going well, I feel that it is only temporary.
18. ____ If I make a mistake, I deserve to be punished.
19. ____ I don't have people to give me warmth, holding, and affection.
20. ____ I need other people so much that I worry about losing them.
21. ____ I feel that I cannot let my guard down in the presence of other people, or else they will intentionally hurt me.
22. ____ I'm fundamentally different from other people.
23. ____ No one I desire would want to stay close to me if he or she knew the real me.

24. ____ I'm incompetent when it comes to achievement.
25. ____ I think of myself as a dependent person when it comes to everyday functioning.
26. ____ I feel that a disaster (natural, criminal, financial, or medical) could strike at any moment.
27. ____ My parent(s) and I tend to be over-involved in each other's lives and problems.
28. ____ I feel as if I have no choice but to give in to others more than myself.
29. ____ I am a good person because I think of others more than myself.
30. ____ I find it embarrassing to express my feelings to others.
31. ____ I try to do my best; I can't settle for "good enough".
32. ____ I'm special and shouldn't have to accept many of the restrictions or limitations placed on other people.
33. ____ I can't reach a goal, I become easily frustrated and give up.
34. ____ Accomplishments are most valuable to me if other people notice them.
35. ____ If something good happens, I worry that something bad is likely to follow.
36. ____ If I don't try my hardest, I should expect to lose out.
37. ____ I haven't felt that I am special to someone.
38. ____ I worry that people I feel close to will leave me or abandon me.
39. ____ It is only a matter of time before someone betrays me.
40. ____ I don't belong; I'm a loner.
41. ____ I'm unworthy of the love, attention, and respect of others.
42. ____ Most other people are more capable than I am in areas of work and achievement.
43. ____ I lack common sense.
44. ____ I worry about being physically attacked by people.
45. ____ It is very difficult for my parent(s) and me to keep intimate details from each other without feeling betrayed or guilty.
46. ____ In relationships, I usually let the other person have the upper hand.
47. ____ I'm so busy doing things for the people that I care about that I have little time for myself.
48. ____ I find it hard to be free-spirited and spontaneous around other people.
49. ____ I must meet all my responsibilities.
50. ____ I hate to be constrained or kept from doing what I want.
51. ____ I have a very difficult time sacrificing immediate gratification or pleasure to achieve a long-range goal.
52. ____ Unless I get a lot of attention from others, I feel less important.
53. ____ You can't be too careful; something will almost always go wrong.
54. ____ If I don't do the job right, I should suffer the consequences.
55. ____ I have not had someone who really listens to me, understands me, or is tuned into my true needs and feelings.
56. ____ When someone I care for seems to be pulling away or withdrawing from me, I feel desperate.
57. ____ I am quite suspicious of other people's motives.
58. ____ I feel alienated or cut off from other people.
59. ____ I feel that I'm not lovable.

60. ____ I'm not as talented as most people are at work (or school).
61. ____ My judgment cannot be counted on in everyday situations.
62. ____ I worry that I'll lose all my money and become destitute or very poor.
63. ____ I often feel as if my parent's are living through me – that I don't have a life of my own.
64. ____ I've always let others make choices for me, so I really don't know what I want for myself.
65. ____ I've always been the one who listens to everyone else's problems.
66. ____ I control myself so much that many people think I am unemotional or unfeeling.
67. ____ I feel that there is constant pressure for me to achieve and get things done.
68. ____ I feel that I shouldn't have to follow the normal rules or conventions that other people do.
69. ____ I can't force myself to do things I don't enjoy, even when I know it's for my own good.
70. ____ I make remarks at meetings or when introduced in social situations, it's important for me to get recognition and admiration.
71. ____ No matter how hard I work, I worry that I could be wiped out financially and lose almost everything.
72. ____ It doesn't matter why I make a mistake. When I do something wrong, I should pay the consequences.
73. ____ I haven't had a strong or wise person to give me sound advice or direction when I'm not sure what to do.
74. ____ Sometimes I am so worried about people leaving me that I drive them away.
75. ____ I'm usually on the lookout for people's ulterior or hidden motives.
76. ____ I always feel on the outside of groups.
77. ____ I am too unacceptable in very basic ways to reveal myself to other people or to let them get to know me well.
78. ____ I'm not as intelligent as most people when it comes to work (or school).
79. ____ I don't feel confident about my ability to solve everyday problems that come up.
80. ____ I worry that I'm developing a serious illness, even though nothing serious has been diagnosed by a doctor.
81. ____ I often feel I do not have a separate identity, from my parent(s) or partner.
82. ____ I have a lot of trouble demanding that my rights be respected and that my feelings be taken into account.
83. ____ Other people see me as doing too much for others and not enough for myself.
84. ____ People see me as uptight emotionally.
85. ____ I can't let myself off the hook easily or make excuses for my mistakes.
86. ____ I feel that what I have to offer is of greater value than the contributions of others.
87. ____ I have rarely been able to stick to my resolutions.
88. ____ Lots of praise and compliments make me feel like a worthwhile person.
89. ____ I worry that a wrong decision could lead to disaster.
90. ____ I'm a bad person who deserves to be punished.

# Appendix E

## PTSD Checklist for DMS-5 (PCL-5)

**Instructions:** Below is a list of problems that people sometimes have in response to a very stressful experience. Please read each problem carefully and then circle one of the numbers to the right to indicate how much you have been bothered by that problem in the past month.

| In the past month, how much were you bothered by: | Not at all | A little bit | Moderately | Quite a bit | Extremely |
|---|---|---|---|---|---|
| 1. Repeated, disturbing, and unwanted memories of the stressful experience? | 0 | 1 | 2 | 3 | 4 |
| 2. Repeated, disturbing dreams of the stressful experience? | 0 | 1 | 2 | 3 | 4 |
| 3. Suddenly feeling or acting as if the stressful experience were actually happening again (as if you were actually back there reliving it)? | 0 | 1 | 2 | 3 | 4 |
| 4. Feeling very upset when something reminded you of the stressful experience? | 0 | 1 | 2 | 3 | 4 |
| 5. Having strong physical reactions when something reminded you of the stressful experience (for example, heart pounding, trouble breathing, sweating)? | 0 | 1 | 2 | 3 | 4 |
| 6. Avoiding memories, thoughts, or feelings related to the stressful experience? | 0 | 1 | 2 | 3 | 4 |
| 7. Avoiding external reminders of the stressful experience (for example, people, places, conversations, activities, objects, or situations)? | 0 | 1 | 2 | 3 | 4 |
| 8. Trouble remembering important parts of the stressful experience? | 0 | 1 | 2 | 3 | 4 |
| 9. Having strong negative beliefs about yourself, other people, or the world (for example, having thoughts such as: I am bad, there is something seriously wrong with me, no one can be trusted, the world is completely dangerous)? | 0 | 1 | 2 | 3 | 4 |
| 10. Blaming yourself or someone else for the stressful experience or what happened after it? | 0 | 1 | 2 | 3 | 4 |
| 11. Having strong negative feelings such as fear, horror, anger, guilt, or shame? | 0 | 1 | 2 | 3 | 4 |
| 12. Loss of interest in activities that you used to enjoy? | 0 | 1 | 2 | 3 | 4 |
| 13. Feeling distant or cut off from other people? | 0 | 1 | 2 | 3 | 4 |
| 14. Trouble experiencing positive feelings (for example, being unable to feel happiness or have loving feelings for people close to you)? | 0 | 1 | 2 | 3 | 4 |
| 15. Irritable behavior, angry outbursts, or acting aggressively? | 0 | 1 | 2 | 3 | 4 |
| 16. Taking too many risks or doing things that could cause you harm? | 0 | 1 | 2 | 3 | 4 |
| 17. Being “superalert” or watchful or on guard? | 0 | 1 | 2 | 3 | 4 |
| 18. Feeling jumpy or easily startled? | 0 | 1 | 2 | 3 | 4 |
| 19. Having difficulty concentrating? | 0 | 1 | 2 | 3 | 4 |
| 20. Trouble falling or staying asleep? | 0 | 1 | 2 | 3 | 4 |