5-9-2022

Posttraumatic Stress Symptoms, Anger, and Substance Use as Risk Factors for Trauma Revictimization

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M.A., Psychological Sciences, University of Missouri-St. Louis, 2020

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A Dissertation Submitted to The Graduate School at the University of Missouri-St. Louis

in partial fulfillment of the requirements for the degree

Doctor of Philosophy in Psychology with an emphasis in Clinical

May 2023

Advisory Committee

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Abstract

Maltreatment survivors are at an increased risk for adult revictimization. Yet, existing work has specifically focused on sexual revictimization, and it is unclear what factors increase one's risk for revictimization more broadly. Posttraumatic stress symptoms (PTSS), anger, and substance use have been identified as potential risk factors for sexual revictimization. Still, the role of these variables is ambiguous in the broader revictimization framework. There is also a lack of understanding regarding the roles of the *DSM-5* posttraumatic stress disorder (PTSD) symptom clusters and revictimization. This study aims to: 1) examine the links between maltreatment and revictimization and three factors (i.e., PTSS, anger, and substance use), 2) determine whether there are indirect effects between maltreatment and revictimization through each factor, and 3) investigate whether the PTSD clusters have indirect effects on the relationship between maltreatment and revictimization. The sample included 417 maltreated college students (M_{age} = 22.04, *SD* = 5.08; 83.2% female; 54.9% white) from two universities. Mediation results indicated that maltreatment and revictimization were linked with PTSS (*B* = .02, *B* = .01, respectively). Only maltreatment was related to anger, *B* = 1.86, and revictimization was tied to substance use, *B* = .02. Only PTSS had an indirect effect on the link between maltreatment and revictimization (*B* = .02). Maltreatment was associated with each of the four PTSD symptom clusters, but the clusters had no indirect effects on the link between maltreatment and revictimization. These findings indicate that PTSS may be uniquely important in increasing risk for trauma revictimization.

Keywords: child maltreatment; revictimization; posttraumatic stress symptoms; anger; substance use

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Children's exposure to maltreatment is a pervading problem in the United States (Department of Health and Human Services [DHHS], 2021). The term maltreatment encapsulates child physical (CPA) and sexual abuse (CSA), witnessing intimate partner violence (IPV), emotional abuse, and neglect. In 2019, 656,243 children experienced maltreatment that was substantiated by child services (DHHS, 2021). Although this prevalence is overwhelming, it is certainly an underestimate, as many cases may go unreported or are not substantiated due to having insufficient evidence of the maltreatment (Fang et al., 2012). It is more common, unfortunately, for individuals to be exposed to chronic maltreatment rather than an isolated incident (Finkelhor et al., 2015). Further, maltreated children frequently experience multiple forms of maltreatment (e.g., CSA and emotional abuse), as opposed to a single type (e.g., only CSA; Finkelhor et al., 2015). Though prior work has suggested that child maltreatment is related to numerous adverse physical (e.g., injury, death; Widom et al., 2012), psychological (e.g., posttraumatic stress disorder [PTSD], depression; Connolly, 2014; Das & Otis, 2016; Young & Widom, 2014), biological (e.g., lower brain volumes; Hart & Rubia, 2012), and neurocognitive outcomes (e.g., lower IQ; Cowell et al., 2015; Kavannaugh et al., 2017; Su et al., 2019), cumulative maltreatment exposure may have even more devastating consequences across the lifespan than a single incident (Finkelhor et al., 2011).

Beyond the aforementioned outcomes, maltreated individuals are at greater risk of being revictimized in both adolescence and adulthood (Dias et al., 2017; Miron & Orcutt, 2014; Walker et al., 2019). In the past several decades, a large body of research on the

impact of sexual revictimization (i.e., CSA and adult sexual assault [ASA]) has amassed; however, the relations between other types of maltreatment and adult victimization have been investigated far less. This dearth is rather surprising, as relations have been identified between non-sexual childhood trauma and subsequent revictimization (Stroem et al., 2019; Widom et al., 2008). Despite these findings, very few studies have examined revictimization following non-sexual traumatic events, such as CPA, witnessing IPV, emotional abuse, or neglect (Desai et al., 2002; Stroem et al., 2019; Werner et al., 2016; Widom et al., 2008). Furthermore, to this author's knowledge, no study has examined each of these maltreatment types cumulatively and their specific relations with adult victimization. Thus, the factors by which cumulative maltreatment may increase the risk for revictimization are poorly understood.

Given the variability that exists between childhood trauma types and the skewed focus towards sexual revictimization in the literature, it is imperative that researchers garner a better understanding of what is driving the risk for revictimization following cumulative maltreatment exposure, particularly given work suggesting that these cumulative outcomes may be particularly devastating (Messman-Moore & Bhuptani, 2017). Several potential mediating variables have been routinely examined in the sexual revictimization literature, including posttraumatic stress symptoms (PTSS), emotion dysregulation, anger/aggression, risk perception abilities, risk-taking behaviors, sexual assertiveness, and dissociation (Gidycz et al., 2006; Hannan et al., 2017; Jouriles et al., 2014; Lilly et al., 2014; Messman-Moore et al., 2013, 2015; Walker et al., 2021). However, very few studies have evaluated the roles of these factors when examining multiple forms of maltreatment and revictimization more broadly, which is a critical gap

in the literature. Therefore, the first aim of this study is to investigate the relations between cumulative maltreatment, adult revictimization, and three potential risk factors (i.e., PTSS, anger, and substance use). These specific variables were chosen based on their importance in the relation between CSA and ASA (Messman-Moore et al., 2009, 2013; Scoglio et al., 2021; Ullman, 2016; Ullman & Vasquez, 2015; Walker et al., 2021). The second aim is to study the indirect effects of these potential risk factors on the associations between maltreatment and adult revictimization. Given the large body of work citing the significance of PTSS in the revictimization framework (Iverson et al., 2013; Littleton & Ullman, 2013; Messman-Moore & Bhuptani, 2017; Scoglio et al., 2021; Ullman & Peter-Hagene, 2016; Walker et al., 2021), a tertiary aim is to explore the associations between maltreatment, adult revictimization, and the four *DSM-5* PTSD symptom clusters, as well as to investigate whether the clusters have an indirect effect on the relations between child maltreatment and adult revictimization.

Child Maltreatment and Polyvictimization

Child maltreatment has been defined as any act or failure to act by the caregiver which results in death, physical or emotional harm, sexual abuse, or exploitation (DHHS, 2021). CPA, CSA, emotional abuse, and neglect are encompassed under the term maltreatment, as is witnessing IPV, which is a more unique maltreatment type given that the parent/caregiver action or lack of action is not directed towards the child. Witnessing IPV can range from direct exposure (i.e., seeing and hearing violence) to less direct exposure (i.e., seeing injuries resulting from a violent act and/or being told about violent acts; Hamby et al., 2011). Of cases substantiated in 2019, neglect was the most common maltreatment type, representing 74.9% of cases (17.5% CPA, 9.3% CSA, 6.1% emotional

abuse; DHHS, 2021). Rates of witnessing IPV were not reported by the DHHS, as child services only responds to IPV calls when the child's safety is directly at risk (DHHS, 2021). However, one national survey reported that 8.2% of children witnessed IPV over a one-year period (Finkelhor et al., 2015). Although child abuse and neglect have well-documented physical and psychological ramifications (Breslau et al., 2014; Pratchett & Yehuda, 2011; Widom et al., 2012; Young & Widom, 2014), witnessing violence between one's caregivers can also be incredibly traumatic for youth (for a meta-analysis, see Kitzmann et al., 2003).

For decades, the developmental impact of maltreatment has been studied given the potential for devastating short- and long-term ramifications (Charak et al., 2018; Ehring & Quack, 2010; Hanson et al., 2008; Kisiel et al., 2014; Littleton et al., 2014; Messmen-Moore et al., 2013; Wilson & Scarpa, 2014). Although specific maltreatment types may be linked with worse outcomes depending on their severity (e.g., CSA), there is evidence that suggests that the consequences of experiencing multiple types of maltreatment (i.e., polyvictimization) may be even more severe (Finkelhor et al., 2007). It is, unfortunately, quite common for maltreatment types to overlap rather than occurring as a singular event (Finkelhor et al., 2011). In the National Survey of Children's Exposure to Violence (NatSCEV), 48.4% of children experienced more than one form of maltreatment or violence exposure within a one-year period (51.6% only reported one type; Finkelhor et al., 2015). Thus, when examining individual forms of maltreatment, the consequences of maltreatment may be linked to a specific incident of victimization, when the totality of one's experience is responsible (Finkelhor et al., 2015).

Risk Factors for Child Maltreatment. Numerous risk factors for maltreatment have been identified at the individual level, including one's gender, age, race, and ethnicity (DHHS, 2021; Finkelhor et al., 2015; Hamby et al., 2011). Prior work has demonstrated that females are more likely to experience CSA, whereas males tend to have higher rates of CPA (Finkelhor et al., 2015). Further, younger children are more vulnerable to maltreatment in general, and in 2019, approximately one quarter (28.1%) of victims were younger than three years old (DHHS, 2021). Black and Hispanic/Latinx children are overrepresented among those being reported as victims of maltreatment (DHHS, 2021), and these increased rates may be the result of racial biases and a greater vulnerability to risk factors (i.e., poverty, low parental education, single parent homes, and other disparities; Lanier et al., 2014). Critically, in regions where there is a greater poverty divide between Whites and minorities, maltreatment rates have differed based on race and ethnicity; however, in states with more income equality, these differences are less apparent (Kim & Drake, 2018; Lanier et al., 2014).

There are also risk factors for child maltreatment that are systemic, as maltreatment often occurs within the context of other adversity, such as poverty or a dysfunctional environment, and the combined impact of trauma and external stressors generally elevates the risk and severity of mental health consequences across the lifespan (Drake & Jonson-Reid, 2014). Though it is well-understood that maltreated children are more likely to be living in poverty (for a review, see Drake & Jonson-Reid, 2014), the associations between maltreatment and family poverty appear to be more complex than a direct link. Indeed, other factors, such as parental education, stress, and mental health challenges (e.g., parental substance use), may be strengthening this relationship (Drake &

Jonson-Reid, 2014). Additionally, being a survivor of maltreatment may be a risk factor for perpetration in adulthood, a notion that has been termed the intergenerational transmission of abuse (Widom, 1989). Although evidence suggests that surviving maltreatment increases one's risk for perpetrating abuse, this is certainly not a guarantee, as the rates of the intergenerational transmission of abuse are quite variable (6.75% to 70%; for a review, see Berzenski et al., 2014). Notably, CPA appears to have the most persistent rates of transmission compared with other forms of maltreatment (Berzenski et al., 2014); however, other maltreatment types and levels of severity have also been linked with a greater likelihood of perpetration in adulthood (Murrell et al., 2005; Widom et al., 2015).

Child Maltreatment Outcomes. Maltreatment is associated with a myriad of negative ramifications across several domains of functioning (e.g., physical, cognitive, neurobiological, social/behavioral, and psychological; for a review, see Widom, 2014). CPA and neglect have been most strongly linked with both physical injury and death, along with medical conditions and disability into adulthood (e.g., diabetes, obesity, lung disease, poor nutrition; Leventhal et al., 2012; Widom et al., 2012). Approximately 1,840 children died of abuse and neglect in 2019, with child fatalities being most common among young, Black male children (DHHS, 2021). Cognitive and executive functioning deficits have also been identified as consequences of maltreatment, including lower IQs and academic performance, as well as language, memory, and attention deficits that may be linked with decreased success in the long-term (for a review, see Su et al., 2019). Significant neurological changes in one's brain structure and function are also potential maltreatment outcomes (Hart & Rubia, 2012; Teicher et al., 2016). For example, reduced

hippocampal volumes following maltreatment may be particularly important due to their role in memory and regulating the body's response to stress through the hypothalamic pituitary adrenal (HPA) axis (for a review, see Holliday et al., 2014). Maltreatment has also been related to difficulties with self-regulation and behavior problems in children, which may result in challenges in the classroom and/or worsened family and peer relations (Kim & Cicchetti, 2010). These difficulties are even more elevated if the maltreatment exposure is chronic (Jonson-Reid et al., 2012; Widom, 2014).

Various psychological outcomes are also common following maltreatment, including PTSD, depression, anxiety, emotion dysregulation, and substance use, and they can be damaging throughout one's life (Pratchett & Yehuda, 2011). PTSD is one possible consequence of child maltreatment; however, only a small proportion of trauma-exposed individuals actually develop PTSD in their lifetime (8.7%; APA, 2013). Maltreatment is associated with high levels of PTSS (30.9%) in adulthood, and CSA has specifically been linked with a greater risk for PTSD (37.5% lifetime, 22.5% current), along with more severe PTSS, compared with other forms of maltreatment (Ehring & Quack, 2010; Kisiel et al., 2014; for a review, see Messman-Moore & Bhuptani, 2017). Further, internalizing problems, including depression and anxiety, have been related to maltreatment in the short- and long-term (for a review, see Widom, 2014). As an example, one prospective study demonstrated that individuals with CPA and those with multiple forms of maltreatment were more likely to have a lifetime diagnosis of major depressive disorder (MDD) compared to other maltreatment types (Widom et al., 2007). However, the same study found that 15% of the neglected children also met criteria for current MDD. Children with a history of maltreatment may also struggle to identify and express their

emotions and have more difficulties with modulating emotional experiences when they are upset, compared to children with no history of maltreatment (Charak et al., 2018; Kim & Cicchetti, 2010; Messman-Moore et al., 2015).

A greater propensity for substance use has also been identified as an outcome of maltreatment (for a review, see Widom, 2014). Maltreated children are exposed to a variety of risk factors for substance use (e.g., comorbid psychopathology, behavioral problems; for a review, see Cicchetti & Handley, 2019). As a result, they are more vulnerable to misusing substances at an earlier age (Lansford et al., 2010), and have faster inclines in heavy episodic substance use compared to their non-abused peers (Shin et al., 2016). Furthermore, tension-reduction hypotheses, such as the self-medication theory, assert that trauma survivors are more likely to have substance-related difficulties, possibly to help them cope with their trauma-related distress (Stewart & Israeli, 2002). By using substances to cope with distress, maltreatment survivors may be more likely to be in risky or potentially dangerous situations (Ullman, 2016). One nationally representative study demonstrated that experiencing CSA and/or CPA was linked with an increased risk of developing an alcohol use disorder and having family and/or occupational problems related to one's alcohol use (Lown et al., 2011). Prior work has indicated that CPA, CSA, and emotional abuse are each linked with greater tobacco, alcohol, illicit, and multi-drug use (Alvarez-Alonso et al., 2016; Moran et al., 2004; Shin et al., 2016). Although it is understood that adversity in general (e.g., parental death, incarceration, etc.) may be related to increased substance use among youth, child maltreatment has been found to uniquely predict substance use over a three-year period above and beyond other life stressors (Elliott et al., 2014).

Trauma Revictimization

As noted, individuals with a maltreatment history are also at an elevated risk for revictimization across developmental time periods (e.g., adolescence and adulthood; Finkelhor et al., 2007; Walker et al., 2019). To date, revictimization research has largely been focused on the links between CSA and ASA. This emphasis is certainly warranted, as sexual victimization is associated with a greater conditional risk for PTSS (Kilpatrick et al., 2013; Messman-Moore & Bhuptani, 2019; Walsh et al., 2012), and it is well-documented that rates of sexual revictimization are exceedingly high (47.9%; Walker et al., 2019). However, despite this focus on sexual revictimization, other maltreatment types also appear be linked with a greater propensity for revictimization (for example, Desai et al., 2002; Stroem et al., 2019), and to the author's knowledge, no studies have examined each form of maltreatment and adult revictimization simultaneously. Prior work with a nationally representative sample has indicated that both CPA and CSA may be linked with adult revictimization for both males and females (Desai et al., 2002), though witnessing IPV, emotional abuse, and neglect were not accounted for. Only one known study has examined the relations between witnessing IPV and ASA (Werner et al., 2016). A prospective study of child services data collected in 1967 through 1971 and again from 2000 through 2002 observed that three distinct maltreatment types (i.e., CPA, CSA, neglect) were associated with trauma exposure in adulthood, but those who experienced multiple forms were at an even greater risk for subsequent victimization than individuals with any one trauma type (Widom et al., 2008). Therefore, it is apparent that maltreated individuals in general, beyond CSA survivors, are at risk for revictimization in adulthood, particularly if their maltreatment is cumulative.

Regarding adult victimization, maltreatment exposure has also been linked with elevated rates of IPV (McIntyre & Widom, 2011), and thus, revictimization in adulthood should not be limited to ASA. Although very few studies have explored potential relations between child maltreatment and IPV in adulthood, one study found that individuals with a history of CSA were at an increased risk for IPV compared to those with no history of abuse (Noll et al., 2003). CSA has also been associated with an increased risk for emotional or psychological abuse in adulthood (Messman-Moore & Long, 2003), with individuals reporting more feelings of isolation and acts of emotional-verbal abuse from partners than those with no CSA history. Given that rates of sexual revictimization are high (Walker et al., 2019), it is critical to develop a better understanding of maltreatment and revictimization more generally, as cumulative maltreatment exposure substantially increases one's revictimization risk (Widom et al., 2008).

There are several additional challenges that have been identified in the revictimization literature. Importantly, there is variability in how revictimization has been operationally defined which further contributes to our ambiguous understanding of the true prevalence of revictimization. Specifically, the different forms of revictimization have been defined inconsistently (Iverson et al., 2013; Walker et al., 2019). Sexual revictimization is most frequently conceptualized as occurring across distinct developmental time points, such as childhood and adulthood, whereas IPV revictimization often includes victimization within the same time period (e.g., multiple occurrences with distinct perpetrators; Iverson et al., 2013; Kuijpers et al., 2012). In fact, a recent systematic review indicated that research on IPV revictimization with different

partners is rather scarce (Ørke et al., 2018). Due to limitations of data collection, it can also be very difficult to establish whether maltreatment occurred continuously from childhood into adolescence or adulthood, potentially by the same perpetrator, which further contributes to equivocation regarding the prevalence revictimization.

Furthermore, there are clear differences in the emphasis of types of traumas between the child and adult trauma literatures. As mentioned previously, the adult trauma literature has largely focused on sexual revictimization, which likely results in a lack of awareness regarding more cumulative effects of other trauma exposure. In contrast, research on child maltreatment has devoted more attention to understanding polyvictimization, as opposed to focusing on specific maltreatment types and their relation to revictimization. Although this broader view of maltreatment is paramount given that maltreatment types tend to overlap, there are also some limitations to this cumulative approach, given that there are likely some nuanced ramifications related to specific trauma types (e.g., CSA). As an example, it is widely agreed upon that sexual trauma is linked with a greater risk for PTSD compared with other trauma types (Kilpatrick et al., 2013). However, findings also indicate that experiencing multiple forms of maltreatment may also increase one's risk for developing PTSD, along with greater severity of PTSS (for a review, see Messman-Moore & Bhuptani, 2017). Thus, it has been posited that PTSS may have a "dose-response" relationship, where symptom severity becomes greater as the number of maltreatment types increases (Messman-Moore & Bhuptani, 2017). There are clearly merits to having both a cumulative and a more focused examination of trauma exposure in developing our understanding of the relationship between maltreatment and revictimization.

Theories of Revictimization

In line with the disproportionate literature on sexual revictimization, the leading theories of revictimization have centered on sexual revictimization as well. Given the complexity of the revictimization phenomenon, it is clear that no single factor will explain these relationships (for a review, see Messman-Moore & Long, 2003). Therefore, Messman-Moore and Long (2003) proposed an ecological theory of sexual revictimization which included several dimensions of factors that are likely present in the revictimization framework. This ecological model includes several potential mediating variables, such as psychological factors, conflict with others, others' perceptions of one as a victim, socioeconomic status (SES), cultural beliefs about trauma, gender roles, etc. At present, Messman-Moore and Long's (2003) theory is the most comprehensive, as it acknowledges the complexities that contribute to revictimization, and it recognizes that both internal and external mediating factors elevate the risk for revictimization, and that these constructs may interact with one another. Although this theoretical framework is useful, the concentration on sexual victimization and revictimization is quite limiting given that child maltreatment types tend to overlap (Finkelhor et al., 2015), and non-sexual forms of maltreatment may also be very damaging to individuals in the short- and long-term (Lewis et al., 2016; for a review, see Widom, 2014). Therefore, the inclusivity of other forms of maltreatment (e.g., CPA, neglect) and adult victimization (e.g., IPV) may be useful for our developing understanding of these relationships.

Risk Factors for Revictimization

Consistent with theory (Messman-Moore & Long, 2003), a variety of potential mechanisms for revictimization have been investigated, including PTSS, emotion

dysregulation, anger and aggression, risk perception, risk-taking behaviors (e.g., substance use, risky sexual behavior), sexual assertiveness, and dissociation (Bockers et al., 2014; Easton & Kong, 2017; Iverson et al., 2013; Jouriles et al., 2014; Lilly et al., 2014; Messman-Moore et al., 2009; Ullman, 2016; Walsh et al., 2011). Although certain factors have been researched extensively (i.e., PTSS, emotion dysregulation), they have almost exclusively been investigated within the context of sexual revictimization. Thus, examination of potential mechanisms that may increase the likelihood of broader trauma revictimization is essential. Although several risk factors appear to be particularly salient in the revictimization framework, the respective roles and strength of these factors is still ambiguous.

Posttraumatic Stress Symptoms. Numerous factors may increase one's risk for revictimization, but it appears that PTSS may play a critical role. The development of PTSD and PTSS is a possible response to trauma exposure in childhood and adulthood; however, only a small proportion of trauma-exposed individuals actually develop PTSD in their lifetime (8.7%; APA, 2013). Although research indicates that sexual trauma is linked with a greater risk for PTSD (Kilpatrick et al., 2013), there is evidence to suggest that cumulative maltreatment is associated with an even greater risk for the development of PTSD, along with more severe PTSS, than those experiencing one trauma type (Kennedy et al., 2014; Messman-Moore & Bhuptani, 2017). In one study of approximately 4,000 women, CSA, CPA, and emotional abuse were all individually linked with PTSS, but the cumulative impact of the three maltreatment types was related to 23 times the risk for probable PTSD (Schneider et al., 2007).

Given the high rates of PTSD following maltreatment (range = 30.6% to 37.5% [lifetime PTSD]; Messman-Moore & Bhuptani, 2017), it is unsurprising that PTSD has received substantial attention in the extant revictimization literature. Furthermore, many risk factors for revictimization overlap and interact with one another, and PTSS appear to be the most frequently associated with other factors in this framework (e.g., substance use, anger, risk perception; Iverson et al., 2014; Messman-Moore et al., 2009; Ullman, 2016; Yeater et al., 2010). Elevated levels of PTSS have been related to both sexual and IPV revictimization in adulthood (Iverson et al., 2013; Kuijpers et al., 2012; Lilly et al., 2014; Messman-Moore et al., 2009, 2013). PTSS may be related to an overall decrease in one's awareness and information processing, which has been linked to impairments in risk assessment and self-protective behavior (Messman-Moore et al., 2009; Yeater et al., 2010). Further, the psychological distress associated with PTSS can be detrimental, and this distress may contribute to the use of maladaptive coping strategies (e.g., substance use, risky sexual behavior) to aid in alleviating one's distress (Messman-Moore et al., 2009; Ullman, 2016). As an example, PTSS have been indirectly related to sexual victimization and substance use, and therefore, PTSS may be associated with the development of problematic substance use (Ullman et al., 2013). PTSS have also been linked with alcohol use following CSA in a longitudinal study, which in turn, was predictive of sexual revictimization in adulthood over a one-year period (Ullman et al., 2009). Although relations between PTSS and sexual and IPV revictimization have been established (Iverson et al., 2013; Ullman et al., 2013), it appears that other variables, including alcohol and other substance use, may also help explain the association between PTSS and revictimization, indicating that PTSS may be a key factor in our understanding

of revictimization (Messman-Moore et al., 2009; Ullman, 2016; Ullman & Peter-Hagene, 2016).

According to the *DSM-5*, PTSD includes the presence of clinically significant distress across four symptom clusters: intrusion, avoidance, negative alterations in cognitions and mood, and marked alterations in arousal and reactivity (APA, 2013). To date, the roles of the *DSM-5* PTSD symptom clusters have only been examined in one study of sexual revictimization to the author's knowledge. The aforementioned study determined that each cluster was associated with CSA, but only marked alterations in arousal and reactivity were related to ASA (Walker et al., 2021). Though there is very limited work utilizing the *DSM-5* conceptualization of PTSD, the *DSM-IV* PTSD symptom clusters (i.e., re-experiencing, avoidance/numbing, hyperarousal) have been previously tied to both sexual and IPV revictimization (Kuijpers et al., 2012; Risser et al., 2006; Ullman et al., 2009). Re-experiencing symptoms have been associated with an increased risk for IPV revictimization (Kuijpers et al., 2012). Similarly, numbing and hyperarousal symptoms have been related to both sexual (Risser et al., 2006; Ullman et al., 2009) and IPV (Iverson et al., 2013; Krause et al., 2006) revictimization. It is possible that these symptoms may be interfering with one's ability to accurately assess risk or one's ability to appropriately respond to threatening situations. Furthermore, findings from a prospective study suggested that IPV survivors were at greater risk for additional IPV exposure over a six-month period as their hyperarousal symptoms increased (Iverson et al., 2013). Given that the specific roles of the updated *DSM-5* PTSD symptom clusters (i.e., intrusion, avoidance, negative alterations in cognitions and mood, and marked alterations in arousal and reactivity) have yet not been explored in relation to

revictimization, aside from one study of sexual trauma (Walker et al., 2021), further work is needed to further our understanding of their potentially unique associations.

Anger. Emotion regulation has been identified as a mechanism through which maltreatment is related to both sexual and IPV revictimization (Berezenski & Yates, 2010; Lilly et al., 2014; Messman-Moore et al., 2013). Emotion regulation skills begin developing during early childhood (Lee, 2015), and thus, theorists have asserted that early maltreatment exposure may interrupt the development of these important skills, which may contribute to negative functioning following trauma exposure (Shields & Cicchetti, 1998). Anger is a specific emotion that is often intense and may be particularly challenging to regulate appropriately. Anger-specific emotion dysregulation appears to be quite relevant in our developing understanding of revictimization, as symptoms of anger and aggression now fall under the fourth symptom cluster (i.e., marked alterations in arousal and reactivity) of the *DSM-5* conceptualization of PTSD (APA, 2013). To date, a host of studies have examined the role of broader emotion dysregulation in the revictimization framework; where anger-specific difficulties, such as problematic levels of anger and aggression, have been explored rather sparingly, or in male-only samples.

Among men, anger, aggression, and hostility have been linked with both sexual trauma and revictimization (Charak et al., 2019; Easton & Kong, 2017). Similarly, physical forms of revictimization have been related to greater difficulties with anger and aggression in men (Iverson et al., 2014), potentially due to the dissonance between victimization and cultural views of masculinity and men being invulnerable. A recent study determined that problematic anger had an indirect effect on the association between CSA and ASA among men and women (Walker et al., 2021). Anger-specific emotion

dysregulation has also been found to mediate the link between CPA and IPV (Iverson et al., 2014), and it has been identified as a potential mechanism for adult IPV revictimization in a longitudinal study of men and women (Kuijpers et al., 2012). In one study of female undergraduates, increased difficulties with emotion regulation and processing resulted in greater difficulties with impulsivity and reactive anger, which in turn, increased one's risk for IPV revictimization (Berzenski & Yates, 2010). These findings align with our understanding that early trauma exposure may adversely impact the development of adaptive emotion regulation skills (Shields & Cicchetti, 1998), and they also suggest that anger may be an emotion that is particularly challenging to regulate following trauma exposure, thereby increasing one's risk for additional victimization (Iverson et al., 2014).

Substance Use. Like PTSS, problematic levels of anger have been associated with elevated substance use, possibly to cope with the turbulent emotion and trauma-related distress (Messman-Moore et al., 2009; Turchik, 2012). Negative reinforcement models of substance use appear to be relevant in our understanding the underlying motivations for substance use following trauma exposure, as individuals appear to use substances as a way to reduce aversive states (Carpenter et al., 2019; Koob & Le Moal, 2008). Indeed, avoiding negative emotion following trauma may be a principle motivating factor for substance users, as negative emotion is always present when one is in withdrawal (Baker et al., 2004). As a result, substance use may become cyclical and potentially more severe over time, though individuals who are at higher risk for substance use experience less of a reduction in negative emotionality compared to lower risk individuals (Carpenter et al., 2019). Like negative reinforcement models, the tension-

reduction hypotheses, such as the self-medication theory (Stewart & Israeli, 2002), assert that trauma survivors are at an increased risk for substance-related difficulties, possibly to self-medicate their trauma-related distress (e.g., PTSS). Notably, the data on the tension-reduction hypotheses have varied, as research has found both significant and null relations between trauma-related distress or PTSS and substance use (Messman-Moore et al., 2009; Ullman & Najdowski, 2009). Thus, there are likely additional factors that may be salient (e.g., how survivors are attempting to reduce distress or in what context, type of substance, trauma type, etc.). As an example, one study demonstrated that distress had an indirect effect on the relation between CSA and problematic drinking, but only among individuals who reported that their drinking behaviors were for coping reasons (Smith et al., 2014). These results suggest complex pathways between PTSS, substance use, and victimization that require further investigation.

Prior research has extended these tension-reduction hypotheses to aid in our understanding of substance use and revictimization, suggesting that individuals may engage in more risk-taking behavior to reduce their trauma-related distress, which may increase their risk for additional victimization (Messman-Moore et al., 2009; Ullman, 2016). It has been postulated that substance use may be a key mechanism of revictimization due to the added impairment of self-protective behaviors, being viewed as vulnerable due to intoxication, and a greater likelihood of being in risky or potentially threatening situations (Messman-Moore & Long, 2003), which has been supported by research (Messman-Moore et al., 2009; Ullman, 2016). Prior work has indicated that the relation between ASA and using substances to cope with trauma-related distress is likely reciprocal, where ASA elevates the likelihood of misusing substances to cope with

trauma-related distress, which in turn, increases the risk for revictimization (Messman-Moore et al., 2015). Notably, this association exists for both men and women (Cafferky et al., 2018; Testa et al., 2012). In research on IPV, findings similarly suggest that substance use is linked with revictimization, though these studies often define revictimization differently (e.g., revictimization by the same perpetrator or within the same developmental time point; for a review, see Ørke et al., 2018). However, one longitudinal study of IPV revictimization by multiple partners determined that marijuana and illicit drug use was associated with an elevated risk for experiencing violence by new partners (Testa et al., 2003).

The Present Study

Despite the substantial theoretical and empirical work that has advanced our understanding of the revictimization framework, specifically regarding sexual revictimization, there are still significant gaps in the literature that must be addressed. As mentioned previously, the prior focus on sexual revictimization is important given the severity of the potential outcomes (Messman-Moore et al., 2013; Miron & Orcutt, 2014; Santos-Iglesias et al., 2012; Ullman, 2016; Ullman & Vasquez, 2015). However, there is still a critical need for additional work to identify modifiable risk factors for more general revictimization, as they may differ given the added impact of cumulative trauma exposure. As an example, specific factors that place CSA survivors at risk for revictimization may differ in type and severity compared to those who have experienced CPA or polyvictimization. Further, it is plausible that the cumulative impact of maltreatment may increase the likelihood of the presence of multiple risk factors (e.g., anger and substance use), which certainly contributes to the complexity of the pathway

between maltreatment and revictimization and may also introduce more intricate, reciprocal pathways. Based largely on the sexual revictimization literature, PTSS, anger, and substance use appear to be key mechanisms by which maltreatment increases one's risk for revictimization across the lifespan (Charak et al., 2019; Lilly et al., 2014; Messman-Moore et al., 2009; Messman-Moore & Bhuptani, 2017; Ullman, 2016; Walker et al., 2021). Although there are many potential risk factors that appear to be relevant in this revictimization framework, this author chose to focus on these three variables, as they appear to be particularly salient based on prior findings.

In line with Messman-Moore & Long's (2003) theoretical model, potential mediating variables, such as PTSS, anger, and substance use are critical in understanding and explaining the revictimization framework. Given that each of these factors is malleable, if they are associated with trauma revictimization, there may be important clinical implications that may reduce one's risk for victimization. The overarching goal of this study was to expand our understanding of revictimization by taking a more cumulative approach by which child maltreatment (i.e., CPA, CSA, witnessing IPV, emotional abuse, and neglect) may increase the risk for adult revictimization (i.e., ASA, IPV). The first aim of the study was to determine whether relations exist between both maltreatment and adult revictimization and each of the three factors. It was hypothesized that both maltreatment and adult revictimization would be positively associated with greater levels of PTSS, anger, and substance use. The second aim of the study was to investigate whether there are any indirect effects between maltreatment and adult revictimization through each of the factors. PTSS, anger, and substance use were expected to each demonstrate a partial indirect effect on the relation between

maltreatment and adult revictimization. Finally, given the substantial attention that PTSD has received in the revictimization literature, the third aim of the study was to examine whether there were indirect effects between maltreatment and adult revictimization through each of the four PTSD symptom clusters (i.e., intrusion, avoidance, negative alterations in cognition and mood, marked alterations in arousal and reactivity; APA, 2013). Each of the four *DSM-5* PTSD symptom clusters were anticipated to demonstrate a partial indirect effect on the association between maltreatment and adult revictimization.

Method

Participants

The present study utilized a subsample of participants from a larger cross-site study (n = 744). Three hundred and twenty-seven individuals from the larger study were not included in this study due to having reported no history of child maltreatment (i.e., CPA, CSA, witnessing IPV, emotional abuse, neglect), resulting in the final sample of 417 maltreated adult participants. The included participants were students (M_{age} = 22.04, SD = 5.08, Range = 18-63) from the University of Missouri-St. Louis (UMSL; n = 237) and the University of Memphis (n = 180). The sample (n = 417) was predominantly female (83.2%; 16.8% male), and the majority of these participants were White (54.9%; 30.5% Black, 6% Biracial/Multiracial, 6.5% Asian, 4.1% Middle Eastern, 1.9% American Indian or Alaskan Native, 1.0% Native Hawaiian or Pacific Islander, and 4.1% other), and 7.0% of participants identified as Hispanic/Latino. Participants reported their family's annual income categorically in groupings of $10,000 (e.g., <$10,000, $10,000-$19,999). The average income for this sample was $50,000-$59,000. Of the 417

maltreated participants, 145 also experienced adult revictimization (34.7%), whereas 272 (65.2%) did not endorse experiencing revictimization at the time of data collection. This study defined maltreatment and adult victimization as occurring before and after age 16, respectively, to remain consistent with the Life Stressor Checklist-Revised (LSC-R). Please see Table 1 for the additional demographic and clinical characteristics for this sample.

Procedures

This study utilized data that were collected as part of a larger cross-site research project at UMSL and the University of Memphis investigating the effects of exposure to community violence and other traumatic events and clinical outcomes. Participants from both universities were recruited from their respective psychology human subject pools. In total, 744 participants were recruited to participate in the larger cross-site study (UMSL *n* = 397, University of Memphis *n* = 347). Participants self-selected into the study and completed all study procedures online using Qualtrics. Study procedures took approximately 90 minutes to complete. Participants received research credit for a psychology course. Inclusion criteria for this study were: 1) being student at either UMSL or the University of Memphis, 2) experiencing at least one incident of maltreatment (i.e., CPA, CSA, witnessing IPV, emotional abuse, and neglect) before the age of 16 as defined by the LSC-R. There were no exclusion criteria. The final sample for the present study included 417 maltreated adults, as 327 participants were not included given their lack of maltreatment history. All study procedures were approved by the Institutional Review Boards (IRB) at UMSL and the University of Memphis.

Measures

Demographics. A brief questionnaire was administered to each participant to ascertain basic demographic information, such as recruitment site, age, gender, race, ethnicity, marital status, employment status, education level, annual household income, and military status.

Maltreatment and Revictimization. Participants completed the Life Stressor Checklist-Revised (LSC-R; Wolfe & Kimerling, 1997) to gather information regarding exposure to maltreatment and revictimization. The LSC-R assesses for 30 traumatic events and significant life stressors that may potentially result in PTSD, including child maltreatment, witnessed violence, and both sexual and physical assault in adulthood. For the present study, the participants indicated whether they experienced maltreatment and/or adult victimization using a dichotomous rating scale (0 = *No*; 1 = *Yes*). Six items from this measure were added together to create the maltreatment variable. These items included exposure to CPA, CSA (including items for both unwanted sexual contact and forcible penetration), witnessing IPV, emotional abuse, and neglect before the age of 16. Example items include, "Have you ever been physically neglected (for example, not fed, not properly clothes, or left to take care of yourself when you were too young or ill?" "Have you ever been emotionally abused or neglected (for example, being frequently shamed, embarrassed, ignored, or repeatedly told you were 'no good')?" Three items from the LSC-R were summed to create the adult victimization variable, which includes both sexual assault (including items for both unwanted sexual contact and forcible penetration) and IPV after age 16. Example items include, "After age 16, were you ever touched or made to touch someone else in a sexual way because he/she forced you in some way or threatened harm to you if you didn't?" "After age 16, did you ever have sex

(oral, anal, genital) when you didn't want to because someone forced you in some way or threatened to harm you if you didn't?" The LSC-R has been linked with satisfactory indices of reliability and validity (Wolfe & Kimerling, 1997). Due to the independence of traumatic events, reliability was not calculated for the current sample.

Posttraumatic Stress Symptoms. Participants completed the Posttraumatic Stress Disorder Checklist-Civilian 5 (PCL-5; Weathers et al., 2013), which is a 20-item self-report measure that assesses *DSM-5* PTSD symptoms experienced in the last month. Participants were asked to rate the levels of distress they are experiencing related to certain symptoms on a 5-point Likert scale (0 = *Not at all* to 4 = *Extremely*). Sample items include "Repeated, disturbing dreams of the stressful experience," "Avoiding memories, thoughts, or feelings related to the stressful experience," "Feeling distant or cut off from other people," and "Loss of interest in activities that you used to enjoy." Total scores range from 0 to 80, with higher scores indicating more elevated levels of PTSS. The PCL-5 also includes four subscales that correspond to each of the four *DSM-5* PTSD symptom clusters (i.e., intrusion, avoidance, negative alterations in cognitions and mood, and marked alterations in arousal and reactivity). There is well-documented evidence of good reliability and validity of the PCL-5 (Wortmann et al., 2016). Cronbach's α for this sample was excellent for total PTSS (α = .95), and satisfactory for the *DSM-5* PTSD symptom cluster subscales (α = .84-.91).

Anger. Participants completed the Dimensions of Anger Reactions scale (DAR-5; Forbes et al., 2004). The DAR-5 is a 7-item, self-report measure that assesses for trait anger, state anger, and anger control over the past month on a 9-point Likert scale (0 = *not at all* to 8 = *exactly so*). Sample items include "When I do get angry, I get really

mad," "When I get angry, I stay angry," and "My anger interferes with my ability to get my work done." The total sum score was utilized, where greater scores indicated higher levels of problematic anger. The DAR-5 has previously been found to be a reliable and valid measure of anger among trauma-exposed individuals (Forbes et al., 2004). For this sample, internal consistency was adequate, $\alpha = .89$.

Substance Use. Participants completed the National Institute on Drug Abuse Quick Screen (NIDA; Smith et al., 2010; NIDA, 2012). The NIDA is a 21-item self-report screening measure that assesses for drug use, including alcohol use, tobacco use, illicit drug use (e.g., cocaine, methamphetamines, opioids, hallucinogens), and nonmedical prescription drug use (e.g., prescription stimulants, sedatives, or opioids), on a 5-point Likert scale (1 = *Never* to 5 = *Daily or almost daily*). This brief assessment was originally designed to assist clinicians in quickly screening for substance use and it includes measures of substance use over a three-month period, a year-long period, and across one's lifetime. The total sum score of substance use over the past year was utilized, with higher scores indicating greater levels of substance use. Please see Table 2 for specific descriptive characteristics of the NIDA. In the present study, $\alpha = .79$.

Data Analytic Plan

All analyses were conducted using SPSS Statistics 27. The data were cleaned and screened for assumptions, including homoscedasticity, multicollinearity, and multivariate normality. Tests to see if the data met the assumption of collinearity indicated that multicollinearity was not a concern for the majority of the independent variables (variance inflation factors [VIF] < 3). Notably, the relations between the first PTSD cluster (i.e., intrusion) and the fourth cluster (i.e., marked alterations in arousal and

reactivity) had slightly elevated levels of multicollinearity (VIF = 3.53). Similarly, avoidance symptoms also had mildly elevated multicollinearity with the fourth cluster (VIF = 3.46). See Table 3 for a correlation matrix of the PTSD symptom clusters. Given that levels of collinearity were relatively low, no independent variables needed to be removed from the main analyses. Missing data was observed in 2.2% of the cases and was found to be likely missing completely at random using Little's Missing Completely at Random (MCAR) test, X^2 (148, n = 417) = 71.27, p > .05. Multiple imputation procedures were used for the first hypothesis to avoid losing cases to listwise deletion. Given the small amount of missing data, a smaller number of imputed datasets were used (m = 5; Rubin 1987). The imputed datasets were generated at random, and the pooled data were utilized for the preliminary and main analyses. There were no convergence issues with the data. Each of the variables that were included in the analyses were included in the multiple imputation procedures. In multiple imputation, the standardized beta variables are not automatically pooled; therefore, the author pooled those variables manually using a Microsoft Excel macro. For hypotheses two and three, the author utilized the original data given that the PROCESS macro cannot be run using imputed datasets.

Prior to running the main analyses, several demographic variables, including recruitment site (1 = University of Memphis, 2 = UMSL), age, sex (1 = male, 2 = female), race (0 = nonwhite, 1 = white), ethnicity (0 = not Hispanic/Latino, 1 = Hispanic/Latino), and income, were examined using bivariate correlations for continuous variables and chi-square analyses and independent samples t-tests for the categorical variables. Demographic variables that were significantly associated with the dependent

variables were included as covariates in the main analyses. G*Power 3.1 was used to run a post hoc power analysis to calculate power based on the study's sample size and number of independent variables. This power analysis indicated that the analyses conduced in this study were sufficiently powered ($f^2 = 0.15$, $\alpha = .05$, $n = 417$, $1\text{-}\beta = .95$).

When examining the first hypothesis, that maltreatment and adult revictimization would be associated with each of the three included factors (i.e., PTSS, anger, and substance use), a multivariate regression model was run to allow for the examination of the three continuous dependent variables (i.e., PTSS, anger, and substance use) simultaneously, as opposed to running six separate regression models. Child maltreatment was examined as a continuous variable to allow for statistical variance. Adult revictimization was coded dichotomously (0 = no revictimization, 1 = revictimization), given that the conceptual goal of the study was to determine whether certain factors, including PTSS, anger, and substance use, increase one's risk for revictimization, as opposed to examining the levels at which one was revictimized. The dichotomous coding of revictimization has been used in prior literature (Andersson et al., 2020; Das & Otis, 2016; Exner-Cortens et al., 2017). To test the second hypothesis, that higher levels of PTSS, anger, and substance use would have indirect effects on the relation between maltreatment and adult revictimization, a parallel mediation model was conducted using Model 4 of the PROCESS macro (Hayes, 2017). For the third hypothesis, Model 4 was also used to assess whether greater levels of each of the PTSD symptom clusters would have an indirect effect on the relationship between maltreatment and revictimization.

Results

Descriptive characteristics. See Table 1 for a summary of additional demographic characteristics and the rates of trauma exposure for the sample. Emotional abuse was the most commonly disclosed maltreatment type (68.6%; 54.4% witnessing IPV, 35.3% CSA, 29.3% CPA, and 12% neglect). Of the individuals who endorsed a history of CSA, 93.8% reported a history of unwanted sexual contact and 42.4% reported forced intercourse prior to the age of 16 with both unwanted sexual contact and forced intercourse prior to age 16 reported by 12.7% of participants. The average number of endorsed maltreatment types was 2.12 (SD = 1.26). Forty-one percent of participants endorsed experiencing one type of maltreatment, 29.5% reported two types of maltreatment, 13.7% reported three forms, 10.3% endorsed four forms, and 5.5% reported experiencing all five maltreatment types. Nearly 35% of the participants disclosed that they have been revictimized in adulthood (34.7%). Over 25% of participants reported a history of ASA (26.7%) with 69.3% reporting unwanted sexual contact and 77.3% reporting forced intercourse. Similarly, 19.4% of participants endorsed exposure to IPV in adulthood. Six percent of participants experienced both ASA and IPV in this sample.

Preliminary analyses. Compared to undergraduates at the University of Memphis, UMSL students had significantly higher levels of anger, $t(415) = -3.93$, $p < .001$, but not PTSS, substance use, or any of the four *DSM-5* PTSD symptom clusters, *ps* $> .05$. Adult revictimization was also linked with increased likelihood of being a student at UMSL, X^2 (2, $N = 417$) = 5.20, $p = .02$, but maltreatment history was not related to recruitment site, $p > .05$. Participant's age was correlated with maltreatment ($r = .17$, $p <$

.001) and substance use (r = .10, p = .04), but not with PTSS or anger. Of the four symptom clusters, age was only correlated with avoidance (r = -.12, p = .01). Revictimization was also related to age, $t(415) = -3.23$, $p < .001$. Annual income was inversely related to maltreatment (r = -.11, p < .03), PTSS (r = -.10, p < .05), and anger (r = -.14, p = .03), as well as positively linked with substance use (r = .12, p < .02). Participant's income was also associated with marked alterations in arousal and reactivity (r = -.11, p = .02); however, income was not associated with revictimization or the other PTSD symptom clusters, $p > .05$. Women reported higher rates of maltreatment, $t(415) = -2.01$, p = .04, and revictimization, X^2 (2, N = 417) = 4.07, p = .04, than men. Female participants also reported greater levels of PTSS, $t(415) = -3.30$, $p < .001$. Women reported greater levels of intrusion, $t(415) = -3.91$, $p < .001$, avoidance, $t(415) = -3.29$, $p < .001$, negative alterations in cognitions and mood, $t(415) = -2.48$, p = .01, and marked alterations in arousal and reactivity symptoms, $t(415) = -2.43$, p = .02, compared to men. Sex was not related to anger or substance use.

Ethnicity was not associated with maltreatment or adult revictimization, $ps > .05$. Individuals who identified as Hispanic/Latinx also did not report higher levels of PTSS, anger, or substance use, or the specific PTSD symptom clusters than individuals who did not identify as Hispanic/Latinx, $ps > .05$. Being a Person of Color was not associated with maltreatment or revictimization ($ps > .05$); however, people of color acknowledged higher levels of anger than White participants, $t(415) = 3.43$, $p < .001$, but levels of PTSS and substance use were equivalent. When looking at the differences between Black and White participants, Black individuals endorsed greater levels of anger, $t(371) = 3.57$, $p < .001$, but lower levels of substance use, $t(371) = -2.25$, p = .03, compared to their White

peers. Of the PTSD symptom clusters, only avoidance symptoms were tied to race, with people of color endorsing higher symptoms than white participants, $t(415) = 2.27$, $p = .02$. Based on these preliminary analyses, recruitment site, sex, age, race, and income were included as covariates in the regression and mediation models.

Regression model. A multivariate regression was conducted to investigate the associations between both maltreatment and adult revictimization and PTSS, anger, and substance use (see Table 4). Maltreatment was associated with a significant amount of the variance in PTSS, $F(1, 417) = 31.49$, $p < .001$, partial $\eta^2 = .07$, as was adult revictimization, $F(1, 417) = 20.37$, $p < .001$, partial $\eta^2 = .05$. Both older participants and females reported higher levels of PTSS. As hypothesized, maltreatment and adult revictimization were related to higher levels of PTSS. Child maltreatment was linked with a significant amount of the variance in anger, $F(1, 417) = 11.93$, $p < .001$, partial $\eta^2 = .03$, but revictimization was not, $F(1, 417) = 2.01$, $p > .05$, partial $\eta^2 = .01$, respectively. Recruitment site was related to anger, where UMSL students endorsed higher levels of anger. Older participants and people of color also reported greater levels of anger. Black participants endorsed higher levels of anger compared to White participants. Maltreatment was directly related to anger. Conversely, adult revictimization was not linked with anger. Maltreatment was not associated with a significant portion of the variance in substance use, $F(1, 417) = .70$, $p > .05$, partial $\eta^2 = .002$; however, adult revictimization was, $F(1, 417) = 7.96$, $p = .01$, partial $\eta^2 = .02$. Family income was positively associated with substance use. Contrary to hypotheses, maltreatment was not significantly related to substance use, however, adult revictimization was tied to greater substance use.

Mediation models. The results for the first mediation model can be found in Table 5. The mediation model for child maltreatment and the three potential factors (i.e., PTSS, anger, and substance use) was significant, $F(9, 407) = 8.50$, $p < .001$, and accounted for a significant portion of the variance in adult revictimization, $r^2 = .16$. Women reported higher levels of PTSS. As expected, maltreatment was related to higher levels of PTSS, and PTSS were also linked with adult revictimization. There was a direct effect of maltreatment on revictimization, as well as a significant indirect effect for maltreatment on revictimization through PTSS.

Recruitment site was linked with anger, where UMSL students reported higher levels of anger. Racial minority status was associated with greater levels of anger, and more specifically, Black participants endorsed higher levels of anger than White participants. Maltreatment was also significantly linked with higher levels of problematic anger, but unexpectedly, revictimization was not associated with anger, and there was no indirect effect for maltreatment on revictimization through anger. In contrast, adult revictimization was positively linked with substance use, though maltreatment was not. There was also no significant indirect effect for maltreatment on adult revictimization through substance use. Please see Figure 1 for a visual representation of the mediation model.

Mediation analyses were run to determine whether child maltreatment was related to adult revictimization through each of the four *DSM-5* PTSD symptom clusters (see Table 6). The mediation model was significant, $F(10, 406) = 7.13$, $p < .001$, $r^2 = .15$. Females endorsed higher symptom levels across each of the four PTSD clusters, compared to their male peers. Black participants reported significantly greater avoidance

symptoms compared to White participants. As hypothesized, maltreatment was directly related to adult revictimization. Maltreatment was associated with greater symptoms of intrusion, avoidance, negative alterations in cognition and mood, and marked alterations in arousal and reactivity. Adult revictimization was not directly tied to any of the four PTSD symptom clusters, and there were no indirect effects between maltreatment and revictimization through the four clusters. A visual representation of the second mediation model can be found in Figure 2.

Discussion

Despite there being a large body of literature focused on sexual revictimization, there is a lack of understanding of broader trauma revictimization (i.e., cumulative childhood maltreatment and adult interpersonal trauma). Researchers have often studied PTSS as a potential risk factor for sexual revictimization, but it also appears to be a driving factor for revictimization more generally (Debell et al., 2014; Iverson et al., 2013; Messman-Moore & Long, 2003; Messman-Moore et al., 2009; Ullman et al., 2013). Less is known, however, about how the updated *DSM-5* PTSD symptom clusters may be tied to maltreatment and revictimization, as they have only been examined in relation to CSA and ASA to date (Walker et al., 2021). Emotion dysregulation is another factor that has been frequently associated with sexual revictimization (Ehring & Quack, 2010; Messman-Moore & Bhuptani, 2017), but anger, which is a symptom of PTSD and a powerful emotion that may be challenging to regulate, has been largely overlooked in this research. Further, substance use, and even more specifically, problematic alcohol use, has been identified as a risk factor for sexual revictimization given that using substances may increase one's vulnerability for victimization; however, substance use has not been

previously studied alongside trauma revictimization more broadly. The present study therefore extends the revictimization literature by: 1) determining whether relations exist between both cumulative maltreatment and adult revictimization and three factors (i.e., PTSS, anger, and substance use), 2) investigating whether there are any indirect effects between maltreatment and revictimization through each of these factors, and 3) examining whether there are associations between maltreatment, revictimization, and the four *DSM-5* PTSD symptom clusters (i.e., intrusion, avoidance, negative alterations in cognition and mood, marked alterations in arousal and reactivity; APA, 2013), and identifying any indirect effects between maltreatment and revictimization through each of the clusters.

The findings from this study make several valuable contributions to the revictimization literature. First, the results align with existing research demonstrating that maltreatment is tied to adult revictimization (Desai et al., 2002; Stroem et al., 2019; Walker et al., 2019; Werner et al., 2016; Widom et al., 2008), and to the author's knowledge, this is the first study to be inclusive of each of the five maltreatment types (i.e., CSA, CPA, witnessing IPV, emotional abuse, and neglect), along with both ASA and IPV. Rates of adult victimization were high in this sample, which is also consistent with prior work suggesting that college students are at an elevated risk for interpersonal trauma exposure (Espeleta et al., 2017). Emotional abuse was the most frequently reported form of maltreatment (68.6%), but other maltreatment types were also relatively common (54.4% witnessing IPV, 35.3% CSA, 29.3% CPA, and 12% neglect). Moreover, most participants endorsed experiencing multiple forms of maltreatment (29.5% two types, 29.5% three or more types), which is consistent with our understanding of the high

occurrence of polyvictimization (Finkelhor et al., 2015). Although this sample was relatively young given that they were college students (M_{age} = 22.04, *SD* = 5.08), nearly 30% reported already experiencing sexual and/or IPV revictimization in adulthood, which unfortunately, is comparable to sexual revictimization rates reported in other studies (for a meta-analysis, see Walker et al., 2019).

Revictimization was also associated with being a student at UMSL. It is noteworthy that UMSL is a less "traditional" university setting than the University of Memphis, in that many of the students commute to campus as opposed to living in campus housing, and the students tend to be a bit older than a typical undergraduate population (UMSL M_{age} = 22.68, *SD* = 5.21; University of Memphis M_{age} = 21.21, *SD* = 4.77). Thus, it appears that the older age of the UMSL students, as well as their potentially differing life circumstances (e.g., not residing on campus, commuting), may be associated with differing risk for revictimization. Future research would benefit from querying how and where revictimization takes place to expound upon the potential impact of living on campus. Further, in line with epidemiological findings (Kilpatrick et al., 2013), females were more likely than males to endorse maltreatment and revictimization, along with higher levels of PTSS and across each of the four *DSM-5* PTSD symptom clusters. Interestingly, there were also racial differences in symptoms between Black and White participants, where Black participants endorsed greater levels of anger, along with higher levels of avoidance symptoms of PTSD. Prior work has demonstrated that race-related trauma and stressful life events may elicit significant anger symptoms, both internally and externally (McKenna et al., 2021). Similarly, avoidant

strategies in managing trauma-related distress have been tied to more severe trauma symptoms among Black adults (Carter & Forsyth, 2010; Polanco-Roman et al., 2016).

Maltreatment and revictimization were related to greater levels of PTSS, which was consistent with hypotheses and prior literature (Iverson et al., 2013; Kuijpers et al., 2012; Lilly et al., 2014; Messman-Moore & Bhuptani, 2017; Messman-Moore et al., 2009; Walker et al., 2021). Thus, this study provided further evidence that PTSS are important to consider when examining the associations between maltreatment and trauma revictimization, more broadly, beyond specific types (e.g., sexual or IPV revictimization). PTSS have been specifically associated with revictimization in studies of sexual revictimization (i.e., incidents of CSA and ASA; Lilly et al., 2014; Messman-Moore et al., 2009), as well as IPV revictimization (i.e., defined as two IPV occurrences with different partners; Iverson et al., 2013; Kuijpers et al., 2012). Both theoretical and empirical work have indicated that PTSS may be tied to the development and/or severity of other risk factors for revictimization, such as greater engagement in risk-taking behaviors as an attempt to alleviate one's trauma-related distress (Messman-Moore et al., 2009; Stewart & Israeli, 2002; Ullman et al., 2016). PTSS also may negatively affect one's ability to accurately assess risk and respond to threating situations, thereby increasing their vulnerability for revictimization (Iverson et al., 2011; Yeater et al., 2010). Prevention programs targeting revictimization may be more effective if PTSS, along with factors that often exist concurrently with PTSS, are specifically addressed. Additional work is needed to determine whether reductions in PTSS through clinical intervention may also successfully mitigate one's risk of engaging in risk-taking

behaviors while bolstering skills for assessing risk and responding to potentially threatening situations.

Beyond PTSS, the findings of this study indicate that maltreatment was specifically tied to problematic anger, though contrary to expectations, revictimization was not. A large body of work has indicated that emotion dysregulation is a key factor in the revictimization framework (Lilly et al., 2014; Messman-Moore & Bhuptani, 2017, Messman-Moore et al., 2013). However, there has been very little exploration of problematic anger and revictimization. Prior trauma research has suggested that individuals with PTSD may be more reticent or struggle to disclose about their anger (Orth & Wieland, 2006), which may provide an explanation as to why revictimization and anger were unrelated in this study. Furthermore, work that focuses on anger or anger-regulation has primarily been conducted with male-only samples (Charak et al., 2019; Easton & Kong, 2017; Iverson et al., 2014), which is limiting, as trauma-exposed females also self-report high levels of anger (Walker et al., 2021). Studies of males who have experienced repeat victimization, either sexual or IPV, have demonstrated that they may have a vulnerability for elevated levels of anger and anger-dysregulation (Charak et al., 2019; Iverson et al., 2014). Interestingly, one study found that levels of anger among maltreatment survivors did not differ from those of the revictimization group, suggesting that maltreatment may be tied to powerful, long-term difficulties with anger among men (Charak et al., 2019). Additional work is needed to examine these relations among samples of both men and women, as much of the extant work on revictimization has focused on women struggling with broader difficulties with emotion regulation, and there

may be important implications specific to distinct emotional experiences (e.g., anger, sadness).

Anger is a common response to trauma and is included as a PTSD symptom within the fourth symptom cluster in the *DSM-5* (i.e., marked alterations in arousal and reactivity; APA, 2013). However, unexpectedly, anger did not have an indirect effect on the association between cumulative maltreatment and revictimization. It is possible that anger is a symptom that is less strongly tied to an increased risk for revictimization, and that other PTSS are more salient in this framework. Notably, anger can be manifested in several ways- state- and trait-based anger, hostility, and aggressive behavior. The DAR-5 specifically assesses for state- and trait-based anger, as well as anger control (Forbes et al., 2004). Although the DAR-5 is a psychometrically appropriate measure of anger, other dimensions of anger, such as hostility and aggression (i.e., more overt forms of anger) are not accounted for and perhaps these other aspects may have stronger ties to one's risk for revictimization, as opposed to difficulties with anger and anger control. For example, angry or hostile feelings towards others may have stronger relations with maltreatment and revictimization, given that negative beliefs or feelings towards others and/or the world are a normative consequence of trauma exposure (APA, 2013). A study of men identified relationships between CSA and greater hostility over a fifty-year period (Easton & Kong, 2017). Similarly, more overt forms of anger, such as verbal or physical aggression, appear to be more common among trauma-exposed adults with PTSS (Wamser-Nanney et al., 2019, 2020). Research is still needed to investigate the potentially distinct roles of anger in relation to revictimization given that how one expresses their negative emotions may be tied to different outcomes following

maltreatment. Moreover, much of the existing work on anger has been conducted in male-only samples, further research utilizing female samples should be prioritized, as the ways that women experience and process various facets of anger may look very different compared to men based on differences in gender socialization.

Beyond psychological risk factors for revictimization, the present study also examined the role of substance use, given the large focus on problematic drinking and other substance use in the sexual revictimization literature. Contrary to expectations, maltreatment was not associated with substance use. This finding was surprising, as maltreatment has previously been linked with greater substance use (Lansford et al., 2010). This study specifically examined substance use from the past year, as opposed to lifetime use. Perhaps participants who experienced maltreatment have experienced their time in college as being protective thus far, as they may have some physical distance from childhood homes where traumatic events may have taken place. In contrast to the maltreatment findings, revictimization was related to greater substance use. It is possible that revictimized individuals may have had greater challenges with substance use given the recency of their traumatic experiences, as well as the fact that their trauma history has spanned across multiple developmental time periods compared to participants whose trauma may have happened many years earlier.

Substance use did not have an indirect effect on the relation between maltreatment and revictimization, which contrasted with previous findings from the sexual revictimization literature. These results may indicate that this factor may not be particularly important when examining cumulative maltreatment and revictimization, or that substance use increases after revictimization occurs. Although this was an

unexpected result, there are many avenues for college students to experience greater vulnerability to assault while intoxicated (e.g., college parties, underaged drinking, experimenting with substances for the first time). Thus, substance use may be more strongly tied to sexual victimization compared to other traumatic events in college populations specifically. However, as mentioned previously, a large portion of the total sample used in this study was from a less traditional university setting. Therefore, this particular college sample may be less likely to partake in some of the higher-risk activities that a more typical college population is exposed to (e.g., college parties, binge drinking, etc.). At the same time, they are in a semi-structured environment and receiving an education, which can be protective for young adults. Given that prior work is almost exclusively limited to the relations between substance use and sexual revictimization among traditional college students, research is still needed to replicate this finding with community-based samples, as their experiences may be very different from college students. Moreover, if substance use truly does not increase one's risk for trauma revictimization, beyond sexual revictimization, it is imperative that further research is conducted to investigate potential mechanisms for revictimization following maltreatment, as current prevention methods are largely based on the sexual revictimization literature, and differing risk factors would have considerable clinical implications.

This was the first known study to examine the associations between maltreatment and revictimization through each of the four *DSM-5* PTSD symptom clusters: intrusion, avoidance, negative alterations in cognition and mood, and marked alterations in arousal and reactivity. Notably, only maltreatment was linked with each of the four clusters,

whereas adult revictimization was unrelated. These results were not anticipated, as research with the *DSM-IV* criteria has identified relations between the *DSM-IV* clusters and both sexual revictimization (Risser et al., 2006) and IPV revictimization (Krause et al., 2006). Only one study to date has utilized the updated *DSM-5* PTSD symptom clusters to explore the link between CSA and ASA (Walker et al., 2021). Like the present study, Walker and colleagues (2021) identified relations between maltreatment (i.e., CSA) and the four *DSM-5* clusters; however, they also observed an association between ASA and marked alterations in arousal and reactivity. Like sexual trauma (Kilpatrick et al., 2013), cumulative maltreatment is also associated with more severe outcomes than individual trauma types due to the additive effect of experiencing multiple forms of trauma (Finkelhor et al., 2015; Messman-Moore & Bhuptani, 2017). Thus, it is not surprising that cumulative maltreatment was related to each of the specific clusters.

It was unexpected, however, that adult revictimization was not associated with any of the four clusters. Findings regarding the relations between the *DSM-IV* PTSD symptom clusters and revictimization have been mixed. For example, Krause and colleagues (2006) identified ties between numbing symptoms and a greater risk for IPV revictimization over one year, though the other symptom clusters were unrelated. Similarly, other prospective studies have found that only *DSM-IV* re-experiencing (Kuijpers et al., 2012) or hyperarousal (Iverson et al., 2013; Risser et al., 2006) symptoms were predictive of an increased risk for revictimization. These discrepancies with the *DSM-IV* PTSD symptom clusters have largely been accounted for by sampling differences across studies (e.g., help-seeking versus non-help-seeking individuals, IPV by an index partner versus IPV by multiple partners; Iverson et al., 2013; Krause et al.,

2006; Kuijpers et al., 2012). The present sample was relatively young, and thus, revictimization may have occurred rather recently for these individuals. It is possible that in the recent aftermath of their trauma, participants may be more likely to experience elevated PTSS and other psychopathology (e.g., depression). Consistent with the substance use findings in this study, participants may also have a greater engagement in substance use and other risky behaviors due to their age and being in a university setting (McCabe et al., 2018; Schulenberg et al., 2004). Therefore, levels of distress may be high across several domains, potentially limiting any specificity among the clusters. Another possibility is that there were suppression effects among the symptom clusters given that they are so highly correlated (see Table 3) and were included within the same parallel mediation model. Due to the absence of research investigating the relations between the *DSM-5* PTSD symptom clusters and broader revictimization, as well as the inconsistent findings utilizing the *DSM-IV* clusters, replication is needed using other samples (e.g., older, community-based samples). Garnering a better understanding of the role of the specific clusters may inform existing trauma-informed intervention methods by highlighting specific clusters that may be more salient among certain trauma-exposed individuals or groups.

In contrast to the hypotheses, the PTSD symptom clusters also did not have any indirect effects on the relationship between maltreatment and revictimization. Although this finding was unexpected given the indirect effect of PTSS on maltreatment and revictimization, it was in agreement with the only other known study using the *DSM-5* clusters (Walker et al., 2021). Importantly, these clusters have changed with the updated *DSM-5* criteria and are distinct constructs. Therefore, research is still warranted to

examine the updated *DSM-5* clusters in this more general revictimization framework, as this is the first known study to explore these relationships. The findings of the present study suggest that more severe PTSS, in general, as opposed to specific clusters, may be more strongly tied to an increased risk for revictimization. Thus, tailoring prevention and intervention efforts to focus on mitigating overall PTSS may be beneficial, as opposed to targeting specific symptom clusters. This study examined cumulative maltreatment and adult revictimization, including both ASA and IPV; however, there may be greater specificity when distinct trauma types are examined alongside each cluster. For this reason, it may be advantageous to examine the updated *DSM-5* symptom clusters while looking at specific types of revictimization (e.g., IPV revictimization), or by looking at the clusters while examining distinct maltreatment types (e.g., CPA, witnessing IPV) and their unique relations with broader adult revictimization.

Limitations

These findings should be considered within the context of several key limitations. This study utilized a cross-sectional design, which precludes the ability to establish any causality regarding the associations between potential risk factors for maltreatment and revictimization. Therefore, it cannot be conclusively said that PTSS is a risk factor for revictimization based on the indirect effect that was identified in this study, as it is impossible to establish temporality and it cannot be confirmed whether individuals' symptoms developed before, after, or concurrently with their reported traumatic experiences. Additionally, data were collected retrospectively, and due to recall bias, it may be challenging for some participants to recall traumatic events that possibly occurred years ago. The interpersonal trauma types included in this study have been associated

with significant stigma, particularly traumas that are sexual in nature (i.e., CSA, ASA). Thus, the reported rates of maltreatment and adult revictimization are likely underestimated, as individuals may be self-conscious or uncomfortable disclosing information about these experiences. Self-report measures were used for this survey, and some individuals may not have recognized or reported that they have been victimized (Wilson & Miller, 2016). Clinician-administered measures of trauma exposure and levels of distress (e.g., CAPS-5) may have offered a more valid assessment of participants' history and functioning, along with uncovering higher rates of trauma.

College students were enlisted to participate in this study from two universities in the United States. About half of the participants were White (54.9%) and the majority identified as female (83.2%), and as a result, our study findings may not generalize to a larger, more diverse population. Notably, the participants included in this study are in a developmentally high-risk period given their age (M_{age} = 22.04, SD = 5.08) and their enrollment in a university. It is well understood that university students are more likely to engage in risk-taking behaviors (e.g., binge drinking), and they are also at a greater risk for sexual violence on campus (Messman-Moore et al., 2015; Norris et al., 2018). Thus, it is likely that the substance use and revictimization findings also cannot generalize to older samples, or community-based samples. Moreover, our group sizes limited our ability to investigate differences based on gender and sexual orientation; however, it is noteworthy that both male and LGBTQ+ populations are at high risk for revictimization (Aosved et al., 2011; Balsam et al., 2011; Turchik, 2012) and have been largely neglected in this research to date.

The extant revictimization literature has varied in terms of how researchers differentiate between childhood, adolescence, and adulthood, which negatively impacts our ability to understand the overall prevalence of revictimization (Pereda et al., 2009; Walker et al., 2019). In the sexual revictimization literature, some have chosen to distinguish between children and adults with an age cut-off of 18 (Brenner & Ben-Amitay, 2015), whereas others have considered ages 14-18 as adolescence (Balsam et al., 2011; Miron & Orcutt 2014). Further, IPV revictimization has typically been operationalized as including multiple instances of victimization within the same developmental period but by different perpetrators (Iverson et al., 2013; Kuijpers et al., 2012). The LSC-R was used to assess for exposure to child maltreatment and adult revictimization. This measure conceptualizes maltreatment as occurring in individuals aged 16 and younger, whereas participants above age 16 are considered adults. The LSC-R, unfortunately, does not differentiate between those who were victimized in childhood and adulthood from those who were continuously victimized across time points, which is a notable limitation of the measure. Similarly, the LSC-R only distinguishes between ASA and IPV as occurring specifically in adulthood (i.e., after the age of 16), and thus, other interpersonal traumas (e.g., community violence exposure, non-partner assault) were not able to be investigated as adult revictimization factors. Another limitation of the LSC-R is that it does not assess for the survivors' relationship with the perpetrator. Prior work has demonstrated that the level of closeness with or dependence on one's perpetrator can be associated with a host of adverse outcomes given the sense of betrayal and loss of trust following the trauma (Gagnon et al., 2019). The LSC-R age cut-offs are relatively common in the revictimization literature; however, it is essential to note that

individuals who reported experiencing both maltreatment and revictimization may have actually experienced continuous victimization by the same perpetrator that began in childhood and continued into adulthood. The LSC-R also utilizes explicit language regarding the victimization types, which requires participants to perceive their experiences as traumatic in nature. Thus, future research should consider using more behavioral descriptions of traumatic events that exclude the respondents from labeling their experiences as trauma.

The NIDA screening measure of substance use also had important limitations. Specifically, substance use was assessed across four different dimensions of substance use in the past year (i.e., alcohol, tobacco, illicit drug, and nonmedical prescription drug use). Certain types of substances, including opioids, may fall under both illicit drug use and nonmedical prescription drug use, and therefore, participants may have endorsed engaging in substance use across multiple categories of use when they were actually reporting about their use of a single type of substance (e.g., Oxycodone).

Future Directions and Conclusions

Regardless of these limitations, the results of this study contributed to the revictimization literature by expanding upon our understanding of revictimization to include broader interpersonal trauma exposure between childhood and adulthood. Our findings align well with prior work illustrating that maltreatment and revictimization in adulthood are closely related (Stroem et al., 2019; Walker et al., 2019; Widom et al., 2008); thereby, underscoring the need to consider multiple trauma types, as maltreatment, including but not limited to CSA, is related to revictimization. However, research is still warranted to contribute specificity to the revictimization literature by looking at potential

nuance between initial traumas (e.g., CSA versus CPA), as well as subsequent adult trauma types (e.g., ASA versus IPV) to determine if there are specific maltreatment types that are more likely to elevate one's risk for revictimization. It is also important to highlight that a more consistent definition of revictimization is needed, one that can account for and better incorporate the role of multiple trauma types across time periods, to facilitate a more cohesive revictimization literature. Furthermore, work is still needed across a myriad of diverse samples, including males and LGBTQ+ individuals. Both groups are at an elevated risk for revictimization (Aosved et al., 2011; Balsam et al., 2011), but due to difficulties with recruitment and smaller sample sizes among samples of convenience, such as college populations, these groups are largely absent from the revictimization literature.

PTSS, anger, and substance use have been previously identified as potential risk factors in the sexual revictimization literature, and the present study contributed to the literature by examining these factors concurrently, in a model of broader trauma revictimization following cumulative maltreatment. The respective roles of the updated *DSM-5* PTSD symptom clusters were also investigated in this model. Although the clusters did not mediate the link between maltreatment and revictimization, our results indicate that broader PTSS is a still key factor to consider in relation to increased risk for revictimization, and the specificity of symptoms may be less important than the overall levels of PTSS. Of the factors investigated in this study, only PTSS mediated the association between maltreatment and adult revictimization. This finding is noteworthy, as the other variables of interest have been previously tied to sexual revictimization (Easton & Kong, 2017; Messman-Moore et al., 2009, 2013), and thus, PTSS may be

more strongly related to broader revictimization, not restricted to specific types (e.g., sexual revictimization). Critically, PTSS can be targeted in a clinical setting, unlike more external or fixed factors, such as living with one's perpetrator. Therefore, these results reiterate the importance of mental health treatments following maltreatment that specifically target the reduction of PTSS, to help mitigate the risk for future victimization experiences.

Sexual revictimization has been the focus of decades of trauma research given the high prevalence and devastating outcomes (Messman & Long, 2003; Messman-Moore et al., 2013; Walker et al., 2019). However, research is still needed to identify mechanisms by which maltreatment survivors are more likely to be revictimized, not limited to sexual trauma. In line with prior work (Messman-Moore & Bhuptani, 2017), this study demonstrated that maltreatment survivors experience elevated PTSS, which is related to a greater risk for revictimization in adulthood. Previous research has suggested that PTSS may be tied to the development and/or the severity of other factors that may also increase one's risk for revictimization (e.g., emotion dysregulation, substance misuse; Iverson et al., 2011; Lilly et al., 2014; Ullman, 2016). Although three factors were examined in the present study, only PTSS mediated the link between maltreatment and revictimization, suggesting that other factors that may have been identified as increasing the risk for sexual revictimization may not predict broader revictimization following cumulative maltreatment. Yet PTSS appear to still have a strong association with one's risk for revictimization. Given that there is very little work examining risk factors for revictimization more broadly, it is critical that research is conducted to further our understanding of this framework and the relative strength of specific mechanisms that

increase the risk for revictimization. To effectively identify mechanisms of trauma revictimization, longitudinal research is essential for identifying potential risk factors, as this allows researchers to establish temporality in a clear way, which serves to advance both prevention and intervention methods for trauma survivors.

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Table 1

Descriptive Statistics of Selected Study Variables

Variables	n	Mean (%)	SD (Range)
Total Sample	417		
Recruitment Site			
University of Missouri-St. Louis	237	56.8%	0-1
University of Memphis	180	43.2%	0-1
Sex			
Female	347	83.2%	0-1
Male	70	16.8%	0-1
Racial/Ethnic Background			
White	229	54.9%	0-1
Black	127	30.5%	0-1
Hispanic/Latinx	29	7.0%	0-1
Asian	27	6.5%	0-1
Biracial/Multiracial	25	6.0%	0-1
Middle Eastern	17	4.1%	0-1
American Indian or Alaskan Native	8	1.9%	0-1
Native Hawaiian or Pacific Islander	4	1.0%	0-1
Family Income	417	6.29	3.48
Age	417	22.04	5.08
Child Maltreatment			
Physical Abuse	122	29.3%	0-1
Sexual Abuse	147	35.3%	0-1
Witnessing IPV	227	54.4%	0-1
Emotional Abuse	286	68.6%	0-1
Neglect	50	12.0%	0-1
Adult Victimization			
Sexual Assault	111	26.7%	0-1
IPV	81	19.4%	0-1
Trauma Revictimization	145	34.7%	0-1
PCL-5 Total	417	27.93	18.74
Intrusion	417	6.77	5.16
Avoidance	417	3.73	2.63
Negative Alterations in Cognitions and Mood	417	9.87	7.51

Marked Alterations in Arousal and Reactivity	417	7.55	5.88
DAR-5 Total	417	16.54	12.58

Note. In Income: 6.29 equates to $50,000-$59,999; IPV = intimate partner violence, PCL-5 = Posttraumatic Stress Disorder Checklist-Civilian 5; DAR-5 = Dimensions of Anger Reactions-5

Table 2

Descriptive Statistics for the National Institute on Drug Abuse (NIDA) Quick Screen

Variables	n	Mean (%)	SD (Range)
Total Sample	417		
NIDA Total (Past Year)	417	7.31	3.09
Alcohol Use	417	2.58	1.11
Never	84	20.1%	0-1
Once or twice	125	30.0%	0-1
Monthly	98	23.5%	0-1
Weekly	104	24.9%	0-1
Daily or almost daily	6	1.4%	0-1
Tobacco Use	417	1.69	1.24
Never	289	69.3%	0-1
Once or twice	54	12.9%	0-1
Monthly	22	5.3%	0-1
Weekly	20	4.8%	0-1
Daily or almost daily	32	7.7%	0-1
Illicit Drug Use	417	1.75	1.24
Never	270	64.7%	0-1
Once or twice	68	16.3%	0-1
Monthly	23	5.5%	0-1
Weekly	27	6.5%	0-1
Daily or almost daily	29	7.0%	0-1
Non-medical Prescription Drug Use	417	1.31	.79
Never	340	81.5%	0-1
Once or twice	50	12.0%	0-1
Monthly	12	2.9%	0-1
Weekly	6	1.4%	0-1
Daily or almost daily	9	2.2%	0-1

Note. NIDA = National Institute on Drug Abuse

Table 3

Correlations between the Four DSM-5 PTSD Symptom Clusters

Variables	1	2	3	4
1. Intrusion	-			
2. Avoidance	.69***	-		
3. Negative alterations in cognitions and mood	.73***	.61***	-	
4. Marked alterations in arousal and reactivity	.70***	.50***	.79***	-

Note: * $p < .05$, ** $p < .01$, *** $p < .001$

Table 4

Multivariate regression model for PTSS, anger, and substance use

	B	*SE*	*t*	*p*	*95% CI* *Lower Upper*
PTSS					
Recruitment Site	.22	1.72	.13	.90	-3.15 – 3.59
Sex	5.43	2.31	2.35	.02	.91 – 9.96
Age	-.64	.17	-3.72	<.001	-.98 – -.30
Race	-.65	1.77	-.37	.71	-4.13 – 2.81
Family Income	-.44	.26	-1.72	.09	-.94 – .06
Child Maltreatment	3.95	.71	5.58	<.001	2.56 – 5.34
Adult Revictimization	8.15	1.87	4.36	<.001	4.49 – 11.82
Anger					
Recruitment Site	5.02	1.20	4.17	< .001	2.66 – 7.38
Sex	-.74	1.62	-.46	.65	-3.90 – 2.43
Age	-.24	.12	-1.96	.05	-.47 – .001
Race	-3.89	1.24	-3.14	.002	-6.32 – -1.47
Family Income	-.19	.18	-1.04	.30	-.54 – .16
Child Maltreatment	1.68	.50	3.39	<.001	.71 – 2.65
Adult Revictimization	1.90	1.31	1.45	.15	-.67 – 4.46
Substance Use					
Recruitment Site	.41	.30	1.34	.18	-.19 – 1.00
Sex	-.35	.41	-.86	.39	-1.15 – .45
Age	.05	.03	1.56	.12	-.01 –.11
Race	.35	.31	1.11	.27	-.27 – .96
Family Income	.10	.05	2.31	.02	.02 – .19
Child Maltreatment	.11	.13	.87	.39	-.14 – .35
Adult Revictimization	.90	.33	2.73	.01	.26 – 1.55

Note. CI = confidence interval; PTSS = posttraumatic stress symptoms

Table 5

Parallel mediation model for PTSS, anger, and substance use

	B	*SE*	*p*	*95% CI* *Lower Upper*
PTSS				
Maltreatment -> PTSS	4.76	.70	<.001	3.38 – 6.13
Site -> PTSS	.92	1.75	.60	-2.52 – 4.36
Sex -> PTSS	6.24	2.35	.01	1.62 – 10.86
Age -> PTSS	-.56	.17	.001	-.91 – -.22
Race -> PTSS	-.23	1.81	.90	-3.78 – 3.32
Income -> PTSS	-.42	.26	.11	-.93 – .09
PTSS -> RV	.01	.001	.002	.002 – .01
Maltreatment -> RV Direct Effect	.07	.02	<.001	.04 – .11
Indirect Effect	.02	.01		.01 – .04
Anger				
Maltreatment -> Anger	1.86	.48	<.001	.92 – 2.81
Site -> Anger	5.18	1.20	<.001	2.82 – 7.54
Sex -> Anger	-.55	1.61	.73	-3.72 – 2.62
Age -> Anger	-.22	.12	.07	-.45 – .02
Race -> Anger	-3.80	1.23	.002	-6.24 – -1.37
Income -> Anger	-.18	.18	.30	-.54 – .17
Anger -> RV	-.001	.002	.83	-.004 – .003
Maltreatment -> RV Direct Effect	.07	.02	<.001	.04 – .11
Indirect Effect	-.001	.004		-.01 – .01
Substance Use				
Maltreatment -> Substance Use	.20	.12	.11	-.04 – .44
Site -> Substance Use	.48	.30	.11	-.12 – 1.08
Sex -> Substance Use	-.26	.41	.52	-1.07 – .54
Age -> Substance Use	.06	.03	.07	-.004 – .12
Race -> Substance Use	.39	.31	.21	-.22 – 1.01
Income -> Substance Use	.11	.05	.02	.02 – .20

Substance Use -> RV	.02	.01	.04	.001 – .03
Maltreatment -> RV Direct Effect	.07	.02	<.001	.04 – .11
Indirect Effect	.003	.003		-.001 – .01

Note. CI = confidence interval; PTSS = posttraumatic stress symptoms, RV = revictimization

Table 6

Parallel mediation model for the DSM-5 posttraumatic stress disorder symptom clusters

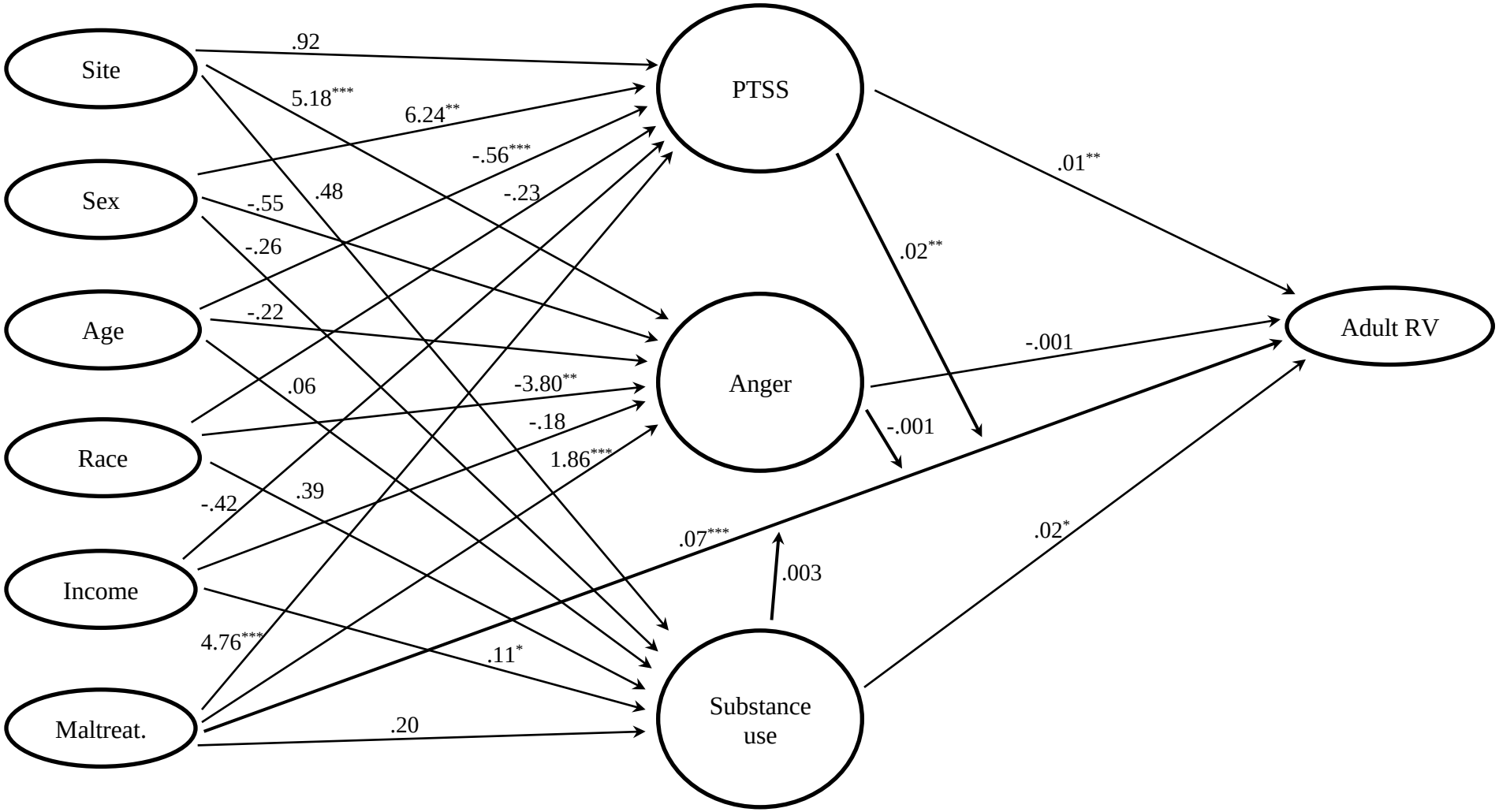
	B	*SE*	*p*	*95% CI* *Lower Upper*
Intrusion				
Maltreatment -> Intrusion	1.18	.19	<.001	.80 – 1.56
Site -> Intrusion	.92	.49	.06	-.04 – 1.87
Sex -> Intrusion	2.13	.65	.001	.85 – 3.41
Age -> Intrusion	-.13	.05	.01	-.22 – -.03
Race -> Intrusion	-.29	.50	.56	-1.28 – .69
Income -> Intrusion	-.07	.07	.32	-.21 – .07
Intrusion -> RV	.01	.01	.24	-.01 – .02
Maltreatment -> RV Direct Effect	.07	.02	<.001	.04 – .11
Indirect Effect	.01	.01		-.01 – .03
Avoidance				
Maltreatment -> Avoidance	.47	.10	<.001	.27 – .66
Site -> Avoidance	.35	.25	.17	-.15 – .84
Sex -> Avoidance	.89	.34	.01	.23 – 1.56
Age -> Avoidance	-.09	.03	<.001	-.14 – -.04
Race -> Avoidance	-.52	.26	.04	-1.03 – -.01
Income -> Avoidance	-.005	.04	.90	-.08 – .07
Avoidance -> RV	.005	.01	.70	-.02 – .03
Maltreatment -> RV Direct Effect	.07	.02	<.001	.04 – .11
Indirect Effect	.002	.01		-.01 – .01
Negative alterations in cognitions and mood				
Maltreatment -> NACM	1.63	.29	<.001	1.07 – 2.19
Site -> NACM	-.40	.72	.57	-1.81 – 1.00
Sex -> NACM	1.87	.96	.05	-.02 – 3.76
Age -> NACM	-.21	.07	.003	-.35 – -.07
Race -> NACM	.44	.74	.55	-1.02 – 1.89
Income -> NACM	-.18	.11	.09	-.39 – .03

NACM -> RV	.005	.01	.36	-.01 – .02
Maltreatment -> RV Direct Effect	.07	.02	<.001	.04 – .11
Indirect Effect	.01	.01		-.01 – .03
Marked alterations in arousal and reactivity				
Maltreatment -> MAAR	1.48	.22	<.001	1.04 – 1.92
Site -> MAAR	.06	.55	.92	-1.03 – 1.15
Sex -> MAAR	1.35	.74	.07	-.12 – 2.81
Age -> MAAR	-.14	.06	.01	-.24 – -.03
Race -> MAAR	.15	.57	.79	-.97 – 1.28
Income -> MAAR	-.16	.08	.05	-.32 – .001
MAAR -> RV	.004	.01	.55	-.01 – .02
Maltreatment -> RV Direct Effect	.07	.02	<.001	.04 – .11
Indirect Effect	.01	.01		-.02 – .03

Note. CI = confidence interval; RV = revictimization; NACM = negative alterations in cognitions and mood; MAAR = marked alterations in arousal and reactivity

Figure 1

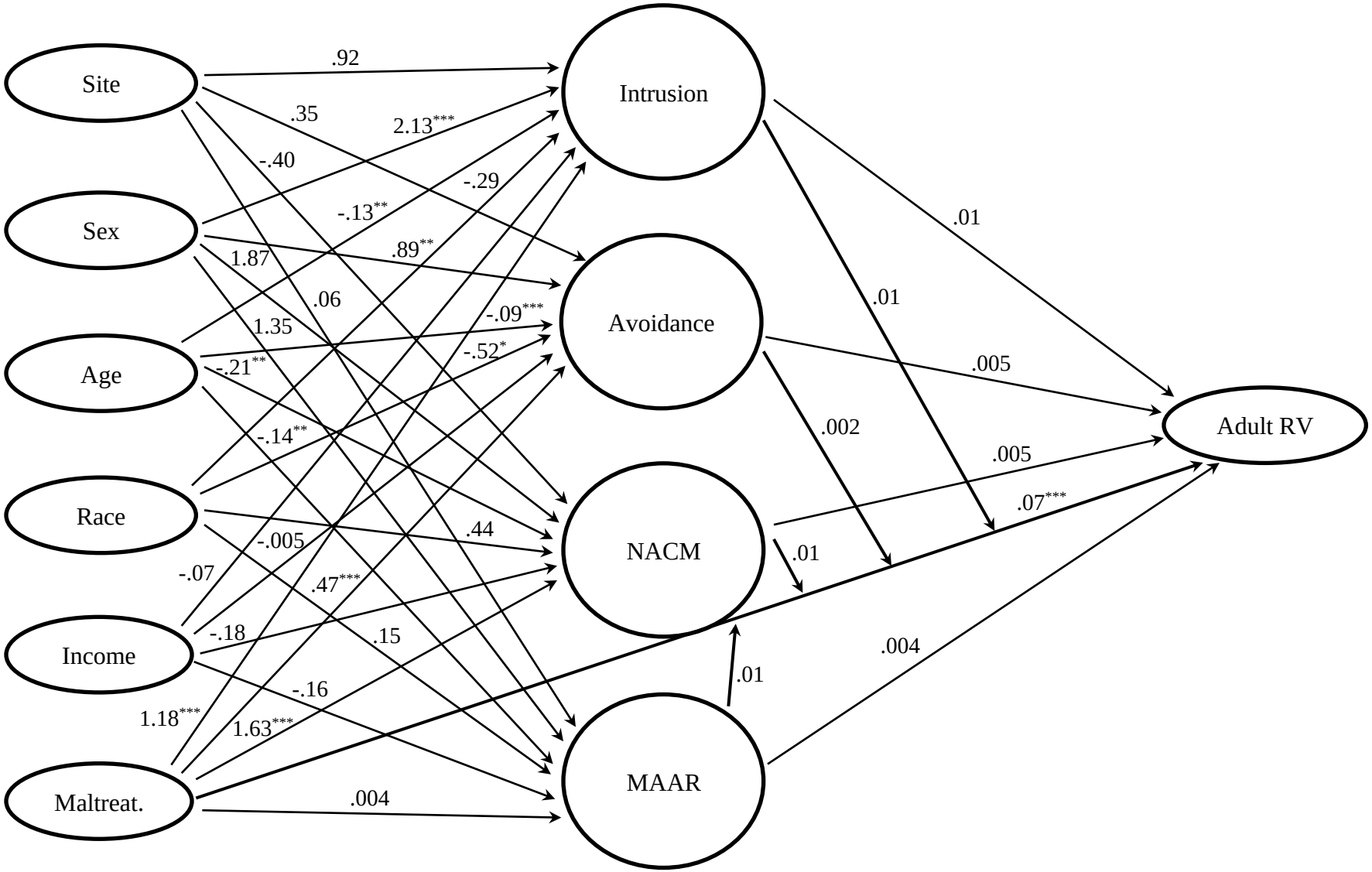
Mediation models for PTSS, anger, and substance use



Note. PTSS = posttraumatic stress symptoms; Maltreat. = cumulative maltreatment; Adult RV = adult revictimization
$^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$

Figure 2

Mediation models for the DSM-5 posttraumatic stress disorder symptom clusters



Note. Maltreat. = cumulative maltreatment; Adult RV = adult revictimization; NACM = negative alterations in cognitions and mood; MAAR = marked alterations in arousal and reactivity

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