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A Comparison of PTSD Severity Associated with
Different Types of Traumatic Events

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Abstract

Trauma exposure is common, yet post traumatic stress disorder (PTSD) severity varies widely depending on trauma characteristics. This study examined whether PTSD severity differed by trauma type and the developmental timing of individuals' self-identified worst traumatic event. Participants were 636 undergraduate students who reported at least one DSM-5 Criterion A traumatic event. Trauma type was categorized as Child Maltreatment, Interpersonal Violence, Non-Interpersonal Trauma, or Loss/other, and PTSD symptoms were assessed using the PCL-5. Welch's ANOVA revealed a significant effect of trauma type on PTSD severity, such that Non-Interpersonal trauma was associated with significantly lower symptom severity than the other three trauma categories, which did not differ from one another. In contrast, PTSD severity did not differ by developmental timing of the worst trauma (e.g., childhood, adolescence, adulthood). These findings suggest that the nature of the traumatic event may be more important than age at exposure in predicting PTSD symptom severity.

Introduction

Trauma Exposure and Prevalence

Psychological trauma is operationalized in the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2022) as exposure to actual or threatened death, serious injury, or sexual violence, experienced directly, witnessed, learned about in relation to close others, or through repeated/ extreme exposure to aversive details of such events by the DSM-5 criteria. Large epidemiological studies consistently find that trauma exposure is the norm rather than the exception. For example, in the World Health Organization (WHO) World Mental Health Surveys, Kessler and colleagues (2017) found that 70.4% of respondents reported experiencing at least one traumatic event, and, on average, participants experienced 3.2 lifetime traumas per person. Despite this high exposure rate, only a small proportion (approximately 7%) of exposed individuals go on to meet criteria for PTSD (Lee & Park, 2018) and less is understood about which trauma-exposed individuals go on to develop PTSD. In the present study, we aim to determine which individuals are most likely to develop PTSD symptoms to inform targeted prevention and intervention efforts.

The Societal Burden of PTSD

PTSD can be a profoundly disabling and chronic syndrome, frequently co-occurring with other psychiatric illnesses such as depression, substance use, and anxiety disorders (Kessler et al., 2017; Grubaugh et al., 2011). Beyond psychiatric comorbidity, many studies have shown that PTSD symptoms increase vulnerability to chronic physical illnesses, particularly cardiovascular and metabolic conditions like hypertension and diabetes (Lee & Park, 2018), further compounding its long-term consequences. This condition imposes a substantial public health burden, with significant loss of “human capital” through reduced work productivity, days out of role, and increased medical service utilization (Kessler et al., 2017; Lee & Park, 2018). The persistent suffering and functional impairment of chronic PTSD exacerbate existing mental health challenges and escalate healthcare expenditures. Although most trauma-exposed individuals do not develop PTSD, those who do suffer disproportionately levels of impairment. As such, PTSD represents a major societal and economic concern.

Previous Studies

Previous research has often relied on restricted trauma categorizations that limit generalizability. For example, in 2009, Kelley and colleagues studied a sample

consisting entirely of women and classified their most salient traumatic experiences into three main categories: sexual assault, motor vehicle accident, and sudden death of a loved one. They found that sexual assault survivors reported the highest overall PTSD severity, with especially elevated symptoms of reexperiencing and emotional numbing, whereas motor vehicle accident and sudden-death groups showed lower but comparable levels. While useful, this classification excluded many trauma types, such as child maltreatment, experiencing a natural disaster, or physical assault, that may also shape PTSD outcomes.

Similarly, in 2011, Grubaugh and colleagues examined the relationship between trauma exposure and PTSD across several demographic factors, but their work was limited to adults with severe mental illness, including schizophrenia spectrum and mood disorders. This focus may obscure the direct association between trauma and PTSD, since comorbid psychiatric conditions can also exacerbate outcomes. They also systematized evidence on PTSD and gender, showing that while overall PTSD rates in men and women with severe mental illness may be comparable, women are more likely to meet PTSD criteria when exposed to sexual assault, whereas physical assault has the strongest association for men. Within this population, the authors highlighted three key findings: PTSD risk increases if the first trauma occurs during childhood, and the risk is higher with cumulative exposure (i.e., the lifetime accumulation of multiple or chronic traumatic events), and more recent traumatic events are strongly associated with symptom severity.

Evidence from general population studies supports and expands these conclusions. For example, in 2017, Dunn and colleagues examined four developmental periods (early childhood, middle childhood, adolescence, adulthood), Ogle et al. (2013) analyzed five life stages (childhood, adolescence, young adulthood, mild life, and older adulthood), and Miller-Graff et al. (2016) focused on age of first exposure and cumulative violent events, collectively showing that earlier developmental exposure predicts greater PTSD risk. Similarly, research demonstrates a “dose-response” pattern: each additional childhood trauma type increases lifetime PTSD risk (Suliman et al., 2009; da Silva et al., 2024), and individuals with greater lifetime trauma accumulation tend to exhibit more severe PTSD symptoms (Kira et al., 2008). In 2016, Briere and colleagues refined this conclusion, showing that cumulative interpersonal trauma is the strongest predictor of PTSD, whereas non-interpersonal trauma does not show the same effect. This aligns with Kessler and colleagues (2017), who reported that although the sudden death of a loved one is highly prevalent, contributes relatively little to PTSD burden compared to rarer interpersonal traumas like rape, sexual assault, or stalking, which disproportionately account for cases despite their lower base rates.

Additionally, in 2010, McCutcheon and colleagues focused exclusively on women and reported that more than half of the participants with assault-related trauma experienced their first exposure during childhood. In their study on women's risk of PTSD, eight trauma types were classified into two broader groups: assaultive traumas (e.g., sexual assault, physical abuse, neglect, being threatened with a weapon or kidnapped, severe physical assault) and non-assaultive traumas (e.g., life-threatening accident, natural disaster, witnessing someone being badly injured or killed). The researchers further examined developmental timing by distinguishing between trauma exposure at age 11 or younger (childhood) versus age 12 or older (adolescence/early adulthood). The results from this study again support previous evidence that sexual trauma carries the highest risk of PTSD in women and that early trauma exposure increases the risk of PTSD (McCutcheon et al., 2010).

Complementing this work, Ogle and colleagues (2013) investigated how both the most distressing single event and the cumulative lifetime accumulation of traumas across developmental stages (e.g., childhood, adolescence, young adulthood, midlife, and older adulthood) influenced PTSD symptoms and psychosocial functioning among older adults. Traumatic events were defined according to DSMIV-TR criteria and classified along four dimensions: (1) A1 vs. non-A1 (whether the event met Criterion A1, involving actual or threatened death, serious injury, or threat to integrity), (2) self-oriented vs. other-oriented (whether the trauma happened to the self, such as assault, versus to others, such as the death of a loved one), (3) interpersonal vs. non-interpersonal (violence/abuse versus illness, accidents, or disasters), and (4) A2 vs. non-A2 (whether the person reported strong emotional reactions of fear, helplessness, or horror at the time, consistent with Criterion A2). Their results indicated that older adults who experienced their most distressing traumas during childhood reported greater current PTSD symptom severity and lower levels of psychosocial functioning, including happiness, social support, and coping ability, than those whose worst traumas occurred later in life.

These findings underscore the enduring impact of early-life trauma, showing that its adverse consequences can persist for decades. Although this framework offered a nuanced understanding of trauma characteristics, the sample was overwhelmingly Caucasian (99.3%) and composed of highly educated older adults with greater cognitive, social, and economic resources, factors that may have mitigated adverse outcomes and limited the cultural generalizability of the findings.

Developmental Timing

Neurodevelopmental theory suggests that there are “sensitive periods” in childhood or adolescence during which stress can have especially pronounced effect

on the brain. Both studies of Mandelli and colleagues (2015) and Grubaugh and colleagues (2011) observed that these developmental stages are marked by unique cognitive, emotional, and social changes that shape vulnerability to PTSD beyond sociodemographic influences. For instance, in 2018, Dunn and colleagues noted that because memory is not fully developed in early childhood, traumatic experiences are more likely to be reported as beginning in middle childhood. This raises concerns that observed “sensitive periods” may partly reflect recall bias rather than true developmental vulnerability, thereby complicating conclusions about whether certain developmental windows are inherently more harmful.

In 2023, Li and colleagues extended this perspective by suggesting that specific developmental stages make the brain particularly susceptible to negative experiences through neural plasticity. For example, neglect or abuse periods when the hippocampus and amygdala are maximally sensitive (around age 7 for boys and age 10 for girls) can impair neurogenesis, leading to long-term emotional and behavioral dysfunction. In line with this, Vaughn-Coaxum and colleagues (2018) found that trauma exposure in early life can influence later coping behaviors both biologically through altered HPA axis and prefrontal cortex functioning and behaviorally by increasing threat sensitivity. Together, these findings highlight that early life trauma not only disrupts brain development but also leaves enduring marks on how individuals interpret and respond to stress.

Importantly, while biological mechanisms underlying these effects are increasingly well documented, far less is known about how developmental context interacts with trauma exposure to shape PTSD risk. Moreover, most studies have prioritized the first exposure (Dunn et al., 2017, 2018) or cumulative burden (Copeland et al., 2018; Vaughn-Coaxum et al., 2018), while overlooking the role of subjectively defined “worst” trauma events that individuals perceive as most distressing, which may have a disproportionate impact on psychopathology (Kelley et al., 2009). It is unclear whether the developmental timing of the individuals’ self-identified “worst” traumatic events also plays a role in the resulting level of PTSD symptomatology.

The Present Study

Prior research demonstrates several consistent patterns regarding trauma exposure and PTSD. First, studies show that earlier trauma exposure is linked to higher PTSD risk (Dunn et al., 2017; Ogle et al., 2013; Miller-Graff et al., 2016). Second, cumulative trauma with multiple exposures is associated with greater lifetime PTSD risk and more severe symptoms (Suliman et al., 2009; da Silva et al., 2024; Kira et al., 2008). Importantly, cumulative interpersonal traumas have emerged as the strongest predictor of PTSD, particularly compared to non-interpersonal traumas (Briere et al., 2016; Kessler et al., 2017). Third, the recency of

of trauma, especially physical and sexual abuse, is associated with heightened symptom severity (Dunn et al., 2018). Gender differences further shape vulnerability, with women at greater risk following sexual assault and men more affected by physical assault (Grubaugh et al., 2011). Together, these findings highlight that trauma type, developmental timing, cumulative number of traumatic events, and gender all play important roles in PTSD risk.

Despite these advances, significant gaps remain in understanding how trauma type and developmental timing jointly influence PTSD. Prior findings have been inconsistent, with some studies reporting that childhood exposure carries the highest risk for PTSD (Dunn et al., 2017; Ogle et al., 2013), whereas others find no unique effect of early exposure once cumulative trauma burden or recency are controlled (Copeland et al., 2018). Similarly, research differs in how it categorizes trauma types. Some studies focus on broad categories such as interpersonal versus non-interpersonal events, while others use narrower or population-specific classifications, making it challenging to compare across studies. Moreover, while cumulative and first-exposure effects have been widely studied, less is known about the impact of individuals' self-identified worst trauma across developmental stages in terms of PTSD symptoms. The present study aims to address this gap by examining the relationship between individuals' self-identified worst traumatic event and their level of PTSD severity, and by testing whether this relationship differs by age of exposure. In doing so, this work seeks to clarify which types of trauma are most predictive of PTSD at different developmental stages, thereby illuminating the joint role of trauma type and developmental timing in PTSD risk.

Previous research has consistently demonstrated that the nature of traumatic experiences plays a critical role in determining the severity of PTSD symptoms (Gould et al., 2021; McLaughlin et al., 2017). The present study aimed to examine how characteristics of traumatic experiences are related to the severity of PTSD symptoms. Specifically, this study investigated whether PTSD symptom severity differed depending on the type of trauma and the developmental timing of the traumatic event identified by participants as their worst trauma. In this study, trauma type (Child Maltreatment, Interpersonal Violence, Non-Interpersonal Trauma, and Loss/Other) and developmental timing of trauma exposure (childhood, adolescence, adulthood) served as the independent variables, while PTSD symptom severity, measured using the PCL-5, served as the dependent variable.

First, we aimed to examine whether PTSD symptom severity differed across trauma types. Based on prior literature indicating an elevated risk for PTSD following interpersonal forms of victimization (Kul & Gündoğmuş, 2020), we hypothesized that individuals who identified Interpersonal Trauma or Child Maltreatment as their worst traumatic event would report greater PTSD symptoms compared to those exposed to other types of trauma.

Second, we sought to determine whether PTSD symptom severity differed according to the developmental period during which individuals were exposed to their worst traumatic event. For each event, participants reported the age at which it occurred. Consistent with previous research, childhood was defined as 0 to 10 years of age (Dunn et al., 2018), and adolescence was defined as 11 to 17 years of age (Tervo-Clemmens et al., 2023). Guided by epidemiological research, patterns observed in our dataset, and prior literature, we defined age 18 as the beginning of adulthood. Based on these definitions, participants were categorized into three developmental groups. We expected that individuals who experienced their worst trauma during earlier developmental periods would report greater PTSD symptom severity.

Third, we hypothesized that the interaction between trauma type and developmental timing would significantly predict PTSD symptom severity. In particular, we expected that exposure to interpersonal trauma or child maltreatment during early developmental periods would be associated with more severe PTSD symptoms compared to similar trauma experienced later in life. Given that trauma exposure is widespread but only a subset of individuals develop PTSD, identifying factors that contribute to greater symptom severity remains an important clinical and public health priority. By examining how trauma type and developmental timing relate to PTSD symptoms, this study may help improve understanding of who is most vulnerable following trauma exposure.

Method

Participants

Participants were 636 undergraduate students at a university in the southeastern United States. This reflects all participants who completed the survey validly and who reported having experienced at least one event that met the DSM-5 definition of a traumatic event. The average age was 20.7 years ($SD = 4.73$), with ages ranging from 18 to 52. The majority of participants identified as female (77.1%). Regarding racial and ethnic background, 49.7% identified as White, 37.7% as Black/ African American, and the remaining participants identified as another racial/ethnic group or as multiracial. A total of 1,070 college students originally completed the survey. Based on pilot testing and inspection of completion-time patterns, participants who completed the survey in under 25 minutes ($n = 215$) were removed because this was considered too fast to reflect valid responding. Participants younger than 18 years old were also excluded ($n = 22$), as they were instructed not to participate. Individuals who did not provide a describable worst event ($n = 106$) were also removed, as well as those whose worst event did not meet DSM-5 Criterion A for PTSD ($n = 88$). Because the present analyses focus exclusively on civilian trauma exposure, participants who endorsed LEC item 10 (combat or war-zone exposure)

were excluded ($n=3$). After applying all exclusion criteria, the final analytic sample consisted of 636 participants.

Measures

Trauma exposure was assessed using the Life Events Checklist (LEC; Blake et al., 1995), a 17-item self-report instrument designed to screen for lifetime exposure to potentially traumatic events. For each event, participants indicated whether it happened to them personally, whether they witnessed it, learned about it, were unsure, or if it did not apply. When a participant endorsed an event, additional follow-up questions were presented to obtain more detailed information about the most salient traumatic experience and to verify that it met Criterion A for trauma exposure as defined by the DSM-5 criteria (American Psychiatric Association, 2022).

The primary outcome variable in this study was PTSD symptom severity which was assessed using the PTSD Checklist for DSM-5 (PCL-5; Weathers et al., 2013). The PCL-5 is a 20-item self-report measure designed to assess the severity of PTSD symptoms based on the criteria outlined in the DSM-5. Participants rated how much they had been bothered by each symptom over the past month using a 5-point scale ranging from 0 (not at all) to 4 (extremely). In this study, participants were instructed to respond in reference to the traumatic event they identified as the worst event on the LEC. Item responses were then summed to yield a total PCL-5 score. PCL-5 scores can range from 0 to 80 and higher total scores indicate greater severity. The PCL-5 demonstrates excellent internal consistency and reliability across samples.

Procedure

Participants were recruited from psychology courses at the University of Memphis through the departmental Sona Systems research pool, which provides course credit in exchange for participation. The Institutional Review Board at the University of Memphis approved this study before data collection. Students who chose to participate accessed the study through an online survey link. After reviewing the study information, participants completed an informed consent form before beginning the questionnaires. Participants first completed the Life Events Checklist (LEC) to report lifetime exposure to potentially traumatic events. For events they endorsed, follow-up questions asked them to identify the single worst traumatic event and to report the age at which the event occurred. Participants then completed the PTSD Checklist for DSM-5 (PCL-5), responding to all items in reference to the worst traumatic event they identified.

Based on their LEC responses, participants were assigned to one of four LEC responses, participants were assigned to one of four groups:

1) Child Maltreatment: Defined by Mandelli and colleagues (2015) as any form of abuse or neglect that causes or threatens harm to a child's well-being, including sexual, physical, emotional/psychological abuse, exploitation, or failure to provide necessary care. Such experiences can significantly impair a child's psychological, physical, emotional, and social development. In our study, Child Maltreatment is treated as a subgroup of interpersonal trauma. Because the dataset does not include information on the perpetrator, we classified an event as Child Maltreatment if it was described as physical or sexual assault or "Other unwanted or uncomfortable sexual experience" and if it occurred before age 13, based on epidemiological patterns and prior literature (da Silva et al., 2024).

2) Interpersonal Violence: This category included events that involved (being shot, stabbed, or threatened with a weapon), sexual assault (rape or forced sexual physical assault (being attacked, hit, or beaten), assault with a weapon acts), other unwanted or uncomfortable sexual experiences, or captivity (being kidnapped, held hostage, or imprisoned).

3) Non-Interpersonal Trauma: This category included events that did not involve direct harm from another person but posed a significant threat to life or physical safety. Specifically, events were coded as Non-Interpersonal Violence if they involved a natural disaster (e.g., flood, hurricane, tornado, earthquake), fire or explosion, a transportation accident (car, boat, train, or plane), a serious accident occurring at work, home, or recreation, or a life-threatening illness or injury.

4) Loss/other: This category included events such as severe human suffering, sudden or unexpected death of someone close, or sudden, violent death (homicide, suicide), or any other very stressful event or experience.

Data Analysis

Before conducting primary analyses, variables were screened for accuracy, missing data, outliers, and distributional assumptions in accordance with recommendations by Tabachnick and Fidell (2013). Assumptions of homogeneity of variance were evaluated using Levene's test, and robust statistical procedures were applied when these assumptions were violated. Two one-way analyses of variance (ANOVAs) were conducted to test Hypotheses 1 and 2, examining differences in PTSD symptom severity across trauma type and developmental timing groups. Trauma categories were derived from participants' responses to the Life Events Checklist and follow-up questions regarding their worst traumatic event. Coding was conducted by the research team, using SPSS to automatically apply predefined classification rules derived from prior literature on trauma typologies. Each participant's worst event was categorized into one of four trauma groups based on the type of event and contextual information provided in the survey. For the Child

Maltreatment category specifically, contextual information included the participant's age at the time of the event (coded as childhood if the event occurred before age 13), as well as event descriptions indicating abuse or neglect consistent with maltreatment definitions from prior literature (Mandelli et al., 2015). The research team reviewed coding decisions to verify that each classification adhered to the predefined rules and discussed any ambiguous cases to reach consensus, ensuring consistency with the established criteria. In addition, descriptive analyses were conducted for demographic variables, including gender and race or ethnicity, to characterize the sample. Hypothesis 3 proposed that trauma type and developmental timing would interact to predict PTSD severity. However, preliminary analyses indicated that some trauma categories occurred almost exclusively within specific developmental periods (e.g., Child Maltreatment occurring primarily during childhood). Because these structural data limitations produced empty cells, a two-way ANOVA testing the interaction between trauma type and developmental timing was not statistically appropriate and therefore was not conducted.

Results

Descriptive Statistics for Trauma Exposure

Participants were asked to identify the single “worst” traumatic event they had experienced. As shown in Table 1, the most frequently reported worst trauma was transportation accident (n = 120, 18.9%), followed by sexual assault (n = 92, 14.5%), sudden, unexpected death of a loved one (n = 65, 10.2%), sudden, violent death (n = 63, 9.9%), physical assault (n = 55, 8.6%), and severe human suffering (n = 46, 7.2%). Other commonly endorsed events included any other very stressful event or experience (n = 42, 6.6%), assault with a weapon (n = 41, 6.4%), life-threatening illness or injury (n = 40, 6.3%), and natural disaster (n = 37, 5.8%). Less frequently reported worst traumas included serious accident (n = 17, 2.7%), fire or explosion (n = 12, 1.9%), captivity (n = 3, 0.5%), and other unwanted sexual experiences (n = 3, 0.5%). All participants reported the worst traumatic event.

Trauma types

As noted previously, trauma exposure was categorized into four trauma types based on participants' self-identified worst traumatic event. Child Maltreatment was reported by 59 participants (9.3%), Interpersonal Violence by 134 participants (21.1%), Non-Interpersonal Trauma by 226 participants (35.5%), and Loss/other trauma by 216 participants (34.0%).

Traumatic Event (LEC)	Childhood (ages 0 - 10)	Adolescence (ages 11 - 17)	Adulthood (ages 18+)	Total (%)
Natural disaster	6 (6.4%)	20 (6.8%)	11 (4.5%)	37 (5.8)
Fire or explosion	2 (2.1%)	8 (2.7%)	2 (0.8%)	12 (1.9)
Transportation accident	9 (9.6%)	56 (19.1%)	54 (22.0%)	119 (18.8)
Serious accident	4 (4.3%)	9 (3.1%)	4 (1.6%)	17 (2.7)
Physical assault	4 (4.3%)	29 (9.9%)	22 (8.9%)	55 (8.7)
Assault with a weapon	5 (5.3%)	15 (5.1%)	21 (8.5%)	41 (6.5)
Sexual assault	32 (34.0%)	38 (13.0%)	22 (8.9%)	92 (14.5)
Other unwanted sexual experience	0 (0.0%)	1 (0.3%)	1 (0.4%)	2 (0.3)
Captivity	2 (2.1%)	1 (0.3%)	0 (0.0%)	3 (0.5)
Life-threatening illness or injury	6 (6.4%)	15 (5.1%)	19 (7.7%)	40 (6.3)
Severe human suffering	8 (8.5%)	24 (8.2%)	14 (5.7%)	46 (7.3)
Sudden violent death	6 (6.4%)	32 (10.9%)	24 (9.8%)	62 (9.8)
Sudden unexpected death	7 (7.4%)	24 (8.2%)	34 (13.8%)	65 (10.3)
Any other very stressful event or experience	3 (3.2%)	21 (7.2%)	18 (7.3%)	42 (6.6)

Table 1

Distribution of Participants' Most Distressing Traumatic Events (LEC) by Developmental Period, n(%)

Note: Traumatic events were assessed using the Life Events Checklist for DSM-5 (LEC-5). Participants selected their most distressing traumatic event from the LEC-5.

Developmental Timing of the Worst Trauma

Nearly half of participants, 46.1%, reported having experienced their worst event during adolescence (ages 11–17) ($n = 293$), 39.1% ($n = 248$) reported having experienced their worst event during adulthood (ages 18 and older) and 14.8% ($n = 94$) reported having experience their worst event during childhood (ages 0–10). One participant (0.2%) did not report their age at trauma exposure. Table 1 shows that certain trauma types were more commonly reported during childhood, most notably sexual assault, which accounted for approximately one-third of childhood exposures (34.0%). In contrast, events such as transportation accidents were reported more frequently during adolescence (19.1%) and adulthood (22.0%). Other traumatic events were reported across all developmental periods.

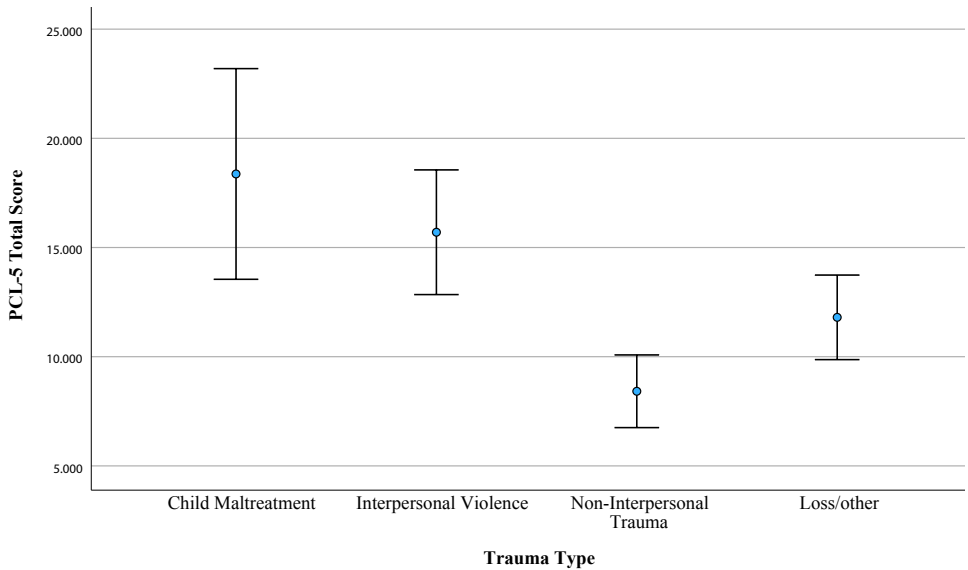


Figure 1

Mean PTSD Symptom Severity (PCL-5 Total) by Trauma Type

Note: Error bars represent 95% confidence intervals. PTSD symptom severity was measured using the PTSD Checklist for DSM–5 (PCL-5), with higher scores indicating greater symptom severity.

Hypothesis 1: Trauma Type and PTSD Symptom Severity

To test Hypothesis 1, which predicted that PTSD symptom severity would differ across trauma types, a one-way between-subjects ANOVA was conducted with trauma type (Child Maltreatment, Interpersonal Violence, Non-Interpersonal Trauma, and Loss/Other Trauma) as the independent variable and PCL-5 total score as the dependent variable. Preliminary assumption testing indicated that the homogeneity of variance assumption was violated, as Levene's test was significant ($p < .001$). Therefore, Welch's ANOVA was used to test group differences.

Results of Welch's ANOVA indicated a statistically significant effect of trauma type on PTSD symptom severity, Welch's $F(3, 198.09) = 9.88, p < .001$. This finding suggests that mean PCL-5 scores differed across the four trauma

categories (see Figure 1). Effect size estimates indicated a small magnitude of group differences ($\eta^2 = .051$; $\omega^2 = .046$), representing a relatively modest proportion of the variance in PTSD symptom severity.

Post-hoc pairwise comparisons were conducted using the Games-Howell procedure due to unequal variances and group sizes. These comparisons showed that the Non- Interpersonal Trauma group had a mean PCL-5 score that was significantly lower than the other three groups (Table 2). No statistically significant differences were observed among the Child Maltreatment, Interpersonal Violence, and Loss/other trauma groups ($ps > .05$). Collectively, these findings support Hypothesis 1, indicating that Non-Interpersonal Trauma was associated with lower PTSD severity, compared to Child Maltreatment, Interpersonal Violence, and Loss/other trauma.

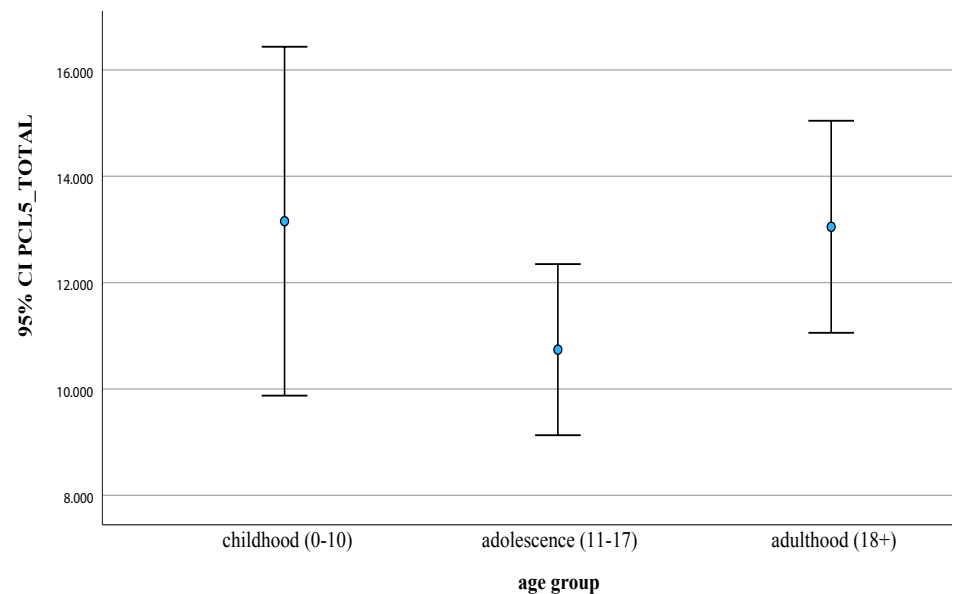


Figure 2
Mean PTSD Symptom Severity (PCL-5 Total) by Age Group
Note: Error bars represent 95% confidence intervals.

PCL-5 Score			
Trauma Type	n	M	SD
Child maltreatment	57	18.37 ^a	18.18
Interpersonal violence	123	15.70 ^a	15.99
Non-interpersonal trauma	216	8.42 ^b	12.41
Loss/other trauma	213	11.80 ^a	14.34

Table 2

Mean Post traumatic Stress Disorder Symptom Severity (PCL-5 Total Score) by Trauma Type.

Note: PTSD symptom severity was measured using the PTSD Checklist for DSM– 5 (PCL-5), with higher scores indicating greater symptom severity. Means in the same column that share the same superscript letter do not differ significantly from each other.

Hypothesis 2: Developmental Timing and PTSD Symptom Severity

To test Hypothesis 2, we conducted a second one-way between-subject ANOVA to examine whether PTSD symptom severity differed based on the developmental timing of exposure to participants' worst traumatic event. Developmental timing was categorized into three groups: childhood (ages 0–10), adolescence (ages 11–17), and adulthood (ages 18 and 400 older). Assumption testing indicated that the homogeneity of variance assumption was met, as Levene's test was non-significant ($p > .05$). Therefore, standard ANOVA procedures were used.

The one-way ANOVA revealed no statistically significant effect of developmental timing on PTSD symptom severity, $F(2, 606) = 1.90$, $p = .151$. Mean PCL-5 scores were similar across groups, with participants exposed in childhood (ages 0–10) reporting a mean score of 13.16 ($SD = 15.66$), those exposed in adolescence (ages 11–17) reporting a mean score of 10.74 ($SD = 13.68$), and those exposed in adulthood (ages 18 and older) reporting a mean score of 13.05 ($SD = 15.65$). Effect size estimates were small ($\eta^2 = .006$; $\omega^2 = .003$), indicating that developmental timing accounted for a very small proportion of variance in PTSD symptom severity. These findings suggest that the timing of the worst trauma, considered in isolation, was not meaningfully associated with PTSD symptom severity in this sample.

Post-hoc comparisons using Tukey's HSD were non-significant for all pairwise comparisons among childhood, adolescence, and adulthood groups.

These results suggest that PTSD symptom severity did not differ meaningfully depending on whether the worst trauma occurred earlier or later in development. Accordingly, Hypothesis 2 was not supported.

Hypothesis 3: The interaction between trauma type and developmental timing

A two-way ANOVA examining the interaction between trauma type and developmental timing could not be conducted due to structural limitations in the dataset, including empty cells and uneven distributions of trauma categories across developmental periods.

Discussion

The present study examined whether trauma type and developmental timing of trauma exposure were associated with posttraumatic stress disorder (PTSD) severity among individuals who reported their worst traumatic event. The present study examined whether trauma type and developmental timing of trauma exposure were associated with posttraumatic stress symptom severity among individuals who had experienced at least one traumatic event.

The current study used one-way ANOVA tests to examine how trauma type and the developmental timing of trauma relate to PTSD severity. The findings provided partial support for Hypothesis 1. We found a significant effect for trauma type (child maltreatment, interpersonal violence, non-interpersonal trauma, or loss/other) on PTSD severity, and post-hoc comparisons showed that participants whose worst trauma was non-interpersonal trauma had significantly lower levels of PTSD severity than those whose worst trauma was child maltreatment, interpersonal violence, or loss/other. The other three trauma groups did not differ significantly from each other. In other words, non-interpersonal trauma was associated with the lowest PTSD symptom levels, while the other three trauma groups were linked to higher symptom levels.

In contrast, Hypothesis 2 was not supported, as the one-way ANOVA for developmental timing (age of worst trauma: childhood, adolescence, adulthood) showed no significant effect on PTSD severity. Indicating that, for this sample, PTSD severity did not meaningfully differ based on whether the index trauma occurred earlier or later, across the spectrum from early childhood through emerging adulthood. Due to the nature of our sample, we were not able to make comparisons among a full range of ages into middle and later adulthood.

The pattern we observed for trauma type closely matches prior research showing that interpersonal and sexual traumas are associated with higher PTSD severity than non-interpersonal events such as accidents or natural disasters

(Kessler et al., 2017; Kul & Gündoğmuş, 2020; Smith et al., 2016; Thomas et al., 2021). Longitudinal research also suggests that individuals who experience childhood trauma or interpersonal violence are less likely to achieve remission from PTSD and tend to have longer recovery periods compared to those exposed to non-interpersonal trauma (Chapman et al., 2011). Together, these findings support the idea that interpersonal forms of trauma are more severe and more persistent in their psychological impact.

A likely explanation is that interpersonal traumas involve intentional harm, betrayal, and violation of trust (Birkeland et al., 2021; Reiland & Harrington, 2025). Being harmed by another person can strongly disrupt beliefs about safety, relationships, and self-worth. These experiences may also lead to feelings of shame, guilt, and fear of others. In contrast, non-interpersonal events such as accidents or natural disasters do not usually involve personal betrayal. This may explain why, in our study, the three trauma categories with interpersonal elements (child maltreatment, interpersonal violence, and loss/other) all showed higher PTSD severity and did not differ significantly from each other, while non-interpersonal trauma showed the lowest symptom levels.

The developmental timing of trauma exposure was not significantly associated with PTSD symptom severity in the current sample. Importantly, this finding should not be interpreted as evidence that the timing of trauma exposure is altogether unimportant. Rather, the results suggest that within this specific sample and study design, the age at which participants experienced their worst trauma was not strongly related to current PTSD symptom severity. In the present sample, sexual assault was most frequently reported during childhood and adolescence, whereas transportation accidents were more common during adolescence and emerging adulthood. Meanwhile, other studies have found different distributions of types of trauma. In contrast to some previous research, we did not find that earlier age at trauma exposure (in childhood or adolescence) was associated with higher PTSD symptom severity. Several studies have reported that trauma in childhood, especially interpersonal violence and sexual abuse, predicts more severe and long-lasting PTSD symptoms in adulthood (Nasir et al., 2021; Chapman et al., 2011). These studies suggest that early trauma can disrupt emotional development, attachment, and coping skills, which may increase long-term vulnerability to PTSD. However, not all studies have found a clear effect of age at exposure. For example, Mueller-Pfeiffer and colleagues (2013) and Maercker and colleagues (2004) reported no significant differences in PTSD severity based on when the trauma occurred. Overall, the literature on developmental timing is mixed, and relatively few studies have examined this issue in detail.

There are several possible reasons why we did not find a timing effect in our study. First, our analyses focused on the single “worst” trauma, rather than total

lifetime trauma exposure. Previous research shows that cumulative trauma, especially repeated interpersonal violence, strongly increases PTSD severity (Ogle et al., 2014; Da Silva et al., 2024; Chapman et al., 2011). Other studies also suggest that trauma type and cumulative exposure may be more important than timing alone in predicting PTSD severity (Ogle et al., 2014; Hagenaars et al., 2011). Some participants who reported their worst trauma in adulthood may have also experienced earlier traumas that were not captured in our analysis. Without accounting for total trauma load, the effect of timing may be difficult to detect.

Second, individuals differ in recovery and resilience. Some people may recover from childhood trauma over time, while others may develop more severe symptoms after trauma in adulthood. These different recovery patterns could reduce differences between age groups. Third, our developmental categories were broad, which may have masked more subtle differences between specific ages or stages of development. It is also important to acknowledge that all participants in the present study were enrolled in college. It is possible that individuals who experienced severe trauma early in life were not represented in our sample due to impairment related to their experiences. Some research suggests that adverse childhood experiences are associated with high school dropout (Moore & Stoddard, 2025) and with barriers to success in college (Hinojosa et al., 2019).

Overall, the present findings suggest that developmental timing alone may not be sufficient to predict PTSD severity without considering trauma type, frequency, and context. This supports the idea in the literature that the nature of the event may be more important than when it happened. Additional research will help to shed light on the importance of developmental timing of trauma.

Several limitations should be considered when interpreting the findings of this study. First, this study used a cross-sectional design, meaning that all data were collected at one point in time. As a result, we cannot make strong conclusions about cause and effect or about how PTSD symptoms develop over time. For example, we cannot determine whether trauma characteristics caused differences in PTSD severity or whether current PTSD symptoms influenced how participants remembered and reported their trauma experiences.

Second, the study relied on retrospective self-reports. Participants were asked to recall their worst traumatic event and the age at which it occurred. This approach may introduce recall bias, as individuals may have difficulty remembering the exact timing, details, or severity of past events. Although we had no direct measure of recall accuracy, memory errors could have affected our results.

Third, there were unequal group sizes and structurally empty cells across trauma types and developmental periods. Some trauma categories were rare or occurred mainly at specific ages. In particular, child maltreatment was, by definition,

only reported in the childhood group. These issues may also have reduced statistical power for some comparisons.

Fourth, there was limited variability in trauma frequency. As a result, we could not fully examine the impact of cumulative trauma exposure. Previous research suggests that repeated and multiple traumas, especially interpersonal ones, are strongly related to PTSD severity. Not accounting for cumulative exposure may have reduced our ability to detect timing effects.

Fifth, we excluded participants who reported combat or war-zone exposure ($n = 3$) to maintain a focus on civilian trauma. This decision was appropriate given our undergraduate sample and the very small number of participants who reported combat exposure. However, this choice also limits the generalizability of our findings. Previous research shows that combat trauma is strongly associated with high PTSD prevalence and severity (Kessler et al., 2017; May & Wisco, 2016). Therefore, excluding these cases may have influenced the overall symptom distribution and group comparisons in the present study. At the same time, some civilian studies, such as the sample examined by Kelley and colleagues (2009), also did not include combat exposure. For this reason, the findings of the current study should be interpreted specifically within the context of civilian trauma, and caution should be used when applying these results to military or veteran populations. Future research should examine whether the patterns observed in this study, particularly the higher PTSD severity associated with interpersonal trauma compared to non-interpersonal trauma, also appear in samples that include combat-related trauma.

Finally, several important factors were not measured in this study. We did not assess contextual details such as the duration of the trauma, the closeness of the relationship to the perpetrator, or the level of perceived betrayal. We also did not assess co-occurring mental health conditions, which may influence PTSD severity but were outside the scope of the current analysis.

Future research should build on the current findings in several important ways. First, future studies should aim to recruit larger samples with clinical assessment across trauma types and developmental periods. Larger and more evenly distributed samples would allow the use of more advanced statistical models, such as regression or interaction analyses, to better test how trauma type and developmental timing jointly predict PTSD severity. Although a continuous age-at-trauma variable could be used, regression assumes a linear relationship between age at exposure and PTSD severity. In our data, this assumption does not appear to hold, as the adolescent group showed lower PTSD severity than both childhood and adulthood, suggesting a non-linear pattern. Future studies with larger samples could test linear models or use finer-grained age categories to more accurately capture developmental effects.

In the present study, some trauma categories were rare or only occurred in certain age groups, which limited our ability to test interactions. For example, child maltreatment was reported only in childhood, making it impossible to examine its effects across later developmental periods. Recruiting more adults whose worst trauma was child maltreatment would allow researchers to directly test interactions between trauma type and timing, including the hypothesis that early interpersonal trauma has especially strong effects.

Second, longitudinal designs are strongly recommended. Studies that follow individuals over time after trauma exposure would help clarify how PTSD symptoms emerge, change, and persist. Longitudinal research could also better examine whether early-life trauma leads to different symptom trajectories than trauma experienced in adolescence or adulthood. In addition, prospective designs would reduce reliance on retrospective recall and help minimize memory bias. Finally, future research should use more detailed trauma assessments, especially those assessing trauma frequency. Rather than focusing only on the worst trauma, studies should assess important contextual features such as whether the trauma was single or repeated, the identity of the perpetrator (e.g., family member vs. stranger), the severity of the event, and its immediate consequences. These factors may help explain why some traumas are more psychologically damaging than others.

In conclusion, this study highlights the importance of trauma characteristics, especially the distinction between interpersonal and non-interpersonal events, in predicting PTSD symptom severity. We found that traumas involving another person (Interpersonal Violence or Child Maltreatment) or sudden loss were associated with higher PTSD symptoms, whereas Non-Interpersonal Traumas like accidents yielded lower symptoms. The timing of trauma alone had little effect on symptoms in our sample, suggesting that the nature of the trauma may be more important than the age at which it occurred in predicting PTSD symptom severity. These findings underscore that clinicians and researchers should pay close attention to the nature of a person's trauma exposure when assessing PTSD risk and planning interventions. Our results align with prior work emphasizing the outsized impact of interpersonal trauma on PTSD. In sum, future trauma research and care should consider trauma type and context, not just age of occurrence, to better understand and treat PTSD.

References

- American Psychiatric Association. (2022). *Diagnostic and Statistical Manual of Mental Disorders* (5th ed., text rev.) . <https://doi.org/10.1176/appi.books.9780890425787>.
- Birkeland, M. S., Skar, A. M. S., & Jensen, T. K. (2021). Do different traumatic events invoke different kinds of post-traumatic stress symptoms? *European Journal of Psychotraumatology*, 12 (sup1), 1866399. <https://doi.org/10.1080/20008198.2020.1866399>
- Blake DD, Weathers FW, Nagy LM, Kaloupek DG, Gusman FD, Charney DS, Keane TM (1995). The development of a Clinician-Administered PTSD Scale. *J Trauma Stress*.8:75–90.
- Briere, J., Agee, E., & Dietrich, A. (2016). Cumulative trauma and current post-traumatic stress disorder status in general population and inmate samples. *Psychological Trauma: Theory, Research, Practice, and Policy*, 8 (4), 439–446. <https://doi.org/10.1037/tra0000107>
- Chapman, C., Mills, K., Slade, T., McFarlane, A., Bryant, R., Creamer, M., Silove, D., & Teesson, M. (2011). Remission from post-traumatic stress disorder in the general population. *Psychological Medicine*, 42, 1695–1703. <https://doi.org/10.1017/S0033291711002856>
- Copeland, W. E., Shanahan, L., Hinesley, J., Chan, R. F., Aberg, K. A., Fairbank, J. A., Van Den Oord, E. J. C. G., & Costello, E. J. (2018). Association of childhood trauma exposure with adult psychiatric disorders and functional outcomes. *JAMA Network Open*, 1(7), e184493. <https://doi.org/10.1001/jamanetworkopen.2018.4493>
- da Silva, H. C., Vilete, L., Coutinho, E. S. F., Luz, M. P., Mendlowicz, M., Portela, C. M., Figueira, I., Ventura, P., Mari, J. de J., Quintana, M. I., Ribeiro, W. S., Andreoli, S. B., & Berger, W. (2024). The role of childhood cumulative trauma in the risk of lifetime PTSD: An epidemiological study. *Psychiatry Research*, 336, 115887. <https://doi.org/10.1016/j.psychres.2024.115887>
- Dunn, E. C., Nishimi, K., Gomez, S. H., Powers, A., & Bradley, B. (2018). Developmental timing of trauma exposure and emotion dysregulation in adulthood: Are there sensitive periods when trauma is most harmful? *Journal of Affective Disorders*, 227, 869–877. <https://doi.org/10.1016/j.jad.2017.10.045>

- Dunn, E. C., Nishimi, K., Powers, A., & Bradley, B. (2017). Is developmental timing of trauma exposure associated with depressive and post-traumatic stress disorder symptoms in adulthood? *Journal of Psychiatric Research*, 84, 119–127. <https://doi.org/10.1016/j.jpsychires.2016.09.004>
- Gould, F., Harvey, P. D., Hodgins, G., Jones, M. T., Michopoulos, V., Mapples-Keller, J., Rothbaum, B. O., Rothbaum, A. O., Ressler, K. J., & Nemeroff, C. B. (2021). Prior trauma-related experiences predict the development of post-traumatic stress disorder after a new traumatic event. *Depression and Anxiety*, 38 (1), 40–47. <https://doi.org/10.1002/da.23084>
- Grubaugh, A. L., Zinzow, H. M., Paul, L., Egede, L. E., & Frueh, B. C. (2011). Trauma exposure and posttraumatic stress disorder in adults with severe mental illness: A critical review. *Clinical Psychology Review*, 31(6), 883–899. <https://doi.org/10.1016/j.cpr.2011.04.003>
- Hagenaars, M., Fisch, I., & Van Minnen, A. (2011). The effect of trauma onset and frequency on PTSD-associated symptoms. *Journal of Affective Disorders*, 132 1-2, 192–199. <https://doi.org/10.1016/j.jad.2011.02.017>
- Hinojosa, R., Nguyen, J., Sellers, K., & Elassar, H. (2019). Barriers to college success among students that experienced adverse childhood events. *Journal of American College Health*, 67 (6), 531–540. <https://doi.org/10.1080/07448481.2018.1498851>
- Karsberg, S., Elklit, A., Pedersen, M., Pedersen, M., & Vang, M. (2024). A nationally representative survey of ICD-11 PTSD among Danish adolescents and young adults aged 15-29. *Scandinavian Journal of Psychology*, 65(5), 893-900. <https://doi.org/10.1111/sjop.13032>
- Kelley, L. P., Weathers, F. W., McDevitt-Murphy, M. E., Eakin, D. E., & Flood, A. M. (2009). A comparison of PTSD symptom patterns in three types of civilian trauma. *Journal of Traumatic Stress*, 22(3), 227–235. <https://doi.org/10.1002/jts.20406>
- Kessler, R. C., Aguilar-Gaxiola, S., Alonso, J., Benjet, C., Bromet, E. J., Cardoso, G., Degenhardt, L., de Girolamo, G., Dinolova, R. V., Ferry, F., Florescu, S., Gureje, O., Haro, J. M., Huang, Y., Karam, E. G., Kawakami, N., Lee, S., Lepine, J.-P., Levinson, D., ... Koenen, K. C. (2017). Trauma and PTSD in the WHO World Mental Health Surveys. *European Journal of Psychotraumatology*, 8 (sup5), 1353383. <https://doi.org/10.1080/20008198.2017.1353383>

- Kira, I. A., Lewandowski, L., Templin, T., Ramaswamy, V., Ozkan, B., & Mo-hanesh, J. (2008). Measuring cumulative trauma dose, types, and profiles using a development-based taxonomy of traumas. *Traumatology*, 14(2), 62–87. <https://doi.org/10.1177/1534765608319324>
- Kul, A. T., & Gündoğmuş, I. (2020). The effect of trauma type on the severity of Post-Traumatic Stress Disorder (PTSD) symptoms. *Archives of Clinical Psychiatry (São Paulo)*, 47, 135–139. <https://doi.org/10.1590/0101-60830000000249>
- Lee, S. Y., & Park, C. L. (2018). Trauma exposure, posttraumatic stress, and preventive health behaviours: A systematic review. *Health Psychology Review*, 12 (1), 75–109. <https://doi.org/10.1080/17437199.2017.1373030>
- Li, M., Gao, T., Su, Y., Zhang, Y., Yang, G., D’Arcy, C., & Meng, X. (2023). The timing effect of childhood maltreatment in depression: A systematic review and meta-analysis. *Trauma, Violence, & Abuse*, 24(4), 2560–2580. <https://doi.org/10.1177/15248380221102558>
- Maercker, A., Michael, T., Fehm, L., Becker, E. S., & Margraf, J. (2004). Age of traumatisation as a predictor of post-traumatic stress disorder or major depression in young women. *British Journal of Psychiatry*, 184(6), 482–487. <https://doi.org/10.1192/bjp.184.6.482>
- Mandelli, L., Petrelli, C., & Serretti, A. (2015). The role of specific early trauma in adult depression: A meta-analysis of published literature. *Childhood trauma and adult depression. European Psychiatry*, 30(6), 665–680. <https://doi.org/10.1016/j.eurpsy.2015.04.007>
- May, C. L., & Wisco, B. E. (2016). Defining trauma: How level of exposure and proximity affect risk for posttraumatic stress disorder. *Psychological trauma: theory, research, practice, and policy*, 8(2), 233. <https://doi.org/10.1037/tra0000077>
- McCutcheon, V. V., Sartor, C. E., Pommer, N. E., Bucholz, K. K., Nelson, E. C., Madden, P. A. F., & Heath, A. C. (2010). Age at trauma exposure and PTSD risk in young adult women. *Journal of Traumatic Stress*, 23(6), 811–814. <https://doi.org/10.1002/jts.20577>

- McLaughlin, K. A., Koenen, K. C., Bromet, E. J., Karam, E. G., Liu, H., Petukhova, M., Ruscio, A. M., Sampson, N. A., Stein, D. J., Aguilar-Gaxiola, S., Alonso, J., Borges, G., Demyttenaere, K., Dinolova, R. V., Ferry, F., Florescu, S., Girolamo, G. de, Gureje, O., Kawakami, N., ... Kessler, R. C. (2017). Childhood adversities and post-traumatic stress disorder: Evidence for stress sensitisation in the World Mental Health Surveys. *The British Journal of Psychiatry*, 211(5), 280–288. <https://doi.org/10.1192/bjp.bp.116.197640>
- Miller-Graff, L. E., Scrafford, K., & Rice, C. (2016). Conditional and indirect effects of age of first exposure on PTSD symptoms. *Child Abuse & Neglect*, 51, 303–312. <https://doi.org/10.1016/j.chiabu.2015.09.003>
- Moore, C. R., & Stoddard, S. A. (2025). Associations between adverse childhood experiences, adolescent behavioral health challenges, and high school dropout. *Journal of School Health*, 95(2), 162–171. <https://doi.org/10.1111/josh.13527>
- Mueller-Pfeiffer, C., Moergeli, H., Schumacher, S., Martin-Soelch, C., & Et., A. (2013). Characteristics of child maltreatment and their relation to dissociation, posttraumatic stress symptoms, and depression in adult psychiatric patients. *Journal of Nervous & Mental Disease*, 201(6), 471–477. <https://doi.org/10.1097/nmd.0b013e3182948096>
- Nasir, B., Black, E., Toombs, M., Kisely, S., Gill, N., Beccaria, G., Kondalsamy-Chennakesavan, S., & Nicholson, G. (2021). Traumatic life events and risk of post-traumatic stress disorder among the Indigenous population of regional, remote and metropolitan Central-Eastern Australia: A cross-sectional study. *BMJ Open*, 11. <https://doi.org/10.1136/bmjopen-2020-040875>
- Ogle, C. M., Rubin, D. C., & Siegler, I. C. (2013). The impact of the developmental timing of trauma exposure on PTSD symptoms and psychosocial functioning among older adults. *Developmental Psychology*, 49(11), 2191–2200. <https://doi.org/10.1037/a0031985>
- Reiland, S., & Harrington, E. (2025). Posttraumatic cognitions mediate the relationship between trauma type and PTSD symptoms. *Journal of Psychiatric Research*, 186, 50–56. <https://doi.org/10.1016/j.jpsychires.2025.04.003>
- Smith, H. L., Summers, B. J., Dillon, K. H., & Cogle, J. R. (2016). Is worst-event trauma type related to PTSD symptom presentation and associated features? *Journal of Anxiety Disorders*, 38, 55–61. <https://doi.org/10.1016/j.janxdis.2016.01.007>

- Smith, P., Yule, W., Perrin, S., Tranah, T., Dalgleish, T., & Clark, D. M. (2007). Cognitive-behavioral therapy for PTSD in children and adolescents: A preliminary randomized controlled trial. *Journal of the American Academy of Child & Adolescent Psychiatry*, 46 (8), 1051–1061. <https://doi.org/10.1097/CHI.0b013e318067e288>
- Suliman, S., Mkabile, S. G., Fincham, D. S., Ahmed, R., Stein, D. J., & Seedat, S. (2009). Cumulative effect of multiple trauma on symptoms of posttraumatic stress disorder, anxiety, and depression in adolescents. *Comprehensive Psychiatry*, 50 (2), 121–127. <https://doi.org/10.1016/j.comppsy.2008.06.006>
- Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics* (6th ed.). Boston, MA: Pearson.
- Tervo-Clemmens, B., Calabro, F. J., Parr, A. C., Fedor, J., Foran, W., & Luna, B. (2023). A canonical trajectory of executive function maturation from adolescence to adulthood. *Nature Communications*, 14(1), 6922. <https://doi.org/10.1038/s41467-023-42540-8>.
- Thomas, E. A., Owens, G. P., & Keller, E. M. (2021). Relationships among non-interpersonal and interpersonal trauma types, posttraumatic stress, and posttraumatic growth. *Journal of Clinical Psychology*, 77(11), 2592–2608. <https://doi.org/10.1002/jclp.23190>
- Vaughn-Coaxum, R. A., Wang, Y., Kiely, J., Weisz, J. R., & Dunn, E. C. (2018). Associations between trauma type, timing, and accumulation on current coping behaviors in adolescents: Results from a large, population-based sample. *Journal of Youth and Adolescence*, 47 (4), 842–858. <https://doi.org/10.1007/s10964-017-0693-5>
- Watts, B. V., Schnurr, P. P., Mayo, L., Young-Xu, Y., Weeks, W. B., & Friedman, M. J. (2013). Meta-analysis of the efficacy of treatments for posttraumatic stress disorder. *The Journal of Clinical Psychiatry*, 74(6), e541–e550. <https://doi.org/10.4088/JCP.12r08225>
- Weathers, F. W., Litz, B. T., Keane, T. M., Palmieri, P. A., Marx, B. P., & Schnurr, P. P. (2013). The PTSD checklist for DSM-5 (PCL-5).