

**The Cycle of Violence: Neighborhood Concerns as a Mediator Between Childhood  
Maltreatment and Gun Violence**

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### **Abstract**

**Background:** Gun violence remains a persistent public health issue in the United States. Two notable risk factors for violence include childhood maltreatment and exposure to community violence. Yet, little is known about the link between childhood maltreatment and gun violence in adulthood and whether a lack of community safety (i.e., increased firearm presence and violence) may explain the association.

**Objective:** This study aimed to investigate the relationship between childhood maltreatment (i.e., emotional abuse and neglect, physical abuse and neglect, and sexual abuse) and firearm violence while examining the potential mediating role of neighborhood concerns among adults hospitalized with violent injuries.

**Participants and setting:** The study included 329 violently injured adults ( $M_{\text{age}} = 32.7$ ) recruited from a Level 1 Trauma Center in Virginia.

**Methods:** Participants completed assessments of childhood maltreatment, neighborhood concerns, and firearm violence.

**Results:** All forms of childhood maltreatment, except for emotional neglect, were related to firearm violence. Neighborhood concerns partially mediate the relation between both emotional abuse and physical abuse and firearm violence and fully mediate the relation between both sexual abuse and physical neglect and firearm violence. The results show the critical importance of addressing both individual-level trauma and broader social determinants of health (i.e., community violence) in violence prevention efforts.

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**Conclusion:** By understanding the pathways through which childhood maltreatment manifests in community settings and contributes to firearm violence, the findings offer valuable insights for informing targeted interventions and policy initiatives aimed at reducing the prevalence of firearm-related violence and fostering safer neighborhoods.

*Keywords:* Childhood maltreatment; child abuse; neighborhood concerns; firearm; gun violence.

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## **The Cycle of Violence: Neighborhood Safety Concerns as a Mediator Between Childhood Maltreatment and Gun Violence**

### **Introduction**

Gun violence is a persistent public health problem in the United States, with an average of 134 firearm-related deaths occurring daily (Davis et al., 2023). Addressing this issue necessitates a comprehensive understanding of its roots and risk factors grounded in empirical research. Gun violence does not only inflict grave harm on individuals but also threatens community safety on a profound level. Among the myriad of factors contributing to gun violence, childhood trauma is considered a concern (Wamser-Nanney et al., 2019). While extensive research has explored the link between childhood maltreatment and various forms of violence, including intimate partner violence (Curtis et al., 2022; Gómez, 2011; Li et al., 2020) and homicide (DeLisi & Beauregard, 2018; Pflugradt et al., 2018), scant attention has been directed towards understanding its association with gun violence. This study seeks to bridge this gap by investigating the relationship between childhood maltreatment and firearm violence in adulthood, thereby contributing to a deeper understanding of this issue.

### **Childhood Maltreatment and Violence**

Each year, 1 in 7 children experience child maltreatment in the United States (Centers for Disease Control and Prevention [CDC], 2022). This pervasive issue encompasses various forms of maltreatment, ranging from emotional, physical, and sexual abuse to emotional and physical neglect. Childhood maltreatment is defined as “any act or series of acts of commission or omission by a parent or other caregiver that results in harm, potential for harm, or threat of harm to a child” (Leeb et al., 2008, p.11). The consequences of childhood maltreatment reverberate throughout an individual’s life, manifesting in diverse negative outcomes such as cognitive

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deficits, substance abuse, poorer physical and sexual health, externalizing and internalizing behavior problems, and psychiatric disorders (Strathearn, et al., 2020).

Research consistently indicates that experiences of childhood abuse and neglect serve as potent predictors of violence and aggression in adulthood (Dardis et al., 2013; Milaniak & Widom, 2015; Welfare and Hallin, 2015; Yang & Corso, 2007; Zurbriggen et al., 2010).

Whether it be the perpetration of intimate partner violence or involvement in criminal actions, individuals with a history of childhood maltreatment are at an elevated risk for engaging in violent behavior. Despite this well-established connection between childhood maltreatment and general violence, the specific relationship between types of childhood maltreatment and gun violence remains understudied.

**Emotional Abuse.** Emotional abuse, though often elusive due to its non-visible nature, has been identified as a prevalent form of maltreatment, impacting the victims' psychological well-being and behavioral tendencies (Stoltenborgh et al., 2014). It involves verbal aggression, intimidation, gaslighting, or belittlement by a caregiver, undermining a child's sense of self-worth and security (Kumari, 2020). Research suggests that individuals who experience emotional abuse are more likely to exhibit maladaptive coping strategies, such as aggression and hostility, in response to stressors in adulthood (Allen, 2011; Brewer-Smyth et al., 2015; Lake et al., 2015; Sansone et al., 2012). Furthermore, emotional abuse has been linked to an increased risk of perpetrating intimate partner violence in adulthood, serving as a potential predictor of aggression and violence (Berzenski & Yates, 2010).

**Physical Abuse.** Physical abuse, characterized by bodily harm or injury by a caregiver, represents a form of childhood maltreatment with far-reaching consequences. Research consistently shows that individuals who experience physical abuse in childhood are at heightened

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risk of exhibiting aggression and violence in adulthood (Cullerton-Sen et al., 2008; Kolla et al., 2013). The trauma associated with physical abuse can disarray the development of healthy coping mechanisms, leading to maladaptive responses to conflict and stressors later in life (Wolff & Shi, 2012). Moreover, a history of childhood physical abuse has been related to increased involvement in criminal activities and violent offending both in adolescence and adulthood (Fagan, 2005; Fang & Corso, 2007; Brewer-Smyth et al., 2015; Lansford et al., 2007; Watts and McNulty 2013). Notably, research suggests that physical abuse may be particularly conducive to violent criminal behavior compared to other forms of maltreatment, underscoring its significance in understanding the pathways to adult violence (Byrd & Davis, 2009; Dalsklev et al., 2021; Mersky & Reynolds, 2007; Maxfield & Widom, 1996).

**Sexual Abuse.** Childhood sexual abuse represents a particularly egregious form of maltreatment, characterized by unwanted sexual context or exploitation by caregivers or other individuals in positions of authority. The traumatic nature of sexual abuse can have enduring effects on victims' psychological well-being and behavioral development. Research indicates that individuals who experience sexual abuse in childhood are at increased risk of exhibiting aggressive and violent behavior in adulthood, including perpetration of intimate partner violence (Cubellis et al., 2018; Trabold et al., 2015). Moreover, victims of childhood sexual abuse may be more likely to engage in sexually aggressive behavior, perpetuating a cycle of violence and victimization (Norton-Baker et al., 2019; Voith et al., 2020). Notably, a significant proportion of individuals involved in the criminal justice system report a history of sexual abuse (Dalsklev et al., 2021), highlighting the role of early trauma in shaping pathways to adult criminality (Brewer-Smyth et al., 2015; Watts and McNulty, 2013).

**Emotional and Physical Neglect.** Neglect, whether emotional or physical, represents a failure on the part of the caregiver to meet a child's basic needs, including adequate supervision, care, and emotional support. Despite its less overt nature compared to other forms of maltreatment, neglect can have long-term consequences for children's development and well-being (Kumari, 2020; Stoltenborgh et al., 2013). Research suggests that people exposed to childhood neglect are at increased risk of exhibiting violence and antisocial behavior in adulthood (Chapple et al., 2005; Grogan-Kaylor & Otis, 2003). The absence of nurturing and supporting relationships during critical development periods can contribute to deficits in social and emotional competence, increased vulnerability to maladaptive coping strategies, and aggressive behavior (Evans and Burton, 2013). Notably, childhood neglect has been linked to increased involvement in criminal activities and violent offending in adolescence and adulthood, pointing to its significance in understanding the integrational transmission of violence (Maxfield & Widom, 1996; Mersky & Reynolds, 2007; Milaniak & Widom, 2015).

Despite the established associations between various forms of childhood maltreatment and general violence, research examining their impact on gun violence remains sparse. This study aims to fill this gap by elucidating the nuanced pathways through which types of childhood maltreatment may contribute to gun violence perpetration in adulthood.

### **The Cycle of Violence**

A fundamental concept for understanding the proposed connection between child maltreatment and gun violence is the "cycle of violence" hypothesis, which posits that individuals who have experienced childhood violence are at elevated risk of perpetrating violence in adulthood (Koolschijn et al., 2023; Widom, 2017). This hypothesis finds its roots in social learning theory, which contends that children exposed to violence will likely replicate such

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behavior through observational learning (Bandura 1973, 1977). Research consistently supports this theory, demonstrating its relevance to behavioral patterns and belief systems. For instance, in the realm of dating violence victimization, an individual's attitudes and justification of violence have been associated with exposure to violence between parents during childhood (Kwan & You, 2023). Moreover, a qualitative study revealed that violent offenders often attribute their behavior to exposure to violence, particularly within the family context, fostering beliefs that violence perpetration is acceptable and normative (Morrison et al., 2024). Similarly, individuals who experienced corporal punishment in childhood tend to harbor positive attitudes towards this form of discipline, with more severe forms of punishment correlating with higher endorsement of such disciplinary measures (Witt et al., 2021). Thus, the cycle of violence and social learning theory exert a significant influence on social cognitions regarding violence, potentially reinforcing violent behavior (Huesmann, 2017).

Prior research has extensively explored the connection between childhood maltreatment and subsequent violent behaviors. Studies have found that exposure to violence and abuse within one's family of origin is associated with an increased likelihood of perpetrating intimate partner violence (Heyman & Slep, 2002). Generally, experiencing abuse or neglect during childhood is linked with future offending, particularly among males (Widom, 1989; Currie & Tekin, 2012). Prior research has also demonstrated that maltreatment predicts violent criminal offending and weapon charges, including charges related to firearms (Maxfield & Widom, 1996; Topitzes et al., 2012).

### **Childhood Maltreatment and Firearm Violence**

Childhood maltreatment is associated with increased access to and carrying of firearms (Leeb et al., 2007; Nelson, 1995; Osborne et al., 2022; Wolfe et al., 2001). Additionally, children



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who experience abuse and neglect have significantly higher odds of having a gun in their home, with increased odds for those experiencing several adverse childhood experiences (Attridge et al., 2023; Meeker et al., 2021). Moreover, witnessing familial violence increases the risk of carrying firearms (Jones et al., 2023) and violent crime arrests (Wamser-Nanney et al., 2019), with compounded risk of gun carrying for those who are both victims and witnesses of family violence (Yexley et al., 2002). Furthermore, neglect also contributes to increased firearm use among adolescents and early adults (Beardslee et al., 2019). In summary, individuals with a history of childhood maltreatment tend to have greater access to firearms and are more likely to carry firearms, thereby heightening the risk of gun violence. Although exploring the role of childhood maltreatment in gun violence is critical for directing trauma-informed gun violence prevention programs, it is important to understand the role of the person's environment in exacerbating the link between childhood maltreatment and gun violence.

### **Neighborhood Factors and Firearm Violence**

The link between childhood maltreatment and violence may be enforced by other factors, including neighborhood disadvantage (Wright & Fagan, 2013). Young people in dysfunctional families are more likely to be exposed to violence in their communities, a characteristic often associated with disadvantaged neighborhoods (Gorman-Smith et al., 2004; Harding, 2009). Exposure to violence, whether directly (e.g., individual trauma) or indirectly (e.g., community violence), can have negative consequences on mental and physical health (Mitchell et al., 2019). When individuals feel unsafe in their neighborhoods due to high rates of disorganization and violence, they may be more inclined to resort to gun violence (Sanchez et al., 2020). Witnessing community violence has been linked to various forms of violence perpetration, including gun

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assaults, violent crime arrests, gun carrying (Wamser-Nanney et al., 2019), and overall engagement in violent behavior (Gorman-Smith et al., 2004).

Moreover, individuals involved in violence may have beliefs that violence is acceptable or needed to prevent victimization or to retaliate (Anderson, 2000). Childhood maltreatment may contribute to an altered view of violence, which, combined with neighborhood factors, may result in violence perpetration (Wamser-Nanny et al., 2019). Experiencing violence by caregivers or in the neighborhood may shape beliefs regarding violent behavior, and allow for observational learning of violence (Husemann, 2018). Indeed, individuals who experience gun violence victimization, exposure to violence, and have easy access to firearms are more likely to use guns in adulthood (Teplin et al., 2021; Huesmann et al., 2021). Thus, the cycle of violence is a valuable framework for understanding the relationship between childhood maltreatment and later gun violence and how neighborhood safety and the prevalence of firearms in the community explain the association between childhood maltreatment and gun violence.

### **The Current Study**

Prior research has established a clear link between childhood maltreatment and subsequent involvement in violence. Building upon the cycle of violence hypothesis, this study aims to extend the existing literature by investigating the relation between child maltreatment and firearm violence, with a focus on examining if neighborhood safety concerns mediate this relationship. While research has demonstrated several associations between childhood maltreatment and various forms of violence, including dating violence, intimate partner violence, and general violent crime, there remains a dearth of studies examining the specific association between childhood maltreatment and gun violence.

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Existing research has predominantly focused on adolescents, neglecting to explore this relationship in adulthood despite individuals aged 15-34 being at the highest risk of firearm-related violence (CDC, 2023; NICJP, 2023). This is also concerning because individuals aged 25-34 have a high rate of gun ownership and access, further amplifying susceptibility to firearm-related violence (Kellerman et al., 1993; Parker et al., 2017). Thus, to effectively address gun violence, it is imperative to identify individuals at heightened risk for firearm-related injury, because a targeted approach may facilitate assessments of future involvement in gun violence (Rich et al., 2005; Wamser-Nanney et al., 2019). Moreover, child protection services show that African-American children experience nearly double the rates of maltreatment than white children. Generally, these differences are attributed to community and societal factors (CDC, 2016).

Given prior research supporting the relationship between childhood maltreatment and violence (Brewer-Smyth et al., 2015; Chapple et al., 2005; Evans and Burton, 2013; Norton-Baker et al., 2019), it was hypothesized that all types of childhood maltreatment would relate to firearm violence. In addition, based on the premise that neighborhood exposure serves as a mechanism through which childhood maltreatment is linked to violence (Mitchell et al., 2019), it was expected that neighborhood safety would mediate the relationship between all types of childhood maltreatment and firearm violence. By examining these contributing risk factors, this study aims to enhance our understanding of pathways to gun violence.

### Methods

#### Participants

A total of 329 violently injured adults from a level 1 trauma center in Virginia were included in this study. Participants ranged in age from 16-75 ( $M_{age} = 32.7$ ,  $SD = 13$ ), were

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predominantly male (74%), and identified as African American (67%), White (11%), or mixed race and other (22%). Eighty percent of participants attained a 12<sup>th</sup>-grade or higher education level. Fifty percent of participants had access to a gun and were in the hospital for gunshot wound(s) (47%), assault (28%), and stab wound(s) (8%).

## **Procedure**

Violently injured adult patients were recruited from a level 1 trauma center daily using live medical records with a recruitment rate of 75%. Before consent, participants were informed that their involvement was for research and not part of the medical care and participation in the study would not impact their medical care. Following consent, participants completed a series of self-report assessments. The assessment lasted ~2 hours, and participants were compensated \$160 for their participation. This study is part of a larger ongoing research project to evaluate a hospital-based prevention program to reduce retaliatory gun violence ([MASKED FOR REVIEW]). All assessments in this study were completed before group randomization. The study was approved by the [MASKED FOR REVIEW] institutional review board and received a CDC Certificate of Confidentiality.

## **Measures**

**Childhood Trauma Questionnaire.** The Childhood Trauma Questionnaire – Short Form (CTQ-SF; Bernstein et al., 2003) is a 28-item self-report measure rated on a 5-point scale, including 5 subscales with 5 items each: (1) emotional abuse (e.g., “My family said hurtful and insulting things to me”); (2) physical abuse (e.g., “Hit so hard that I had to see a doctor”); (3) sexual abuse (e.g., “Someone molested me”); (4) emotional neglect (e.g., “Family felt close to each other” reverse scored); and (5) physical neglect (e.g., “Had to wear dirty clothes”). The total childhood trauma score is computed from the 25 items in the subscales (3 items are validity

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items). Prior research has shown that the scale has strong internal consistency and structural validity (Saini et al., 2019). The subscales showed good internal consistency (EA,  $\alpha = .89$ ; PA,  $\alpha = .82$ ; SA,  $\alpha = .94$ ; EN,  $\alpha = .88$ ; PN,  $\alpha = .74$ ).

**Neighborhood Safety Concerns.** The neighborhood concerns subscale of the Gun Behavior and Beliefs Scale assessed neighborhood safety concerns (Wamser-Nanney et al., 2020). The subscale consists of 4 items: “In my neighborhood, you are seen as an easy mark if people think you won’t fight back,” “The police frequently use guns in my neighborhood,” “In my neighborhood, a gun is needed to protect me,” and “In my neighborhood, you have to be seen as willing to use violence to keep from being a victim”) rated on a 7-point Likert-scale (1 = *Strongly disagree*, 7 = *Strongly agree*). The scale showed good internal consistency in this study,  $\alpha = .87$ .

**Firearm Violence.** The Firearm Aggression Questionnaire (FAQ; Thomson et al., 2024) is an 8-item self-report scale using a 3-point rating format (0 = *never*, 2 = *often*). The scale was adapted based on the Buss-Perry Aggression Questionnaire – Physical (BPAQ; Buss & Perry, 1992) to measure firearm violence (e.g., “I have threatened people I know with a gun” and “When I get angry, I shoot a gun”). The scale showed good internal consistency,  $\alpha = .81$ .

### **Data Analysis Plan**

Correlations among the main study variables were examined to understand the connection between childhood maltreatment, neighborhood safety concerns, and firearm violence. Analyses were performed in R with Hayes’ PROCESS (Hayes, 2022; Team, 2020), enabling a regression-based mediation analysis approach with bootstrapping and robust standard error. The mediation model bootstrapping was conducted with 1,000 replications. Sex, age, race, and gun access were included as covariates in each model. Childhood maltreatment types (i.e.,

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emotional abuse, physical abuse, sexual abuse, emotional neglect, physical neglect) and neighborhood concerns were standardized before mediation analysis. A prior power analysis with G\*Power 3.1.9.6 for a regression model with five predictors (i.e., four covariates, an independent variable, and one mediator), with  $\alpha$  set to .05, power set to .80, and medium effect size indicated a required sample size of 92.

## Results

### Preliminary Analyses

Assumptions were tested before analyses. A total of 11 participants were excluded due to missing data. Data met the criteria for normality (skewness < 3; kurtosis < 10; Joanes & Gill, 1998). Table 1 displays the correlations and descriptive statistics of measures. Firearm violence was positively correlated with neighborhood concerns ( $r = .37, p < .001$ ), emotional, and physical abuse ( $ps < .001$ ), and unrelated to sexual abuse ( $p = .01$ ), physical ( $p = .02$ ), and emotional neglect ( $p = .70$ ). Neighborhood concerns were positively related to emotional abuse ( $p < .001$ ), physical abuse ( $p < .001$ ), sexual abuse ( $p = .001$ ), physical neglect ( $p < .001$ ), and unrelated to emotional neglect ( $p = .28$ ). All types of childhood trauma were positively correlated ( $ps < .001$ ). Sex was positively related to firearm violence ( $p = .04$ ) and negatively related to sexual abuse ( $p < .001$ ). Race was positively related to firearm violence ( $p = .01$ ) and negatively related to emotional neglect ( $p = .04$ ). Firearm access was positively related to firearm violence ( $p < .001$ ) and neighborhood concerns ( $p = .01$ ) and negatively related to emotional neglect ( $p = .04$ ). Overall, except emotional neglect, all types of childhood maltreatment were related to firearm violence and neighborhood concerns.

[INSERT TABLE 1 ABOUT HERE]

### Mediation Analyses

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Table 2 displays the results for emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect with neighborhood safety concerns predicting firearm violence.

Each mediation model controlled for sex, age, race, and gun access.

**Emotional abuse.** Emotional abuse ( $\beta = .25, p < .001$ ), gun access ( $\beta = .15, p = .006$ ), and race ( $\beta = .11, p = .044$ ) had a significant direct effect on neighborhood concerns,  $R^2 = .10, F(5, 323) = 8.26, p < .001$ . Further, emotional abuse ( $\beta = .16, p = .008$ ), neighborhood concerns ( $\beta = .29, p < .001$ ), sex ( $\beta = .13, p < .001$ ), and gun access ( $\beta = .17, p < .001$ ) had a significant direct effect on firearm violence,  $R^2 = .22, F(6, 322) = 8.65, p < .001$ . Lastly, emotional abuse had a significant indirect effect on firearm violence via neighborhood concerns,  $\beta = .07, 95\% \text{ CI } [.04, .11]$ . Thus, neighborhood concerns partially mediated the relationship between emotional abuse and firearm violence.

**Physical abuse.** Physical abuse ( $\beta = .22, p < .001$ ) and gun access ( $\beta = .14, p = .009$ ) had a significant direct effect on neighborhood concerns,  $R^2 = .09, F(5, 323) = 6.46, p < .001$ . Further, physical abuse ( $\beta = .17, p = .014$ ), neighborhood concerns ( $\beta = .29, p < .001$ ), sex ( $\beta = .13, p = .003$ ), and gun access ( $\beta = .16, p = .001$ ) each had a significant direct effect on firearm violence,  $R^2 = .22, F(6, 322) = 8.69, p < .001$ . Lastly, physical abuse had a significant indirect effect on firearm violence via neighborhood concerns,  $\beta = .06, 95\% \text{ CI } [.03, .10]$ . Thus, neighborhood concerns partially mediated the relationship between physical abuse and firearm violence.

**Sexual abuse.** Sexual abuse ( $\beta = .22, p < .001$ ), race ( $\beta = .11, p = .04$ ), and gun access ( $\beta = .16, p = .004$ ) had a significant direct effect on neighborhood concerns,  $R^2 = .08, F(5, 323) = 7.55, p < .001$ . Sexual abuse did not have a direct effect on firearm violence ( $\beta = .06, p = .38$ ), however, neighborhood concerns ( $\beta = .31, p < .001$ ), sex ( $\beta = .13, p = .005$ ), and gun access ( $\beta = .17, p = .001$ ), had a direct effect on firearm violence,  $R^2 = .20, F(6, 322) = 8.26, p < .001$ .

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Lastly, sexual abuse had a significant indirect effect on firearm violence through neighborhood concerns,  $\beta = .07$ , 95% CI [.03, .11]. Thus, neighborhood concerns fully mediated the relationship between sexual abuse and firearm violence.

**Emotional neglect.** Emotional neglect ( $\beta = .06$ ,  $p = .35$ ) did not relate to neighborhood concerns, yet, gun access ( $\beta = .16$ ,  $p = .005$ ) was significant,  $R^2 = .04$ ,  $F(5, 323) = 2.74$ ,  $p = .02$ . Further, emotional neglect did not have a direct effect on firearm violence ( $\beta = -.004$ ,  $p = .94$ ); however, neighborhood concerns ( $\beta = .33$ ,  $p < .001$ ), sex ( $\beta = .11$ ,  $p = .008$ ), and gun access ( $\beta = .16$ ,  $p = .001$ ) had a significant direct effect on firearm violence,  $R^2 = 0.19$ ,  $F(6, 323) = 8.56$ ,  $p < .001$ . Lastly, emotional neglect did not have an indirect effect on firearm violence via neighborhood concerns,  $\beta = .02$ , 95% CI [-.02, .06]. Thus, there was no relation between emotional neglect and firearm violence.

**Physical neglect.** Physical neglect ( $\beta = .20$ ,  $p < .001$ ), race ( $\beta = .11$ ,  $p = .04$ ), and gun access ( $\beta = .156$ ,  $p = .003$ ) had a significant direct effect on neighborhood concerns,  $R^2 = .08$ ,  $F(5, 323) = 5.99$ ,  $p < .001$ . Physical neglect did not have a direct effect on firearm violence ( $\beta = .04$ ,  $p = .49$ ), however, neighborhood concerns ( $\beta = .32$ ,  $p < .001$ ), sex ( $\beta = .11$ ,  $p = .007$ ), and gun access ( $\beta = .17$ ,  $p < .001$ ) had a significant direct effect on firearm violence,  $R^2 = .19$ ,  $F(6, 322) = 8.43$ ,  $p < .001$ . Lastly, physical neglect had a significant indirect effect on firearm violence via neighborhood concerns,  $\beta = .06$ , 95% CI [.03, .10]. Thus, neighborhood concerns fully mediated the relationship between physical neglect and firearm violence.

[INSERT TABLE 2 AND FIGURE 1-5 ABOUT HERE]

## Discussion

The results demonstrated that all types of childhood maltreatment (except emotional neglect) were related to firearm violence in adulthood, thus aligning with existing research on the



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cycle of violence. This underscores the long-term impact of early trauma on violence and emphasizes the need for comprehensive, multifaceted interventions to address childhood trauma and adversity to break the cycle of violence. Importantly, our study found youth exposed to higher levels of childhood maltreatment were also more likely to report greater neighborhood safety concerns. This finding aligns with previous research linking childhood maltreatment to neighborhood disadvantage (Conrad-Hiebner & Bryam, 2020; Morris et al., 2019; Hunter & Flores, 2020) and underscores the broader social determinants that contribute to violence.

Neighborhood concerns mediated the relationship between childhood maltreatment types and firearm violence differently, illustrating the interplay between individual experiences and community context in shaping violent behaviors. Both sexual abuse and physical neglect were fully mediated by neighborhood concerns, suggesting that these forms of maltreatment have no direct effect on gun violence when considering neighborhood concerns. Whereas emotional abuse and physical abuse associated with gun violence were partly mediated by neighborhood safety concerns, suggesting that these forms of maltreatment also exert direct effects on violent behaviors. This underscores the nuanced impact of different types of childhood trauma on later violence (Milaniak & Widom, 2015; Welfare and Hallin, 2015; Yang & Corso, 2007) and stresses the importance of tailored interventions that address diverse underlying mechanisms at the individual and community level.

The findings that only emotional abuse and physical abuse had a direct effect on gun violence may be due to the unique effects of these forms of maltreatment. Physical abuse is the strongest predictor of physical aggression (Cullerton-Sen et al., 2008) and violent criminal behavior (Maxfield & Widom, 1996) compared to all other types of abuse. Experiencing physical abuse models the use of violence, which in turn can inform the interpretation of social

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cues and responses (Dodge et al., 1990; 1995; Su et al., 2010). Individuals who have experienced physical abuse are also more likely to approve of the use of violence (Kim et al., 2022). Thus, violent beliefs may influence individuals to respond more violently to situations and see violence as necessary for self-beneficial outcomes (Dodge et al., 1990; 1995).

On the other hand, the direct effect of emotional abuse on gun violence may be due to this form of maltreatment being linked to greater impulsivity (Liu, 2019) and emotion dysregulation (Ali & Yousaf, 2022; Burns et al., 2010). Both of these issues are associated with aggression (Bresin, 2019; Hatfield & Dula, 2014) and violence perpetration (Fehon et al., 2005). Impulsivity has also been linked to positive attitudes towards guns (Martin et al., 2001). Additionally, individuals who have been emotionally abused may have schemas of vulnerability to harm (Wright et al., 2009), which may result in gun ownership as a coping mechanism to enhance feelings of safety (Buttrick, 2020). We encourage future research to examine whether impulsivity and emotional dysregulation may impact the link between emotional abuse and gun violence.

The findings also point to the significance of neighborhood factors in gun violence among individuals who have experienced childhood maltreatment. Gun violence disproportionately affects individuals who live in disadvantaged communities (Kravitz-Wirtz et al., 2022), and exposure to violence feeds violence (Halliday-Boykins & Graham, 2001; Patchin et al., 2006). Relatedly, victims of childhood maltreatment often have lower socioeconomic status (Convey et al., 2013; Pinto Pereria et al., 2016; Tanaka et al., 2011), thus pushing them to live in more disadvantaged communities. Combining the effect of childhood trauma with exposure to dangerous neighborhoods encourages gun use and exacerbates the risk of firearm-related harm.

Overall, our findings carry implications for understanding the pervasive issue of gun violence in the United States. While childhood maltreatment is a global concern, the United

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States stands out due to its unparalleled access to firearms, with more firearms per citizen than any other nation (Karp, 2018). This distinctive aspect illuminates the gravity of our findings, as they shed light on the detrimental consequences of widespread firearm use in violence. Moreover, our study identified emotional abuse and physical abuse as direct risk factors for gun violence and the influential role of neighborhood safety concerns in exacerbating this association. These findings remained even while accounting for access to firearms. These findings are crucial for informing preventative and intervention strategies aimed at curbing the prevalence of firearm-related homicide and fostering safer communities.

Both childhood maltreatment and firearm violence have long-term implications because they increase both direct and indirect exposure to violence. Thus, it is essential to advance public health initiatives targeting the cessation of violence and the management of its repercussions, especially through community-based outreach efforts and trauma-informed services (Jay, 2023). One such example of outreach initiatives is Hospital-Based Violence Intervention Programs, which utilize trauma-informed care to treat an individual's psychological trauma as a means of reducing future violent injury (Purtle et al., 2015). These programs have been effective for various outcomes, including reducing the likelihood of participants being convicted of violent crime and increasing community service utilization rates (Purtle et al., 2013). The current state of these programs may aid in the reduction of gun violence. Still, it could also serve as a means of identifying individuals with a history of maltreatment and aid in diminishing the negative effects of childhood maltreatment. Early intervention for individuals who have experienced childhood maltreatment may help reduce the number of individuals who grow up to live in neighborhoods with safety concerns, which can reduce gun violence indirectly, as well as aid in mitigating the symptoms of trauma that may push an individual to perpetrate gun violence.

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The link between childhood maltreatment and gun violence may be disrupted by the implementation of community-based interventions and policy-level changes that increase community safety. Community-based gun violence prevention efforts have the potential to shape the environment by creating safer spaces and fostering a sense of collective well-being (Garvin et al., 2013; Grant et al., 2023). Implementing infrastructure improvements such as greening initiatives, enhanced lighting, and the revitalization of vacant lots can transform communities that discourage criminal activity and promote community engagement (Gong et al., 2023; South et al., 2023). This approach not only addresses the physical aspects of safety but also provides youth with greater resources and opportunities for positive youth development, thus buffering the impact of childhood maltreatment on gun violence.

### **Limitations**

While this study has strengths, including considering all types of maltreatment, some limitations exist. First, the sample includes high-risk individuals who were predominately male and African American, which may limit the generalizability of the findings. However, given that African American men are at the greatest risk of being killed by a firearm, we believe this is a valuable contribution. Second, our research relied on self-reports of childhood maltreatment; prior research argues that individuals can be reluctant to reveal experiences of childhood abuse and tend to minimize or attempt to actively forget these experiences (Bonanno et al., 2003). Therefore, it is possible that some participants who have experienced childhood maltreatment did not disclose it. Including official records or caregiver reports may provide a more complete understanding of participant experience of maltreatment and potentially reveal additional results. Thus, we encourage future research to include multiple measures of maltreatment to expand our understanding of the link between childhood maltreatment and gun violence. Responses to

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questions about neighborhood safety concerns and firearm violence may also have been underreported due to social desirability bias and/or fear of getting into trouble, despite being informed that all responses are confidential. Finally, the cross-sectional nature of this study limits predictions of long-term effects. Thus, we encourage future longitudinal research.

### **Conclusion**

Childhood emotional, physical, and sexual abuse, as well as physical neglect, are risk factors for firearm violence, and neighborhood concerns mediated this relationship. Additionally, emotional abuse and physical abuse were related to firearm violence above and beyond neighborhood concerns. These results remained while controlling for notable risk factors for gun violence, including racial minority status, sex, and having access to a firearm. Thus, gun violence prevention efforts must take a trauma-informed approach to address underlying childhood maltreatment trauma, all while navigating the real-world challenges of living in unsafe communities. Community-based and community-level programs that promote safety and reduce violence are also critical for shaping individual-level risk factors for gun violence. In summary, intervention and prevention strategies must take a multi-model approach to address the gun violence epidemic.

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**Table 1.** Correlations between study variables and descriptive statistics

Measures	1	2	3	4	5	6	7	8	9	10	11
1. Sex <sup>a</sup>	-										
2. Race <sup>a</sup>	.04	-									
3. Gun access <sup>a</sup>	.13	.002	-								
4. Age	.06	-.03	.01	-							
5. Firearm violence	.14*	.15*	.27**	-.10	-						
6. Neighborhood concerns	.06	.10	.15*	-.05	.37**	-					
7. Emotional abuse	-.07	-.04	.01	-.05	.21**	.23**	-				
8. Physical abuse	-.05	-.01	.08	.02	.22**	.22**	.74**	-			
9. Sexual abuse	-.32**	-.06	-.05	.003	.06	.18*	.57**	.54**	-		
10. Emotional neglect	-.11	-.09	-.12*	-.07	-.03	.03	.52**	.39**	.30**	-	
11. Physical neglect	-.02	-.09	-.04	-.04	.09	.18*	.56**	.47**	.39**	.65**	-
<i>Mean</i>	0.74	0.67	0.50	32.69	1.68	14.97	9.40	9.19	7.44	10.83	8.48
<i>SD</i>	0.44	0.47	0.50	13.00	2.53	7.69	5.45	4.89	5.12	5.71	4.16
<i>Skewness</i>	-1.06	-0.73	-0.01	1.01	2.16	0.09	1.28	1.51	2.17	0.78	1.35
<i>Kurtosis</i>	-0.87	-1.47	-2.01	0.17	5.96	-1.24	0.73	1.82	3.63	-0.35	1.53

Note. Sex = Male (1), Female (0). Race = African American (1), Other (0), Gun access = (0) No, (1) Yes. <sup>a</sup>Spearman's rho. \* $p < .05$ , \*\* $p < .001$

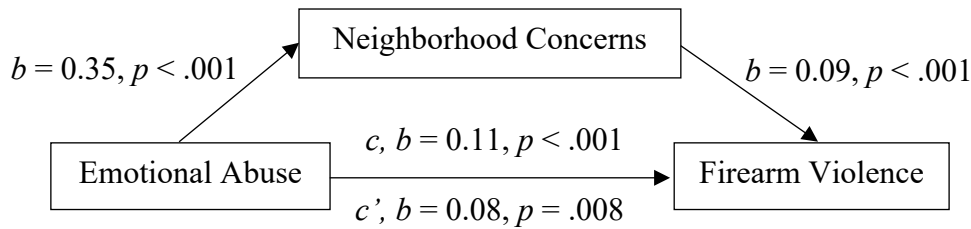


Table 2. Neighborhood concern as a Mediator Between Childhood Maltreatment and Firearm Violence

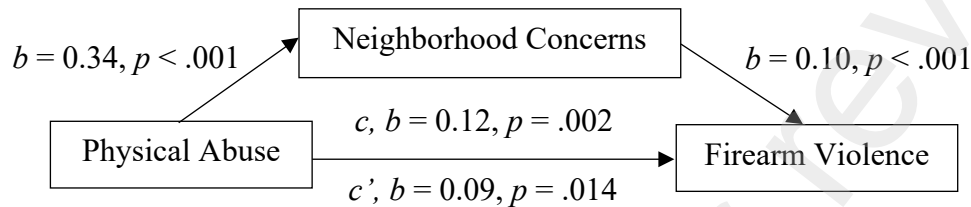
Pathways	Estimate	SE	95% CI	
			Lower	Upper
<b>Emotional abuse</b>				
<i>Total effect</i>	0.11	0.03	0.05	0.17
<i>Direct effects</i>				
Emotional abuse → Neighborhood concern	0.35	0.07	0.21	0.49
Emotional abuse → Firearm violence	0.08	0.03	0.02	0.13
Neighborhood concern → Firearm violence	0.09	0.02	0.06	0.13
<i>Indirect effect</i>				
Emotional abuse → Neighborhood concern → Firearm violence	0.03	0.01	0.02	0.05
<b>Physical abuse</b>				
<i>Total effect</i>	0.12	0.04	0.05	0.19
<i>Direct effects</i>				
Physical abuse → Neighborhood concern	0.34	0.08	0.18	0.50
Physical abuse → Firearm violence	0.09	0.03	0.02	0.16
Neighborhood concern → Firearm violence	0.10	0.02	0.06	0.13
<i>Indirect effect</i>				
Physical abuse → Neighborhood concern → Firearm violence	0.03	0.01	0.01	0.06
<b>Sexual abuse</b>				
<i>Total effect</i>	0.06	0.04	-0.007	0.14
<i>Direct effects</i>				
Sexual abuse → Neighborhood concern	0.34	0.07	0.19	0.48
Sexual abuse → Firearm violence	0.03	0.04	-0.04	0.10
Neighborhood concern → Firearm violence	0.10	0.02	0.06	0.14
<i>Indirect effect</i>				
Sexual abuse → Neighborhood concern → Firearm violence	0.03	0.01	0.02	0.06
<b>Emotional neglect</b>				
<i>Total effect</i>	0.01	0.03	-0.04	0.05
<i>Direct effects</i>				
Emotional neglect → Neighborhood concern	0.08	0.08	-0.09	0.24
Emotional neglect → Firearm violence	-0.002	0.02	-0.05	0.05
Neighborhood concern → Firearm violence	0.11	0.02	0.07	0.15
<i>Indirect effect</i>				
Emotional neglect → Neighborhood concern → Firearm violence	0.01	0.01	-0.01	0.03
<b>Physical neglect</b>				
<i>Total effect</i>	0.06	0.04	-0.01	0.11
<i>Direct effects</i>				
Physical neglect → Neighborhood concern	0.36	0.10	0.17	0.56
Physical neglect → Firearm violence	0.03	0.04	-0.05	0.10
Neighborhood concern → Firearm violence	0.10	0.02	0.07	0.14
<i>Indirect effect</i>				
Physical neglect → Neighborhood concern → Firearm violence	0.04	0.02	0.03	0.10

Note. Sex, race and gun access were adjusted as covariates. 95% CI = 95% bootstrap confidence intervals.

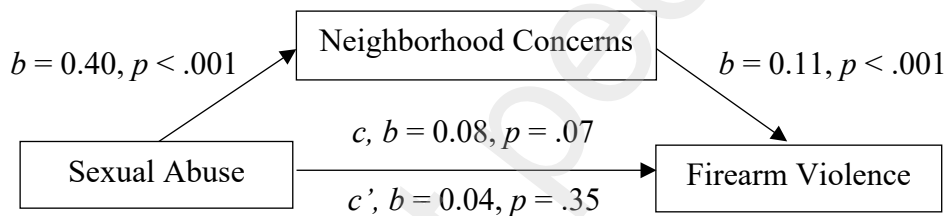
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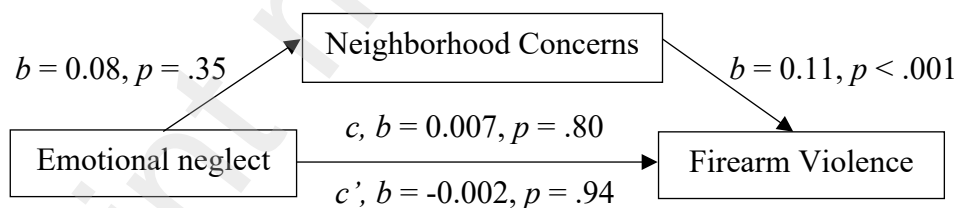
**Figure 1.** Neighborhood concerns as a mediator between emotional abuse and firearm violence. Analyses were adjusted for sex, age, race, and gun access.



**Figure 2.** Neighborhood concerns as a mediator between physical abuse and firearm violence. Analyses were adjusted for sex, age, race, and gun access.

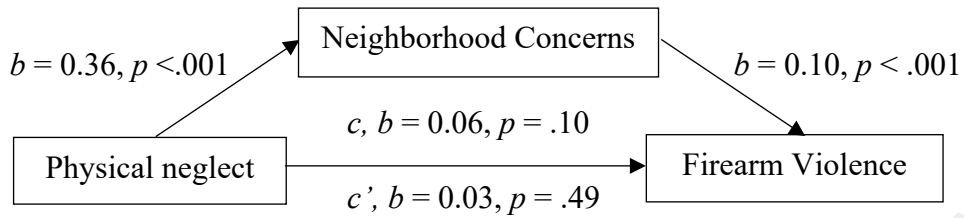


**Figure 3.** Neighborhood concerns as a mediator between sexual abuse and firearm violence. Analyses were adjusted for sex, age, race, and gun access.



**Figure 4.** Neighborhood concerns as a mediator between emotional neglect and firearm violence. Analyses were adjusted for sex, age, race, and gun access.

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**Figure 5.** Neighborhood concerns as a mediator between physical neglect and firearm violence. Analyses were adjusted for sex, age, race, and gun access.