

Exploring Relationships Between Childhood Adversities and Homicides

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ABSTRACT

Despite decades of research, there is still a limited understanding of the psychological and social drivers of homicide. A prominent factor is childhood adversity, which is shockingly influential and could cause numerous problems in later adolescence and adulthood. Adverse childhood experiences are associated with increased prevalence of mental illness and substance abuse issues later in life and could result in violent behavior, which in extreme cases could escalate to homicide. While aspects of these relationships are well documented by prior research, most papers only examine a few risk factors at a time and do not provide a comprehensive overview of how childhood adversity may influence homicidal behavior. This review paper discusses the specific impacts of varying forms of childhood adversity and its downstream consequences, including its effects on the occurrence of school shootings, domestic homicide, and serial homicide. Case studies are incorporated to provide real-world perspectives to complement the theories presented, and recommendations for future research and interventions are discussed.

Keywords: Homicide; childhood adversity; mental illness; substance abuse; school shootings; domestic homicide; serial homicide

INTRODUCTION

Often in the wake of homicidal events, people are left to wonder how someone could commit such a tragedy. There are numerous places to look for answers to this question; their current stressors at

work, with family, or with their community are some sources that may contribute to such actions. Another critical source of information involves looking back at the perpetrators' pasts, specifically their childhoods, and analyzing whether they experienced childhood adversities. A wealth of research has demonstrated that adverse experiences during childhood may have lasting impacts on an individual, such as leading someone to abuse substances, experience mental illnesses, or even engage in antisocial behaviors. While this may not be the cause of all criminals, this could be a compelling way of understanding a killer's strong urge for violence and power over their victims. In turn, having a more

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Accepted October 15, 2025

<https://doi.org/10.70251/HYJR2348.35952968>

nuanced understanding of how childhood adversity relates to different forms of homicidal behavior could allow for the development of prevention and rehabilitation programs to reduce the likelihood of these violent tendencies escalating into murder. This narrative review paper discusses childhood adversity, then explores several domains of homicide and presents an analysis of the influences of various factors on these crimes, applying research and theory to real-world cases. The goal of this analysis is to offer a thoughtful lens for understanding why individuals may commit violence, in order to support the need for more holistic intervention on the root causes of such atrocities, rather than stigmatizing those who struggle with mental disorders and behavioral dysfunction.

CHILDHOOD ADVERSITIES

One-third of the general population has been affected by severe childhood adversities at least once in their life (1). Childhood adversities cover a wide range of traumatic events that occur in a person’s life before the age of 18, including sexual abuse, physical abuse, emotional/psychological abuse, neglect, parental death, and bullying (1). These events typically impact a person’s well-being and mental health into adolescence

and adulthood due to the dysfunction it is capable of causing to the hypothalamic-pituitary-adrenal (HPA), glucocorticoid, hippocampus, corticotropin-releasing factor within the hypothalamus, serotonergic receptors, and alpha-2 noradrenergic receptors (2). The HPA is critical for the brain’s stress response, as it releases cortisol after sensing an environmental stressor and prepares your body to react to said stressor appropriately, as well as focusing on calming you down after the event has passed. As the HPA can become overactive with the onset of severe childhood adversities, too much cortisol is released, which could lead to illnesses such as depression, insomnia, memory problems, and more (2).

While the severity of childhood adversities depends greatly on the individual and the environment within which they occurred, a common way to measure the extent to which they affected someone is by using the Adverse Childhood Experiences (ACE) score, which was developed from the Adverse Childhood Experiences study. The ACE test covers several categories of childhood adversities with specific descriptions, which can be summarized in Table 1 (2).

The ACE study focused on 17,337 adult participants, out of which only 12.5% had an ACE score of 4 or higher. For the purpose of this review, these individuals

Table 1. Categories of childhood adversities and example questions of how they are evaluated in the Adverse Childhood Experiences (ACEs) test, a retrospective self-report questionnaire (2)

Type of Childhood Adversity	Example Question
Emotional Abuse	Did a parent or other adult in the household often or very often swear at you, insult you, put you down, or make you fear that you might be physically hurt?
Physical Abuse	Did a parent or other adult in the household often or very often push, grab, slap, throw something at you, or hit you hard enough to leave you marked or injured?
Sexual Abuse	Did an adult or person at least 5 years older ever touch or fondle you in a sexual way, make you touch their body in a sexual way, or attempt/achieve having anal, vaginal, or oral intercourse with you?
Household Dysfunction (Substance Abuse)	Did you ever live with anyone who was a problem drinker, alcoholic, or used street drugs?
Household Dysfunction (Mental Illness)	Was a household member ever depressed, mentally ill, or have attempted suicide?
Mother Treated Violently	Was your mother or stepmother sometimes, often, or very often pushed, grabbed, slapped, kicked, bitten, hit, had something thrown at her, or threatened/hurt by a knife or gun?
Incarcerated Household Member	Did a household member go to prison?
Parental Separation or Divorce	Were your parents ever separated or divorced?

are referred to as ‘ACE elevated’ and contrasted to individuals with an ACE score of 0, referred to as ‘ACE floored’(2). Anda and colleagues then went on to cross-reference these statistics with a psychosocial evaluation to find an odds ratio with mental health disturbances, somatic health disturbances, substance abuse issues, stress, anger control, and intimate partner violence. The risk of depressed affect increased 3.5-fold for an ‘ACE elevated’ individual relative to an ‘ACE floored’ individual. ‘ACE elevated’ individuals were 4.5 times more likely to use illicit drugs than ‘ACE floored’ individuals. Difficulty controlling anger multiplied by 4 when comparing someone who was ‘ACE floored’ to an ‘ACE elevated’ individual, and the risk of perpetrating intimate partner violence escalated by 5.5-fold. When comparing the mean number of comorbid outcomes in the study with the ACE scores, there was a dramatic positive correlation between the two. (2).

A meta-analysis claims that if the childhood adversities they examined were entirely removed from the population, the number of people with psychosis would be reduced by 33% and that the exposure to such severe events should be regarded as one of the main determinants of psychotic disorders (1). When looking at how childhood adversities could relate to personality disorder (PD) diagnosis, Afifi *et al.* found that the greatest link is to schizotypal PD, followed by antisocial PD, borderline PD, and narcissistic PDs, following child abuse, neglect, and/or household dysfunction. Early traumatic childhood events have the power to shape personalities and cause dysfunctional personality traits, which may lead to personality disorder symptoms and, therefore, personality disorder diagnosis (3). Furthermore, Pietrek *et al.* states that “stress exposure during windows of vulnerability at some stages in brain maturation affects further developments that increase susceptibility for depression in adolescents”, which they later specified as ages 14-1. All patients in this study, when compared to healthy subjects across all age periods, demonstrated a significantly higher rate of adverse experiences, with an overwhelming dominance of emotional neglect/abuse. Specifically, patients diagnosed with borderline personality disorder (BPD) had undergone more adversities across their stages of childhood (preschool, prepubescent, pubertal, and adolescent) than patients diagnosed with major depressive disorder (MDD) and schizophrenia (SCH). Throughout these patients’ preschool and early prepubescent years, 56% diagnosed with BPD, 40% with MDD, and 18% with SCH had suffered an

influential amount of adversities. Out of all of these subjects, 14 were diagnosed with comorbid BPD and MDD, 58% of whom had a substantial amount of early traumatic experiences (4).

According to other studies, within the construct of ‘maladaptive family functioning’, which can include parental mental illness, parental substance misuse, parental criminality, family violence, physical abuse, sexual abuse, and neglect; the odds ratio between childhood adversities and the subsequent first onset of a clinical psychiatric diagnosis occurring within the ages 4-12, 20-29, and 30+ is most common with the occurrence of parental mental illness, and within the ages 13-19, abuse is the highest reoccurring variable. Within ‘other childhood adversities’, including parental death, parental divorce, other parental loss, serious physical illness, and family economic adversity, the odds ratio for a following diagnosis during the ages 4-12, 13-19 is highest with the onset of a serious physical illness, and during ages 20-29 and 30+, the strongest indicator is other parental loss. When examining all countries, the population attributable risk proportions of childhood adversities predicting lifetime diagnosable illnesses for mood disorders, behavior disorders, and substance disorders are highest during ages 4-12; however, in the case of anxiety disorders, it is highest during ages 20-29 (5).

“Rejected children had the highest rates of delinquency” (6). According to an analysis by Widom, abusive parents have a 70% chance of having been abused themselves, and between 20% to 33% of adults who have been abused as children go on to abuse their own children. In a study comparing the arrest records of abused and neglected children to a control group, children who experienced abuse or neglect had more arrests as juveniles (26 versus 17%) as well as during adulthood (29 versus 21%), and overall had more arrests for violent offenses (11 versus 8%). Abused and neglected children also had a higher mean number of offenses (2.43 vs 1.41) and tended to start committing their first offense at an earlier age when comparing their mean with that of a control group (16.48 versus 17.29). The most frequent marker for an arrest for any violent offense is physical abuse, with an occurring rate of 15.8% (6). The overwhelming information about the negative and ongoing effects of childhood adversities is clearly shown in these studies. It is related not only to mental health, well-being, and substance abuse issues, but also has strong relations to various forms of future criminality, which is discussed in greater detail below.

TYPES OF HOMICIDE AND RELATIONSHIPS WITH CHILDHOOD ADVERSITIES

School Shootings

School-Based Childhood Adversity

More than 150,000 students in the US have experienced a shooting on their school campus (7). One study found that childhood adversities such as bullying, teasing, and ostracism could lead to such onsets of violence. Dylan Klebold, a 17-year-old in Littleton, Colorado, reportedly exclaimed, “You’ve been giving us sh*t for years, I’m going to kill you all”, before opening fire in his high school that killed 13 people and injured 21. Out of the 15 school shootings that this particular study examined 80% of them showed signs that the perpetrators had been maliciously teased or bullied on an ongoing basis throughout their time in school (8). Feelings of continuous rejection may result in deep shame that could give rise to anger and aggression in the same way that physical pain could, for example, jabbing your toe into a blunt object.

While 75% of elementary and middle school students have experienced occasional bullying at school, an unusual amount that is particularly humiliating and cruel must take place to cause such ideas of destruction. 10,000 young children forfeit a day of their education by skipping school just to avoid mistreatment by other peers (8); however, this is not possible for all students, especially when the cruelty is over a long duration of time or when other childhood adversities are taking place, specifically in their homes. According to Harold I Schwartz’s discussion on school shootings, he claims that most of these perpetrators considered their schools a place of failure and isolation, and the commitment of this crime reflects their sense of injustice and victimization, and may, in a sense, show dominance over the students who have been causing them such pain. He goes as far as to say that these shootings are a way of saying, “I want you to see the terrible harm you have done to me. I want you to feel my pain through the pain that you will suffer” (9). The perpetrators may feel as if they are reclaiming justice by harming students in the place where they were once hurt.

For one to enable such violence, a lack of morality must occur, which may be caused by the lack of social engagement and connectedness to a group that is prominent in most of these perpetrators due to the ostracism they faced. The process by which socially excluded individuals distance themselves from their moral compass disconnects them from all concerns and

empathy for the victims who are physically or mentally punished through this violent crime. While most cases of bullying occur at random, they at times also derive from discrimination and prejudice, which was the case for one school shooter named Diego. At the formative age of twelve years old, he shot and killed one person at his middle school while injuring two others, where he was bullied due to masculine stereotypes that he did not abide by and homophobic beliefs against his sexuality (7). While Diego also suffered from other underlying denominators that may have pushed him to commit such a tragedy, the bullying he endured was one of the adversities that pushed him over the edge. Henceforth, bullying, teasing, and ostracism are primary childhood adversities that play a role in school shootings, but are not the only factors, and often do not occur in isolation from other potential influences.

Home-Based Childhood Adversity

In addition to those occurring directly in school and among peers, childhood adversities in the home among families are also leading factors that can influence students to commit school shootings. In Mount Morris Township, Michigan, a boy as young as six shot his fellow classmate after being left in the care of his uncle, who had been living in a crack house to allow his mother to work two jobs. Another case in Santee, California, featured a fifteen-year-old boy who rarely saw his mother and had a very loose relationship with his father; he killed two students and injured thirteen (8). In Anne Nassauer’s study, one of the perpetrators, A.J., testified that “Now I have a life. Probably won’t get a job, but I’ll-I’ll at least have a life” (7). A.J. desperately needed a way out of his horrific family situation, when he saw a school shooting report on the news and decided that the only way out was to recreate this unlawful act.

A.J.’s justification is often seen in other perpetrators, as 72% of the school shootings analyzed in this study were found to have had shooters eagerly anticipating their prison time to flee from the abuse they were experiencing in their own homes. Some of these shooters had even applied to the military beforehand to try and experience a life with better structure than theirs did at the time; however, most were denied due to the presence of mental illness. In one of the previous cases mentioned, Diego had repeatedly witnessed his father, who was described as extremely violent, beat his mother in front of him. This is considered an adverse childhood experience on the ACE scale and is

classified under ‘mother treated violently’, similar to Diego, 72% of school shooters had at least one ACE (10). Diego believed that by perpetrating this offense, he could travel back in time and, in his own words, “fix everything”. This was most likely linked to the victimization of his mother, which he might have wished he could have provided aid in, instead of letting his hostile father have his way with her. To add to this, he may have felt as if he was a burden to his family due to his inability to fit into masculine stereotypes and his homosexual identity.

Including Diego, thirteen other school shooters in this study experienced symptoms of psychosis-related mental illnesses such as schizophrenia, which are discussed in more detail below. As one of these shooters’ close friends stated, “You have to commit a crime to get the help you need. Why isn’t it the reverse? This could have been avoided. The entire thing”; however, this was far more easily said than done (7). These perpetrators were either unable to get access to care due to their home circumstances or afraid of getting help for their condition, as they feared the consequences at home that would follow, such as increased rejection or abuse. The secret service lists trauma, loss, family member arrests/incarceration, neglect, physical abuse, sexual abuse, and family discord as influences that may shape a school shooter, despite these rarely occurring within the school setting itself (9). Therefore, it’s important to consider not just an individual’s school life, but also their home life, when designing prevention and awareness programming.

Mental Illnesses

One of the consequences of severe childhood adversities is the onset of a wide variety of mental illnesses that could impair everyday functioning and thought. In Georgia, a 14-year-old boy who had been “begging for help from everybody around him” due to his impaired mental health and family with a history of violence killed four individuals and injured eight others. He unfortunately never received that help, which could have, in the end, saved four lives (10). In one study, out of 15 school shootings analyzed, 47% of the perpetrators suffered from a form of depressive disorder, 10% suffered from pervasive developmental disorders (specifically Asperger’s or autism), and 33% showed signs of brain damage leading to learning disorders and dysfunctional impulse-control, and one struggled with bipolar disorder (7).

Depression. One report hypothesized that 80% of

shooters exhibit symptoms of depression, which could be associated with the elevated suicide attempt rate in these perpetrators prior to the shooting (10). Although difficult to know the exact number, it is estimated that three-fourths of all school shooters had suicidal ideations or attempts before committing their crime, and a substantial number of them committed suicide following their attack (8). As most of these shooters were highly suicidal, they may have felt as if they had nothing to lose by harming others, as they likely did not see a future for themselves. It is exceedingly difficult for individuals who suffer from depression to receive help, especially if they are undergoing bullying and/or family issues; however, even if they are put on an antidepressant to relieve some of their suffering, it may increase their suicidal ideations and overall violence. Prozac, a very commonly prescribed antidepressant, especially in teens, is shown to cause violent behavior to increase 10.9 times and, as the Food and Drug Administration states that almost all antidepressants do, includes a side effect for patients under 25 who are taking it that it may increase the risk of suicide (7). As mentioned previously, individuals who suffer from severe childhood adversities and are ‘ACE elevated’ have a 3.5 times higher odds risk of having an onset of depression compared to individuals who are ‘ACE floored’ (2).

Psychotic Disorders. Another subset of mental illnesses is psychotic disorders, including schizophrenia. In Nassauer’s study, where 15 cases are discussed, 21% of the shooters exhibit symptoms of psychotic disorders, even though only 1% of United States adults are estimated to suffer from schizophrenia, making it a very rare condition (7). A 32-year-old shooter who attacked his former middle school, where he injured 2 students, experienced psychosis, and during his prosecution, when asked what caused him to inflict such violence, he responded, “I want my life back” (7). Schizophrenia also tends to come with an abnormal amount of suicidal ideation, which can be exemplified through a 19-year-old African American female who randomly shot at her classmates. The morning prior to this event, she called a crisis hotline, exclaiming that she wanted to take her life, but soon realized help would not be provided to her and found that shooting the last few social contacts she had left in her life was the only solution (7). As previously emphasized by Pietrek *et al.*’s study, 18% of the sample they analyzed of patients diagnosed with schizophrenia had experienced a significant amount of childhood adversities throughout their preschool and pre-pubescent years (4).

Antisocial Personality Disorder. A further subgroup of mental disorders is antisocial personality disorder, which includes the subset of psychopathy (7). While in Nassauer's sample of 15 cases, only 7% were diagnosed with psychopathic disorders. Considering that, similarly to schizophrenia, only 1% of people are believed to be clinically psychopathic in the United States, it is a considerably uncommon disorder (7). 50% of the sample diagnosed with psychopathic disorders committed their shootings with partners who surprisingly did not share the same illness; however, they still struggled significantly with depression and suicide, along with a feeling of not being able to make it out of their current dreadful life (7). These specific illnesses were found to have not been the only factor leading to the shootings, meaning perpetrators with this disorder must have also experienced other severe childhood adversities, whether in their homes or in their schools (7).

Case Studies concerning School Shootings

Columbine Shooting

In April 1999, Eric Harris, age 18, and Dylan Klebold, age 17, killed fourteen students during the infamous Columbine High School shootings. This was reported as one of the deadliest school shootings in America; however, the death toll would have dramatically increased if the propane tank bombs the perpetrators had placed in the cafeteria had been detonated. The mass shooting came to an end when both shooters took their own lives (11). Prior to this horrific event, the shooters had documented evidence about their desire to commit this monstrosity, in which they stated their goal was to kill as many as 500 of their peers. Within the documented evidence, they expressed their aspirations to outdo the notorious Oklahoma City bombing of 1995, and they also bragged about how they will be remembered for this event for years to come (12). In light of the shooting, a well-known athlete from the school made a statement about the perpetrators in which he exclaimed that "Columbine is a clean, good place except for those rejects... sure we teased them. But what you expect... It's not just jocks; the whole school's disgusted with them...If you want to get rid of someone, usually you tease 'em" (12). It has also been found in various news reports that Harris's last journal entries read, "I hate you people for leaving me out of so many fun things. And no, don't ... say, 'Well that's your fault,' because it isn't, you people had my phone number, and I asked and all, but no. No, no, no, don't let the weird-looking Eric KID come along." (13). It was also reported by many of the school staff that the

shooters often underwent rampant bullying, including getting feces thrown at them, ketchup packets squirted onto them, and being called homophobic slurs (13). The amount of school-based adversities these perpetrators faced was beyond abnormal and might be linked to their commitment of such an immoral and unimaginable act. They wanted to get revenge on those who wronged them and overtake power in an environment where they were always weak and unsafe. Through this shooting, they were able to feel in control in a place where they never got that luxury due to the immense bullying they faced.

Virginia Tech Shooting

In 2007, another infamous school shooting occurred by 23-year-old Seung-Hui Cho, who committed one of the deadliest mass school shootings by murdering 33 students and staff at his university, the Virginia Polytechnic Institute and State University, better known as Virginia Tech. Cho started his attack by shooting one student and a resident adviser at a dorm on campus; however, the university did not react strongly as they believed this was a domestic homicide case and the perpetrator had fled. Shortly after, Cho mailed a package to NBC News in New York City containing a manifesto, a DVD featuring videos of Cho, and photos of him holding several lethal weapons. Loaded with 400 rounds of ammunition, he continued his attack 45 minutes later, where he injured and killed an astonishing number of students in addition to taking his own life. Cho was said to have been diagnosed with a mood disorder, and after the shooting, officials investigating the incident speculated that he may have been suffering from symptoms of schizophrenia. It was found that two years prior to his offense, he was held at a psychiatric hospital but was quickly released. He was reportedly ordered to undergo outpatient treatment that he never attended. He continued to seek mental health services at his university, however they later claimed they were unaware that he had been compelled to join outpatient treatment, so it is likely that this treatment was not adequately addressing the degree of difficulty he was experiencing. Within the materials Cho sent to NBC, he appeared angry, rambling that "You forced me into a corner and gave me only one option. The decision was yours" (14). It was reported by several of his classmates that Cho was often mocked due to his shyness and uncommon way of speaking, and in one incident where he was assigned to read aloud in his English class but struggled, the students started laughing and pointing at him, telling him to "Go back to China" (15). Cho

was described as extremely silent and isolated not only throughout university but also during his previous years in high school and middle school. Another video sent to NBC featured him proclaiming that “When the time came, I did it. I had to” (15). As described earlier, Cho may have felt that this shooting was his only way out and that he had no other choice. Due to his deeply impaired mental health, isolation, and school-based adversities, he may have seen this shooting as the only solution to his issues, which he ended with the taking of his own life. This devastating massacre shows the result of inadequate mental health services and a lifetime of seclusion from friends or a social life.

Domestic Homicide Childhood Adversity

Domestic homicide can be defined as “the unlawful killing of a person in an incident involving the death of a family member or other person in a domestic relationship, including people who have a current or former intimate relationship” and is the cause of death for many unfortunate victims (16). In the United States and the United Kingdom, about one-half of female homicides occur at the hands of a current or ex-partner (17). A majority of these perpetrators learn their domestically violent behaviors from their own homes through the form of many different adversities in their childhood, which then normalize and, in a sense, teach their brains to function in this way with their future partner or children. Alma, a woman who murdered her infant son and was often abused during her childhood, made this statement during her prosecution, “I did not know what to do ‘cause I do not understand nothing about disciplining a child ‘cause I was raised by my own family, how they abused me and I did not know what to do, so I took it out on my son... I did not know how to love him ‘cause I did not have, did not love myself, I did not know how to love him” (18). In a systematic review, 27 cases were analyzed, of which it was found that 90.9-100% of males who committed domestic homicide by killing their child had undergone emotional neglect throughout their own childhood. Between 70-81% of perpetrators experienced physical abuse, 77.8% witnessed violence against their mother, 54.4% lived with a mentally ill parent, and 46% were under the care of a parent with substance abuse issues (18).

Domestic homicide of a child is an extremely violent and merciless act that, as supported by the numbers above, most commonly occurs when adverse childhood

experiences transpire that could negatively impact the workings of the brain and the psychology behind it. The systematic review concluded that as someone’s ACE score increases, there is a much greater likelihood of problematic violence or even homicides during their adulthood, specifically towards a family member, child, or partner/ex-partner. Another study discussed the association between family polyvictimization in childhood and the perpetrator of child abuse. When comparing patients who underwent no victimization, 14.15% were reported to have abused their children, contrasting with the 38.39% of those who endured 1-3 types of victimization, and 44.19% of those who were subjected to 4+ types of victimization committed acts of child abuse (19). The strong positive correlation between child abuse and victimization in childhood highlights the significant link between early-life adversity and the likelihood of future maltreatment. The study further examines the link between childhood family polyvictimization and the perpetration of spousal abuse. Among individuals who experienced no victimization, .13% were found to abuse their spouse. This figure rose to 20.87% among those exposed to 1–3 types of victimization, and reached a shocking 34.47% among those who endured four or more different victimizations(19). Although these figures do not specifically explore links to domestic homicides, their connection to domestic violence is equally significant, as, unfortunately, in many cases, domestic violence might escalate to domestic homicide extremely rapidly. As another systematic review states, one of the main risk factors of domestic homicide is childhood abuse victimization experience, and previous physical abuse, among other things (20).

Substance Abuse

One of the many future outcomes of childhood adversities is substance abuse during adulthood. According to Frederick *et al.*’s research, 33.3% of cases in which an individual murdered their child were committed while the perpetrator was struggling with substance abuse, and 0.4% were struggling with a longer-term addiction. 31% of perpetrators had been found under the influence of alcohol when the crime was committed, and 29% intoxicated by a drug (18). Another study that reviewed data from 1,431 domestic homicide cases found that 38% had a severe alcohol dependency, which was more common in intimate partner homicide, and 35% had a profound drug dependency, more commonly found in adult family homicides (17).

Hanlon *et al.*'s study compared spontaneous domestic homicide to nondomestic homicide, within which it was found that domestic homicide perpetrators had a higher tendency to have a lifetime history of drug use (21). Substance abuse is a very common way that many adults, regrettably, use as a coping mechanism in times of distress. Drugs and alcohol are frequently used to combat post-traumatic stress disorder symptoms, a common byproduct of childhood adversities. These can often be seen as a quick, cheap, and easy solution that is a factor that, in many cases, actually amplifies the issue. In a study previously mentioned, it was found that individuals who are 'ACE elevated' have a 7.2 times higher risk than those who are 'ACE floored' to develop alcoholism. They are also 4.5 times more likely to use illicit drugs and are 11.1 times more likely to undergo injection drug use (2). Therefore, the relationship between substance abuse and domestic homicide may be partially explained by the effects of childhood adversities.

Mental Illness

A common foreseeable embodiment of experiencing childhood adversities is the onset of a mental illness. It was found that out of a sample of 1,431 domestic homicides committed, 34% struggled with a lifetime mental illness (17). Mental illness encompasses a wide range of conditions that can be further categorized into distinct subtypes; this section examines two primary classifications: mood disorders, including depression, and psychotic disorders, featuring schizophrenia.

Mood Disorders. Mood disorders, mostly covering depression, are often observed in perpetrators of domestic homicide. One study provided evidence that two-thirds of maternal perpetrators had documented depression and mood disorder symptoms before they committed their crime, while another study found that 85% of the accused individuals had been previously treated for depressive symptoms (18). Hanlon *et al.*'s study compares spontaneous domestic homicides to non-domestic homicides and found that a shockingly higher percentage of perpetrators who committed domestic homicides had been prescribed and actively taking antidepressant medication, 49 vs. 30.1% (21). In the presence of depression, suicidal ideation is a common symptom seen among patients. Within the study that analyzes familicide (the homicide of a child and spouse committed by a parent or step-parent), half of the perpetrators committed suicide (20). Another study found that 31.3% of offenders of domestic

homicides had previously attempted suicide or had endorsed strong suicidal ideation. As discussed earlier, in Pietrek *et al.*'s study, it was established that 40% of patients diagnosed with major depressive disorder (MDD) had suffered an influential amount of childhood adversities compared to the average population during their preschool and prepubescent childhood years (4).

Psychotic Disorders. The second subcategory of mental illnesses that is discussed in this section is psychotic disorders. The study performed by Hanlon *et al.* found a sizable difference in the percentage of individuals diagnosed with psychotic disorders who committed spontaneous domestic homicides compared to non-domestic homicides, 41.2 vs 21.5% (21). Another study estimated that in their sample, psychosis was experienced by 27% of perpetrators who committed adult family homicide and 7% of those who committed intimate partner homicide, at the time the crime was committed (17). In this study it was also found that 78% of perpetrators may have been experiencing 'command hallucinations' in which they heard voices ordering them to harm and kill their child. Some mothers who were experiencing psychosis reported the belief that they were saving their children from an imagined, formidable future in which they were struggling. It was concluded that 85% of perpetrators in the study had a 'psychiatric motive' for their domestic homicide due to their immense and unhelped struggle with psychosis (21). In a previously discussed study performed by Anda *et al.*, it was observed that those who were 'ACE elevated' had 2.7 times greater odds of experiencing hallucinations, a first-rank symptom of psychosis (2). Taken together, the overall toll of mental illnesses could be seen as a risk factor for domestic homicides, linking back to signs of deeply traumatic childhood adversities that can influence the onset of psychopathology.

Case Studies concerning Domestic Homicides

Valérie Bacot

In 2016, Valérie Bacot, a French woman admitted to killing her husband using his own gun. This case is extremely abnormal as Daniel Polette, her victim, was also her stepdad, and had sexually abused her as she grew up. Her mother was reported to abuse alcohol and be extremely violent throughout Bacot's childhood, and her biological father was always absent (22). Bacot reported that her mother would often state, "I don't give a damn as long as she doesn't get pregnant," when confronted about the sexual abuse (23). However, at the age of 17, Bacot got pregnant, which is when she

was kicked out by her mother and had no choice but to live with Polette. Polette was also known to be a heavy drinker, which would increase his violence against her, and he would reportedly slap, kick, punch, and choke her, with one incident even involving a hammer. Polette did not allow Bacot to obtain a job or use contraception, causing her to have 3 other children during their marriage. The only way Polette allowed her to make money was through anonymous sex work (22). After 14 years, Polette started making extremely sexual comments about their daughter, which Bacot would later describe as her final straw, and she took a pistol and shot him. Polette's body was found a year later, and Bacot confessed to his murder, however she was released after a year in prison due to the French public's petitions for 'battered women syndrome' (24). Bacot was a very troubled woman who was taken advantage of her entire life by the same man. The childhood adversities she endured, from the sexual abuse by her stepfather to the physical abuse by her mother, greatly altered her worldview and may have given her a need to take back power, however she could. Once this was compounded by the further abuse during their marriage in adulthood, Bacot reached her breaking point with her husband, resulting in this heinous outcome.

Katherine Mary Knight

The infamous Australian killer, Katherine Mary Knight, was the first woman in Australian history to receive a life sentence without parole. In 2000, Knight's husband, John Price, was found brutally stabbed to death in the couple's home. According to reports, Price and Knight would often have argumentative disputes that would sometimes turn violent and abusive, but it reached its peak when Price told his coworkers that if he was not at work the next day, something must be wrong. When the concerned coworkers called the authorities, who entered their home, they found Knight passed out on the floor, which was later found to have been a result of the large amount of sleeping pills she had taken. Next to Knight, they found Price, who had been skinned and decapitated; his skin was completely intact and was described to have been hanging up in one piece like a suit. In the kitchen, his head was being boiled while pieces of his glutes had been carved out and had been cooked with vegetables. Knight had a troubling past filled with varying forms of abuse and violence, which led detectives investigating the case to describe her as 'a horror movie in the making' (25). Knight's father was said to have been an alcoholic who

would frequently subject his wife to sexual abuse in front of Knight. When she would ask her mother about intimacy with future partners, her mother described it as something she must 'put up with and stop complaining' (26). Knight later confessed that throughout her childhood, she experienced sexual assault from several family members, not including her father. The severe adversities that Knight underwent resulted in her forming unhealthy relationships with men, in which she would often become violent; however, her husband was the only one who unfortunately did not escape. The abuse she witnessed her mother endure, and the similar abuse that she was subjected to by various other men, were significant forms of childhood adversity and may have caused Knight to form violent and abusive tendencies in her future relationships.

Serial Homicide

Childhood Adversity

It was estimated, on average, that 50% of serial killers have experienced psychological abuse, 36% have experienced physical abuse, and 26% have struggled with sexual abuse (27). When comparing a sample of serial killers to the general population, a dramatic increase in the levels of reported abuse can be seen. In contrast, less than 5% of the general population have endured sexual abuse, while only a little over 5% have been subjected to physical abuse (27). It was found that different types of abuse experienced could significantly influence the typologies of serial killers, though it is worth noting that these categories are not mutually exclusive.

Lust Serial Killer. Lust serial killers are those whose crimes seek sexual gratification or act out sexual fantasies (27). Perpetrators who have been physically abused often commit crimes within this typology, often using overkill (27). Overkill is seen as the perpetrator using an excessive amount of force beyond what is necessary for death to occur (28). Physical abuse might lead perpetrators to have a deep-seated need to take power over their victims, a power and control that was taken over them throughout their childhood. In these cases, by killing their victims to achieve sexual gratification, they took control over them for their own personal and selfish desires. Sexual abuse during childhood is also often seen in perpetrators of this typology. Sexual abuse may lead to sexual dysfunction or contribute to abnormal fetishes, as observed in the killers in this typology. In a study carried out by Anda *et al.*, it was found that those

who are 'ACE elevated' have a 2 times higher risk of experiencing sexual dissatisfaction throughout their adulthood compared to those who are 'ACE floored', which could result in the atypical sexual behaviors carried out by lust serial killers (2). Finally, a study showed that 18% of lust killers had experienced neglect throughout their childhood (27). Neglect is thought to cause psychological issues in children due to the lack of fundamental needs being met. A strong bond between a child and its caregiver is critical and has long-lasting effects on future attachment functions. Perpetrators who experienced parental neglect during childhood may feel inadequate and powerless in relationships, resulting in an urge to take sexual power over their victims (27).

Power Serial Killer. Power serial killers seek to dominate their victims and exercise control over them, which gives them pleasure in ending another person's life. Victims are more often than not swiftly murdered rather than mutilated and tortured (27). For these killers to experience a momentary 'power high', they rapidly took the life of their victims rather than dragging it on using torture methods, which are considerably longer. Childhood sexual abuse has a link with this typology (27). Sexual abuse is often deeply traumatizing and sometimes results in victims feeling degraded or powerless. Thus, victims may try to reclaim power for the rest of their adult life, and sometimes in extreme and troubling ways, as in the case of power serial killers. Taking another person's life would allow for complete control over them and an immediate feeling of power that the perpetrator may have been struggling to find elsewhere.

Anger Serial Killer. Anger serial killers are those who are driven by extreme feelings of frustration and anger, and oftentimes a sense of betrayal. The homicides committed by these perpetrators are typically done impulsively and quickly. Perpetrators who were physically abused are often observed to exhibit this type of crime. There is also a correlation between sexual abuse and this typology of serial killing (27). The evidence of overkill in these crime scenes exhibits the perpetrator's inherent anger, which is most likely towards their childhood abusers, but is wrongfully taken out on their victims, causing the killer to end their lives promptly and impulsively.

Mental Illness

The most commonly found mental illness among serial killers is antisocial personality disorder, defined as "a pervasive pattern of disregard for and violation of

the rights of others that has been continuously occurring since an individual was age 15 years old" (29), and more specifically, the more severe and persistent presentation known as psychopathy. While psychopathy is relatively uncommon within the United States, with only 1.2% of adult men and 0.7% of adult women recorded to be clinically diagnosed, it is hypothesised that individuals with this personality style make up a profoundly large percentage of the prison population. Based on many studies conducted with prisoners, those who commit violent crimes often show these types of behaviors and actions at a young age (29). One study found evidence of psychopathic traits in 10-15% of perpetrators of child molestation and 40-50% of perpetrators of rape, demonstrating the heightened prevalence of these traits among offenders. Disregard for and violation of the rights of others is likely to contribute to violent behavior, and the pervasive pattern may result in a more serial occurrence of violence. Psychopathy was associated with a three times higher rate of reoffending, sometimes through more violent and serious offenses, following their prison release (29). Studies have provided evidence that at least 8% of incarcerated individuals with psychopathic traits have endured some form of maltreatment throughout their childhood. Individuals with psychopathic traits are often described as engaging in predatory behavior and seeking out victims who may be vulnerable to fulfill their own personal desires; this description may also extend to serial killers (29). It was also noted that children who endure ACEs, particularly physical abuse, have a strong link to the development of psychopathic traits throughout their adulthood. As noted, antisocial personality disorder has a 2.23 times higher risk of emerging if childhood adversities are present (3).

There is some evidence that psychopathy itself has genetic underpinnings, which could increase the likelihood of violent behavior among individuals exposed to childhood adversity. The monoamine-oxidase-A (MAOA) gene is responsible for the breakdown of different neurotransmitters such as serotonin, epinephrine, dopamine, and more. Lower activity on the MAOA gene may cause certain neurotransmitters to build up in the brain, causing increased aggression or violence. Therefore, this could make people more genetically predisposed to committing impulsive and violent acts (28). This gene might be linked with some psychiatric disorders, such as psychopathy, one of the main risk factors for serial killers (27).

Case Studies concerning Serial Homicides

Edward Gein

Edward Gein was an infamous American serial killer. Although he was convicted of only one murder, he was suspected of having committed around 40 murders and is best known for using his victims' remains to create household objects such as lamps. Born in 1906, he grew up in poverty with parents that were described as controlling and religious. When asked to describe his family's relationship, he reportedly exclaimed that it was "one that did not show love towards one another" (29). In response to experiencing extreme neglect and witnessing severe alcohol abuse from his father, Gein formed a close-knit relationship with his Christian mother. His mother had a fascination with death and the afterlife and often brought young Gein to cemeteries and identified those she believed to be good religious women. She taught Gein that sex was immoral and evil and instilled ideologies in him about women and their many sins. In 1954, it is believed that Gein committed his first murder after the death of his mother in 1945. He exclaimed that his mother passed down her fascination with death and the female body, and he intended to save the skin of his victims to eventually build a wearable 'women's suit' to impersonate his mother (29). Due to the neglect and substance misuse that Gein experienced or observed from his father, it could be hypothesized that he developed attachment issues that led to his abnormal relationship with his mother. Her death may have been the catalyst for his killings, considering his motivation to recreate her out of his victims' skin.

John Wayne Gacy

John Wayne Gacy, often referred to as the killer clown, went on to sexually assault, torture, and kill 33 boys and men. He suffered through a childhood filled with physical, sexual, and emotional abuse (30). As a young boy, Gacy tended to have a more feminine personality and appearance, which his father held against him, often calling him a 'sissy'. His father would typically get drunk and humiliate him in the basement, calling him demeaning words and psychologically abusing him. When Gacy was two, he watched his mother get beaten by his dad, which would later happen to him from ages 4 to 17, and when Gacy was six, he watched his dad shoot his own dog (28). When he was younger, it was suspected that he had carried out many petty crimes, including theft. As he grew older, he began molesting young boys, and only four years after that, he murdered his first victim. He went on to kill for

six years, where he would often sexually abuse victims in the same positions he was put in by his father as a child. When they expressed fear, he would punish them for acting scared and cowardly in the same way his father had humiliated him years earlier (27). His childhood adversities were displayed in his crimes, as he liked being the one in control by having his victims powerless and in the same placement that he was put in, with the roles reversed.

Ted Bundy

Ted Bundy was born into a family with an unknown secret, which was revealed to him at age 13; his sister was really his mother, and his mother was his grandmother. He is primarily identified by his 3 proven female victims, although many more are suspected, whom he abducted, raped, and brutally murdered from ages 27 to 33 (28). It is estimated that Bundy had suffered from sexual, emotional, and physical abuse (30). His childhood years were claimed to have been full of abandonment and a lack of a sense of belonging. One retrospective analysis suggested that Bundy may have had narcissistic personality disorder (31). Those who experience any ACEs are 1.74 times more likely to have an onset of this disorder (3). It has been claimed that Bundy had a need for power that could only be satisfied by his victims, whom he killed mercilessly and often raped post-mortem.

PROTECTIVE AND PREVENTATIVE FACTORS

Protective Factors

While there is a clear link presented by the research above connecting childhood adversities and different types of homicides, these links tend to be extreme outliers. It was estimated that around 90 million of the children alive today have been subjected to sexual abuse at least once in their lives (32). However, while many children experience childhood adversities, and crime is generally observed to be higher among people who do (33), the rate of crime-free lifestyles is still quite high. It was estimated that between 66% (34) and 92.1% of children who had at least a score of 1 on the ACE test continued their lives without committing any violent crimes (35). In a sample that looked at primarily 'ACE elevated' individuals, the estimate of those who would live a life without perpetrating violence was 91.41-94.6% (33). Thus, as most children who experience childhood adversity do not go on to commit violent crimes, *let alone* any crimes at all, there must be

protective factors present that could counteract the effects of the childhood adversities, allowing them to lead normal, functional lives.

It was found in one study that men who had undergone childhood adversities and became nonviolent individuals were more likely to have had religious attendance throughout their upbringing (36). Religions often bring people structure and reassurance in their daily lives, especially after times of hardship, such as abuse. Having this support from an early age and during times of adversity could have a significant impact on violence levels during adulthood. Another significant link found in adults who are nonviolent yet have experienced childhood adversities is educational aspirations. In Dubow *et al.*'s study, it was found that men who had experienced abuse in their childhood and had significant educational or professional goals were 0.81 times more likely not to inflict violence on others in adulthood (36). Having certain ambitions that someone is aiming to complete in the future may drive them away from negative thoughts and behaviors, as this may impact their chances of completing these desired outcomes. Someone who has been subjected to adversities during their childhood years, yet aims to graduate from college and work an important job, may have more capabilities of understanding that violence, specifically homicide, is not the answer to certain problems, especially if they wish to lead a successful life.

Another significant correlation was found between peer-nominated popularity and decreased risk of developing aggressive traits throughout adulthood after being subjected to violence in childhood (36). Peer-nominated popularity might, specifically, decrease the risk of school shootings, as most are committed by those with strong feelings of rejection related to their peers. This concept is also supported by Ttofi *et al.*'s study, in which it was found from a range of longitudinal studies that supportive peer relationships are a key protective factor in the decreased risk of violence (37).

Having a strong, supportive group of friends who make you feel loved, listened to, and accepted could contradict home-based adversities. This could be linked to prosocial developments in personality and behaviors, which, in turn, may lead to a decrease in homicidal ideations. Protective factors such as the ones listed above are crucial in a child's development, more importantly so when they have been exposed to childhood adversities. These could be the determining factor in achieving nonviolent, and more importantly, nonhomicidal behaviors and relationships in adulthood.

Prevention and Intervention

While protective factors are usually naturally occurring and may not be present in all cases, preventive factors may be used in appropriate circumstances when warning signs and risk factors are present. Prevention could be a critical factor in reducing the incidence of homicide cases throughout the world when utilised correctly and on the right individuals. For example, once a child or young adult is diagnosed with a mental illness, childhood adversities should be assessed and analyzed as part of the treatment. If this individual expresses violent behaviors or homicidal ideations, intervention should be presented immediately to reduce the risk of tragedy. Certain prevention programs have already been introduced throughout schools and in cultural groups. A systematic review analyzing the effectiveness of current school prevention programs for students found that there was a 7.3% relative reduction rate in violence for students in middle school who had received the program, and a 29.9% reduction rate for students in high school (38). Most of the programs evaluated in this review focused on improved school behavior, improved social behavior outside of school, emotional self-control, and conflict resolution. The review also discusses the outcomes of bullying, how to prevent it, resist it, and report it. Another educational approach recommended by a review article is to have professional activities that inform school teachers and staff on the characteristics of school shooters. This could lead the teachers to report to a counselor, parent, or, depending on the severity of the situation, a member of law enforcement, so that effective preventative methods can be put into place to reduce the risk of violence and homicide (39). This review article also claims that certain security measures should be put in place as prevention, such as reducing the extent of media coverage, specifically on school shootings, but also applying to all other types of homicide. This could reduce the amount of 'copycat' school shootings that currently occur in today's world, as less media coverage and details would diminish the homicidal ideologies that may reproduce in one's head. This would also reduce the amount of information that at-risk children or adults may have about the methods that are used to commit crimes, as these may stem into replicating homicidal behaviors (39).

Certain homicide prevention programs have already been set up in Latin America and the Caribbean, and their effect on the reduction of violence has been discussed in some studies. Programs such as Diadema

(‘Dry Law’) in Brazil work on the restriction of alcohol consumption through campaigns and techniques to raise awareness about the negative, violent effects that may stem from its use (40). Other programs, such as one in Venezuela titled the Plan de Recuperación y Mantenimiento de Espacios de Encuentro para el Fortalecimiento y Embellecimiento (Plan for the Recovery and Maintenance of Meeting Spaces for Strengthening and Beautification), have been proven effective in homicide reduction. This initiative, along with other similar ones, focuses on improving lighting, construction of sports facilities, installation of security cameras, and building cultural amenities to instill situational prevention in public spaces. In Rio de Janeiro, action has been taken involving law enforcement to try and increase police presence in high-risk areas, accompanied by the increase of other local interventions in these areas, such as cultural youth workshops. Projects with these intentions have been proven to be highly effective in the overall reduction of homicidal crimes (40). If initiatives such as the ones mentioned above were introduced more globally, especially in places with high risk factors, the impact could be extremely beneficial to the well-being of the community and in the decrease of crime rates. Preventative measures have been found to be extremely useful and may be the catalyst for the reduction in homicide rates when used correctly, specifically for at-risk individuals or areas.

Socioeconomic and Gender Risks

Certain socioeconomic and gender risk factors should be taken into account when trying to appropriately utilize prevention factors. It has been found that traumatic childhoods in male individuals more commonly lead to aggressive and antisocial behaviors than in females (41). This means that when taking preventative measures, males who have reported any form of childhood adversity should be given appropriate treatment to prevent future criminal or homicidal behaviors. In incarcerated populations, studies have found that female perpetrators are more likely to have experienced sexual abuse, and men were found to have experienced more physical abuse in their childhoods (41). These findings should also be taken into account as risk factors when trying to avoid violence and find appropriate intervention methods in individuals. Another study found that men who had overcome childhood adversities and were from lower socioeconomic levels were more likely to inflict violence

during adulthood (36). When trying to find appropriate areas to deploy prevention initiatives, men in lower socioeconomic groups should be considered due to the findings of this data. Socioeconomic and gender factors should be heavily monitored when applying preventive treatments, as they may be an essential risk factor for homicidal behaviors.

Case Study: ACEs and Nonviolence

Oprah Winfrey, a public figure, has recently gone on to describe the sexual abuse she was subjected to throughout childhood. Many recognize Oprah from her various charitable projects, most notably her very own Oprah Winfrey Charitable Foundation. She has currently donated 400 million dollars to education for communities of poverty, including scholarships and building schools, and to food insecurity organizations to try and solve America’s current food deprivation issues (42). Winfrey’s ‘angel network’ is only one other example of her numerous philanthropic endeavors, where she has managed to build over 55 schools in 12 different countries.

Winfrey grew up in a small town in Mississippi, where she was abandoned by her teenage mother and forced to live with her grandmother, who would often inflict physical abuse upon her. However, throughout her childhood, Winfrey was introduced to a close-knit church community, which gave her some structure where she claims she felt loved and safe. At age six, she was sent to live with her mother in a poverty-stricken city where she was put to work tending houses (43). It was during her time here that her years of sexual abuse would start, inflicted upon her by her 19-year-old cousin. As small touches that were perceived as affection slowly turned into common incidents of rape, Winfrey discovered she was pregnant (44). Ashamed and lost, she kept her secret from her friends and family out of fear of expulsion from her school and society, causing her to run away at 13. When she later gave birth, her baby passed away several weeks later in the hospital (45).

After this, she started living with her father, who was described as strict but gave her a life with structure and support that she believes was crucial to her development during this time. Winfrey stated in an interview that “As strict as he was, he had some concerns about me making the best of my life and would not accept anything less than what he thought was my best” (43). It was after his support that Winfrey would go on to become one of the best scholars at her high school and later become a television talk show personnel, which would result in her

gaining the millions of dollars she continues to donate every year. Overcoming her abuse and early life of poverty may have been possible due to some protective factors, such as her initial involvement and the church and the subsequent ideals taught to her by her father.

DISCUSSION

The goal of this analysis was to explore the relationships between specific types of homicides, including school shootings, domestic homicides, and serial homicides, and differing childhood adversities. This analysis provided evidence that there are strong links between childhood adversities and differing types of homicide that may manifest themselves in many different ways. Mental illness was the most common type of manifestation evident from childhood adversities, which is most commonly presented through mood disorders, psychotic disorders, and antisocial personality disorders. Paralleling the link between childhood adversities and the onset of mental illnesses, a link between these disorders and committing homicides is often found to be equally as strong. Mental illnesses, which could be triggered by deeply traumatic childhood events, often influence an individual's worldview. In extreme cases, this can result in erratic or violent behavior that, over time, may lead to homicidal crimes. Another link to committing homicides that was less prominent but equally important in this analysis was substance abuse. Substance abuse is frequently found in adults who have been subjected to childhood adversities as a self-medicated form of relief, which may, in turn, be extremely damaging mentally and physically. Perpetrators who commit homicides are at times found to be under the influence of drugs or alcohol, which could be a contributing factor in their commission of the crime. Substances give people an altered sense of reality, which may negatively influence their moral reasoning and amplify violent traits.

These findings are relevant for the prevention of future homicides or other violent crimes and can help society and medical workers understand the severity of childhood adversities and the subsequent issues, such as mental illness or substance abuse. Those who are exposed to such traumas at a young age should be provided with appropriate treatment to avoid the onset of certain disorders or addictions. Those who have already been diagnosed with such issues should be treated immediately, and if violent thoughts or actions are observed, they should not be taken lightly. Suitable

treatment is critical in such cases and could potentially stop casualties from occurring. These findings may also bring to light the effects that bullying may have on young students and why it is a serious issue that must be avoided whenever possible. Schools must find a way to limit bullying, as it could be fatal for the rest of their students, especially if said student is struggling with other issues at home or mentally. In addition to these findings, potentially preventing fatalities from occurring, they could also aid in the rehabilitation of convicted criminals. Mental health professionals may be able to help people in jail work through these issues and become a better version of themselves, even after they have caused harm. Although perpetrators are often seen as unfixable delinquents, these findings show that they may be misunderstood, and while the harm they have caused to others is inexcusable, they should be afforded the right to be treated for trauma, mental illness, and/or substance abuse. Beyond the moral/human rights issue, treatment would likely prevent recidivism, saving more lives in the future. A distressing number of criminals are known to re-commit a crime that may be of a more severe degree upon their release from prison, which can cause more damage to the community.

This analysis does present some limitations in terms of the findings. The majority of the research on school shooters is based in the United States of America, as this is one of the only countries where this type of homicide is prevalent. When trying to find research based in other countries, mass shootings could be studied; however, as these are two varying types of homicides, the mechanisms or motivations may not be comparable. Further, many school shooters, especially those who have been studied and discussed in this analysis, have taken their lives or have been shot by police during their crime. Thus, the information that could be researched about their home and school life is limited to reports before the incident or accounts taken by the affected community after the crime. This also limits the validity of the mental illness analyses discussed about the perpetrator, as they could not be interviewed or tested after their crime, so some reports may be speculative and involve some degree of hindsight bias. In terms of domestic homicide, while these crimes are not uncommon, the data is relatively limited. As most domestic homicides are not highly reported, biological information about the perpetrator's childhood life is often missing or scarce. In contrast, serial homicide is fairly uncommon, so the research that has been done is on a much smaller scale, despite its

relative depth, which limits the validity and reliability of the data. Finally, all of the research presented above is highly retrospective and suffers from the multifinality problem. While there is a link between childhood adversity and homicides, the reverse claim can not be made with certainty. Although most murderers seem to have experienced adversities in their childhood, mental health disorders, or substance abuse issues, it can not be stated that those who suffer from said types of issues will go on to commit homicides, *let alone* any type of violence or crime. All of these limitations should be taken into account when considering the research.

Future research should attempt to find more cases to study in different countries, focusing on the effects of early life and social stressors in different communities to compare the data and see if it varies. Longitudinal studies focusing on the development of children who have suffered adversities into adulthood would be useful in further understanding the link to criminal behavior, more specifically, homicides. This would allow researchers to analyze different patterns in perpetrators and see how many of the children who do suffer from adversities grow up to commit violent crimes, rather than looking retrospectively at criminals' backstories to find a link. This could also help determine the sequencing effects of the risk factors described here, i.e., whether childhood adversities must cause adult-onset mental illness and substance abuse issues in order to influence subsequent criminal activity, and the separable influences of each risk factor. This topic overall should be researched in more depth, as it could not only help with profiling when trying to find certain criminals but also help in the prevention and rehabilitation of those who suffer.

CONCLUSION

This analysis aimed to examine the significant relationships between various forms of homicide, including school shootings, domestic killings, and serial murders, with childhood adversities, which were observed to be present. While prior research has documented certain features of these relationships, most published literature tends to only analyze a limited number of risk factors at a time and does not provide a complete summary of how childhood adversity may influence homicidal behavior. The relation between these types of crime and mental illness and substance abuse in adulthood is also evident; however, evidence suggests that they may also arise from childhood

adversities. When childhood adversities lead to further issues such as mental illness and substance abuse, it could be a lethal mix that may cause people to commit extremely violent crimes, such as homicide, if not given the proper treatment. The most prominent links found between childhood adversities and specific types of homicides are summarized in Table 2.

Table 2. The most prominent links found in this analysis between childhood adversities and types of homicide

Type of Childhood Adversity	Type(s) of Homicide Associated
Physical Abuse	Domestic homicide, Lust serial killer, Anger serial killer
Neglect	Lust serial killer
Sexual Abuse	Lust serial killer, Power serial killer, Anger serial killer
Mother Treated Violently	Domestic Homicide
Bullying/Rejection	School shooting

This research paper evaluates extreme outliers in data, so while a direct link is observable between childhood adversities and homicides, the opposite claim cannot be made with certainty. This research also highly focuses on data from the United States of America, especially when looking at school shootings, so reported links may not be found in other countries. Gaps in data also lead to validity issues when looking at certain cases in which the perpetrator is no longer living and recorded information has been given by friends and/or family members. Future research should be conducted so that appropriate treatments can be developed in hopes of preventing at-risk would-be-perpetrators from engaging in this behavior, rehabilitating perpetrators, and preventing re-offending. For example, case studies on individuals who have committed less severe crimes while struggling with childhood adversities, mental illness, and/or substance abuse after their release from jail could allow us to see which treatments can most effectively reduce the risk of recidivism. The most successful treatments can then be further tested on perpetrators who have committed more violent crimes, such as homicide, and have experienced childhood adversities to see if the success rate is equivalent. In turn, this would lower the current overwhelming crime volume and reduce the likelihood of future tragedies.

ACKNOWLEDGMENTS

I'd like to thank Emily Martinez for mentoring me in the writing of this paper and Sarah Michael for supporting me.

CONFLICT OF INTERESTS

The author declares that there are no conflicts of interest regarding the publication of this article.

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