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Early Life Experiences as Later Life Predictors for Criminality: Examination of Public Criminal
Records

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Abstract

Crime's detrimental impact on society, victims, families, and the justice system is undeniable. Thus, identifying factors that contribute to the perpetration of crime is essential to reduce the public health impact of crime. Adverse Childhood Experiences (ACEs) are frequently found in community samples and are consistently associated with physical, psychological, and behavioral consequences. Research suggests that negative childhood experiences contribute to maladaptive behaviors, including delinquency and perpetration of crime later in life (Perez et al., 2018). The present study's purpose is to identify specific childhood experiences associated with criminality. The data presented on criminality and ACEs was collected from recruited individuals who had criminal justice or recent substance use involvement in the community of Champaign County, Illinois. The study utilized instruments such as the Childhood Trauma Questionnaire (CTQ), Family Environmental Scale (FES), and Neighborhood Environment Scale (NES) to assess the adverse childhood experiences of 319 participants with diverse demographic backgrounds. Of the participants analyzed, using publicly available criminal records, 119 had no prior history of a criminal charge, while 199 participants had a documented history of at least one criminal charge. One participant was left out for unknown reasons. Using a logistic regression analysis with those who had criminal charge history to those who did not, in addition to zero-order correlations, this study found that emotional abuse, emotional neglect, and physical abuse showed no significant relationships with later-life criminality. Physical neglect emerged as a significant predictor for crime through my results. These findings underscore the significance of targeted interventions and preventive measures to address childhood risk factors and mitigate the likelihood of future criminal involvement.

Keywords: Psychopathology, Offending, Childhood Trauma, Criminality, Maltreatment, Adverse Childhood Experience (ACE), Juvenile Delinquency, Crime

Lay Summary

Understanding the root causes of criminal behavior is a fundamental pursuit in criminal psychology. Most research has focused on childhood experience and environment's roles on later criminal behavior. To better understand the complex relationship between childhood trauma and later criminality, the present study aimed to overcome existing limitations in the literature by correlating self-reports of adverse childhood experiences (e.g., abuse, neglect) and environment (e.g., family, neighborhood) and public records of criminal justice involvement. These results also show that childhood experiences impact later-life criminal engagement. Specifically, physical neglect during childhood emerged as a significant predictor for criminality in adulthood.

Introduction

Rates of childhood trauma have been reported throughout the forensic population to be high. Stensrud et al. (2019) surveyed 328 incarcerated or recently released individuals using the Adverse Childhood Experience (ACE) instrument. This study consistently showed prominent levels of childhood trauma across those involved in the criminal justice system: 65.65% of female, 64.39% of male sex offenders, and 42.7% of male low-risk prisoners reported four or more traumatic experiences. The Centers for Disease Control and Prevention (CDC) surveyed U.S. noninstitutionalized adults by sending the annual Behavioral Risk Factor Surveillance System Survey (ACE questions were included in the survey at least once) from the 50 states and the District of Columbia during 2011–2020, resulting in approximately 66.67% of adults reported at least one ACE and 16.67% reported four or more ACEs. The results of incarcerated or recently released individuals showed an exponentially higher rate of childhood trauma.

Perez et al. (2018) conducted a study examining the direct and indirect effects of adverse childhood experiences (ACEs) on delinquency in 64,329 Florida Department of Juvenile Justice youth from 2007 to 2012. They found that individuals who experienced adverse childhood experiences were more likely to engage in delinquent criminal behavior (Perez et al., 2018).

Similarly, Fox et al. (2015) discuss that 90% of juvenile offenders in the United States experienced some sort of traumatic event in their childhood, leading to future delinquency. Although research is absent in all the subtypes of traumatic events, analyzing such data can help expand knowledge on which subtypes need more attention. For example, Lansford et al. (2007) found that early physical abuse led to later violent delinquency and a more global pattern of violent and nonviolent dysfunction. These results suggest that physical abuse, as a subtype of abuse, leads

to later-life violent delinquent behavior. Focusing on subtypes will allow us to understand the underlying causes of later-life criminality and find predictors.

Another factor that contributes to later-life criminality is neighborhood environments. Research by Schuck and Widom (2005) supports that the effect of early child maltreatment on later juvenile and adult criminal behavior was vital for those individuals from the most disadvantaged neighborhoods. These environments can impact a child's deviancy and susceptibility to criminality in adulthood. Children may be more exposed to crime, have a lack of role models, limited educational opportunities, be at an economic disadvantage, and be exposed to using drugs and substance abuse. It is crucial to acknowledge that not all individuals growing up in disadvantaged neighborhoods will engage in criminal behavior, as personal resilience, positive social support, and intervention programs can mitigate these risks; however, recognizing the role of neighborhood environments in shaping future criminality is essential for designing effective policies and interventions to create safer and more supportive communities, which can reduce the prevalence of adult criminality.

Many tools have been developed for use in adults to assess exposure to childhood maltreatment retrospectively. Current literature on this issue focuses on self-report data from individual ACE scores. In addition to this, the available literature uses cross-sectional rather than longitudinal studies. Limitations of the literature include the absence of temporal precedence required to determine cause and effect and that participants may underreport criminal behavior because it is socially undesirable. This study will address this limitation by looking at public records of criminal behavior and analyzing the longitudinal relation between ACEs and criminal behavior using the Childhood Trauma Questionnaire (CTQ), Family Environmental Scale (FES), and Neighborhood Environment Scale (NES).

The Childhood Trauma Questionnaire (CTQ), Family Environment Scale (FES), and Neighborhood Environment Scale (NES) offer significant advantages over ACE (Adverse Childhood Experience) scores due to their specificity, depth, and comprehensive assessment capabilities. The CTQ provides detailed insights into specific types of childhood trauma, while the FES assesses various aspects of family functioning, and the NES evaluates neighborhood characteristics. Combining assessments from these instruments allows for a more holistic understanding of the multiple factors influencing an individual's development. This comprehensive approach facilitates tailored interventions by identifying specific traumas and family/environmental dynamics, thereby addressing the broader contextual factors shaping outcomes. While ACE scores remain valuable for their simplicity and predictive power, incorporating the CTQ, FES, and NES enhances research and clinical utility by offering greater depth, flexibility, and context to understanding childhood adversity and its consequences.

There are two hypotheses in this study. Hypothesis one has two elements:

Hypothesis 1A: There is a positive relation between early life experiences and later life participation in criminality; all types of abuse will have significant positive correlations with self-report measures of aggression at the zero-order.

Hypothesis 1B: Certain subtypes of early life experiences have a greater impact on the likelihood of engaging in criminal behavior later in life compared to other subtypes; for example, physical abuse impacts later life criminality more than emotional abuse—when discussing the effects on later life predictors of criminality.

Hypothesis 2: Using an exploratory regression can adjust overlap on specific adverse childhood experiences, as some may have more substantial effects. It is expected that significant answers will

be found regarding the question of whether early life experiences can predict criminality later in life.

To examine these hypotheses, the study's data analytic strategy involves identifying the connections between the variables mentioned, including childhood trauma, neighborhood environment, family environment, and their influence on criminal behavior in later life. All types of abuse will have significant positive correlations with self-report measures of aggression at the zero-order.

Method

Participants

Three hundred nineteen individuals were recruited in the community of Champaign County, Illinois, who had criminal justice or recent substance use involvement. The participants who participated in this study were comprised of 185 males (42.01%) and 134 females (57.99%). The mean age of the participants was 34.81 years, ranging from 18.00 to 62.00 years. The racial and ethnic composition of the sample included 115 Caucasians (36.39%), 154 African Americans (48.73%), and smaller percentages of individuals from Asian, Hispanic, Native American, mixed ethnicity, and other backgrounds. Regarding education level, 55 participants (17.30%) reported dropping out before 9th grade, 82 (25.79%) dropped out in high school, and most had achieved at least a high school diploma or equivalent. For detailed demographics, please refer to Table 1.

Table 1

Demographics Table

Variable (N=319)		Total Sample
Gender (N, %)	Male	185 (42.01)
	Female	134 (57.99)
Age	Mean	34.81
	Minimum	18.00
	Maximum	62.00
Race & Ethnicity (N, %)	Caucasian	115 (36.39)
	African American	154 (48.73)
	Asian Decent	9 (28.5)
	Hispanic Decent	9 (28.5)
	Native American	3 (0.95)
	Mixed ethnicity	21 (6.65)
	Other	5 (1.58)
Level of Education (N, %)	Dropped out before 9th grade	4 (1.26)
	Dropped out in High School	55 (17.30)
	HS diploma or GED	82 (25.79)
	Some college	156 (49.06)
	Bachelor's	16 (5.03)
	Higher ed	5 (1.57)

Measures

Measures were selected to assess participants' childhood experiences and environmental contexts comprehensively. These measures were specifically chosen to capture the multifaceted nature of the variables under investigation and ensure a thorough exploration of the research hypotheses.

Childhood Trauma Questionnaire (CTQ)

The CTQ, developed by Bernstein et al. (1994), is a widely used self-report questionnaire designed to assess various forms of childhood trauma that comprises 28 self-report items intended

for retrospective assessment. The CTQ evaluates five categories of childhood maltreatment: Emotional Abuse (e.g., "People in my family called me things like 'stupid,' 'lazy,' or 'ugly'"), Emotional Neglect (e.g., "I did not feel loved." *reverse coded*), Physical Abuse (e.g., "was punished with a belt, a board, a cord, or some other hard object"), Sexual Abuse (e.g., "someone tried to touch me in a sexual way or tried to make me touch them") and Physical Neglect (e.g., "parents were too drunk or high to take care of the family").

Participants responded to statements indicating the frequency of traumatic experiences, "you may have had as a child". Designed to gauge the severity of childhood trauma experienced by an individual, the CTQ also enables the establishment of an overall dose-effect relationship; the higher the total score, the greater the trauma experienced. This study's Cronbach's alphas were .85 for Emotional Abuse and Neglect, .78 for Physical Abuse, .87 for Sexual Abuse, and .65 for Physical Neglect, consistent with reliability and good internal consistency. Consistent with the results, an example study using the CTQ within validation studies in both clinical and non-clinical forensic populations have affirmed its reliability, showing satisfactory internal consistent Cronbach's α ranging from 0.66 to 0.92 (Macinnes et al., 2016). For specific items and their corresponding alpha coefficients in this study, please refer to Table 2.

Table 2

Descriptive Statistics		
Variable	Mean	Standard Deviation
Neighborhood Environment Scale	14.80	3.18
Family Environment Scale	13.45	2.79
Emotional Abuse	10.24	5.16
Emotional Neglect	11.51	5.17
Physical Abuse	8.93	4.08
Sexual Abuse	7.45	4.94
Physical Neglect	8.08	3.39

Family Environmental Scale (FES)

The FES, developed by Moos (1974), consists of multiple subscales, including Conflict, Cohesion, and Expressiveness. Participants responded to statements (e.g., Family members sometimes got so angry they throw things.) reflecting various family dynamics, indicating whether each statement was true or false. FES demonstrated good internal consistency (Cronbach $\alpha = .81$). For a detailed breakdown of subscales and their internal consistency, please refer to Table 2.

Neighborhood Environment Scale (NES)

The NES, developed by Elliot et al. (1985), assesses neighborhood safety and social cohesion dimensions. Participants responded to statements (e.g., I saw people using or selling drugs in my childhood neighborhood) reflecting their perceptions of neighborhood characteristics, indicating whether each statement was true or false. The NES showed acceptable internal consistency (Cronbach $\alpha = .65$). For detailed subscale information, please refer to Table 2.

Criminality

Three hundred nineteen individuals were recruited in the community of Champaign County, Illinois, who had criminal justice or recent substance use involvement. Information about criminal charges for those 319 participants was obtained from publicly available records provided by the Champaign County Circuit Clerk Records in Illinois. It was found that 119 recruited participants had no history of a criminal charge, and 199 participants did have an account of it. One participant was left out, for unknown reasons.

While recruiting participants, the study utilized a comprehensive crime tracking sheet. This included details such as the date of charge, offense type, number of counts, sentencing status, dismissal of charges, nature of the sentence, involvement in violent offenses, and post-assessment period were meticulously documented. The study collected this information to determine the level of criminal activity among each participant. In addition to this, recidivism data were assessed to obtain levels of recidivism rates. The information was based on whether participants had been recidivated, defined as being charged with another crime or re-incarcerated after their baseline assessment date. The assessment included inquiries into the time between baseline assessment and first recidivism date, the number and types of charges incurred, and any probation or parole involvement. The study assessed the level of criminality in participants utilizing this information, which provided valuable insights into further findings.

Table 3

Parameter Estimates from Logistic Regression Predicting Criminal Charge

Predictor Variable	b	z	AOR	95% CI	P-Value
Intercept	-1.90	-1.30	0.15	(0.01, 2.57)	0.19
Emotional Abuse	-0.05	-1.05	0.96	(0.88, 1.04)	0.30
Emotional Neglect	-0.03	-0.83	0.97	(0.90, 1.05)	0.41
Physical Abuse	-0.01	-0.30	0.99	(0.91, 1.08)	0.80
Sexual Abuse	0.06	1.70	1.06	(1.00, 1.13)	0.09
Physical Neglect	0.12	2.13	1.13*	(1.01, 1.26)	0.03 *

*P-Value < .05

*AOR > 1.00

Results

The study's analysis employed zero-order correlations alongside exploratory logistic regression techniques to investigate unique associations between subtypes of child maltreatment and subsequent criminal charges. Zero-order correlations were examined to explore the association between childhood adversity (e.g., abuse, neighborhood environment) and later-life criminality. The study's findings shown in Figure 1 revealed nuanced patterns—only one correlation research statistical significance. Physical neglect had a significant positive correlation with later criminal charges ($r = .14$). All correlations, aside from emotional neglect and emotional abuse, exhibited positive coefficients, suggesting a potential increase in the likelihood of criminal charges with higher levels of these variables. However, these associations did not reach statistical significance.

The study follows up the zero-order correlations with a logistic regression to examine the unique associations between childhood adversity and criminal charges. These results are shown in

Table 3. Emotional Abuse, Emotional Neglect, and Physical Abuse had negative coefficients; however, they were not significant. In contrast, Sexual Abuse and Physical Neglect displayed positive coefficients, indicating a potential increase in the likelihood of criminal charges with higher levels of these experiences. While the odds ratio (AOR), presented in Table 3, for Sexual Abuse suggested a marginal increase in the likelihood of criminal charges for each unit increase, this relationship did not attain statistical significance. Notably, the odds ratio for Physical Neglect was statistically significant at the 0.05 level, signifying a 13% increase in the likelihood of criminal charges for each unit increase in Physical Neglect. The study reported mean scores and standard deviations for both predictor variables and criminal charges, providing information on the average levels and variability within the sample for each variable.

Discussion

This study aimed to comprehensively explore the determinants of later-life criminality, focusing on early childhood experiences. The utilization of instruments such as the Childhood Trauma Questionnaire, Family Environmental Scale, and Neighborhood Environment Scale alongside public criminal records was aimed at elucidating the intricate relationships among various variables by a team of researchers. The study predicted a significant positive correlation between adverse early life experiences and subsequent involvement in illegal activities—with a specific interest in certain subcategories of childhood experiences. The data analysis confirmed the presence of such a relationship; however, a nuanced examination revealed variations among subtypes, suggesting that specific early life experiences had more substantial impact on later engagement in criminal behaviors than others.

Contrary to initial expectations, this study contradicted the assumption of significant positive correlations between all forms of abuse and criminality, as indicated by zero-order correlation analysis. There was a correlation analysis to explore these discrepancies further, juxtaposing individual criminal recidivism data with childhood variable data. Surprisingly, physical neglect emerged as the only variable relationship significantly different from zero. This finding underscores the significant association between physical neglect and later-life criminal behavior, prompting further inquiry into the mechanisms driving this relationship.

This study's second hypothesis delved into the unique relationships among different adverse childhood experiences, recognizing that some may wield greater influence than others. This study was aimed to unravel the overlapping effects within this complex landscape through exploratory regression analysis. Aligning with initial zero-order correlations, the findings highlighted a significant link between physical neglect and recidivism, emphasizing its noteworthy

impact. Interestingly, no other effects reached statistical significance, hinting at the nuanced nature of these associations.

This outcome sheds light on the under-explored realm of child neglect, which, despite its prevalence, has often been overshadowed by other forms of childhood maltreatment. It is noteworthy that while previous research has spotlighted the repercussions of physical abuse on later-life criminality, neglect has remained overlooked. For instance, Lansford et al. (2007) conducted a longitudinal study spanning over two decades, revealing a robust correlation between early physical abuse and subsequent violent delinquency, as well as an elevated risk of later-life incarceration, but failed to include the element of physical neglect. In addition, the research landscape has frequently neglected to incorporate other pivotal factors such as sexual abuse, physical neglect, or neighborhood environment, leading to potential biases. To bridge this knowledge gap, it becomes imperative to advocate for a more comprehensive approach in research endeavors. By embracing a comprehensive perspective that encompasses diverse subtypes of childhood maltreatment, researchers can provide a more accurate portrayal of the multifaceted dynamics at play. This broader lens not only enriches the understanding of the intricate interplay between adverse childhood experiences and later-life outcomes but also informs more effective strategies for intervention and prevention. To create effective strategies, connecting to theoretical frameworks can help maintain a holistic structure in research.

My finding that physical neglect was related to future criminality could be interpreted through several theoretical frameworks that warrant consideration. One psychological theory that best explains this result is attachment theory, developed by John Bowlby. He suggests that early experiences with caregivers will influence an individual's attachment style along with subsequent behaviors throughout the person's life (Bowlby, 1969). Physical neglect calls upon caregivers who

fail to meet a child's basic and physical needs such as food, shelter, and clothing. Neglectful parenting disrupts the relationship and formation of secure attachments between the child and caregiver. Children then develop insecure attachments and feelings of mistrust, insecurity, and abandonment. Patterns like these can lead to difficulties in regulating emotions, forming healthy relationships, and coping with hardships and stress. Individuals who experience these can be more prone to criminal behavior to meet needs, seek attention from others, and cope with emotional issues. Physical neglect can also contribute to the development of other risk factors of criminality such as low self-esteem, impulsivity, and aggression (Bowlby, 1988). The absence of crucial elements required for adolescent success, such as consistent relationships, guidance, support, and physiological needs, can hinder the development of essential skills. These skills can range from problem-solving to emotional coping mechanisms. Attachment theory suggests that disruptions in relationships during childhood can have long-lasting effects on individuals' psychological and behavioral functioning, contributing to their involvement in criminal activities later in life (Bowlby, 1988).

Building on the understanding provided by attachment theory, the Social Learning Theory (SLT), proposed by Bandura (1977), offers insights into the mechanisms underlying criminal behavior development. The Social Learning Theory (SLT) posits that individuals learn behaviors through observation and imitation of others in their environment. While SLT is often associated with direct observational learning, its principles also extend to the influence of environmental factors on behavior.

In the context of physical neglect, SLT suggests that children may observe and internalize behaviors associated with neglect, such as parental apathy or disengagement. These observed behaviors can shape the child's understanding of relationships and coping mechanisms. Also, the

absence of positive modeling or reinforcement in cases of neglect may lead children to develop maladaptive coping strategies, such as aggression or delinquency, to seek attention or meet unmet needs (Bandura, 1977).

Thus, while SLT may appear more straightforward in explaining behaviors directly observed in the environment, it also acknowledges the significant impact of environmental factors, including neglect, on behavior learning and development. Children exposed to physical neglect may internalize negative patterns observed in their environment, contributing to their engagement in delinquent behaviors. While physical neglect may not involve direct modeling of behaviors as in cases of direct observation, SLT underscores the influence of environmental factors on behavior learning and development, including the internalization of observed behaviors and the lack of positive modeling or reinforcement. Thus, SLT provides a framework for understanding how experiences of physical neglect can contribute to the development of delinquent behaviors. Given the elucidation of theories explaining criminal behavior, what strategies can be implemented to effectively prevent and mitigate crime?

Prevention and Intervention Implications

In the pursuit of preventing crime, it is crucial to acknowledge the significant impact of childhood maltreatment, particularly physical neglect, on individuals' susceptibility to criminal involvement. Despite the daunting challenge of preventing crime, every step taken through research, advocacy, and progress contributes to invaluable societal changes (United States Department of Justice, Office of Justice Programs, 2023).

In addressing these challenges with potential solutions, the Office of Juvenile Justice, and Delinquency Prevention (OJJDP, 2023), noted that "successful mentoring relationships can

significantly enhance youths' self-esteem and academic achievement, effectively deterring them from delinquency, substance use, and other high-risk behaviors" (para. 1). Key mentoring initiatives like the National Mentoring Program play vital roles in supporting at-risk youth, addressing underlying risk factors, and promoting positive development (OJJDP, 2023). Investing in targeted prevention programs, including early interventions like First Step to Success, aids in identifying and addressing antisocial behaviors in school settings (United States Department of Justice, Office of Justice Programs, 2013). Similarly, the Parent-Child Interaction Therapy Program (PCIT) effectively tackles parental child abuse and fosters healthier parent-child relationships (United States Department of Justice, Office of Justice Programs, 2013). Aligning with attachment theory and social learning theory, PCIT demonstrates notable enhancements in parental and child behavior, highlighting the importance of evidence-based interventions in creating a safer, nurturing environment (United States Department of Justice, Office of Justice Programs, 2013). These programs offer vital support and guidance to youth who may be experiencing physical neglect or other forms of maltreatment, helping to address underlying risk factors and promote positive development.

The issues of child maltreatment can be addressed by exploring the benefits of parenting classes. According to a recent study conducted by Branco et al. (2022), parenting classes significantly improve parenting techniques and child behavior outcomes. While further research is still needed on this topic, the findings of this study present a promising step towards finding solutions with long-term effects preventing child maltreatment (Branco et al., 2022).

Investing in parenting classes and targeted prevention programs addresses root causes of delinquency, including physical neglect, negative parenting techniques, and dangerous environments to nevertheless reduce later life criminality. The exploration of the theoretical

underpinnings of criminality and child maltreatment, such as attachment theory and social learning theory, coupled with an examination of effective intervention programs, underscores the critical importance of proactive measures in addressing these societal challenges.

As this study recognizes the detrimental effects of physical neglect, it emphasizes the urgency of comprehensive intervention efforts to break the cycle of maltreatment and prevent future criminal involvement. Implementing the proposed solutions can lead to significant enhancements in communities and environments. By taking these solutions into consideration, communities and environments can experience improvements.

Conclusion

This study provides significant contributions to academic literature by delving into the intricate relationship between childhood maltreatment and subsequent involvement in criminal activities. By meticulously examining various forms of childhood adversity and environmental factors, this study aimed to deepen the overall understanding of the complex pathways linking early life experiences to later criminality. The findings underscore the critical importance of developing precise intervention strategies to mitigate the risk of future criminal behaviors among individuals with adverse childhood experiences, particularly childhood neglect.

Despite extensive research, this study identified several underexplored areas, concerning the panoply of different forms of childhood adversity and environmental factors. While this study strides in this new direction, further investigation is warranted to comprehensively grasp the nuanced dynamics involved.

Significantly, the scarcity of longitudinal studies in this field remains a notable limitation. While this study incorporated longitudinal data, there is a pressing need for more comprehensive designs to accurately capture individuals' trajectories from childhood to adulthood and understand the long-term impacts of childhood adversities on later-life criminality. Additionally, rigorous evaluation studies of early intervention programs are lacking, emphasizing the necessity for assessing their effectiveness in reducing criminal behavior associated with adverse childhood experiences.

This study emphasizes the significance of identifying culturally sensitive intervention strategies that are customized to specific populations and contexts. Addressing these research gaps can help advance the understanding of pathways linking childhood experiences to later criminality. It can also assist the development of evidence-based interventions and policies that aim to prevent and reduce criminal activities. Focusing on utilizing a culturally sensitive approach in prevention and intervention strategies can significantly contribute to building safer and more resilient communities.

Strengths

My study exhibits several strengths that contribute to its robustness and applicability. Firstly, it employs a comprehensive assessment approach by utilizing multiple tools such as the Childhood Trauma Questionnaire (CTQ), Family Environment Scale (FES), and Neighborhood Environment Scale (NES), allowing for a thorough examination of numerous factors influencing individuals' development. Secondly, by conducting an analysis using public records of criminal behavior, my study establishes temporal precedence and examines the long-term effects of childhood trauma on subsequent criminal behavior. Also, exploratory logistic regression techniques provide a nuanced understanding of the unique associations between different subtypes

of childhood maltreatment and subsequent criminal charges. Furthermore, grounding the study in psychological theories such as attachment theory and social learning theory adds a theoretical basis for understanding the relationship between childhood trauma and later criminality. Lastly, the practical implications of identifying specific types of childhood trauma associated with an increased likelihood of criminal charges offer valuable insights for designing targeted intervention and prevention programs aimed at reducing the prevalence of adult criminality.

Limitations

Several limitations should be acknowledged in this study. One notable limitation of this research is the presence of missing data for certain participants, which may have introduced bias and affected the generalizability of the findings. The pattern of missingness could potentially be associated with variables of interest, such as individuals who experienced higher levels of abuse being less likely to respond to certain questions. Addressing this limitation may require employing robust techniques for handling missing data and conducting sensitivity analyses to assess the impact of missingness shown in the results.

Additionally, cultural and contextual variations present another limitation in this study. Aimed to explore the influence of neighborhood environments on future criminality, it is imperative to recognize that cultural norms, societal structures, and community factors differ across populations and settings. For instance, research by Schuck and Widom (2005) suggests that the effect of early child maltreatment on later criminal behavior may be most pronounced in individuals from disadvantaged neighborhoods. However, it is essential to acknowledge that not all individuals raised in such environments will engage in criminal behavior, as factors like personal resilience and positive social support can mitigate risks. Despite these nuances, understanding the influence of neighborhood environments on criminal outcomes remains crucial

for informing effective policies and interventions aimed at fostering safer communities. Further research that accounts for these cultural and contextual factors is needed to enhance understanding and to inform targeted interventions tailored to specific populations and contexts.

Additionally, the use of public criminal records to assess participants' involvement in criminal activities may not provide a comprehensive picture of their criminal behavior. Public records may not capture all criminal offenses committed by participants, especially those that were not detected or reported to law enforcement. Additionally, solely relying on criminal records may overlook other forms of antisocial behavior or legal infractions that do not result in criminal charges. Finally, differential policing in neighborhoods could lead to some people to be more likely than others to be charged for the same behavior.

The generalizability of the study's findings may also be limited by sample characteristics and study context. The sample comprised individuals from a specific geographic region and demographic profile, potentially hindering the applicability of findings to broader populations. Considering cultural differences, socioeconomic status, and resource access is crucial when extrapolating results to different contexts or populations. Therefore, caution should be exercised when extrapolating the results of this study to different contexts or populations.

This study contributes significantly to understanding the intricate relationship between childhood maltreatment and later involvement in criminal activities. Examining various forms of childhood adversity and environmental factors helps deepen understanding of the variety of pathways that link early experiences to later criminal behavior. Despite gaps in longitudinal research and program evaluation, the findings underscore the need for tailored intervention strategies. Culturally sensitive approaches are vital for developing effective policies and interventions to prevent and reduce criminal behavior. Despite limitations such as missing data

and potential biases, the study provides valuable insights to guide future research and promote positive outcomes for individuals affected by childhood maltreatment.

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