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(DIPLOMSKI RAD)

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Sadržaj

Abstract

This thesis explores the nature vs. nurture debate in the development of serial killers, examining the complex interaction between genetic predispositions and environmental influences. More specifically, the study investigates whether serial killers are born with inherent tendencies toward violence or shaped by life experiences. Through an analysis of key factors such as psychopathy, childhood trauma, brain injuries, and genetic components like the MAOA gene, the thesis argues that serial killers are the result of a combination of biological and environmental factors. Case studies of notorious killers, including Ted Bundy, Jeffrey Dahmer, and Aileen Wuornos, illustrate how both nature and nurture contribute to violent behavior. Furthermore, the thesis addresses the role of psychopathy and its relationship to serial killing, revealing that while some serial killers exhibit psychopathic traits, others do not fit the traditional profile. Ultimately, the research highlights that neither nature nor nurture alone can explain the development of serial killers, but rather it is the interaction between the two that leads to extreme violent behavior.

Key words: Nature vs. Nurture, Serial Killers, Personality Types, Psychopathy, Epigenetics

Sažetak

Ovaj rad bavi se analizom sukoba prirode i odgoja u kontekstu razvoja serijskih ubojica, proučavajući kompleksnu interakciju između genetskih predispozicija i utjecaja okoline. Središnje pitanje koje se razmatra u radu jest jesu li serijski ubojice rođeni s inherentnim sklonostima prema nasilju ili su te sklonosti oblikovane kroz njihova životna iskustvo? Istraživanje ključnih čimbenika poput psihopatije, trauma iz djetinjstva, ozljeda mozga te genetskih komponenti kao što je MAOA gen, upućuje na zaključak da su serijski ubojice rezultat kombinacije svega navedenog. Kroz analizu slučajeva poznatih serijskih ubojica poput Teda Bundyja, Jeffreyja Dahmera i Aileen Wuornos, prikazuje se kako i priroda i odgoj zajednički doprinose razvoju nasilnog ponašanja. Osim toga, teza ispituje ulogu psihopatije i njezin odnos prema serijskom ubijanju, otkrivajući da, premda neki serijski ubojice pokazuju psihopatske osobine, drugi ne odgovaraju tradicionalnom profilu psihopata. U konačnici, istraživanje naglašava da ni priroda ni odgoj sami za sebe ne mogu u potpunosti objasniti razvoj serijskih ubojica već takve ekstremne oblike nasilnog ponašanja možemo objasniti kao zamršenu i mračnu interakciju bioloških i okolinskih faktora.

Ključne riječi: Priroda i Odgoj, Serijski ubojice, Karakterne Osobine, Psihopatija, Epigenetika

1. Introduction

The fascination with serial killers is a long-lasting and puzzling phenomenon. This interest spans across cultures and epochs, from the monstrous figures of Humbaba in the Epic of Gilgamesh to the terrifying Grendel in Beowulf. In these ancient stories, as well as in modern media, literature, and art, serial killers capture the public imagination, combining horror with an unsettling allure (Dietrich & Hall, 2010). This attraction is not merely a product of sensationalism. It also reflects a deep human curiosity about the darkest aspects of human nature and a desire to understand behaviors that defy societal norms. Serial killers, both real and fictional, compel us to confront the unknown. The gruesome adventures of historical figures like Nero or Jack the Ripper have been subjects of endless speculation and study. Modern examples, such as Ted Bundy and Jeffery Dahmer, continue to fascinate us. In fictional representations—from Hannibal Lecter in The Silence of the Lambs to Dexter Morgan in Dexter—artists depict these characters as both terrifying and captivating, forcing us to connect with our fear in a controlled environment, such as the one of a movie, TV show, podcast or a book. In such an environment, we feel comfortable engaging with our fears as it is safe, and no one can harm us. This dynamic is evident in the dichotomy between the real and the imagined: while real-life serial killers evoke horror, fictional ones provide a "safe" way to explore our fear and curiosity (Dietrich & Hall, 2010).

One reason behind this fascination is that serial killers represent a radical form of deviance from social norms. According to Thomas Hobbes' concept of the "State of Nature," humans are naturally self-interested, driven by personal desires and survival instincts. In such a state, without rules or authority, life is chaotic and violent, governed by fear and self-preservation (Friend, 2004). To escape this chaos, humans collectively agree to a "Social Contract," surrendering certain freedoms to maintain order and security. Serial killers, in many ways, embody a rejection of this social contract. They operate outside the boundaries of societal norms and rules, creating a stark contrast to the rule-following nature of human societies. This contrast may explain why serial killers are so captivating—they embody the ultimate form of rule-breaking and self-assertion, going far beyond the boundaries of acceptable behavior (Dietrich & Hall, 2010).

As mentioned earlier, serial killers have always fascinated the public, appearing frequently in books, movies, and TV shows. This interest comes from a mix of fear, curiosity, and the desire

to understand the minds behind such extreme crimes. Serial killers are often depicted as mysterious and complex, which has led to widespread speculation and dramatic stories in popular culture. However, these portrayals can distort how people see serial killers, leading to myths and misunderstandings about who they are and what motivates them. While popular culture offers a compelling portrayal of serial killers, it often lacks the detail and accuracy that research aims to provide. Moreover, the public's fascination with serial killers has not only influenced how people talk about them but has also shaped what researchers choose to study. Scholars have tried to move past these sensationalized stories to develop a more accurate, evidence-based understanding of serial murder. This shift to a more scientific approach is important because it allows for a careful examination of the behaviors, motivations, and social contexts of serial killers. Despite a lot of research on serial killers, there are still many challenges in the field.

In her research on serial killers, Elizabeth A. Gurian (2016) provides a broad analysis of 508 cases, covering both male and female offenders as well as partnered serial killers, in an attempt to identify behavioral patterns and legal outcomes. While her findings highlight the importance of data-driven studies over traditional case-based research, they also bring attention to critical issues within the field. One of these issues is the lack of consensus regarding the causes of serial killing behavior, particularly when it comes to the interplay between genetic predispositions and environmental influences. The field of serial killer research faces a significant debate between scholars who emphasize genetic explanations, such as brain injuries or the presence of the low-functioning MAOA gene, and those who argue for the stronger role of environmental factors, such as childhood trauma or societal influences. This nature versus nurture debate is central to understanding the root causes of violent behavior. While some researchers suggest that certain individuals may be biologically predisposed to aggression, others argue that no one is "born a killer," but rather shaped into one by their life experiences. The controversy over which factor carries more weight, nature or nurture, remains unresolved, leaving room for ongoing research and theoretical development.

This lack of agreement raises critical questions about how we define and understand serial killers. If we lean more toward genetic predispositions, we must explore the mechanisms that lead individuals with certain genetic traits to become violent. On the other hand, if we prioritize environmental explanations, we need to better understand the specific conditions that drive some individuals toward such extreme behaviors while others remain unaffected. Addressing

these questions is essential for advancing the field, as it directly impacts research methodologies and public policies, and legal practices related to serial murder.

In addition to exploring the nature versus nurture debate, it is equally important to investigate the relationship between serial killers and psychopathy, addressing the crucial question of whether serial killers are inherently psychopaths. Psychopathy is often associated with traits such as lack of empathy, impulsivity, and manipulative behavior, traits frequently linked to violent offenders. By examining psychopathy's role (or lack thereof) in serial murder, we can clarify the distinction between biological predispositions, such as psychopathy, and behaviors learned through environmental influences. This deeper understanding of the biological and environmental factors driving serial killers is critical to addressing the broader questions of why these individuals act as they do.

In this context, Gurian's call for a clear and consistent definition of serial murder remains crucial. A unified definition would improve the precision of research and also help bridge the gap between genetic and environmental theories, creating a more integrated approach to understanding serial killers. This would allow for more effective data collection, clearer public policies, and better support for law enforcement efforts (Gurian, 2016). However, it is equally important to recognize that the complexity of serial killing goes beyond simple definitions, requiring a multidisciplinary approach that considers both biological and environmental factors. As such, the ongoing debate between nature and nurture serves as a crucial backdrop for further research into the behavior of serial killers and continues to fuel the development of more sophisticated theories in the field.

This thesis aims to address some of the core issues surrounding the definition and understanding of serial killers, ultimately leading to the question of whether serial killers are born with innate tendencies or shaped by their social environment. While there is an influential line of thinking that suggests a genetic basis for violent behavior, this thesis argues that environmental factors also play a crucial role. These environmental factors can activate violent tendencies in individuals who may already have certain genetic predispositions. To fully understand the development of serial killers, it is essential to examine both innate characteristics and external influences. However, the category of serial killers cannot be seen as representing a homogeneous group. Instead, differences and variations between individuals must be considered when conducting such an analysis. Therefore, the first step in this endeavor will be to examine the different typologies of serial killers and their associated psychological

profiles to provide an appropriate context for discussing the nature versus nurture debate regarding the formation of a serial killer.

The chapters of the thesis are structured as follows. First, I will explore the classification of serial killers and their main characteristics to set the stage for understanding the diversity within serial killer profiles. Next, I will investigate the relationship between serial killers and psychopathy, addressing the crucial question of whether serial killers are inherently psychopaths. By understanding psychopathy's role (or lack thereof) in serial murder, I aim to clarify the distinction between biological predispositions and learned behaviors in these offenders. The final and most critical part of the thesis will explore the etiology of serial killers through the lens of the "nature vs. nurture" debate. Here, I will present arguments for both sides, including the role of sadistic pleasure, physiological factors like hormonal brain injuries, and neurobiological abnormalities, as well as environmental influences such as childhood trauma and socio-cultural pressures.

2. The Classification of Serial Killers

The term "serial killer" has traditionally been attributed to an FBI agent Robert K. Ressler, who is often credited with coining the phrase in the late 1970's as part of his work in criminal profiling[1] (White et al., 2010). The notion of "serial killer" refers to individuals who murder multiple people over time, with each killing occurring separately instead of all at once. While there is no single, universally accepted definition, many scholars agree that committing at least three murders is a key criterion for identifying a serial killer (García-Baamonde et al., 2022). Holmes and Holmes (1998; 2010) further specify that serial killers often have a "cooling off" period between their crimes where they do not commit any murders, which distinguishes them from mass murderers who typically kill many people in one single event (see also Taylor et al., 2012).

The lack of a universal definition causes problems in creating psychological and criminological profiles of the offenders. Serial killers can be very different from each other in terms of their behavior and motivations and they can have various reasons for their crimes and exhibit a range of patterns in their actions. By understanding these differences, the experts can better identify and understand the unique traits and behaviors of each serial killer.

Serial killers can be categorized based on their motivations and behaviors, as explained by Bodhraj Kumkaria and Himalaya Tiwari (2024). One key motivation is rooted in psychodynamic theories, which suggest unresolved childhood trauma or internal conflicts push individuals toward violence. For example, childhood abuse may lead to feelings of powerlessness, driving them to commit murders as a way to regain control and autonomy. Ted Bundy is a famous case where unresolved psychological issues stemming from his childhood may have contributed to his crimes.

Behavioral theories, like Albert Bandura's social learning theory, suggest that individuals learn violent behaviors through observation and reinforcement. If someone is exposed to violence during childhood, they may come to view it as an acceptable way to achieve goals (Kumkaria

[1] However, this might not be quite correct. In an interesting blog post, Fake History Hunter explains that Ressler may not have been the first to coin the term "serial killer." The blog highlights earlier instances of similar terms being used, such as Richard Hughes' use of "serial murderer" in 1950 and historian Robert Eisler's mention of "serial killings" in 1948. The post also points to a German detective, Ernst August Ferdinand Gennat, who used the term "Serienmörder" in the 1930s, and a Dutch journalist who used the term "serie-moordenaar" in 1927 (Fake History Hunter, 2020).

and Tiwari, 2024). In contrast, biological explanations focus on genetic and neurobiological factors. Kumakaria and Tiwari noted that genetic variants, like the "warrior gene" (MAOA), and brain abnormalities in regions such as the prefrontal cortex and amygdala are linked to aggression. These abnormalities can impair decision-making, reduce empathy, and lead to heightened aggression. Serial killers like John Wayne Gacy, who exhibited a lack of empathy and impulse control, may have had neurobiological factors that contributed to their behavior. Furthermore, sociocultural factors also play a crucial role. Experiences of abuse, neglect, and exposure to violence during childhood increase the likelihood of violent behavior in adulthood. Additionally, socio-economic stressors, like poverty and social isolation, can contribute to criminal behavior.

Gender differences in motivation are also observed, with male serial killers often motivated by sexual violence, while female killers may be driven by financial gain or revenge. Aileen Wuornos, for some, exemplifies how trauma, abuse, and social marginalization can lead to violent crimes, claiming her murders were in self-defense against sexual assault (Kumkaria and Tiwari, 2024).

In terms of behavior, modus operandi (MO) and signature behaviors are important tools for profiling serial killers. The MO refers to the techniques used to commit the crime, which can change over time as the killer learns from their experiences. Signature behaviors, however, are unique psychological imprints left at the crime scene, driven by the killer's fantasies and needs. Unlike the MO, the signature behavior remains consistent across different crimes. For example, Dennis Rader, the BTK Killer, had a consistent pattern of binding, torturing, and killing his victims, which fulfilled his psychological needs.

Serial killers also follow distinct victim selection patterns, often targeting individuals who fit certain characteristics or fantasies. Some killers may choose victims based on personal history, while others target specific demographics based on race, age, or occupation. Ted Bundy, for example, specifically targeted young women with certain physical traits, reflecting his desire for control over a particular victim type.

The organized-disorganized typology is another important behavioral framework. Organized killers meticulously plan their crimes, avoid detection, and often have above-average intelligence, as seen with Jeffrey Dahmer. Disorganized killers, on the other hand, act

impulsively with little planning, driven by psychotic episodes, as seen in Richard Chase, the "Vampire of Sacramento."

Kumkaria and Tawari (2024) also refer to the work of Holmes and De Burger, who proposed four types of serial killers that are used to this day while classifying serial killers. Visionary killers, such as Harvey Carignan, believe they are guided by supernatural forces to kill, such as demons or gods. They are out of touch with reality and may be exculpated from responsibility by using an insanity defense in court. Mission-orientated killers have a specific goal to eliminate certain groups they see as undesirable, without experiencing psychosis. For example, a killer targets prostitutes because he believes that they are ruining his community. They are not psychotic, but they see their actions as a form of social justice or cleansing. Hedonistic killers kill purely for pleasure and thrill, often engaging in sadistic behaviors. They may be intelligent and difficult to catch because their crimes are often very complex. And finally, power/control-oriented killers, like Ted Bundy, find satisfaction in having total control over their victims. They are typically considered as not psychotic but usually have a deep personality disorder (Holmes & De Burger, 1985).

Geographic and temporal patterns are also used in profiling. Geographic profiling analyzes the locations of crimes to predict the offender's base of operations, while temporal patterns reveal insights into the killer's routine and psychological state, which can help law enforcement anticipate future attacks. For example, geographically stable serial killers mostly stay in one area and commit their crimes close to home, such as John Wayne Gacy, who murdered many of his victims near his Chicago residence, or Albert Fish, who was active in New York where he also lived (Holmes & De Burger, 1985). In contrast, geographically transient serial killers, like Ted Bundy and Henry Lee Lucas, move from place to place, making it more difficult for authorities to connect their crimes (Holmes & De Burger, 1985).

Despite these classifications, profiling serial killers remains challenging because existing typologies do not fully account for every aspect of their behavior or the relationships between victims and killers (van Aken, 2015). These challenges make it hard to understand and prosecute serial killers, emphasizing the need for further research on criminal profiling to improve the existing methods.

2.1. Profiling

The study of serial killers dates long back, beginning as early as the 1400s with French nobleman Gilles de Rais, notoriously known for raping, murdering, torturing hundreds of children (van Aken, 2015). In the 1960s, criminal profiling, also known as offender profiling, emerged as a useful tool when James A. Brussel helped New York police in catching the "Mad Bomber." However, it became much less used after psychologists struggled to accurately profile the Boston Strangler. In 1960, the police teamed up with a group of psychiatrists and psychologists in hopes of profiling a serial killer called Boston Strangler, who was brutally raping and murdering unmarried women. They concluded that Boston Strangler was in fact two men who lived alone, both schoolteachers, with one of them being homosexual. Unfortunately, the man who confessed to crimes was Albert DeSalvo, who worked alone and did not fit in within the profile created by the experts. DeSalvo was a heterosexual, married with children, and worked as a construction worker (Turvey, 2018).

Profiling regained importance as "stranger murders" became more common, leading law enforcement to embrace this technique again (van Aken, 2015). Stranger murders, also known as stranger killing or homicides refer to murders where there is no indication that the victim and the perpetrator knew each other previously (Zahn & Sagi, 1987) Because of the lack of obvious motives or connection between the victim and the killer, other investigative methods would be less effective. Therefore, criminal profiling was necessary to help law enforcement identify potential behavioral patterns and other traits of the unknown offender.

Despite this progress, profiling serial killers remains challenging due to the lack of a universally accepted profile. Law enforcement agencies and mental health professionals often have different views on the characteristics, motives, and behaviors of serial killers, making it difficult to form a single, clear definition. This lack of consensus complicates the prosecution of serial killers in court (van Aken, 2015).

To address these challenges, researchers like Donald I. Promish and David Lester (1999) introduced a new profiling tool in 1999 aimed at improving investigations. They tested a method that links the appearance and behavior of serial killers to specific "signatures" found on their victims' bodies. By analyzing data from 27 serial killers and classifying them into two types—those with a clean-cut appearance and polite demeanor (Type 1) versus those who did not fit this description (Type 2)—they aimed to refine investigative focus.

The tool's effectiveness was measured using Bayesian probability to estimate how well a killer's appearance and demeanor matched their postmortem signatures. The results showed that for Type 1 killers, the tool predicted the type correctly in four out of eight cases and had high accuracy for well-known killers like De Salvo and Bundy. For Type 2 killers, the tool classified 15 out of 19 with a 10% accuracy margin (Promish & Lester, 1999). The findings suggest that this profiling method could help distinguish between types of serial killers, though it may need further refinement, especially for the Type 1 category which showed a clear pattern in their unique signatures (Promish & Lester, 1999). Overall, while the preliminary results are promising, continued research with larger samples is needed to enhance the tool's effectiveness and offer more definitive insights into serial killer profiling. Profiling methods have their limitations and flaws, and while efforts to improve these techniques are important, they are not the primary focus of this thesis, therefore, they won't be discussed further.

2.2. Understanding Offender Patterns

Profiling serial killers has traditionally focused on a generic "profile" often characterized by middle-aged White males who blend easily into society (van Aken, 2015). However, research shows that serial killers are far more diverse and do not fit neatly into this narrow stereotype. Additionally, many people assume that serial killers suffer from severe mental health disorders, but studies indicate that the majority do not have such serious psychological issues (van Aken, 2015). Most serial killers are fully functioning individuals without any apparent social or psychological disorders, as illustrated by Dennis Rader, the BTK killer, who lived a seemingly normal life while committing his crimes. Rader was a married man who also had two children. What is probably even more bizarre is the fact that he was a Boy Scout leader and a leader in his local church congregation, all while committing horrifying crimes (van Aken, 2015).

Van Aken (2015) also notes that much research regarding serial killers has mainly focused on male serial killers, but women can also be serial killers, even though they make up a smaller portion. The motivations for female serial killers are thought to be different from those of males, and researchers have identified five main types: black widows, who kill family members for financial gain; angels of death, who kill people under their care to gain attention; sexual predators, who commit murders for sexual reasons; revenge killers, who kill out of hatred or jealousy; and those who kill for profit (van Aken, 2015). Another set of categories suggests that female serial killers can also be visionary killers, who act on delusions; comfort-oriented killers, who seek financial gain; power-seeking killers, who enjoy controlling their victims;

hedonistic killers, who kill for sexual pleasure; and disciple killers, who kill under the influence of a leader, such as in a cult (van Aken, 2015). These different types show that female serial killers have varied and complex motivations, just like their male counterparts.

In 2015, Elizabeth A. Gurian published her research on serial killers that looked at 508 cases involving three types of killers: solo male, solo female, and partnered serial killers. Out of these cases, 340 involved solo male killers, 71 involved solo female killers, and 97 involved partnered killers, which includes mixed-sex pairs as well as male/male and female/female pairs. The study found that solo male serial killers tend to target a wide range of victims, mostly female strangers, and use multiple methods to kill, often moving between different locations (Gurian, 2015). Solo female killers, on the other hand, usually target people they know, like family members or acquaintances, often for financial gain, and they mostly use one method, such as poisoning. Partnered serial killers are more likely to target adults and teens, often strangers, and have similar patterns of movement to solo male killers, but they move around less often (Gurian, 2015). The study also found that solo male and partnered killers usually commit their murders within two years, while solo female killers tend to kill over a longer period. When it comes to legal outcomes, many solo female killers and partnered killers plead guilty or make plea deals, while a significant number of male serial killers confess to their crimes (Gurian, 2015).

From Gurian's research, it is evident that serial killers can have different patterns of behavior and different ways of being treated by the legal system based on their gender and whether they act alone or with a partner. These differences are important because they reveal the diverse nature of these offenders as well as the importance of understanding the various factors, such as environmental, biological, and psychological, that contribute to their development.

2.3.Profiling Youth Serial Killers

Profiling youth serial killers presents unique challenges due to the limited understanding and rarity of this phenomenon, further complicated by media sensationalism that often surrounds these cases (García-Baamonde et al., 2022). Unlike adult serial killers, the profiling of youths who commit serial murders requires a deeper exploration of their psychological and criminological profiles, which can differ significantly from those of adult offenders.

Studies suggest that many young serial killers come from troubled backgrounds, often characterized by dysfunctional family relationships, abuse, neglect, and exposure to violence

(García-Baamonde et al., 2022). These early experiences can lead to feelings of rejection, hostility, and an abnormal fascination with violence and control. As a result, many youth serial killers exhibit behaviors such as animal cruelty, arson, and escalating violence, which can culminate in homicide (García-Baamonde et al., 2022). Research into youth serial killers also reveals that their motivations and methods are distinct. While some young killers exhibit sexually motivated behavior that reflects an abnormal erotic interest, others may be driven by peer pressure or situational factors that lead to violent acts (García-Baamonde et al., 2022).

The American psychiatrist Wade C. Myers (2004) highlights the role of psychological and social influences, noting that many of these young offenders lack a clear understanding of the boundaries between pleasure and pain, which may contribute to their violent actions (Myers, 2004). Additionally, the cases of youth serial killers (similarly to adult ones) often do not align with the traditional image of a murderer, as these individuals can appear somewhat normal and socially integrated, making their crimes more shocking and difficult to predict (García-Baamonde et al., 2022).

The analysis of youth serial killers suggests that their development into violent offenders is influenced by a combination of biological, psychological, and environmental factors. For instance, exposure to violence, sexual abuse, and other forms of maltreatment in childhood can significantly increase the likelihood of future violent behavior (García-Baamonde et al., 2022). However, some studies, such as those by Mitchell and Aamodt (2005), challenge the assumption that all serial killers have experienced severe childhood neglect or abuse, suggesting that there may be other factors at play, such as innate predispositions or learned behaviors (Mitchell & Aamodt, 2005). Due to the limited number of cases and the complex interplay of these factors, further research is needed to fully understand the development and motivations of youth serial killers (García-Baamonde et al., 2022).

Understanding the different patterns and characteristics of serial killers, as shown in the research by Elizabeth A. Gurian and García-Baamonde and others, provides valuable insights into their behavioral patterns, methods, and motivations. By examining these profiles, investigators aim to uncover the psychological and environmental factors that contribute to such violent behavior. One psychological trait that frequently surfaces in discussions of serial killers is psychopathy. Profilers often look for signs of psychopathic tendencies, such as lack of empathy, shallow emotions, and manipulative behaviors, as these traits are believed to influence how and why certain individuals commit repeated murders. Serial killers exhibit a

range of behaviors, and the assumption that they are all psychopaths plays a significant role in how we interpret their actions. Research into solo male, solo female, and partnered serial killers reveals that their choices of victims, their methods, and how they navigate their crimes are shaped by various factors. But is psychopathy one of these key factors, or are these behaviors the result of different influences? In the next section, we will explore whether psychopathy alone can explain the actions of serial killers or if a combination of other biological, psychological, and environmental factors plays a more significant role in shaping their behavior.

3. Serial Killers and Psychopathy

Before we analyze the environmental and genetic influences on the development of serial killers, we need to address the important question: Are serial killers psychopaths? This question is at the core of much of the debate about why serial killers behave the way they do. There seems to be a common opinion that serial killers are psychopaths, and this assumption often supports the argument that their violent tendencies are primarily rooted in genetics, insofar as psychopathy may have a genetic underpinning. Understanding whether serial killers are inherently psychopaths is important because it shapes how we think about their behavior. If we can clarify the role of psychopathy in their development, we can better understand how much of their behavior is influenced by certain personality and behavioral traits or other mental health conditions. By making this distinction, we can more accurately evaluate what causes someone to become a serial killer.

Psychopathy, often discussed in connection with violent crimes, is a concept grounded in a combination of affective, interpersonal, and behavioral characteristics. These traits, which include a lack of empathy, superficial charm, and a tendency for manipulative and deceitful behavior, have long been associated with violent offenders, particularly serial killers (Kumkaria and Tiwari, 2024). Psychopathy is also defined by emotional deficits such as a lack of remorse and responsibility for one's actions (Brzović et al., 2016; Brzović et al., 2017). These individuals display arrogance, a pathological tendency to lie, and a superficial charm that can mask their deviant tendencies. Their behavioral patterns also include impulsivity, a parasitic lifestyle, and a marked inability or unwillingness to adhere to societal norms. Psychopaths are not necessarily outsiders to society; rather, their manipulative and charming nature often allows them to blend in, which can make them difficult to detect (Poslon, 2021).

Hervey M. Cleckley, an American psychiatrist, laid the groundwork for our understanding of psychopathy in 1941 by establishing sixteen diagnostic criteria for creating a clinical profile of a psychopath. In his influential text, *The Mask of Sanity*, he described psychopathic individuals as being rational, socially adept, and often highly intelligent. Cleckley's clinical profile of psychopathy remains highly influential today, particularly in forensic psychology. These criteria include superficial charm, egocentricity, and shallow emotions. These traits are not seen only in serial killers but in many high-functioning individuals who may never commit a crime. Cleckley noted that psychopaths could imitate normal psychological functionality so

convincingly that they often appeared completely healthy on the surface. This ability to mask their emotional deficits with a facade of intelligence and charm makes them particularly dangerous, especially when combined with a lack of remorse, manipulation, and self-centeredness (Poslon, 2021).

While psychopathy is often linked to extreme forms of violence, it is important to recognize that not all serial killers fit neatly into this profile. This brings us to an important point: the relationship between psychopathy and serial murder is not always as straightforward as it seems. There is a need to look deeper into the development of psychopathy itself. On one hand, genetic factors may predispose an individual to psychopathic traits, such as a lack of empathy or manipulativeness. However, early life experiences, trauma, and social environments also play significant roles in shaping how these traits develop and manifest. While some serial killers may exhibit pronounced psychopathic traits and engage in extreme forms of violence, this is not the case for all murderers. Many individuals who commit murder do so in response to specific situations or intense emotions, rather than from a psychopathic predisposition. But is psychopathy one of these key factors, or are these behaviors the result of different influences? In the next section, we will explore whether psychopathy alone can explain the actions of serial killers, or if a combination of other biological, psychological, and environmental factors plays a more significant role in shaping their behavior.

3.1. The Distinction between Psychopathy and Antisocial Personality Disorder

While psychopathy is not a formal diagnosis in the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5), it is often considered a subset of Antisocial Personality Disorder (ASPD). ASPD is marked by a pervasive pattern of disregard for the rights of others, impulsivity, deceit, and a lack of remorse, starting from early childhood or adolescence. This overlap in traits between ASPD and psychopathy, as pointed out by Jakšić and Čuržik (2012), can sometimes make it difficult to distinguish between the two disorders. However, while ASPD includes a broad range of antisocial behaviors, psychopathy is considered a more severe and specific manifestation, marked by its emotional and interpersonal deficits such as lack of remorse and shallowness of emotions, which are less pronounced in ASPD (Polson, 2016). This distinction is critical, as not all individuals with ASPD are psychopaths, though all psychopaths typically meet the criteria for ASPD. In 2010, Professor Jeremy Coid and Dr Simone Ullrich interviewed 496 prisoners. Using two tools called the DSM-IV and PCL-R, they found that 44.9% of the prisoners were diagnosed with antisocial personality disorder, and

within that group, 31.8% were considered psychopaths. They also concluded that people who meet both criteria of having both antisocial personality disorder and psychopathy are more likely to exhibit violent behavior compared to those who only have antisocial personality disorder (Coid and Ullrich, 2010).

While antisocial ASPD is diagnosed using the DSM-5 criteria, which requires the person to be at least 18 years old and to have shown signs of conduct disorder (such as repetitive rule-breaking or violating others' rights) before the age of 15, psychopathy is measured differently. There are many constructs used for measuring psychopathy, but one of the most relevant ones is Robert Hare's Psychopathy Checklist-Revised (PCL-R), which has become essential in understanding the link between psychopathy and violent criminal behavior. The PCL-R is a tool that consists of twenty behavioral items of personality traits and behaviors such as superficial charm, egocentricity, deception, lack of remorse, etc., with scores ranging from 0 to 40. Each item is scored from 0 to 2, and the total score ranges from 0 to 40. The diagnosis of psychopathy is based on the total score, with a threshold of 25 points or higher in Europe, and 30 points or higher in the U.S. The tool is widely used in forensic settings to assess the possibility of recidivism and the potential for future violent behavior (Polson, 2016).

While ASPD focuses on the persistent disregard for societal norms and the rights of others, the PCL-R assesses both interpersonal/emotional traits (like lack of empathy) and impulsive/antisocial behaviors, giving a broader view of psychopathic tendencies. Notably, many infamous serial killers, such as Ted Bundy and Paul Bernardo, have scored extremely high on the PCL-R, with Bundy scoring 39 out of 40 and Bernardo scoring 35 (Melko and Topčagić, 2021). This high correlation between psychopathy and serial killers reinforces the perception that psychopathy is a key factor in the development of violent behaviors.

The PCL-R was initially developed and used primarily to assess psychopathic traits within prison and forensic settings. However, because of its demonstrated validity and reliability in these environments, many began to equate the PCL-R with psychopathy itself, which is a problematic interpretation since the PCL-R is merely a tool to measure psychopathy, not its definition. Psychopathy can be assessed with different instruments, and while the PCL-R is effective in detecting psychopathy in forensic institutions, its predictive accuracy for future violent behavior is questionable (Larsen Rosenberg, Jalava, & Griffiths 2020). Although the PCL-R measures psychopathy as a personality trait, its precision in predicting future behaviors

remains debatable. Some research suggests that while it provides reasonable predictions, it is not necessarily better than other instruments.

In 2010, researchers Min Yang, Stephen C. P. Wong, and Jeremy Coid analyzed nine commonly used tools for predicting violence and compared how well they worked. They gathered data from 28 studies published between 1999 and 2008. These studies tested how accurate the tools were at predicting violence, and the researchers then compared the results to see which tools were more effective. The analysis has shown that, compared to other prominent risk assessment methods, the PCL-R often ranks lower in effectiveness for predicting recidivism. Although its overall effectiveness is comparable to other methods, tools like the OGRS (Offender Group Reconviction Scale) and HCR-20 (Historical, Clinical, Risk Management) showed better accuracy in predicting future violence, especially in men. Furthermore, when compared to other tools like the VRAG and LSI-R, the PCL-R performed similarly, showing that while it's a valid tool, it doesn't stand out as the best. The study also noted that some tools perform better for men than women due to their design around male offenders (Yang et al., 2010). A key problem with the PCL-R stems from the lack of diversity in the samples used to develop it. The research by Cleckley and Hare, which formed the basis of the checklist, was largely focused on men, either in the military or in prison. This makes the test useful for assessing male inmates, but it may not be as reliable for wider forensic use, especially for other populations, since the checklist has not been significantly adjusted to reflect broader use.

The PCL-R is divided into two factors, with Factor 1 reflecting core affective and interpersonal deficits of psychopathy (such as lack of empathy and superficial charm), and Factor 2 representing a chronic pattern of antisocial behavior and poor impulse control (such as impulsivity and criminal history). Detailed analysis of the test's structure shows that Factor 2, which measures antisocial behavior and lifestyle, is the key element in predicting future behavior (Larsen Rosenberg, Jalava, & Griffiths, 2020). Diagnoses of ASPD tend to correlate more strongly with Factor 2 than Factor 1. This suggests that while both factors are essential to identifying psychopathy, the PCL-R's ability to predict violence mainly stems from Factor 2, which reflects antisocial behavior, rather than Factor 1 (Zolondek et al., 2015). .

3.2. Biological Underpinnings of Psychopathy

Even though this view has recently come under increasing scrutiny, psychopathy has been traditionally framed as a brain disorder rooted in biological abnormalities (Glenn and Raine,

2014). Research has shown that specific areas of the brain, especially those involved in emotional processing, decision-making, and social behavior, tend to function differently in psychopathic individuals, which might explain many of their behavioral characteristics. One important area is the amygdala, a region of the brain responsible for processing emotional information, particularly related to fear and threat (AbuHasan et al., 2023). In both humans and animals, the amygdala plays a crucial role in recognizing emotions like fear, and this process helps people navigate social interactions and understand emotional cues from others. In psychopaths, however, the amygdala appears to function abnormally, both structurally and functionally. This could lead to a diminished ability to recognize fear or distress in others and may contribute to their lack of empathy and failure to emotionally connect with others (Brzović et al., 2017).

Another set of brain regions is the prefrontal cortex, specifically the ventromedial prefrontal cortex and the orbitofrontal cortex. These regions are deeply involved in decision-making, regulating emotions, and evaluating the consequences of one's actions. Studies suggest that psychopaths have deficits in these areas, leading to impaired ability to integrate emotional information into decision-making processes. This could explain why psychopaths often engage in risky or antisocial behavior without concern for its consequences: because their brains may not be properly weighing the emotional or social impact of their decisions. Their lack of emotional regulation, combined with impulsivity, often results in behaviors that are harmful both to themselves and others (Brzović et al., 2017).

A particularly interesting aspect is the interconnection between the amygdala and the prefrontal cortex. Some researchers like Motzkin, Newman, Kiehl, and Koegins (2011) claim that there is reduced functional connectivity between these two regions in psychopathic individuals (Brzović et al., 2016). This weak connection can explain why they struggle to regulate their emotions and maintain appropriate social behavior. Normally, the prefrontal cortex would help temper emotional responses from the amygdala, leading to more controlled and socially appropriate actions. Without this regulation, psychopaths may act impulsively, without the usual emotional restraint or consideration for social norms.

Abnormalities in other brain areas such as the temporal lobe, paralimbic structures, and cingulate cortex, which are involved in processing sensory information and regulating emotional responses could further disrupt the ability of psychopaths to respond to emotions in typical ways. Additionally, the insula and fronto-insular regions, which contain specialized

neurons called von Economo neurons, are thought to be involved in the development of social cognition. These neurons are important for understanding social cues and emotions in others, so dysfunction here may further explain the social and emotional deficits observed in psychopaths (Brzović et al., 2016; Brzović et al., 2017). Furthermore, while they can feel certain emotions like sadness and surprise, their sense of happiness is weaker, and they are more prone to anger.

One of the most well-known traits of psychopathy is the lack of fear, though this is debated (Hoppenbrouwers, Bulten, & Brazil, 2016). Some studies suggest psychopaths don't feel fear as others do, but others propose that they might experience it in a reduced or different way. This emotional numbness, especially their inability to feel empathy or guilt, plays a major role in the actions of serial killers, who can commit horrific crimes without feeling disturbed. Polson mentions studies by Blair and others that found that psychopaths have a lower physical reaction to upsetting images, like pictures of crying adults, showing a deep lack of empathy. This absence of empathy, paired with their skill in pretending to have normal emotions when it benefits them, helps psychopaths manipulate others easily, adding to their dangerous nature (Polson, 2016).

However, focusing solely on the biological underpinnings of psychopathy risks oversimplifying a more complex condition. Viewing psychopathy as purely a brain disorder ignores the substantial role that environmental factors, such as childhood abuse, neglect, or trauma, can play in shaping these traits. Childhood maltreatment, for example, has been strongly linked to the development of antisocial behaviors later in life, including those that overlap with psychopathy. Additionally, the experiences of marginalized or socially disadvantaged individuals may predispose them to behaviors that are pathologized as psychopathic without taking into account the broader social and environmental contexts. All of this will be discussed in the following subsection.

3.3. Social Correlates of Psychopathy

As previously mentioned, viewing psychopathy purely through a biological lens has faced much criticism, as many think that it is important to consider the significant impact that environmental influences have on its development. While biological factors undoubtedly play a role, early life experiences, and environmental conditions are equally important in shaping psychopathic traits. Robert Hare (1970) focused on the role of biological factors in psychopathy but also acknowledged the impact of environmental influences. He noted that factors like

having psychopathic or antisocial parents, parental substance abuse, inconsistent discipline, and separation from a parent could, when combined with genetic predispositions, contribute to the development of psychopathy (Farrington et al, 2010).

Research has also shown a strong connection between childhood abuse or neglect and later criminal behavior. In 1989, Cathy Spatz Widom conducted a study in Indianapolis that tracked more than 900 children who had suffered abuse or neglect before the age of 11, using court records to gather data. Her findings showed that these children were more likely to be arrested as both juveniles and adults, particularly for violent crimes, when compared to a control group. In addition, Widom and her team found that childhood abuse predicted antisocial personality disorder in adulthood and higher scores on the Psychopathy Checklist[2] (PCL-R) across both genders and races (Farrington et al, 2010). Other research supports these results. In 1993, Malinosky-Rummell and Hansen reviewed evidence that childhood physical abuse predicts violent and nonviolent offenses later in life. For example, the Cambridge-Somerville study found that around half of the boys who had experienced abuse or neglect faced serious problems as adults, including criminal behavior, alcoholism, and mental health issues. Similar studies from Germany, Canada, and other countries also found that early abuse was linked to higher PCL scores in adulthood.

Parental separation, especially the absence of a father, is another factor linked to an increased risk of offending. Farrington and others (2010) also referred to the studies conducted by Joan McCord in Boston in 1983 and Israel Kolvin's conducted in Newcastle in 1998 showed that children from broken homes, particularly those without affectionate mothers, had higher rates of criminal convictions. However, a supportive mother could sometimes reduce the negative effects of family breakdown. Meta-analyses, like the one conducted by Wells and Rankin, found that family breakdowns due to separation or divorce were more strongly linked to delinquency than those caused by a parent's death (Farrington et al, 2010). Research

[2] While the Psychopathy Checklist-Revised (PCL-R) is frequently employed in studies to measure psychopathic traits, including in Widom's research, it is important to acknowledge its limitations, which were also discussed in the previous sections. Despite its popularity, the PCL-R has been criticized for being overly focused on criminal behaviors and failing to capture the full complexity of psychopathy. Its reliance on subjective interpretations of certain behaviors can also lead to inconsistent assessments across different populations and contexts. Therefore, while the PCL-R has been valuable in identifying correlations between early abuse and adult psychopathy, its findings should be interpreted with caution, especially in clinical or forensic settings.

consistently shows that parental conflict, family violence, and instability play a role in the development of antisocial behaviors, including psychopathy.

After providing this broad overview of the construct of psychopathy and its biological, social, and behavioral underpinnings, the next subsection will examine in more detail whether people who become serial killers necessarily manifest psychopathic personalities.

3.3. The Relationship between Psychopathy and Serial Killing

While psychopathy, as measured by tools like the PCL-R, is often associated with violent behavior, it does not account for every case. Many infamous serial killers, such as Ted Bundy, have scored high on the PCL-R, reinforcing the idea that psychopathy plays a key role in their development. However, there are significant indications that the connection between psychopathy and violence is not straightforward. Some psychopathic traits, particularly those related to criminal tendencies and antisocial behavior, are more predictive of violent actions than core psychopathic traits like lack of empathy. This suggests that while psychopathy is a significant factor, it is not the only element that contributes to serial killing behaviors. If an individual has previously demonstrated antisocial behavior, it is likely that they will continue this behavior in the future, regardless of their psychopathy score. Therefore, the predictive power of the PCL-R may derive more from measuring past antisocial behavior than from assessing underlying psychopathic traits (Larsen Rosenberg, Jalava, & Griffiths, 2020).

This aligns with findings from studies such as those conducted by Eric W. Hickey (2013). In his book titled *Serial Murderers and Their Victims*, Hickey indicates that while a significant proportion of serial killers exhibit psychopathic traits, such as lack of empathy and manipulativeness, not all serial killers fit the full profile of psychopathy. In other words, while psychopathy is a common trait among serial killers, it is not the only factor. Similarly, Fox and DeLisi (2019) argue that although psychopathy is linked to extreme violence such as serial murder, its exact role remains unclear, further questioning the ability of tools like the PCL-R to predict violence based solely on psychopathic traits. Psychopathy is relatively rare, affecting only about 1% of the general population, yet it is disproportionately represented in prison populations, where individuals with psychopathic traits are more likely to be involved in serious and violent crimes, such as murder and assault. This overrepresentation in prisons is partly due to the tendency of psychopaths to engage in high-risk, impulsive behaviors that often result in legal consequences (Fox & DeLisi, 2019).

Recent research by Janko Međedović and Nikola Vujičić offers an intriguing twist on our understanding of psychopathy and its link to murder. Međedović and Vujičić conducted a study involving 247 male prisoners from two major penitentiaries in Serbia. They divided the prisoners into three groups: those who had committed murder, those who had committed violent crimes but not murder, and those who had committed non-violent crimes, like drug dealing. To understand the psychological traits of these men, the researchers gave them questionnaires to measure levels of psychopathy, sadism, and Machiavellianism. The study revealed some surprising findings. Murderers, contrary to what might be expected, actually had lower levels of psychopathy and sadism compared to the other two groups. They scored lower in traits like "lifestyle," which relates to how much they deviate from social norms, and "antisocial" behavior, which involves aggressive and harmful actions. Additionally, murderers in this study had a less extensive criminal history compared to those who committed other violent crimes (Međedović and Vujičić, 2022). This finding supports an observation that a significant number of individuals who commit multiple murders had no prior arrests before their crimes.

This finding complicates the widely accepted notion of the common belief that high psychopathy is a major driver of murder, especially when it comes to serial killers and premeditated crimes. Psychopaths are often depicted as cold-blooded and calculating individuals, capable of committing heinous crimes like serial murder without the emotional constraints that might deter others. Their lack of empathy, coupled with traits such as manipulativeness and a sense of superiority, can indeed facilitate the repeated killing of others while maintaining a facade of "normalcy." This profile aligns with the notion that psychopathy may predispose individuals to certain types of murder, particularly those that are intentional and involve strangers or acquaintances. However, the research by Međedović and Vujičić suggests that not all murders are committed by individuals with high levels of psychopathy or sadism. Instead, many murders are driven by emotions like rage or revenge, that do not necessarily require the extreme traits associated with psychopathy. Therefore, while psychopathy may be linked to specific types of murder, it does not account for all forms of homicidal behavior. The relationship between psychopathy and homicide is also frequently highlighted in popular culture. For instance, music like "No One is Innocent" by the Sex Pistols and "Mein Teil" by Rammstein, television shows such as *Mindhunter*, *You*, and *Dexter*, films featuring characters like Michael Myers in *Halloween* and Hannibal Lecter in *The Silence of*

the Lambs, as well as the true crime genre in literature all contribute to the portrayal of psychopathic, cold, calculating killers.

Moreover, despite the strong connection between psychopathy and violence, it is essential to recognize that not all individuals with psychopathy are violent, and not all violent individuals are psychopaths. The concept of the "successful psychopath," as discussed by Sokić and Lukač (2018), highlights that many individuals with psychopathic traits can thrive in non-criminal settings, particularly in business and leadership roles, where their manipulative and callous tendencies may be advantageous. These individuals may never engage in violent behavior, but their actions can still be harmful to others in more subtle ways, such as through unethical decision-making or emotional manipulation. This notion complicates the simplistic association between psychopathy and serial killers, demonstrating that psychopathy is a multifaceted condition with diverse manifestations. Understanding the complexity of psychopathy and its many different manifestations challenges the assumption that all serial killers fit the psychopathic profile. While many serial killers exhibit psychopathic traits, the existence of "successful psychopaths" illustrates that psychopathy alone does not account for the extreme behaviors seen in these individuals.

This brings us to the broader question of what factors contribute to the making of a serial killer. Are these individuals born predisposed to violence, or are they shaped by their environment? To explore this, we must examine the etiology of serial killers through the lens of the nature vs. nurture debate, considering both genetic influences and environmental factors such as trauma, upbringing, and social conditions.

4. Nature vs. Nurture: Understanding the Origins of Serial Killers

The nature vs nurture debate has long been a central issue in understanding human behavior, with roots extending back to ancient philosophy and continuing through modern scientific inquiry. At its core, this debate questions whether heredity (nature) or environment (nurture)

plays a greater role in shaping who we are. For centuries, people have sought to understand why individuals act the way they do, and this search has given rise to numerous theories (both physiological and sociological) that attempt to explain human behavior. However, these explanations have not always aligned, often placing genetics and environment in opposition to one another. The nurture argument was famously championed by John Locke in the seventeenth century, who introduced the concept of the human mind as a "blank slate" (tabula rasa) at birth. He believed that individuals are shaped by their experiences and learning, with their development being a direct result of their environment. In contrast, Jean Jacques Rousseau took the nature side of the argument, claiming that development follows a natural path determined by innate factors, requiring only minimal guidance. These opposing views have persisted and evolved, forming the foundation of the modern debate between environmental influences and genetic predispositions in shaping human behavior.

However, recent research has brought to light the complex interplay between nature and nurture, rather than viewing them as isolated factors. In their article in 2017, Joni Y. Sasaki and Heejung S. Kim discussed the recent research on the interaction between environmental factors and biology regarding human behavior. Studies on gene-environment interactions (G × E) suggest that traits and behaviors are often the result of both genetic and environmental influences working together. For example, research by Caspi and colleagues found that individuals with a certain genetic predisposition (two short alleles of the serotonin transporter gene, 5-HTTLPR) were more likely to develop depression when exposed to stressful life events, whereas individuals with other genetic variations showed less vulnerability under the same conditions. This highlights the idea that the same environment can lead to different outcomes depending on one's genetic makeup, and vice versa. Further, epigenetic research has demonstrated that environmental experiences can actually alter gene expression, influencing behavior in profound ways. Studies in both animals and humans, such as those examining maternal care in rats or the impact of childhood trauma in humans, show that early-life experiences can lead to changes in DNA methylation, which in turn affects behavior and psychological outcomes (Sasaki and Kim, 2017). These findings reveal that nature and nurture do not simply add up to determine behavior, but rather interact dynamically throughout an individual's life.

This understanding of gene-environment interaction introduces the possibility that the development of extreme behaviors, such as those seen in serial killers, could be the result of a

combination of genetic predispositions and environmental factors. In this chapter, we will explore this interaction in the context of serial killer development, analyzing how genetic and environmental influences together may contribute to their violent tendencies. By examining both sides, we aim to gain a deeper understanding of what drives individuals to commit such extreme acts, while also highlighting that the answer may lie in the complex interaction between nature and nurture.

4.1. The Role of Nature

4.1.1. Sexual Sadism

In exploring the role of nature in serial killer development, particularly in the context of serial sexual homicide, the work of Myers and colleagues (2006) provides critical insight into the innate psychological and biological forces that may drive these violent behaviors. Their research explores the motivations behind serial sexual homicide, emphasizing the role of sexual sadism and its deep-rooted connection to aggressive and violent behavior. The findings present a compelling case for how certain individuals may be biologically predisposed to derive pleasure from cruelty, a tendency that is central to understanding the nature-driven aspects of serial killing.

Myers et al. (2006) argue that sexual sadism is a common factor among many serial sexual killers. This type of behavior is characterized by the experience of sexual pleasure, often heightened by acts of cruelty and violence against others. The historical definition of sadism, introduced by Krafft-Ebing over a century ago, still holds relevance in the modern understanding of sexual sadism as defined in the DSM-IV-TR. Krafft-Ebing defined sadism as the experience of sexual pleasure, including orgasm, derived from acts of cruelty, humiliation, and physical harm inflicted on others (Myers et al. 2006). Myers et al. highlight that this core idea remains unchanged, emphasizing that the cruelty and suffering inflicted on victims are often the central elements that fuel the sexual excitement in sadistic individuals. The authors further suggest that this innate predisposition toward cruelty for sexual gratification may be part of a broader spectrum of aggressive behaviors. In many animal species, including humans, aggression is often part of mating behavior, which may point to an evolutionary basis for this kind of violence. For instance, male chimpanzees are known to use force to secure mating opportunities, demonstrating how aggression can be a biologically driven behavior tied to reproduction. In humans, this aggression may manifest as sadistic tendencies, particularly in

men who find sexual excitement in dominating or harming others (Myers et al. 2006). Studies by Eve and Renslow found that a notable percentage of men (16%) reported sexual arousal from fantasies involving the infliction of pain. This suggests that sadistic inclinations may be more widespread than typically assumed and may reflect an evolutionary drive for dominance and control, especially in mating contexts.

The researchers also point to studies indicating that men with higher levels of sexual aggression are more likely to view distressed females as sexually attractive. Heilbrun and Loftus, as cited in Myers et al. (2006), found that men with higher antisocial tendencies and aggressive behaviors responded with greater sexual stimulation when viewing images of disturbed females. These findings suggest that individuals with certain antisocial traits, which are known to have a strong genetic component, may be biologically inclined to link violence with sexual gratification. This connection between aggression, antisocial traits, and sexual pleasure reinforces the idea that some serial sexual killers may be inherently predisposed to sadistic violence due to their psychological makeup. Moreover, Myers et al. (2006) discuss the broader spectrum of sexual sadism, noting that while only a minority of men exhibit extreme sadistic tendencies, the underlying interest in sexual domination may be present in many individuals to varying degrees. For instance, research on the content of sexually explicit magazines has consistently shown that a small but significant percentage of men are drawn to sadomasochistic themes. Myers et al. (2006) argue that these findings suggest that sadistic interests might represent one end of a continuum of sexual aggression, with serial sexual killers occupying the extreme end of this spectrum. These individuals take the same aggressive impulses that may exist in more moderate forms in the general population and amplify them into acts of stalking, torturing, and murdering their victims. This escalation of violence could be the result of biological drives pushing for increasingly intense stimuli to achieve sexual satisfaction.

Another key element in the nature argument presented by Myers et al. (2006) is the neurobiological component of thrill-seeking and pleasure associated with violence. Many serial sexual killers report experiencing excitement and pleasure, not only from the act of killing but also from the process of stalking and dominating their victims. This suggests that their brains may be wired to process violence and cruelty differently from the average person. The pleasure they derive from these acts could be linked to abnormal dopamine regulation or other neurotransmitter imbalances that heighten the sense of reward from violent behavior (Myers et al. 2006). Over time, this thrill-seeking behavior may evolve into a compulsive need to kill, as

the killers find that only through continued violence can they satisfy their urges. This insatiable desire for the thrill of the kill is consistent with the pattern of escalation observed in many serial killers, who often commit more violent and sadistic acts as their crimes progress. The authors further illustrate this point by drawing on historical case studies of well-known serial sexual killers. Figures such as Gilles de Rais, Vincenzo Verzeni, and Peter Kurten all provide striking examples of how sexual sadism manifests in extreme forms. These killers reported intense sexual pleasure from their acts of cruelty, describing feelings of exhilaration and satisfaction that aligned closely with the definitions of sadism explored earlier. For example, Verzeni spoke of the "unspeakable delight" he experienced while strangling women and Kurten confessed to reaching orgasm while stabbing his victims repeatedly. These cases exemplify how, for some individuals, sexual arousal and violence are inextricably linked, reinforcing the argument that biological predispositions may play a significant role in the development of these behaviors.

Myers et al. (2006) suggest that while environmental factors can certainly contribute to the development of violent tendencies, the core of sexual sadism and the drive to kill for pleasure may be rooted in biological and neuropsychological factors. The natural craving for sexual satisfaction, coupled with aggressive and antisocial traits, may push certain individuals to the extreme end of the violence spectrum, where only murder can fulfill their desire for domination and control. This view aligns with the broader understanding of serial sexual killers as individuals who are driven by powerful, innate forces that compel them to commit acts of unspeakable cruelty.

4.1.2. Brain Damage

Brain and head injuries, often caused by falls, assaults, car accidents, and other accidents, can have profound and lasting effects on a person's mental and emotional well-being. When these injuries occur, especially to the developing brains of children, they can result in permanent damage that shapes personality, emotions, and behavior. In the context of serial killer development, traumatic brain injuries (TBI) and acquired brain damage are significant factors to consider, as they can lead to emotional instability, impulse control problems, and aggressive tendencies.

Studies by John F. Kraus et al. (1984) and Emanuelson & Wendt (1997) highlight how brain damage can result in long-term emotional and behavioral changes. Kraus's research on residents of San Diego found that individuals who sustained head injuries often experienced complications like cognitive and sensory deficits, leading to emotional instability. Similarly,

Emanuelson & Wendt's work with children in Sweden revealed that traumatic brain injuries in childhood could result in lifelong impairments, altering a person's emotional control and decision-making abilities. This is particularly important, as the brain's healing process after injury can lead to the formation of new neural connections that may not function as effectively as the original pathways, causing abnormal behavior or personality shifts (Morczkowski, 2023). Furthermore, in her work, Kennedy O'Hara highlights that many studies have focused on the relationship between TBI and criminality, revealing significant findings. One study conducted on offenders in a county jail showed that 87% of the subjects had experienced a TBI in their lifetime, with 36% having suffered a head injury within the past year. The recent head injuries were associated with higher levels of anger and aggression, alongside psychiatric issues and poorer cognitive performance (O'Hara, 2021). These figures suggest a much higher rate of brain injuries among criminal offenders than in the general population, emphasizing the need for both prevention and better support systems for those affected by TBI. Other research has similarly found that approximately 60% of offenders have sustained brain trauma, with 50% experiencing a loss of consciousness, indicating the severity of their injuries (O'Hara, 2021). These studies support the notion that head trauma, especially when severe, can significantly impact behavioral tendencies, leading to higher levels of aggression and criminality.

Interestingly, gender differences in the prevalence of TBI among offenders have been observed. Around 60% of the male population in prisons claimed that they have suffered some kind of brain injury, and these individuals typically entered the prison system at a younger age (around 16 years old) compared to those without a history of TBI. Additionally, offenders with a history of TBI had higher reoffending rates and spent more time in prison (O'Hara, 2021). Among the female population in prisons, studies showed that nearly 70% reported head injuries, with 55% indicating a loss of consciousness, suggesting that TBI is slightly more common in female offenders, potentially linked to abuse and mistreatment before their criminal activity (O'Hara, 2021). Juvenile offenders are also disproportionately affected by TBI, with studies showing that 65% of young male offenders whose age varies from 11 to 19, had sustained a head injury, with 46% experiencing a loss of consciousness. Those with multiple instances of TBI were more likely to have violent criminal convictions and additional offenses compared to those with a single head injury or no injury at all (O'Hara, 2021). These findings suggest that brain injuries during critical stages of development can lead to more violent behavior and repeated criminal activity.

In severe cases, traumatic brain injuries can result in neurological sequelae, a condition that affects the central nervous system and leads to emotional instability, seizures, and behavioral changes (Ronca et al., 2016). For serial killers, this emotional instability, combined with pre-existing genetic or environmental predispositions, could contribute to violent behavior. The frontal lobe, which is responsible for decision-making and impulse control, is often affected by head injuries, leading to increased aggression and poor judgment, traits commonly observed in serial killers. Moreover, children who suffer head trauma before their brains fully develop may experience long-lasting consequences that shape their future personalities. Brain injuries during childhood can disrupt crucial areas of the brain, such as those responsible for emotional regulation, spatial awareness, and sensory processing. As a result, these individuals may grow up with impairments that increase their risk of violent behavior, as seen in some serial killers.

The case of Richard Ramirez, infamously known as the "Night Stalker," is one of the most popular examples of how traumatic brain injuries can play a role in the development of violent behavior. Ramirez was responsible for a series of brutal murders, killing 13 people in just 13 months using a variety of brutal methods, including knives, guns, and physical assault. Throughout his life, he suffered multiple head injuries that likely contributed to his violent tendencies. At the age of two, a dresser fell on him, leaving him unconscious with a deep wound. When he was five, he suffered another head injury when a swing knocked him unconscious, leading to a head laceration. As a consequence of these injuries, Ramirez was diagnosed with temporal lobe epilepsy, a condition linked to altered sexual behavior, excessive aggression, and hyper-religious beliefs. These symptoms, alongside the neurological changes caused by his head trauma, may have significantly influenced his violent tendencies (Allely et al., 2014).

However, in addition to the physical trauma, Ramirez was exposed to intense psychological stressors, including an abusive great-grandfather and father, as well as witnessing his cousin murder a relative. These early experiences, combined with his neurological issues, likely played a role in shaping his antisocial behavior. Researchers also noted that Ramirez exhibited traits of autism spectrum disorder (ASD), such as social isolation and difficulty forming meaningful relationships, further contributing to his detachment from society (Allely et al., 2014). Ramirez's case illustrates the complex interaction between head trauma, psychological stress, and violent behavior, making him a key example in the study of how traumatic brain injuries may contribute to the development of serial killers. His actions, which included

stalking, breaking into homes, raping, and murdering his victims, show how these factors may have contributed to his transformation into one of America's most notorious serial killers.

While not all individuals who suffer brain injuries become violent offenders, the evidence suggests that brain damage and head trauma can play a significant role in shaping the behaviors of serial killers. The emotional instability, cognitive impairments, and aggression associated with these injuries make it more likely that individuals with traumatic brain injuries might struggle with impulse control, leading to violent actions later in life. However, while these factors are important to consider, it is crucial to recognize the interplay between genetic predispositions and environmental influences in the development of serial killers, as seen in the case of Richard Ramirez. Brain injuries may contribute to aggression and cognitive dysfunction, but these alone do not account for the full range of violent behavior seen in such individuals. Understanding this interplay is essential for gaining a comprehensive view of the factors that contribute to the making of a serial killer.

4.1.3. Warrior Gene (MAOA)

The MAOA gene, commonly referred to as the "warrior gene," has been linked to aggression and violent tendencies, playing a potentially significant role in the development of serial killers. This gene, located on the X chromosome, is crucial in regulating the levels of neurotransmitters such as dopamine, serotonin, norepinephrine, and epinephrine, which influence mood, impulse control, and aggression (McDermott, 2009). In individuals with a normal or higher-functioning MAOA gene, these neurotransmitters are broken down efficiently, helping to prevent excessive aggression and impulsive behaviors. However, a mutation or deficiency in this gene can lead to abnormally high levels of these chemicals, particularly dopamine, due to a slower turnover process. This chemical imbalance can result in increased irritability, impulsivity, and a heightened predisposition to violence. Low-functioning variants of the MAOA gene are more commonly found in males, as they inherit only one X chromosome, making them more vulnerable to the gene's effects. Research suggests that individuals with this genetic variation are more likely to exhibit hostile or aggressive behaviors, especially when exposed to environmental stressors such as childhood abuse or trauma. These genetic and environmental interactions may contribute to the development of violent tendencies that are often seen in serial killers (Morczkowski, 2023). Moreover, the MAOA gene has been increasingly used in legal defenses to argue for reduced responsibility in violent crimes. Since the 1990s, several criminal cases in both the United States and Italy have involved defendants claiming that a defective

MAOA gene contributed to their aggressive actions. In some instances, this defense has led to shortened sentences, as judges and juries have considered the genetic predisposition to violence as a mitigating factor (Hernandez et al., 2015).

While having a low-functioning MAOA gene does not guarantee violent behavior, it can be an important piece of the puzzle when combined with other factors such as trauma, stress, or head injuries. Several infamous serial killers have been suspected of having this genetic variant, which may have influenced their actions. For instance, Ted Bundy, despite coming from a seemingly stable family, exhibited disturbing behaviors from a young age, such as an early fascination with knives. When he was a teenager, he was suspected of crimes such as theft and voyeurism. As he became older, his crimes became more serious and he eventually committed his first murder at the age of 27. Since Bundy was not abused during his childhood nor did he suffer any head injury, scholars believed that his low-functioning MAOA gene might have contributed to his violent tendencies (Hernandez et al., 2015). However, although he didn't suffer child abuse, his family did have a secret that could potentially result in psychological trauma once revealed. At the age of 13, Bundy found out that his sister was actually his mother, and the person he thought was his mother was in fact his grandmother. Additionally, his aggression exploded after a breakup with his former girlfriend, suggesting a mix of genetic and environmental triggers. There is a possibility that Bundy was able to repress his dark side until he experienced some kind of an external stressor (Hernandez et al., 2015).

Jeffrey Dahmer, on the other hand, showed abnormal behaviors much earlier in life. His childhood was filled with disturbing actions toward animals, and he ultimately transitioned to killing human beings. Dahmer's psychological history and abusive upbringing are believed to have set the stage for his later crimes, with some experts suggesting that the presence of a low-functioning MAOA gene may have heightened his psychopathic tendencies, especially in the context of his violent childhood (Williams et al., 2009).

These examples demonstrate the possibility that a low-functioning variant of the MAOA gene could have contributed to their violent behavior. However, while the gene might have created biological predispositions to aggression, it was the combination of environmental stressors, and abusive family dynamics that likely triggered these tendencies causing them to act on their violent impulses. This shows that violent behavior often results from the interplay between genetic vulnerability and life experiences.

4.2. Nurture

As former FBI Supervisory Special Agent and profiler Jim Clemente once stated in 2019, "genetics loads the gun, personality and psychology aim it, and your experiences pull the trigger." (Clemente, 2019) This perspective emphasizes that while genetic predispositions might set the stage for violent behavior, it is the interplay of personality, psychology, and, most critically, life experiences that ultimately shape an individual's path. This chapter explores the nurture aspect of serial killer development, aiming to explain how environmental factors and personal experiences contribute to the development of serial killers.

When examining their early lives, it becomes apparent that many serial killers exhibited violent tendencies from a young age. Research has shown that a significant number of serial killers were involved in acts of violence during their childhood (Lewis et al., 1985). In particular, some had what could be described as extraordinarily violent childhoods. This raises important questions about the role of their early experiences: What environmental factors influenced their development? How did these experiences, combined with their genetic predispositions, lead to their eventual criminal behavior?

Through a detailed case study analysis of David Berkowitz, Aileen Wuornos, and John Wayne Gacy made by Joyce Lin, Jayarama Krishnan Bose, and Toulouse-Antonin Roy in 2024, this section investigates how their early life experiences and potential epigenetic changes may have influenced the development of severe mental disorders, ultimately guiding them toward becoming serial killers. By focusing on these case studies, we aim to clarify how nurturing factors shaped by personal trauma, environmental influences, and societal interactions play a pivotal role in the development of serial killers.

4.2.1. David Berkowitz, the Son of Sam

David Berkowitz, aka the Son of Sam, was an American serial killer responsible for a series of attacks that mainly targeted young couples in parked cars. Berkowitz claimed that a demon, which possessed his neighbor's dog, commanded him to commit the murders. He killed six people and injured others before being arrested on August 10, 1977. Police caught him after a witness reported seeing him near the scene of his last shooting and provided his car's license plate number. From a young age, Berkowitz experienced significant emotional and psychological stress living in an unstable and abusive home environment. His adoptive parents frequently argued, and reportedly his father subjected him to physical abuse. Throughout his

childhood, Berkowitz demonstrated troubling behaviors, such as setting fires and torturing animals, which are often early indicators of deep psychological disturbances. His bedwetting, which caused him great shame and embarrassment, was usually followed up with harsh punishment by his father (Lin, Bose, & Roy, 2024). This added to Berkowitz's sense of worthlessness and further diminished his self-esteem. These early experiences are important for understanding his later need to assert power over others, which is a common trait of many serial killers.

Berkowitz started exhibiting more serious violent behavior after his mother died, engaging in criminal activities such as theft and arson. Even before Berkowitz claimed to experience auditory hallucinations and delusions, after the death of his mother, his psychological issues deepened. He became convinced that a group of individuals was plotting against him, which escalated into paranoid thinking and, eventually, Berkowitz believing that a dog was instructing him to commit murders. His eventual killing spree, which spanned 1976-77, left six people dead and several others wounded. After he was arrested for his crimes, he was diagnosed with paranoid schizophrenia (Lin, Bose, & Roy, 2024). Paranoid schizophrenia is a form of schizophrenia marked by delusions (such as paranoid beliefs), and frequent auditory hallucinations. Symptoms include delusions of persecution, reference, and grandeur, along with disorganized speech, behavior, and negative symptoms like apathy and lack of emotion (American Psychiatric Association, 2013). Although his biological predisposition to paranoid schizophrenia undoubtedly played a role in his behavior, it is clear that his environment, particularly the abuse and emotional trauma he experienced as a child, was equally influential.

The combination of genetic vulnerability and childhood trauma played a significant role in shaping Berkowitz into a serial killer. Research into epigenetics, particularly the process of DNA methylation, suggests that childhood trauma can lead to changes in gene expression, which can contribute to the development of mental illnesses like schizophrenia (Mill & Petronis, 2008; Lin, Bose, & Roy, 2024). This is particularly relevant in Berkowitz’s case, as his troubled childhood may have triggered epigenetic changes that exacerbated his paranoid schizophrenia. Although no specific study has identified epigenetic changes in Berkowitz, research has shown that individuals with a history of childhood abuse often display altered gene expression, which can contribute to the development of severe mental health conditions (Mill & Petronis, 2008; Lin, Bose, & Roy, 2024). Berkowitz's case illustrates the complex interaction between nature and nurture. His biological predisposition toward mental illness

combined with his traumatic environment to create a perfect storm that ultimately led to his violent actions. Berkowitz's life shows that while biological factors, including mental illness, are crucial, they are often shaped and triggered by environmental conditions. It is the interplay between genetic vulnerability and environmental damage that most significantly contributed to Berkowitz's transformation into the notorious Son of Sam.

4.2.2. Aileen Carol Wuornos

Aileen Carol Wuornos was a female serial killer who murdered at least seven men in Florida between 1989 and 1990. After killing her victims, she would often rob them, and in some cases, she even mutilated their bodies and covered them with blankets or other materials. Wuornos was eventually arrested, convicted, and sentenced to death for her crimes.

Wuornos' childhood was marked by significant trauma. She was a child of teenage parents who divorced soon after she was born, and she never met her father. When she was four years old, she and her brother were abandoned by their mother and left in the custody of their grandparents. Wuornos later claimed that her grandfather was abusive and had even sexually assaulted her as a child (Lin, Bose, & Roy, 2024). During her teenage years, she spent a lot of time in juvenile detention centers and eventually dropped out of school. By the age of 11, she had begun using substances like cocaine, alcohol, and marijuana and at the age of 14, Wuornos turned to prostitution and entered a relationship with an older man who physically and sexually abused her. That same year, she became pregnant with a baby boy whom she birthed and gave up for adoption. Wuornos' difficult upbringing, history of abuse, and involvement in prostitution were likely contributing factors to her violent behavior and eventual crimes (Lin, Bose, & Roy, 2024). Studies indicate that experiencing childhood trauma and abuse can significantly affect an individual's psychological development, potentially raising the possibility of mental health problems and criminal behavior in adulthood (Felitti et al., 1998; Lin, Bose, & Roy, 2024).

Wuornos was diagnosed with borderline personality disorder (BPD), a mental health condition marked by unstable sense of self, turbulent relationships, and frequent mood swings (American Psychiatric Association, 2013). The DSM-5 outlines that BPD involves persistent instability in relationships and self-image, along with impulsivity and suicidal tendencies (American Psychiatric Association, 2013). In Wuornos' case, she was diagnosed with BPD due to her pattern of unstable relationships, impulsive actions, and intense emotional responses. Although research on the specific epigenetic changes associated with BPD is limited, some studies

indicate that childhood trauma may lead to alterations in gene expression, potentially contributing to the development of mental disorders such as BPD. A study conducted by Bertsch and colleagues (2018) found that childhood abuse was linked to changes in DNA methylation related to stress response and immune function in people with BPD (Bertsch et al. 2018). Another study in the Journal of Affective Disorders found differences in DNA methylation patterns related to serotonin signaling in individuals with BPD compared to healthy controls (Ziegler et al. 2016). Substance abuse is also common in individuals with BPD. One study found that up to 78% of people with BPD also have a substance use disorder (Leichsenring et al., 2011). The high prevalence of substance abuse among those with BPD further underscores the impact of childhood trauma, as individuals may use drugs or alcohol as a coping mechanism.

4.2.3. John Wayne Gacy, the Killer Clown

John Wayne Gacy, who was also called the "Killer Clown," was a serial killer who brutally murdered over 30 teenage boys and young men in the Chicago area during the 1970s. Gacy was infamous for his double persona; he was a successful businessman and community leader who also performed as a clown at events. He lured young men to his home with promises of drinks and drugs, then would handcuff them under the pretense of a "magic trick" before assaulting and killing them. His crimes gained significant media attention due to this shocking contrast between his public image and his brutal actions (Lin, Bose, & Roy, 2024).

When considering his actions, it is important to reflect on his extremely difficult childhood. His father was an alcoholic who often physically abused Gacy and his family. Gacy's father would hit him with a leather strap for the smallest mistakes and called him a "sissy" because he didn't conform to his father's expectations of how boys should behave. Gacy displayed behaviors and enjoyed activities traditionally seen as feminine, such as cooking and sewing, which made him a target of bullying and caused additional abuse from his father. At the age of nine, Gacy was sexually assaulted by a family friend but kept this trauma hidden, struggling with feelings of shame and humiliation. At 18, seeking to escape his difficult home life, Gacy dropped out of high school and left home. By this time, he had already begun engaging in criminal activities like stealing cars and breaking into buildings. His criminal behavior continued into adulthood as Gacy was convicted of multiple crimes. He attacked a man with a lead pipe, assaulted a teenage boy, and continued to engage in criminal activities, including sexually abusing minors. He was eventually arrested for the murders of 33 young men and

boys, with many of the victims buried in the crawl space beneath his home (Lin, Bose, & Roy, 2024).

Gacy’s abusive and traumatic childhood may have influenced his later criminal actions. He was diagnosed with antisocial personality disorder (ASPD), a condition marked by a pattern of behavior where a person constantly violates and disregards the rights of others. According to the DSM-5, the key signs of ASPD include a history of bad behavior starting before age 15, a lack of concern for safety, impulsiveness, lying, and no feeling of remorse for harmful actions (American Psychiatric Association, 2013). People with ASPD, like John Wayne Gacy, often lie, act impulsively, and don't feel guilt for their actions. Gacy showed many of these traits. He was manipulative and often lied to his family and coworkers. He also acted impulsively, engaging in risky behaviors like stealing cars and breaking into buildings when he was a teenager. As an adult, he continued to act recklessly, including through sexual misconduct (Lin, Bose, & Roy, 2024). His actions and behavior fit the pattern of someone with ASPD.

However, Gacy's exposure to physical and emotional abuse from his father, along with bullying and rejection from his peers, may have played a role in shaping his violent behavior and lack of empathy toward others. Lin, Bose, and Roy (2024) argue that his troubled relationship with his emotionally distant and abusive father might have also contributed to Gacy's attraction to young boys as he may have used control over these vulnerable victims to deal with his feelings of insecurity. While the precise causes of antisocial personality disorder (ASPD) remain unclear, they are possibly a result of a combination of genetic, environmental, and epigenetic factors. In John Wayne Gacy's case, his childhood abuse and neglect combined with potential genetic and epigenetic influences, likely had a major impact on the development of his ASPD and related behaviors.

5. Conclusion

The debate over whether nature or nurture plays a bigger role in shaping serial killers is complex and doesn't have a clear answer. This thesis has argued that serial killers are influenced by a combination of genetic, environmental, and psychological factors. It is not just about being born with certain traits or experiencing a difficult environment – it is about how these factors interact to shape violent behavior. The role of nature includes several factors such as the presence of the low-functioning MAOA gene, often called the "warrior gene," which has been linked to impulsive and aggressive behaviors, particularly when coupled with environmental stressors. In cases like Ted Bundy and Jeffrey Dahmer, it is suggested that their actions have been influenced by this kind of genetic predisposition. Additionally, neurobiological abnormalities, including damage to areas like the amygdala and prefrontal cortex, have been shown to disrupt emotional regulation and impulse control, further highlighting the role of biological factors in serial killer behavior. The example of Richard Ramirez, who suffered multiple head injuries, also shows that brain trauma can act as a trigger for violent behavior.

However, it's important to remember that these biological factors do not act in isolation. Early childhood experiences, particularly exposure to abuse, neglect, and violence, are shown to significantly influence the development of antisocial and violent behavior. Case studies of many serial killers exemplify how deeply environmental factors such as troubled childhoods often involving abuse, neglect, or exposure to violence can shape individuals into violent offenders. For example, David Berkowitz, Aileen Wuornos, and John Wayne Gacy all had difficult upbringings, which, coupled with societal pressures and psychological repression likely contributed to their later behavior. These cases suggest that environmental factors, particularly during formative years, play an essential role in shaping behavioral patterns that contribute to the emergence of serial killers.

Moreover, the thesis explored the interplay between psychopathy and serial murder, analyzing whether psychopathic traits, such as superficial charm, lack of empathy, and manipulativeness, are inherent in all serial killers. Although many serial killers, including Ted Bundy and Paul Bernardo, scored high on the Psychopathy Checklist-Revised, an influential tool for measuring psychopathy, the research also uncovered cases where murderers displayed lower levels of psychopathy, suggesting that psychopathy alone cannot explain serial killing behavior. Moreover, the findings of Janko Međedović and Nikola Vujičić (2022), who observed lower

levels of psychopathy in murderers compared to other violent criminals, challenge the common belief that all serial killers are high-functioning psychopaths.

Overall, the argument of the thesis emphasizes the interaction between genetic predispositions and environmental influences when thinking about how people become serial killers. The concept of gene-environment interaction (GxE) suggests that genetic vulnerabilities, such as the presence of the MAOA gene, may only be triggered by certain environmental conditions. Thus, serial killers cannot be understood purely through their biology or their experiences but through the dynamic relationship between the two. This notion is further supported by research into epigenetics, which shows that environmental experiences can alter gene expression, thereby affecting behavior. The evidence from studies of childhood trauma, brain injuries, and exposure to violence reinforces the idea that environmental stressors can activate or intensify genetic predispositions toward aggression and violence. By integrating both biological and environmental perspectives, law enforcement agencies and mental health professionals can adopt more comprehensive profiling methods, improve risk assessment tools such as the PCL-R, and better address the needs of at-risk individuals. This understanding has important implications for fields like criminology, forensic psychology, and public policy. Early intervention programs that address childhood trauma and support mental health could help reduce the risk of someone developing violent tendencies. As we continue to explore these issues, it becomes increasingly clear that a multidisciplinary approach is necessary to fully grasp the origins of such extreme forms of deviance and violence. Further research is essential to refine our understanding of these interactions and to develop more effective strategies for identifying and preventing violent behavior in those predisposed to it.

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