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Examining the Role of Nature and Nurture Factors in Shaping the Motives of Serial Killer Behavior

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Abstract: This literature review investigates the interplay of nature and nurture factors in shaping serial killer behavior. It examines gentic, biological, social and enviromental factors that shape serial killer behavior. This review aims to elaborate on the motivations behind serial killing by examining the interplay of biological, genetic, sociocultural, and environmental factors. As part of examining nature factors, this review will analyze the examination of the MAOA gene and neurobiological pathology. On the nurture side, this review will study the effects of trauma, dysfunctional family environment. In the same respect, psychopathy will also be highlighted as a an interplay of nuture and nature factors. Through using a combination of quantitative and qualitative numbers and word data from peer-reviewed articles, academic studies, and investigations this review aims to provide a comprehensive understanding on the multifacetes resulting in serial killer behavior and the role that both nature and nurture play in this situation.

Keywords: MAOA-gene, serial killing, nature and nurture

1. Introduction

According the FBI, serial killing is "the unlawful killing of two or more victims by the same offender(s) in separate events". Serial killings have a significant characteristics of cooling-off periods, unlike mass murder, where multiple killings occur at roughly the same time [1]. Serial killers have a motive, it is what drives them to kill. Even though the term "serial killer" was created in the 1970's. Serial killers were identified in the Gilles de Rais, who sexually abused and killed hundreds of children in the 1400s [2]. That was only the very start of a long line of serial murders. Studies about understanding the minds of serial killers also arose when more cases appeared.

To understand serial killers and study their motives, factors that shape those motives need to be first explored. Serial killers' motives are often considered through nature and nurture factorshey are used to provide an understanding of psychological phenomena [3]. Nature is the genetic and biological factors. Nurture is the external social and environmental influences throughout development process [4]. The two concepts are involved in a very well-known debate, Nature vs. Nurture. It bargains on the question of whether one's characteristics and development are much formed by "nature" or "nurture." When examining the debate, is it best to examine both nature and nurture factors separately and when both play a part as a factor forming a motive? This literature review aims to provide and understanding in the role of both nurture and nature in the motive of serial killers.

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2. Review of literature

2.1. Nature factors role in motives of serial killers.

2.1.1. MAOA gene

MAOA, is an oxidase enzyme that metabolizes monoaminergic neurotransmitters in the brain, including Noradrenaline, Adrenaline, serotonin, and dopamine. MAOA gene ordinarily regulates the levels of neurotransmitters, which are vital for managing emotions, emotional regulation, and mood stability [5]. If the MAOA gene is mutated or does not function correctly, neurotransmitters accumulate, producing an imbalance in the brain [6]. When neurotransmitters have slower metabolic rates, it is referred to as genetic variants with low activity MAOA gene allele, better known as L-MAOA [7]. For example, the L-MAOA gene elevates dopaminergic levels to increase aggression and hostility. Dopamine is known to regulate movement and reward. If aggression is satisfied, there is the possibility that increased levels of dopamine will urge the individuals to perform aggressive activities for rewards [8]. Increased serotonin levels are also linked to aggression. Research reveals that one with the L-MAOA gene is three times more likely to stage a violent crime when they are 26 years old [9].

MAOA-uVNTR, is the MAOA gene on the X chromosome, has a polymorphism known as the variable number tandem repeat (uVNTR) in its promoter region. It has six different versions based on the times the DNA is copied. These variants are known according to the number of repeats, including 2,3,4,5 and 6 [10]. The 2 and 3 repeat versions are believed to be low-activity MAOA genes [11]. Individuals with L-MAOA have a higher tendency for impulsive aggression. L-MAOA is thought to lead to a high tendency of violent behavior, and this claim is furthermore supported by a Stetler et al. conducted. The study by Stetler et al. included multi-ethnic participants who committed violent and non-violent crimes [10]. Violent or non-violent crimes were classified according to the type of crime they conducted. Examples of violent crimes include assault, kidnap, and murder. While Non-violent crimes included theft and drug offenses [10]. DNA samples were collected from participants using mouth swabs [10]. All carried the 3-repeat allele (L-MAOA) or 4-repeat variant (H-MAOA). Only one individual carried a 2-repeat [10]. 61. 22% of violent participants possesed the L-MAOA gene, and a significant association ($P < 0.0001$) between L-MAOA gene and the occurrence of violent crimes. The results demonstrate that ones with low-activity MAOA (L-MAOA) variants have more tendency to present aggressive and violent behaviors [10]. However, the MAOA genetic variants impact future violences and development of personality disorders only when jointed with adverse environmental circustances [12,13,14,15].

2.1.2. Neurobiological abnormalities

The pre-frontal cortex is mainly responsible of decision-making, emotional control, moral reasoning, control of impulses, and social behavior [16]. On the other hand, the amygdala is involved in emotional processing, particularly infear and threats [17]. It also manipulates feelings of pleasure and reward, linking experience to emotions [18]. Reduced activity in the amygdala can lead to limited emotive actions and sustain skewed views of social threats, thus triggering aggression [19]. A study by Davidson et al. 2000 showed a correlation between low activities in areas of the pre-frontal cortex and impulsive or aggressive actions. A decrease in amygdala activity can only aggravate the situation. Studies have shown the relation between brain regions and violent crime committers, including serial killers [20]. A study by Raine et al. conducted used positron emission tomography (PET) to find that individuals charged with violent crimes, such as murder, decreased activity in the amygdala and pre-frontal cortex when compared with individuals that are considered non-violent [21].

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2.2. Nurture factors in forming the motive of a serial killer

2.2.1. Childhood trauma and abuse

The World Health Organization (WHO) defines child abuse as "all forms of physical and emotional ill-treatment, sexual abuse, neglect or negligent treatment or commercial or other exploitation, resulting in actual or potential harm to the child". Childhood trauma is mainly characterized as childhood abuse and is classified into three types: physical, sexual, and psychological [22]. Physical abuse using force to harm a child intentionally. Physical abuse includes hitting, burning, hanging, etc. Psychological abuse is not visible, but still holds a major effect. It is when the child's self-esteem is intentionally lowered. Mental abuse can be in forms of both verbal and non-verbal. Sexual abuse a child involved in in forced sexual activity [22]. Those kinds of abuses lead to acute psychological distress when they grow up as violent and aggressive acts, including serial killing. [23, 24,25]. Children with experience of abuse are three times more likely to exhibit violent behavior as adults [26]. Research shows that many serial killers have been through child abuse. Studies show a high percentage of serial killers reporting experiences of physical violence and sexual assault [23]. Based on research, approximately in serial killers 50% have faced psychological abuse, while 36% have encountered physical abuse, and 26% have suffered sexual abuse [27]. For example, serial killers Ed Gein and John Wayne Gacy both experienced abuse [28]. The abuses often result in The abuses lead to such states as irregular regulation of emotions, attached problems, and pathologic coping mechanisms that entail future violence. The trauma they experienced leads to a detached state being detached from emotions and reality [29]. The detached state leads to the formation of fantasies.

Fantasies can develop at an early age. During childhood children seek comfort and protection in fantasy when they are abused. The child will foster an imaginary world reflect the hostility experienced in the real world [30]. While growing up many serial killers develop fantasies where they turn from victims to aggressors as a way to process their unresolved trauma that cannot be accepted. This role reversal helps them to show vengeance virtually to help overcome trauma [23]. Victims of childhood abuse are insecure [31]. Fantasy on the other hand gives them momentary self-esteem and not feeling inadequate like they are in real life [32]. Fantasies substitute for feelings of control and to compenstate of faliure in life. [33]. Studies demonstrate that childhood abuse develops sexual, violent, dominant, and control fantasies as maladaptive coping mechanisms to seek comfort and can escalate into real life [24, 34]. This cycle of trauma and fantasy is later extended to adulthood, where they seek consolation in fantasies of domination and manipulation, essentially resulting in serial killing [35,25,34]. The more time they spend in fantasies the more pleasure they gain [36]. These fantasies may encourage the normalization of aggressive thoughts and behaviors [37].

2.2.2. Dysfunctional family

Dynamics of dysfunctional family environments also contribute to the formation of serial killer motives. Research shows that many serial killers reside in families of abuse, neglect, or other forms of familial dysfunction, which significantly influences their psychological development and, later on, criminal behavior. *Neglect* is when parents does not provide essential care for the child. For example, lack of education, daliy essentials and medical intervention [22].

Serial killers who experience family abuse or neglect often suffer from feelings of inadequacy or victimization during childhood years [38]. The power to assert control is another conditioner, they wish to compensate for one's feelings of powerlessness by victimizing others [39]. In dysfunctional families, if parents perform violence or aggression, the child is likely to emulate the same gestures. This is in line with the social learning theory, developed by Albert Bandura. The social learning theory claims that individuals acquire new behaviors and patterns from experiencing or observing

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others. One learns aggressiveness to another person if there is a reinforcer or punisher for aggression [40]. Violent children growing up in violent families may never have examples of positive behavior and support that promote proper human empathy [41]. Growing up, children who faced abuse can start seeing such aggressive actions and believe they are effective in resolving issues and account them as problem solving mechanisms. This then results in the institutionalization of violent behaviors as being quite acceptable [42].

2.2.3. Social and environmental factors

Social factors that contribute for serial killer motives include social media. Serial killers are presented in the media fictionally, and the presentation deems and safeguards their actions [43]. Those having a propensity to violence often have no direction and are clueless about what is appropriate in society [44]. This is aggravated when they lack guidance and do not have anyone to teach them acceptable behaviors [45]. The focus on murder goes hand in hand with their motives, they would perceive it as the key to gaining recognition or authority [44]. This romanticization also led the would-be offenders to condition them to perceive serial killing as a way of gaining fame [46]. Especially for those who are powerless and marginalized. Especially individuals who feel marginalized or powerless in their own lives. Exposure to violent acts through media can inspire imitations, viewing serial killers as role models [47]. The extreme absence of realistic portrayals of the real world gives media entertainment and glamorizes serial killers, thus likely influencing the killer seeking to emulate media portrayals [48].

2.2.4. Personality disorder

ASPD has the characteristics of deviating from social norms and violating the rights of others. Their behaviors include irritability, impulsivity, and aggressiveness. Ones with ASPD can experience limited empathy or remorse [49, 50]. The impulsivity and indifference to societal norms inherent in ASPD can lead them to commit crimes without considering the consequences that come with it. Therefore, serial killing is a more possible means for them to fulfill their desires or impulses [51].

Psychopathy often has affective and interpersonal traits, some characteristics include charm, self-entailment, absence of remorse, and almost complete absence of empathy [52, 53].

Baron-Cohen describes psychopaths “as individuals with zero degrees of empathy, who are utterly detached from the feelings of others, show dominance or control over others, and focus on own needs” [54]. Research has shown their inability to form authentic emotional connections with others, leading to apathy for the feelings and rights of others [55, 56]. While all psychopaths meet the criteria for ASPD, having ASPD doesn’t mean that they are a psycopath [57].

The lack of empathy in psychopaths and ones with ASPD allows serial killers to disgrace and torture victims without experiencing distress. Empirical studies have shown that with the absence of empathy, they manipulate others and engage in violent acts without remorse. Meaning they do not consider their actions as wrong [58, 59]. This allows them to conduct violent acts without feeling the emotional distress that comes along, they can be detached when committing murder [60]. Their emotional detachment aggravates them to seek a thrill. This allows them to see victims not as humans equal to them but as objects for them to gain pleasure [61].

A study by Stone using the the Hare criteria found that 86.5% of serial killers can be assessed as psychopaths and another 9% found with psychotic traits, but not enough to be diagnosed. Furthermore, 50% of the psychopaths in the study displayed schizoid traits. Approximately half of the serial killers met the criteria for schizoid, sadistic, and psychopathic personality disorders [62].

This sadistic pleasure can be seen as an integration of sexual gratification and the act of murder, where they kill to fulfill sexual fantasies [63]. Sadistic personality is the result of abuse through

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childhood; sadism frequently appears as a solution to the experience of having been abused; it is when the victim becomes the victimizer [64]. They obtain pleasure from the suffering of others, often being the core of their motivations [65]. Serial killers use killing as a means to reach a euphoric state or are described as being "high" from the act of merely killing. [66].

3. Methodology

This literature review, under meta-analysis, systematic review, empirical studies, and qualitative and quantitative data, critically analyzed nature and nurture factors influencing motives for serial killing. The articles are searched for through various Virtual databases, including PubMed, Google Scholar, Research Gate, Semantic Scholar, and National Library of Medicine, to enhance the probability of having academic articles. The search incorporated several appropriate terms of search terms and terms, including serial killers, nature vs nurture, genetic predetermination, environmental factors, and psychopathic demeanor, as well as Boolean connectors (AND, OR). The kind of articles to include are those appearing in academic journals of empirical findings and academic research papers. Any article unrelated to this topic or published by an unreliable author or publisher in a scholarly journal should be excluded. Thus, with the help of this multifaceted approach, the literature review aims to deliver an initial analysis of the research matter and bring in new insights into the fields of criminology and psychology.

4. Results

Findings indicates that lower activity MAOA genes (L-MAOA) are associated with aggression and violence when neurotransmitters accumulate. Research also implies that through pathologic examination of various brain regions, various kinds of recidivistic criminals, especially serial killers, exhibit less activity of the and the amygdala pre-frontal cortex than normal individuals. While it correlates with a lack of impulse control and emotional regulation, extending and amplifying aggressive as well as violent conduct. Nurture factors reveal that a various of these serial killers have been found to have endured very much worse forms of childhood adversity. Such adversity is excruciating and interfacing with severe psychological disorders that disrupt the standard attachment patterns of human beings and result in maladaptive ways of coping, leading to the creation of violent imagery. A significant number of serial killer recipients come from highly destructive family environments that involve carelessness, abuse, and poor modeling. This leads to such feelings as low self-esteem and insecurity, thus creating the need for domination and, thus, power. The social learning theory also goes further to indicate that violent families lead to the learning of these as justified. The action of serial killers is portrayed in media in such a dazzling manner that it encourages violent individuals to mimic it. Serial killers and other serial offenders are most likely to have antisocial personality disorder (ASPD) and psychopathy, where they have no feelings for others or can act on impulse.

5. Discussion

Through myriad research, some gaps in the research and methodology still need to be addressed. The methodology had no specific range of data or sources that could be used. Some of the sources were even published in the last century. This is an issue since there are many updates in psychology each year, and new findings might change the entire perspective of a topic. However, the range of data was not limited for a reason. Throughout the research process, the reliability of the sources was prioritized. More recent articles need more actual study and are all for uninfluential authors. Therefore, reliability is prioritized to at least guarantee valid results. Gaps in the field of research include the fact that the studies on this topic are not that generalizable. At the same time, a lot of the information collected

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showed results that were not collected through studies, which makes it hard to check the validity of the research.

Additionally, numerous sources established uncertain relationships frequently using vocabulary such as “may.” To build among the gaps, future research should conduct more generalizable experiments with a large sample size in the field, and there should be more content research directly for serial killer motives. As existing literature rarely directly addresses the formation of serial killer motives. Mainly, existing literature only explores an indirect relation.

6. Conclusion

This literature review discusses the nature and nurturing factors that cultivate serial killer motives. Results indicate that natural factors and genetic predispositions, especially the L-MAOA gene and neurobiological abnormalities, yield aggressive and violent tendencies. These tendencies interact with nurture factors, influences of childhood trauma, dysfunctional family, and social environmental factors, intensifying the risk of violent behavior. These tendencies, furthermore, with nurture factors, develop personality disorder traits or personality disorders. Which they directly lead to the motive of a serial killer. This literature review provides a brand new insight into the field of serial killer motive as it concludes and approaches the motive of serial killers in measures that have rarely been considered. It merges popular one-sided research on the field and approaches using muti-facetes.

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