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Genetics and Crime: Exploring Biological Factors

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***Abstract:** This research involves the intersection of genetics, biology, and criminal behaviour. Biological positivism emerged in the 19th century as a response to classical criminology, challenging prevailing views on crime causation. Modern research on genetics and crime, including twin analyses and the study of XYY syndrome, sheds light on this relationship. A neurobiological perspective investigates the characteristics of physical and mental processes associated with behaviour.*
***Keywords:** Biological positivism, neurobiological, criminal behaviour, XYY syndrome, Genetics*

I. HISTORICAL CONTEXT OF BIOLOGICAL POSITIVISM

Biological positivism emerged as a response to classical criminology, which focused primarily on the social and environmental causes of crime. In the late 19th century and early 20th century, biological theories emerged in criminology, influenced by the advancement of genetics. In general, evolutionary and biological theories have received more support than other environmental theories. Lombroso also gained credibility by using Darwin's theory of evolution to explain the crime. The theory of evolution was very popular at that time, especially in the United States. Finally, as others have noted, Lombroso was responsible for popularizing the treatment model in criminal law. This approach makes criminals violent or more morally ill or mentally ill, making them need treatment rather than punishment.

II. SIGNIFICANCE OF BIOLOGICAL POSITIVISM IN CRIMINOLOGY

Biological positivism emphasizes the role of individual differences, including genetic and neurobiological changes, in the formation of criminal behaviour. The analysis recognizes that not all people have the same level of susceptibility to external influences. Understanding genetic and neurobiological factors can assist in criminal profiling. Police and criminal investigators can improve their ability to detect potential crimes by identifying patterns associated with specific biomarkers. Understanding the origins of criminal behaviour contributes to the theory of justice in criminal justice. It supports a more comprehensive approach to punishing, rehabilitating and treating individuals with criminal histories.

III. BIOLOGICAL POSITIVISM

The theory of biological positivism emerged in the late 19th century and led to a change in society's view of criminals. Before his idea, the criminal justice system was based on the classical theory that criminals make choices because all people have free will. Biological positivism asks, "What drives a person to commit a crime?" It was created by trying to answer the question, but classicism does not like this. Therefore, unlike classicism, biological positivism focuses on criminals rather than crimes. Biological theories of crime focus on two main theories and some research to determine where the environment or a person's biolog y has a greater impact on their behaviour (study smarter, n.d.). Examples of biological theories of crime include:

A. Lombroso Atavistic Theory

Cesare Lombroso (1876) is famous for creating the subversive theory of crime in his book The Criminal man. In this book, Lombroso argued that there is a special biological category of people who commit crimes. Cesare Lombroso is a criminologist who is considered by many today as the father of criminology. He is especially known as the founder of the field of criminology. After studying medicine in Italy and Austria, he worked in a mental institution and then as a military doctor. In 1876 he became professor of law at the University of Turin. He published his book Criminal man in the same year. Lombroso expounded his theory in five different editions of this book over a period of 20 years (1876, 1878, 1884, 1889 and 1897). During this time, he continued to develop his thinking to include many social and cultural aspects in later models. Lombroso's explanation of crime is based on the theory of evolution, and he believes that criminal is less advanced than other humans. He believes that there is a special biological disease among criminals. These people exhibit "atavistic" (that is, primitive) characteristics. Lombroso believes that they are "atavistic", have biological characteristics of the early stages of human development, and appear criminal. Lombroso claimed that such people committed crimes differently than the general public because they looked different.

These people have atavistic or primitive characteristics. Thieves had expressive faces, manual dexterity, and small, wandering eyes; murderers had cold, glassy stares, bloodshot eyes, and hawk-like noses; sex offenders carried thick lips and protruding ears; and female criminals were shorter, wrinklier, had darker hair and smaller crimes than normal women. Lombroso believes this means that criminals are at an earlier stage of transformation than non-criminals and therefore they are unable to integrate into daily life. There is crime because of organization. This means that criminal behaviour can be inherited. Throughout his career, Lombroso measured and recorded the physical characteristics of a variety of people, including normal people, mentally ill people, soldiers, and criminals. He compared his findings and found a relationship between certain personal characteristics, most of which were physical, and criminal behaviour. Lombroso believed that criminals had stigmas or markings that were easy to recognize. Lombroso used his findings to propose a system of classification that evolved with each subsequent volume of his book. As mentioned earlier, his main argument is that many criminals (about 30% of them) are evolutionary regressors or born criminals. He claimed that these people were born this way and that many cases moral insanity and epilepsy occurred simultaneously and were often associated with such crimes. According to Lombroso, many people are not criminals by nature, but guilty by passion. These criminals commit crimes on impulse or politically motivated. This includes political activists or husbands who passionately kill their wives because of their infidelity. Later, Lombroso thought that there were insane or mentally ill people. These people commit crimes due to low intelligence, alcoholism or hysterical, excitable personality.

B. Sheldon somotype theory

In the 1940s, American psychologist William Sheldon popularized the term "Somotype" to predict crime based on a person's body size. A person's body shape will change over time due to exercise, diet and aging. Generally, body fat increases and changes as a person ages, which changes the overall body composition. Although a person's body may change, some features of the body, such as a person's skeleton, remain constant. There are three types of somatotypes: ectomorph, endomorph, and mesomorph. Endomorphs are physically larger, short and plump. Their matching personality is relaxed, tolerant, loving, calm and peaceful. Mesomorphs tend to be muscular and heavy. Thus, they tend to be active, vigorous and assertive. Ectomorphs are tall and thin. Therefore, their personality is close to being fragile, quiet, sensitive and introverted. Later on, Sheldon used this classification as a way to explain deviant behaviour, believing that delinquents were likely to be high in mesomorph and low in ectomorph. Indeed, he believed that mesomorphs' characteristics stated before caused criminal behaviour and delinquency. Sheldon noted that the vast majority of criminals were mesomorphs. One explanation for this is that a solid muscular person becomes involved in crime at an early age due to their intimidating appearance. This biological theory may seem implausible, but people often stereotype others on characteristics such as their appearance. Certain individuals (e.g. the police) may make "snapshot" judgments about people, which may have implications for criminal behaviour.

IV. THEORY OF NATURAL CRIME

The work of Raffaele Garofalo (1914) represents another important contribution to early biological positivism. Garofalo's ideas are based heavily on social Darwinism but are much less biologically oriented than those of his predecessor. He proposed a universal definition of natural crime. Further, he suggested that society was similar to an organism and that crime was like a disease. Much of Garofalo's (1914) work focused on effective ways to deal with crime and suggested ways to reduce it. He believed that criminals should be isolated (or solitary) and treated to prevent the spread of their "diseases". He believes that if treatment proves impossible, criminals should be imprisoned forever, exiled, or executed. Garofalo argued that the crime violated two moral principles: probity and pity. Probity referred to our feelings about the property rights of others (i.e., property crime) while pity referred to our revulsion to the suffering of others. (iresearchnet, n.d.)

V. EVOLUTION OF BIOLOGICAL POSITIVISM

Biological positivism is also known as a biological variant of the predetermined actor model of crime and criminal behaviour. Its roots lie in the work of Lombroso, Ferry and Garofalo, who hypothesized that criminology should be based on scientific research (openoregon, n.d.). The earlier model of crime and criminal behaviour, also known as positivism, was based on the rejection of the model of crime and criminal behaviour. The appropriate model of crime and criminal behaviour is based on the belief that people are free and choose how to think about their actions. Positivism denies the importance of freedom and proposes a concept based on determinism because it is believed that it is the internal and external that influence the person to issue a restraining order against violent behaviour. The concept of evolution and science was an intellectual one foundations of positivism.

Biology was prominent influenced by the works of Darwin, which is said to mean the end a pre-scientific philosophy about human behaviour. Social evolutionism, which was greatly influenced by works Spencer, who postulated that human characteristics are inherited, was another intellectual basis of positivism. Spencer is acknowledged to have had the most profound influence on positivism. Comte also deeply influenced positivism due this postulate that data about human nature and society should be collected using methods used in the natural sciences. Lombroso is considered the father of modern criminology because he laid the foundation for criminological research by collecting measurable, verifiable, and meticulously analysed data. Lombroso is an Italian medical doctor who also perused studies in psychology, hygiene, science, science and criminology. In 1863 he began teaching psychology, neuropathology and anthropology at the University of Pavia, became director of the insane asylum in Pesaro from 1871 to 1873. Lombroso for his postulation that criminality, madness and genius all resulted from the same psychobiological condition of degeneration. Need is a physical abnormality he finds when examining the criminal's brain. The brain's process of change is thought to be abnormal.

VI. GENETICS AND CRIMINAL BEHAVIOUR

People with different genes may behave differently in the environment. People with a genetic predisposition to crime are more likely to become involved in crime if they are exposed to an environment conducive to crime. Conversely, people who do not commit crimes are less likely to become involved in crime, even if they are. in a criminal environment. Caspi (2002) found evidence that genetics interact with the environment. A study by Caspi et al. showed that genetic variants in genes that produce enzymes that break down neurotransmitters such as serotonin and dopamine do not directly affect normal behaviour. It is generally accepted that the genetic explanation of crime is new. But this explanation are as old as the field of criminology and had profoundly shaped the thinking of Lombroso. Early research on genetics and criminal behaviour used twin studies. Thus, a set of questions is asked to a sample of identical twins, and then the same question is asked to a sample of fraternal twins and the results are compared. If the results show that the responses of identical twins are more similar than those of fraternal twins, it can be assumed that this additional similarity is the result of genetic linkage. Schwartz criticizes this theory, arguing that it leads to a misunderstanding of hypothesis testing and prediction. Eysenck and Prell (1951) conducted studies on the genetics of neuroticism. Their sample included 25 pairs of identical twins, 25 pairs of fraternal twins, and a control group of 21 children with Neuroticism. Seventeen personality tests were administered to the participants. Therefore, the relationship between monozygotic and dizygotic twins indicates that approximately 80% of individual differences in neuroticism are due to genetics. They concluded that neuroticism is not a trait but has biological properties. Although the accuracy of the measurement is questionable, Eysenck and Prell were the first to find a relationship between genetics and criminal behaviour. In the early years of the development of genetics and crime, it was thought that genetic abnormalities such as XYY Syndrome (males being born with an extra Y chromosome) would be responsible for harming men. It is important that men are born with an extra Y chromosome, as 1 in 1000 men are born with this condition. XYY syndrome suggests that men born with an extra Y chromosome are prone to violent behaviour and are more likely to commit crimes. In 1965, Jacobs et al. Carstairs Public Hospital in Scotland performed chromosome testing on 197 male patients (psychopathic criminals) and 7 of them were determined to have XYY syndrome. They detected an increase in the number of boys with XYY problem at institution; however, it is not clear whether this increase is due to violence, mental illness, or both. Further research into XYY syndrome and criminal behaviour in the 1960s and 1970s showed that men with this disorder were more likely to end up in prison. However, research on XYY syndrome has been questioned due to poor methodology and a lack of support for an association between Y chromosome insertion and criminal behaviour. The biggest weakness of this theory is that many normal men have an extra Y chromosome without any problems (Singh, n.d.). Brunner et al. (1993) tested their hypothesis through genetic linkage analysis and found that all men with the condition had a rare mutation that caused them to lack the monoamine oxidase A (MAOA) gene and thus were unable to produce the MAOA enzyme. The MAOA gene codes for the MAOA enzyme, which destroys neurotransmitters, causing nerve damage or dysfunction. Men who carry the MAOA gene in the family do not show criminal behaviour. MAOA mutations are associated with mild intellectual disability and behavioural abnormalities. Existing research on the link between MAOA variants and aggression suggests that there is no direct or significant link between MAOA and antisocial behaviour. However, many studies show that low levels of MAOA active alleles can lead to aggressiveness. The sample included men from the Dunedin Multidisciplinary Health and Development Study. Approximately 12% of the sample was abused and had low MAOA activities, and these 12% accounted for 44% of violent crimes. Researchers found that MAOA alleviated the effects of abuse and that those with high levels of MAOA were less prone to antisocial behaviour; This partly explains why not all abused children grow up to harm others. Independently, genetics (low MAOA) and environmental (abuse) have a negative impact on negative behaviour, but together they increase the risk of crime.

VII. ROLE OF NEUROTRANSMITTERS IN CRIMINAL BEHAVIOUR

The role of neurotransmitters in crime involves the study of how chemicals in the brain influence a person's willingness to engage in crime. Serotonin plays a role in mood regulation, emotion regulation and aggression. Low serotonin levels are associated with aggression, negative emotions, and risk-taking behaviour, which are factors associated with crime (tutor2u.net, 2021). Dopamine is associated with reward and pleasure, motivation and motor control. Abnormal dopamine levels or dysfunction of the dopamine system can lead to attention-seeking behaviour, impulsivity, and decreased sensitivity to punishment – all of which are related to crime. Norepinephrine plays a role in emotions, feelings, and the "fight or flight" response. Effects on norepinephrine levels can lead to increased anxiety, aggression, and the potential for violence or behaviour. GABA (gamma-aminobutyric acid) is an inhibitory neurotransmitter that helps control stress and anxiety. GABA dysfunction may be associated with increased anxiety, irritability, and reduced ability to cope with stress, Promoting crime. Glutamate plays an important role in improving learning and memory. Disruption of glutamate signalling can lead to impulsive behaviour and learning disabilities from negative experiences, factors associated with criminal law. Endorphins play a role in pain management and the experience of pleasure. Pursuing activities that stimulate the release of endorphins (such as drug use) can be associated with crime as people seek pleasure (Gulpham). Oxytocin is often called the "love hormone" and is associated with relationships and emotions. Low oxytocin levels can lead to difficulties socializing and interacting with others, which can affect crime. Neurotransmitter function is closely related to hormonal regulation. For example, imbalances in sex hormones (especially testosterone) have been studied in relation with violence and aggression.

VIII. RELATION BETWEEN MENTAL HEALTH AND CRIME

The relationship between mental health and crime has been the subject of much debate and analysis in recent years. While new analysis and media focus on the importance of mental health in such situations is a positive development, the relationship between mental illness and criminality is often confused. It is widely believed that people with mental disorders are prone to violence and violence. The public's perception of mentally ill people as dangerous individuals is often due to the media's portrayal of criminals as "crazy." More information suggests otherwise. People with mental illness are more likely to be victims of violent crimes than criminals. This injustice continues into the criminal justice system, where mentally ill patients are treated as criminals, arrested, tried, and incarcerated longer than the general population. This is an important factor affecting people with mental disorders. The confusion between mental illness and criminal behaviour means that all criminals are mislabelled. The main reason why there is a higher rate of mental illness in jails and prisons is because criminals are labelled as mentally ill. These numbers are not always based on medical and psychological evaluations and diagnoses, but are the result of social interaction.

IX. NEUROBIOLOGICAL AND CRIME

Current neurobiological research on crime focuses on neurobiological features associated with antisocial behaviour (e.g., reduced psychological arousal, frontal lobe brain dysfunction, reduced amygdala volume, hormonal deficits, and genetic factors) and their impact on future predictions of antisocial behaviour (sciencedirect). As a result of neurobiological issues (e.g., low heart rate, poor fear regulation, increased testosterone levels, decreased heart rate response to stress, decreased amygdala volume, decreased anterior cingulate cortex activity) and dealing with psychological and environmental risks. Identifying neurobiological risk factors for crime does not mean that crime is “hard-wired” in the brain or that some people are victims of crime. All behaviour, not just abnormal behaviour, results from the interaction between our neurobiology (genes, brain, hormones, etc.), our psychology (cognitive thoughts such as thoughts, emotions, self-control, or lack thereof), and environment (e.g. peers, health, access to healthcare, education). There is no relationship between biology and crime. Many individuals at biological risk will not go on to commit crimes, but some individuals without special circumstances may continue to commit crimes. Various biological, psychological, and environmental factors and their interactions may increase the risk of behavioural disorders.

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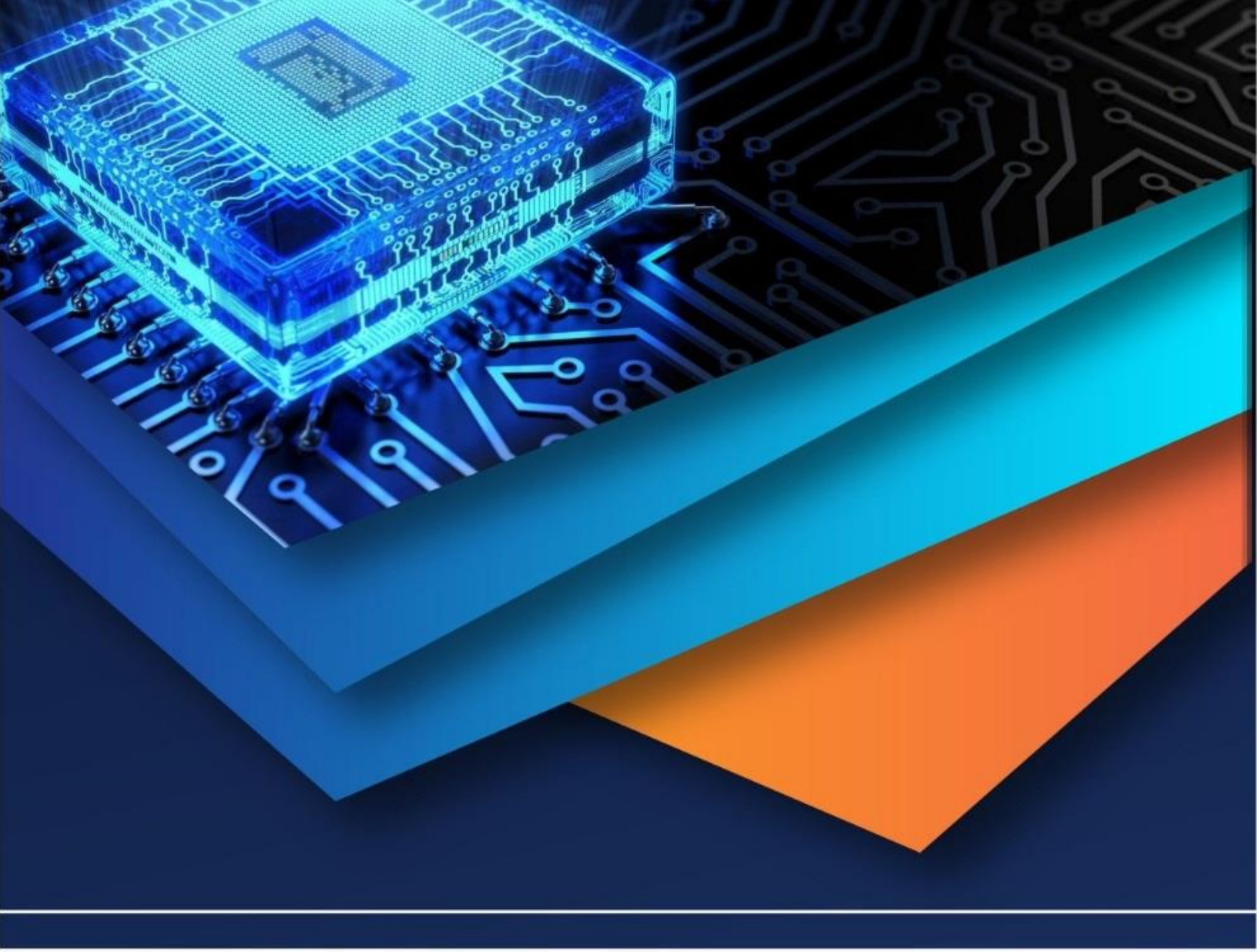

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