

**“A taste for killing” versus “Abusive, traumatic childhoods”:**

**People’s beliefs about the influence of nature and nurture in heinous, violent crimes**

A Thesis in Psychology

by

Jamie Smith

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### **Abstract**

The purpose of this study was to examine people's beliefs about whether nature, nurture, or an interaction of both influence someone to commit heinous, violent crimes such as serial killing and mass shootings. Scientific data suggest nature and nurture interactively influence whether someone becomes a violent criminal. I hypothesized that nature would be more prevalent than nurture in people's beliefs in what influences someone to become a violent criminal, and that this would be consistent for both serial killers and mass shooters. Participants ( $N=233$ ) answered an online questionnaire that included both open-ended and closed-ended questions measuring their beliefs about the influences on violent criminals. Results indicated that in the open-ended responses, participants mentioned nature-related explanations more than nurture-related explanations. However, in the close-ended questions, the opposite pattern was observed as participants endorsed nurture-related explanations more than nature-related explanations. In sum, people's beliefs about what influences a violent criminal is more one-sided than an interaction between nature and nurture. Thus, this finding contradicts what has been found through scientific data and the literature that nature and nurture affect each other to produce someone's behavior.

**“A taste for killing” versus “Abusive, traumatic childhoods”:****People’s beliefs about the influence of nature and nurture in heinous, violent crimes**

People are fascinated by criminals. A poll conducted in 2022 found that half of all Americans watch true crime, with 13% of Americans claiming it is their favorite genre (Cheng & Flynn, 2023). True crime is a nonfiction genre that examines the details of crimes and the effects of criminal activity (Burger, 2016). Researchers have studied the allure of true crime media; the true crime genre allows society to engage in pleasurable fantasy entertainment (Bonn, 2014). True crime promotes the understanding that there are real horrors in this world and suggests that one may never know who might commit crimes. This genre feeds people’s natural desire to solve puzzles and mysteries, gives them an insight into why other people may act the way they do, and examines the darker sides of humanity from a safe distance (Schmidt-Petersen, 2023). True crime also invites the public to generate their own theories that apply to cases, and to wonder whether their own theories are correct. In short, true crime asks the question, “What creates a criminal that we should fear?”

The goal of this thesis is to investigate people’s answers to that question. In particular, I investigated the views the public has on the influence of nature, nurture, or both when it comes to an individual who commits heinous, violent crimes.

**Violent Crime in the United States**

The United States is an especially violent society. The homicide rate in the United States is 7.5 times higher than the homicide rate in all other high-income countries combined, which is largely attributable to a firearm homicide rate that is 24.9 times higher than other countries (Grinshteyn & Hemenway, 2019). This thesis focuses on heinous, violent crimes. For the purpose of this study, *heinous violent crimes* refer to serial killings and mass shootings. Although

these are not the same kinds of crimes, both include a person killing multiple people whether that be all at once or at different times. These crimes also capture substantial attention in terms of news coverage and popular media, and are therefore likely to be at the front of people's minds.

Serial killings are a noteworthy example of violent crime in part due to how gruesome their crimes are (Schmidt-Petersen, 2023). In the 20th century, there were 2,604 identified serial killers. However, in the 21st century, serial killings are rapidly declining (Duwe, 2004). *Serial homicide* is defined as the unlawful killing of two or more victims in separate events that is intentional, premeditated, and impulse-driven. The details of the crime often vary; some assailants are organized killers who are precise and clean, whereas other assailants are disorganized killers who are messy or take risks (Marono, Reid, Yaksic & Keatley, 2020). Serial killers can also fit many forms of typology in their mannerisms of murder, their actions, and their victimization. Unfortunately, the media creates myths about the psyche of such killers which leads to disproportionate fear of victimization (Hodgkinson, Prins & Stuart-Bennett, 2016).

Yet, gun violence, as of 2021, is responsible for the injuries or deaths of over 5,500 American children aged 0 to 17 years old (Muir, 2021). In 2021, 48,830 people died in the United States due to gun violence; these gun-related deaths topped every previous other recorded year and are on the rise (Metzel, Piemonte, & McKay, 2021). Mass shootings, in particular, have become a consistent and present violent crime. *Mass shootings* are defined as one or more individuals actively engaged in killing or attempting to kill people in a populated area with the use of a firearm (FBI Office of Partner Engagement, 2021). As of 2022, 71% of adults reported having experienced a fear of mass shooting that led them to avoid certain public places where mass shootings were more likely to occur (Metzel, Piemonte, & McKay, 2021). School shootings are a specific example of mass shootings, and have received considerable attention within the

United States. Based on the last 53 years of data, a predictive model estimates that 2023 will reach approximately 400 school shootings (Modan, 2023). The rates of mass shootings during the past 3 years have doubled each of the years that came before (Modan, 2023).

The fascination with true crime and serial killing, and the prevalence of gun violence in the United States, all raise the following question: what are the influences of nature and nurture in causing people to commit violent crimes? People tend to form their own answers to this question based on many factors (e.g., what true crime media tells us about the individual) and they speculate their own reasons as to why assailants could have committed their crime (Schildkraut, 2016). There are an abundance of different causes that could be factored into why someone would commit serial homicide or mass shootings. Thus, the goal of this study is to investigate what beliefs people hold about the influence of nature, nurture, or both when it comes to an individual who committed one or more violent crimes. Before considering how laypeople think about the causes of violent crime, I will first consider what scientists have discovered about these causes.

### **What do scientists know about the causes of heinous, violent crime?**

Researchers and scientists believe that nature and nurture interact and influence each other to shape someone's behavior (Levitt, 2013). For example, psychopathologists explain that there needs to be both a genetic predisposition and environmental trigger for mental disorders to develop. Thus, nature and nurture interact together in a complex manner to impact behavior (McLeod, 2007). However, to form this interaction, it is first necessary to understand the different influences of nature and nurture before describing the ways they work together.

### **Nature**

*Nature* is defined as the genetically and physiologically determined characteristics that influence the behaviors of an individual (McLeod, 2007). For example, genes are passed down from one's ancestors and can influence people's behavioral outcomes.

It has been discovered that nature plays an important role when it comes to criminals. For example, the gene known as Monoamine Oxidase A (MAOA) is commonly found in violent criminals' DNA. Low levels of MAOA prevent norepinephrine, epinephrine, serotonin, and dopamine from reaching the brain, ultimately leading to higher levels of aggression (Highsmith, et al. 2014). For example, Norwegian rats were selected to see the presence or absence of high aggressiveness. Those with aggressive behavior had a low MAOA gene (Ardilla, 2012). Another study showed that infants with low levels of MAOA were more prone to maternal sensitivity meaning they need their mothers to respond directly and appropriately to their behavioral signals (Ouellet-Morin, et. al, 2016). When this was not achieved, these infants became more aggressive as they got older which predicted violence in adulthood. In regards to serial killers, Ted Bundy was someone who had low levels of the MAOA gene. Life changing trauma, such as lying about his childhood and his romantic relationship ending, was thought to have deactivated his MAOA gene which is when he started to commit his serial crimes (Highsmith, et al. 2014). Low levels of the MAOA gene may be correlated with higher levels of aggression.

A more in-depth perspective on the MAOA gene is that it controls an enzyme that degrades neurotransmitters such as serotonin and dopamine that provide positive emotions. This affects behavior indirectly due to an imbalance in brain structures and neural pathways involved in emotion regulation and behavior inhibition, which ultimately could make someone more aggressive (Ouellet-Morin, et al. 2016).

In addition to differences within the MAOA gene, other genetic differences may predict criminality. For example, the most frequent chromosomal abnormality detected in criminals is in relation to the sex chromosome (Ouellet-Morin, et al. 2016). For the general population, males have 46 XY chromosomes and females have 46 XX. However, Klinefelter's Syndrome is a condition in which someone has 47 XXY chromosomes. This condition has been detected at higher rates among criminals; for example the presence of Klinefelter's Syndrome in criminals is five times higher than the general population (Magdalena, 2013).

In violent female criminals, hormones and neurotransmitters may play a larger role in aggression rather than a low levels of the MAOA gene. Aileen Wurnos, one of the most infamous female serial killers, is an example of someone whose hormone deficiencies may have explained how her low hormones correlated with the typology of her murders (Gavin, 2014).

Brain abnormalities are another example of nature's influence on violent criminals. The most common brain abnormality seen in criminals has been a reduction in the size and activity of the prefrontal cortex. The prefrontal cortex is responsible for decision-making skills, impulse control, and empathy which are characteristics that violent criminals lack (Crews, 2010). Furthermore, head trauma in childhood may cause damage to certain areas of the brain causing episodic aggressive behavior; some have suffered psychosis, neurosis and paranoia. Head trauma, as in the case of Jeffrey Dahmer, may rewire someone into becoming more violent, especially if the trauma happened in childhood (Castle & Hensley, 2002).

In summary, scientists have considered the influence of nature on criminality, and have subsequently focused on genetics, brain abnormalities, and head trauma. However, it is important to look at how large of a role nurture also plays in shaping someone's behavior.

**Nurture**

Nurture refers to the environmental factors that influence the development and behavior of a person, including sociocultural factors (McLeod, 2007). Sociologists, for example, argue that nurture plays a larger role for crimes because genetic disorders and mental illnesses only explain a small minority of offenses; nurture, they claim, is more influential (Levitt, 2013).

One of the major nurture influences when it comes to criminality is childhood abuse. A recent study examined 233 male serial killers who had the history of their childhood documented by researchers (Marono, Reid, Yaksic & Keatley, 2020). It was found that 50% of them were psychologically abused, 36% physically abused, and 26% sexually abused (Marono, Reid, Yaksic & Keatley, 2020). Consider, for example, Aileen Wuornos – a case study that shows the numerous ways nurture may have influenced her crimes. Her upbringing consisted of the presence of alcohol abuse within her family along with physical, sexual, and psychological abuse. Because of the way she was brought up and the abuse she experienced, nurture played a clear role in her methodology and victimology in the crimes she committed as she targeted older men resembling her grandfather who abused her (Gavin, 2014).

The impact of parents, family, friends and tragic events each influence behaviors. For example, parental brutality and parental humiliation in childhood is associated with emotional maladjustment, aggression and poor self-esteem in adulthood (Stone, 2001). Trauma along with inappropriate sexual patterns can lead to *paraphilia*, which is recurrent, intense, sexually arousing fantasies generally involving non-human objects, children, and/or the humiliation of someone else (McManus, Hargreaves, Rainbow, & Alison, 2013). This is frequently accompanied with having low empathy, poor social decision making skills, and high impulsivity



(Stone, 2001). In Short, these kinds of tragic events can influence the behavior of children and adults and shape their tendencies to commit certain crimes and their victimology.

Abusing substances or having close relationships with people who abuse substances also shapes criminality. Substance abuse, for example, increases impulsivity, decreases judgment, and is highly correlated with criminality (Common & Miller, 2011). Alcohol, LSD, phencyclidine, cocaine and amphetamines decrease the threshold for impulsive action which may in turn influence a person to act out their criminal fantasies (Stone, 2001). For example, being around substance abuse increases the likelihood that a person will be inclined to join in. Substance abusers are also more likely to take small immediate rewards over delayed much larger rewards. Criminals may be less aware of their free will when under a substance. It not only alters their minds but their behaviors as well (Common & Miller, 2011).

In summary, people learn behaviors through the environment they are surrounded with. The terrifying upbringing of childhood abuse, for example, can cause major psychological damage in an individual (Marono, Reid, Yaksic & Keatley, 2020). Parents, family, friends and tragic events can influence certain behaviors that a child learns at a young age. In addition, The presence and use of substance abuse can decrease impulse control that may result in an increased likelihood of committing an illegal or violent crime. However, what happens, as in the case of Jeffrey Dahmer, where there is a presence of *both* nature and nurture influences? In fact, the interaction between the two has gained more attention from scientists to ultimately explain someone's behavior.

### **Interaction between Nature and Nurture**

When looking into what contemporary researchers and scientists have to say about the influence of nature and nurture on violent crimes, it has been found that nature and nurture

interact with each other in shaping human behavior. Epigenetics now explains the interaction between nature and nurture. *Epigenetics* is the study of how one's behaviors and environment can cause changes that affect the way a person's genes work (Crews, 2010). Epigenetics focuses on the physical changes that affect how someone's genes are expressed and how a new gene may now become active or how already formulated genes may be blocked (Crews, 2010). This can ultimately account for a change in one's behavior. For example, epigenetics can be used to explain how low levels of the MAOA gene is more prominent when someone is in an abnormal environment. The expression of this determined gene depends on the environment the individual experiences such as the role of stress and having poor control of impulses (Ardilla, 2012). Likewise, environmental stress has been shown to increase the risk of substance abuse; although the individual never abused substances prior to the stress, they have now developed a new behavior where they find that these substances help to cope with the stress (Crews, 2010). Therefore, epigenetics explain how environmental factors, such as stress, can result in a change in their genes affecting their behavior. In short, nurture affects the nature of someone's DNA makeup creating new genes which allows them to express different behaviors.

An understanding of the interaction between nature and nurture has also helped authorities close criminal cases quicker and more efficiently (McLeod, 2007). Psychological profiles are created by viewing the crime scene as symptoms of a behavioral act; profiles give profilers an insight on the perpetrator's personality, lifestyle and development of experience. They then look into childhood experiences that could have caused this kind of killing along with brain abnormalities (Turco, 1990). Outlines have been made that help experts know the typical brain abnormalities that are consistent in juvenile and adult perpetrators. These profiles help predict the type and style of the murder, the age of the victims and perpetrator, the style of dress

and the type and manner of use of weapons; it helps profilers “get into the perpetrators mind” (Turco, 1990). Scientists thus believe that nature and nurture need to be studied *together* as predispositional genetics and environmental factors, more often than not, interact with each other.

We already know what scientists have found about nature and nurture’s influence on violent crimes. However, it is important to consider what laypeople believe influences someone to commit violent crimes. In people’s minds, which weighs heavier, nature, nurture, or the interaction of both?

### **What do people believe?**

In exploring people’s beliefs about the causes of violent crime, I consider three different bodies of literature: folk psychology, research concerning the fundamental attribution error, and the influence of the media. These streams of research collectively suggest that people believe that nature causes criminals’ behaviors and choices more so than nurture. When it comes to violent crimes, these theories predict that people may blame the criminal, dehumanizing them, due to their genetic makeup or dispositions rather than the environment they were surrounded with (Wiest, 2016). In short, these factors lead people to believe that violent criminals commit their crimes due to an influence of their nature more than an influence of nurture.

#### **Folk psychology**

Folk psychology describes people’s “common-sense” approach about how to explain human behavior (Horgan & Woodward, 1985). Folk psychology explores how people explain and predict the behaviors and mental state of others. The study of folk psychology focuses on how everyday people, those without formal training of the academic field, go about making sense of the mental state of other people (Stitch & Ravenscroft, 1993).

In relation to crime, folk psychology explains that people tend to believe in free will; therefore, when others make “bad choices” it makes sense to punish them because of the general judgment that people should always make rational choices (Common & Miller, 2011). For example, people often make the general judgment that crime is associated with low stages of development, high impulsivity, use of drugs, and poor attachment styles. People then have the belief that if someone is associated with one of those factors they are more likely to make irrational choices and commit a crime (Common & Miller, 2011).

Folk psychology is also commonly used to explain and predict the actions of others. When doing so, people normally attribute others beliefs and desires to what actions they decide to complete. Thus, if someone commits a crime it is because of their personal beliefs and desires that lead them to – freely and willfully – commit that crime. The focus is not on the external presence that contributes to behavior; folk psychology points toward people believing that an individual’s nature influences their beliefs and desire which ultimately contributes to the actions that they express (Stitch & Ravenscroft, 1993).

### **Fundamental Attribution Error**

Consistent with themes that are common in folk psychology, the fundamental attribution error is another phenomena that leads people to focus more on nature than nurture. The *fundamental attribution error* describes people’s beliefs that people’s behaviors are the outcome of their dispositional qualities, while diminishing the contribution of the situation. Ultimately, people blame the individual (Flick & Schweitzer, 2021). We tend to explain a person's behavior - for good or for bad - in terms of dispositions and characteristics (internal factors). We also tend to under-emphasize the contributions of situations (external factors; Gilovich & Eibach, 2001).

Examples of the fundamental attribution error can be seen all throughout an individual's life. One study looked into basketball. Players were split into two gyms; one being well lit and the other being low lit. The players in the low lit gym made fewer free throws. The players who made more free throws in the well lit gym said the others made less because their skill is not as good (Flick & Schweitzer, 2021). Another study looked into a hypothetical car accident where the passenger in the car had passed away. Participants were assigned to two groups, one imagined being the driver and another imagined being an outside watcher. Those who imagined driving blamed outside factors such as weather, environment and road conditions. The outside watchers believed that the situation did not matter, and it was the driver's fault (Flick & Schweitzer, 2021). In both cases, individuals emphasized internal factors even if external factors were present. When someone is assessing themselves instead of others, the fundamental attribution error may be replaced with self-serving bias. If an individual does a positive action then they will attribute that action to their own internal causes; if they are acting in a negative way, they attribute their behavior to external causes (Jellison & Green, 1981).

In summary, the fundamental attribution error suggests that people's opinions on the influence of violent crimes will lead more to blaming the individual's internal causes than external forces. In other words, the fundamental attribution error emphasizes nature.

## **Media**

In addition to basic psychological processes (e.g., a folk psychological focus on free will, and the fundamental attribution error), the media may encourage people to believe that nature has a more important role than nurture in explaining why criminals commit violent crimes. The public is increasingly influenced by the media, or specifically true crime, which shapes their views on serial killers and mass shooters. The media creates myths about the psyche of killers

which leads to disproportionate fear of victimization. The media may exaggerate the number of killers to create moral panic (Hodgkinson, Prins, & Stuart-Bennett, 2016). They also neglect many cases as well as exclude important information from the cases they do share (Hodgkinson, Prins & Stuart-Bennett, 2016).

The media also tends to blame nature and dehumanize criminals. For example, they often portray serial killers as more attractive and appealing than movie stars, musicians and professional athletes (Pearson, 2021). Serial killers have been transformed into larger-than-life celebrity monsters because of the media who have blurred the line between fact and fiction (Bonn, 2014). Ted Bundy, for example, was glamorized for his looks and heterosexuality. Because he defended himself in court, people doubted that someone who seemed so normal and put together could commit these crimes because the media only shows people who “look the part”, rarely being the white middle class (Pearson, 2021). Bundy, to the public, was categorized as a celebrity; he was glamorized, found to be fascinating, and had his “achievements” publicly recognized (Wiest, 2016).

Along with the coverage of serial killers, mass shootings tend to capture the attention of the public through substantial news coverage. The media tends to cover more information regarding the perpetrator than the victims and survivors (Croitoru et. al, 2020). The coverage of these shootings can also create a sense of moral panic and allow people to believe that they are more prevalent than they truly are (Schildkraut, 2016). Mass shootings provide another example in which news sources consciously decide which aspects of a story to highlight, which plays an active role in the construction of reality. Specifically, the media draws attention to the perpetrator to highlight the deviant nature of the crime and simply blame the individual who committed the crime (Schildkraut, 2016). The coverage of mass shootings tends to inflict a belief that the

perpetrator committed these crimes due to their nature rather than external factors that may be present.

In sum, folk psychology, the fundamental attribution error and the media all play a role in shaping a person's beliefs about the reasons why someone behaves the way they do in general, and why people commit crimes in particular. When it comes to violent crime, these factors prompt individuals to infer that people would believe that nature would eclipse nurture in influencing these criminals behaviors.

### **The Current Research**

The current research suggests that an interaction of nature and nurture plays an important role in what can influence someone to commit a violent crime (Ardilla, 2012, Crews, 2010, & McLeod, 2007 ). Yet although scientists have found some possible answers, many other factors may contribute to what an individual person *believes* when it comes to what influences a violent crime. Research on folk psychology, the fundamental attribution error, and the media all suggests that people tend to focus on nature more than nurture when explaining the causes of heinous, violent crimes. Accordingly, this study will investigate what people believe influence why someone would commit such violent crimes such as serial homicide and mass shootings. Although contemporary research points to an interaction between nature and nurture, I predict that people's beliefs will be more one-sided.

Another goal of this study will be to examine the consistency of people's beliefs about the contributions of nature and nurture. Do beliefs about those influences change when it comes to a serial killer versus someone who commits a mass shooting or will they remain the same? I predict that people's opinions of what aspect influences violent crime will be consistent for serial killers and mass shooters.

In sum, I hypothesize that nature will be more prevalent in people's opinion of what aspect influences violent crimes than nurture, and that this will be consistent for serial killers and mass shooters. I will test these hypotheses using a mixed-method approach in which people answer both open-ended and closed-ended questions about the contributions of nature and nurture to heinous, violent crimes.

## **Methods**

### **Participants**

I recruited 259 participants through CloudResearch, which is a service where participants are compensated for each questionnaire they complete. Participants were compensated \$1 for completing the survey. All participants were at least 18 years of age. Out of the 259 participants that completed the survey, I excluded any participants who failed the attention check ( $n=7$ ), any participants who dropped before answering the open-ended questions ( $n=10$ ), any participants who answered open-ended questions with nonsense ( $n=2$ ) including: “A person as in danger” and “kill multiple people in a populated area”, and any participants who were suspicious for being Artificial Intelligence (AI;  $n=7$ ), including a three redundant responses that began: “Serial Killing is a complex phenomenon involving psychological, environment and psychological causes...”. This resulted in 233 participants for analyses.

The final sample ranged in age from 18 to 72 years ( $M= 38.22$ ,  $SD= 11.02$ ) and included 135 (57.9%) males, 93 (39.9%) females, and 5 (2.1%) participants who identify as “non-binary, / third gender.” When regarding the participants’ political affiliation, 67 (28.7%) of participants identified as being Republican, 146 (62.6%) of participants identified as being a Democrat and 20 (8.6%) claimed to be neither. Finally, participants described their race as follows: 162 (69.5%)



White, 30 (12.9%) Asian, 28 (12.0%) Black or African American, 8 (3.4%) Other, 3 (1.3%) American Indian or Alaska Native, and 2 (.9%) Native Hawaiian or Other Pacific Islander.

### **Procedures**

Participants completed a questionnaire that assessed their opinions about the factors that influence someone to become a serial killer or mass shooter. The participants were randomly assigned to answer questions about either serial killers or mass shooters. Participants first responded to open-ended questions about the factors that cause their assigned heinous crime. Next, participants responded to a close-ended nature and nurture questions that assessed how much the participants believed each cause influenced someone to become a violent criminal.<sup>1</sup> Finally, participants responded to questions about their demographics before being debriefed.

### **Measures**

**Open-Ended.** Participants were randomly assigned to answer one of two open-ended questions. There were 116 participants in the serial killer condition that answered the question “In at least a few sentences, please answer the following question: Why do you think a person engages in serial killing?” There were 117 participants in the mass shooter condition that answered the question: “In at least a few sentences, please answer the following question: Why do you think a person commits a mass shooting?” Participants expressed their beliefs in their own words.

**Nature and Nurture Scales.** Seven questions measured participants' opinions on how much a certain factor influences who becomes a serial killer or a mass shooter. These questions had the stem of “How much do you believe the behavior of [serial killers/mass shooters] is due to” followed by: “their genes?”, “brain abnormalities?”, “biological causes?”, “their childhood

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<sup>1</sup> Participants also completed scales assessing their relationship with the media, punishment preferences, and beliefs about mental illness. These variables were not the focus of analyses but can be found in the appendix.

upbringing?”, “trauma?”, “previous forms of abuse?”, and “the impact of parents, family and friends?”<sup>2</sup> Participants responded with one of the following: *Not at all*, *Slightly*, *Moderately*, *Much* or *Very much*. I provide more information about the factor structure of these responses below.

## Results

I predicted that nature would be more prevalent than nurture in people’s opinions about the causes of heinous violent crimes. That is, people would generally refer to nature’s influences over nurture’s influences when it comes to explaining the behaviors of individuals who commit violent crimes. I hypothesized that people’s opinion of what aspect influences violent crime will be consistent for serial killers and mass shooters. As described below, results indicated that participants did appeal more to nature than nurture when it comes to a person committing a violent crime for the open-ended data. However, for the close-ended questions, participants appealed more to nurture than nature related causes.

## Qualitative Analysis

To create a coding scheme, I first read all of participants’ open-ended responses to identify recurring themes as well as examples of each theme. My advisor then reviewed the open-ended responses. In consultation, we discussed each theme, resolved any ambiguity, and finalized the list of themes. We consolidated to 17 themes, as described below. I then re-read each participants’ responses and applied the coding scheme (giving a 0 if the theme was absent, and a 1 if the theme was present). Participants’ responses were coded as including more than 1 theme when appropriate.

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<sup>2</sup> Two questions ended with the words “under their personal control” and “aspects of the situation they could not personally control.” These items were not included in the scale, due to the results of a preliminary factor analysis. This allowed for interpretable scales. See below for more information.

The themes recorded from the qualitative analysis can mostly be categorized as nature and nurture. Nature themes included: mental illness, psychological traits, anger/hate, satisfaction of an urge/asserting control, brain defects, a lack of empathy, genetics, evil, and miscellaneous nature-based explanations. Nurture themes included: childhood trauma, revenge, access to firearms, being bullied, abuse, and miscellaneous nurture-based explanations. Importantly, another theme was the interaction between nature and nurture. Finally, some responses were characterized using a final theme: “I don’t know.” The themes are exhibited in Table 1, and more information is provided below.

**Nature-Focused Themes.** The most common nature-focused theme was *mental illness*, which was seen in a total of 108 responses. Mental illness refers to the criminal having some form of mental disability. Examples of mental illness include: “the person has a mental illness that changes the way they think” (Participant 30), “they are mentally unstable” (Participant 110), “they are mentally challenged” (Participant 144), and “serious mental illness that makes him more likely to be violent” (Participant 230).

Psychological *traits* were mentioned in 47 responses. Many participants explained that these criminals have traits that contribute to their actions such as “issues going on inside them” (Participant 56). Another example includes, “a psychotic taste for killing or violent penetration” (Participant 115).

The words *anger/hate* was mentioned 42 times throughout the responses to show a strong emotion. Examples include, “someone who is deeply angry....” (Participant 29), “they are incredibly broken and angry inside” (Participant 114), and “result from a state of rage that the killer is exhibiting which has left them free of remorse and drunk off anger” (Participant 105).

The theme of *to satisfy an urge/control* refers to when participants believed criminals commit these violent crimes because of internal impulses, including in 34 responses. For example, a mass shooter is someone who “finds joy and satisfaction in killing people” (Participant 168). Other examples include: “they might also do it for power and control” (Participant 8) and “this escalation can be driven by the need for greater stimulation and satisfaction” (Participant 66).

Many participants referred to *brain defects*, that is abnormalities in the brain. Participants used language such as “I assume that there's something wrong with their brain that gives them the compulsion to kill others” (Participant 96). Others claimed that “they are having problems with their brain” (Participant 167). A total of 21 participants claimed that brain defects are an influence of what causes someone to become a violent criminal.

Having *no empathy* was a theme used 16 times overall. Many participants in the serial killer condition claimed that serial killer’s have “no human empathy or emotion” (Participant 59), and “...They lack the sort of empathetic/sympathetic feelings of normal people” (Participant 3).

The theme of *genetics* was mentioned only 6 times, and only in the serial killer condition. Examples include: “I think somewhere inside of them is a gene that they should have evolved away from, but for some reason, it is activated” (Participant 80) or there is a “complex interplay of genes” (Participant 233).

Calling these criminals *evil* was a theme that came up five times throughout the responses. Examples include the following: “Other people are just evil and bad people” (Participant 15), “I think honestly they are simply evil” (Participant 87), and “They are full of pure evil and hatred” (Participant 113).

The *nature miscellaneous* theme was evident in 20 responses. Examples of this theme are, “They might be sexually frustrated” (Participant 213) and “They are the type to project their inner pain to others but in a very destructive and violent way” (Participant 207).

**Nurture-Focused Themes.** An example of a nurture based-theme is *childhood trauma*, that is, references to experiences in childhood that had a lingering effect impacting the individual negatively. For example, “They’re usually damaged human beings who suffered from trauma in childhood (Participant 52). Another example includes: “I feel that this person also may have experienced a trauma in their childhood” (Participant 149). Childhood Trauma was mentioned in a total of 31 responses. A related theme was the specific experience of *abuse*, which was mentioned in 7 responses. Responses consistently used the word abuse to refer to the criminal’s past such as “they had an abusive past” (Participant 59) or “ they grew up in an abusive household and it's all they know” (Participant 75).

*Revenge* was mentioned in a total of 20 responses. Participants either stated the word revenge or claimed that the criminal wanted to get back at people for some wrong they had experienced; “revenge to get back at some people” (Participant 177). Another participant claimed that they “might even be motivated by a desire for revenge on foes” (Participant 97). A related theme was being *bullied*, which was included in 10 responses. Many participants believed that when someone was bullied in school contributed to them committing violent crimes. For example: “I feel like they were bullied in school” (Participant 146) or “Mass shooters are often people who were bullied” (Participant 123).

*Access to Firearms* was mentioned 15 times, and solely in the mass shooter condition. Responses include, “the opportunity could be because of access to guns” (Participant 121) and “by giving everyone easy access to firearms” (Participant 126).

Lastly, there were responses that did not have anything in common with the themes we came up with. The *nurture miscellaneous* theme had a total of eight responses. Examples include: “Because they know our justice system sucks” (Participant 201) and “life drives them to snap” (Participant 233).

**Interaction.** I coded responses as including an *interaction* between nature and nurture when a participant explicitly claimed that the two factors worked together, rather than simply naming examples of each separately. There were only six participants who believed that the influence was an interaction between nature and nurture. One participant, for example, wrote “A combination of psychological, environmental, and personal factors” (Participant 181). Another participant stated the interaction in their response, “I think that nature and nurture also has a substantial precedent in why serial killers engage in this type of behavior” (Participant 27).

**Other themes.** The theme of *I Don't Know* was created to show that some people reported not knowing what could be the influence of violent criminals. For example, “I literally cannot wrap my head around why anyone would do that” (Participant 189) and “I HAVE no earthly idea, why should I know what a strange question, I cannot get in their head, they are too weird” (Participant 190).

### **Findings from Open-Ended Analyses**

See Table 1 for all themes that participants report. As one can see, the themes regarding nature were more present in responses than nurture. Mental illness, traits, anger/hate and satisfying an urge/control far outweighed the remaining themes. However, it is important to note that childhood trauma was the most mentioned nurture response. The most influential theme was that of “mental illness”. Participants used the explanation of mental illness 42 times in the serial killer condition and 66 times in the mass shooter condition.

I made a new variable, nature and nurture, and gave anyone a 0 who mentioned only nature or nurture. I have a 1 for anyone who mentioned at least one nature theme and at least one nurture theme. It was found that 171 participants (73.1%) mentioned only nature or nurture. Only 62 participants (26.5%) mentioned at least one nature theme and at least one nurture theme. Within these participants, only six mentioned there was an interaction between nature and nurture to produce someone's behavior. To test this further, we did a quantitative analysis of the qualitative data.

**Table 1**

*Themes Discovered from Qualitative Data*

Themes	Condition	
	Serial Killer	Mass Shooter
Mental Illness	42	66
Traits	30	17
Anger/Hate	10	32
Satisfy an Urge/Control	28	6
Brain Defects	15	6
No Empathy	15	1
Genetics	6	0
Evil	2	3
Misc Nature	7	14
Childhood Trauma	21	10
Revenge	10	10
Access to Firearms	0	15
Bullied	1	10
Abuse	6	1

Misc Nurture	2	6
Interaction	6	0
I Don't Know	3	1

**Comparing Nature and Nurture Open-Ended Responses.** To take a further look at open-ended responses, I tallied the total number of nature and nurture themes for each participant. I then performed a within-participant ANOVA comparing participants' open-ended tallies for nature and nurture themes. Analyses indicated that participants significantly differed in the degree to which they mentioned nature and nurture,  $F(1, 232) = 169.39, p < .001$ . When it came to open-ended responses, participants more frequently mentioned nature-based explanations for violent crime ( $M = 1.27, SD = .73$ ) than nurture-based explanations ( $M = .39, SD = .59$ ).

To explore whether themes were consistent or inconsistent across conditions, I next conducted a mixed two-way ANOVA, comparing participants' nature and nurture tallies as a function of condition (serial killer, mass shooter). Analyses indicated that – as described above – there was a significant difference between participants' nature and nurture scores,  $F(1, 230) = 170.10, p < .001$ . Analyses did not indicate an interaction of condition and nature-nurture scores,  $F(1, 231) = 1.59, p = .208$ . Across both the serial killer and mass shooter conditions, participant's open-ended responses indicated greater emphasis of nature than nurture.

In the open-ended responses, participants, generally, thought nature had a greater influence than nurture when it came to someone who committed a violent crime. This result was



consistent between serial killers and mass shooters, showing participants thought of these conditions similarly.

### **Quantitative Analyses**

To complement analyses of participants' open-ended responses, I conducted a number of analyses to investigate participants' close-ended responses about nature and nurture.

**Factor Analysis and Descriptive Analysis.** To begin, I tested whether the close-ended nature and nurture items load on one single or two separate factors. To do so, I first conducted a principal axis factor with direct oblimin rotation for participants who answered questions about serial killers. Results indicated that items loaded on two factors, one corresponding to nurture (eigenvalue = 3.28) and another corresponding to nature (eigenvalue = 2.01). Next, I repeated the same analysis for participants who answered questions about mass shooters. Results provided the same factor structure, items loaded onto nurture (eigenvalue = 3.35) and nature (eigenvalue = 1.59) factors. Altogether, these analyses indicate that nature- and nurture-related items separated into two distinct factors.

To create separate nature and nurture scales, I therefore collapsed across the two conditions and calculated the average of the items related to nurture, and the items related to nature to create two overall scales, Cronbachs alpha = .90 and .76 respectively. A takeaway of these initial analyses is that participants' close-ended responses indicated that they thought about nature and nurture as two separate possible causes of violent crime, rather than as a single bi-polar continuum.

Further, I used a Pearson's correlation coefficient to test the relation of nature and nurture scores. There was a weak positive correlation between nature and nurture  $r(233) = .229, p < .001$ .

As endorsement of nature-based causes increased, endorsement of nurture-based causes also increased as well. Surprisingly, nature and nurture increased simultaneously.

**Comparing Nature and Nurture Close-Ended Responses.** To provide a test of the hypothesis that nature will be more prevalent than nurture in people's opinions of what aspect influences violent crimes, I conducted a within-participant ANOVA comparing participants' nature and nurture scores. Analyses indicated that participants significantly differed in the degree to which they endorsed nature-based versus nurture-based explanations for violent crime,  $F(1, 232) = 84.99$ ,  $p < .001$ . When it came to close-ended responses, participants more strongly endorsed nurture-based explanations for violent crime ( $M = 3.41$ ,  $SD = .92$ ) than nature-based explanations ( $M = 2.73$ ,  $SD = .88$ ).

To further explore whether the endorsement of nature/nurture differed for serial killing and mass shooting, I conducted a mixed two-way ANOVA, comparing participants' nature and nurture scores as a function of condition (serial killer, mass shooter). Analyses indicated that – as described above – there was a significant difference between participants' nature and nurture scores,  $F(1, 231) = 85.70$ ,  $p < .001$ . Importantly, analyses also indicated a marginal interaction of condition and nature-nurture scores,  $F(1, 231) = 3.33$ ,  $p = .069$ . Further examination of the data, indicated that in the serial killer condition, participants endorsed nurture ( $M = 3.48$ ,  $SD = .92$ ) more than nature ( $M = 2.94$ ,  $SD = .91$ ). Likewise, in the mass shooter condition, participants endorsed nurture ( $M = 3.34$ ,  $SD = .93$ ) more than nature ( $M = 2.53$ ,  $SD = .80$ ), but to a slightly more pronounced degree.

## Discussion

The results of this study painted a complicated picture. The study was conducted to explore people's beliefs on whether nature or nurture played a larger role in influencing someone

to become a violent criminal. Yet, only about a quarter of participants mentioned both nature and nurture in their open-ended responses, and of those, a very small percentage explicitly noted an interaction. My hypothesis, that nature would be more prevalent in people's opinion of what aspects influence violent crimes, was supported by the open-ended questions of the study. However, in the close-ended questions, participants unexpectedly endorsed nurture-related causes more than nature-related causes. This raises interesting questions about the ways that people think about the causes of serial killings and mass shootings.

It is also worth noting that people generally looked at the causes of serial killing and mass shootings in a similar way. People responded to mass shootings and serial killing with similar kinds of explanations. For open-ended questions, participants mentioned nature-based causes more than nurture-based causes for both serial killers and mass shooters. For close-ended questions, participants endorsed nature-based causes less than nurture-based causes for both serial killers and mass shooters. Yet, in both the open- and close-ended items, there was no interaction between crime type and explanations.

### **Implications**

People tended to see nature- and nurture-based causes as two-separate variables in both open-ended and closed-ended questions. Science suggests that there is an interaction between nature and nurture that leads to the behaviors of a violent criminal (Levitt, 2013). In the open-ended responses, participants tended to mention nature more than nurture, but six of the participants explicitly mentioned an interaction of the two. In the close-ended responses, nature and nurture loaded onto two-factors that unexpectedly positively correlated. That is, higher endorsement of nature predicted higher endorsement of nurture. This shows how people have

their own opinions about the influences of violent crime. This important finding allows the exploration of how people's own opinions differ from what scientists have to say.

Another surprising finding was the inverse nature of the findings for the open-ended and close-ended responses. These results may demonstrate the dual process model of attributions. The dual process model of attributions explains that humans use two different processing styles (Gawronski & Creighton, 2013). When people are first asked to look at a situation they tend to support dispositional attributions because that is their quick and automatic style of responding. Then, when motivated, or prompted, to think about the situation, people start to consider situational information, such as external influences because they are able to think slower and more deliberately due having more time to think about the question or situation at hand (Gawronski & Creighton, 2013). In this study, when participants were asked to write their own opinions of what they believe influences a serial killer or a mass shooter, they choose more internal, dispositional, influences. When the participants were next given a prompt and a scale to choose from and had a second chance to think about the questions, they started to consider there may be situational influences that can play a role.

When it comes to the specific sorts of explanations that people provided for violent crime, the most influential theme discovered in the qualitative data was mental illness. This was, by far, the most reported theme in either of the conditions. This is consistent with my hypothesis that people would appeal to nature influences over nurture influences when asked their opinions on what influences someone to commit a violent crime. Participants believed that people are influenced to commit violent crimes due to their nature.

Folk Psychology explains that people believe in free will. People believe that others should be able to make rational choices freely (Common & Miller, 2011). This theory could

explain why mental illness was seen as the most popular theme discovered in the qualitative data.

Biological influences play a role in shaping whether someone becomes a violent criminal. For example, having low levels of the MAOA gene contributes to high aggression, and may influence a person to become violent. In this study, however, only a handful of participants claimed that genes are a primary influence. It was a surprising finding due to how participants down-played genetics and biological causes more generally despite the considerable evidence on biological factors. Science has often focused on biological influences in nature. People, in converse, seem to think about nature in terms of character and disposition such as evil. We also learned that people believe mental illnesses play a larger role in shaping someone into a violent criminal than someones inherited genes.

People also focus on abuse and trauma differently than the literature. As explored in the study from Marono, Reid, Yaksic & Keatley (2020), it was shown how childhood abuse, either psychologically, physically or sexually plays an important factor in determining an individual's outcome in adulthood. That study explained how violent criminals more, generally than not, experienced abuse. In this study, only a few participants appealed to the nurture influence of abuse. Therefore, these participants believe there are other more important influences such as childhood trauma and getting revenge that play a larger role in shaping a violent criminal.

This important finding shows how science and people's opinions are not in line with one another. Science has had the opportunity to show and explain to the public that an interaction between genes and abuse is, more likely than not, to influence someone to become a violent criminal. However, people stand by their own opinions of what shapes a violent criminal that does not back up what the science data insists.

Although people are entitled to their own opinions, they are not necessarily always correct. This study can be used to show how people are fascinated by the idea of true crime and violent criminals, but do not have an understanding of the actual influences on violent criminals. With the rise of mental health awareness, it was not surprising that many participants claimed violent criminals struggle with mental illnesses. Nonetheless, it is vital for people to recognize that criminality is the result of a complex interplay of nature-based and nurture-based influences, and cannot be attributed to a single cause (such as mental illness) alone.

### **Limitations and Future Directions**

Although this study makes meaningful contributions toward our understanding of people's opinions on what influences someone to become a violent criminal, there were, of course, limitations. The participants in this study were only from the United States. For future studies, it would be beneficial to look at a combination of other countries. The United States is an especially violent society, and there are societal differences between the United States and other countries when it comes to violent crimes (Grinshteyn & Hemenway, 2019). Nonetheless, there are violent criminals all around the world. Thus, it could be helpful to see if the answers differ in other countries.

Another limitation to this particular study was that it was conducted online. This could lead to participants reporting shorter and less complicated answers to the open-ended question due to the study question being very broad. For future studies, it may be useful to do additional offline studies that are more indepth to motivate participants to give more fleshed out answers. This could be achieved by having conversations or conducting interviews. By doing so there could be more consistent answers from the participants or to somehow ensure participants were motivated to think about the questions

As explained previously, the results of the open-ended question and close-ended questions contradicted each other. When the participants answered the open-ended question they mentioned more nature-related responses opposed to the close-ended questions where they chose more nurture-related responses. One possible explanation for this difference may be methodological. Because they were derived from the sorts of explanations used by scientists, the close-ended items were very biologically focused (e.g. genes, brain abnormalities and biological causes) and did not focus on whether people endorse character-or-disposition based explanations for crime. For example, in the close-ended questions, I asked questions regarding the genetics and bodily functions of an individual when participants in the open-ended questions responded with themes such as evil and anger. Thus, it would be useful in future studies to revise the close-ended scales in the light of the open-ended themes discovered in this study. This could lead to having the responses more in line with each other rather than being the opposite.

## **Conclusion**

Americans are fascinated with true crime and why people are capable of doing awful things such as committing violent, heinous crimes. Science explains that nature and nurture interact together to influence someone to become a violent criminal. The results of this study show that people's beliefs about the causes of violent crime are not in alignment with the data from science. With that being said, it is surprising to find that participants first, appeal to nature-related responses more frequently when asked to express their opinion in their own words, then change their responses to more nurture-related responses when prompted with specific questions and statements. It can be concluded that although people are fascinated by the true crime genre, they have beliefs that contradict science about the factors that actually influence

someone to become a violent criminal. This only further adds to the complexity and mystery in our understanding of people who end up committing violent, heinous crimes.



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### Questionnaire

Welcome! Thank you for your interest in our study. This survey will ask questions about violent crimes.

[New page]

**To begin, we would like to ask your thoughts about violent crimes.**

[Half of participants will answer questions about serial killing and half will answer questions about mass shootings.]

A serial killer is someone who commits two or more murders that are separated with time. In at least a few sentences, please answer the following question: Why do you think a person engages in serial killing?

A mass shooter is someone who uses firearms to kill multiple people, typically in a populated area, during a single event. In at least a few sentences, please answer the following question: Why do you think a person commits a mass shooting?

[New page]

**Now, we would like to ask a few more questions about violent criminals and crime.**

How much do you believe the behavior of [serial killers/mass shooters] is under their personal control?

[Questions in random order]

Not at all	Slightly	Moderately	Much	Very Much

How much do you believe someone becomes a [serial killer/ mass shooter] due to their genes?

Not at all	Slightly	Moderately	Much	Very Much

How much do you believe someone becomes a [serial killer/ mass shooter] due to brain abnormalities?

Not at all	Slightly	Moderately	Much	Very Much

How much do you believe someone becomes a [serial killer/ mass shooter] due to biological causes?

Not at all	Slightly	Moderately	Much	Very Much

How much do you believe someone becomes a [serial killer/ mass shooter] due to aspects of the situation they could not personally control?

Not at all	Slightly	Moderately	Much	Very Much



How much do you believe someone becomes a [serial killer/ mass shooter] due to their childhood upbringing?

Not at all	Slightly	Moderately	Much	Very Much

How much do you believe someone becomes a [serial killer/ mass shooter] due to trauma?

Not at all	Slightly	Moderately	Much	Very Much

How much do you believe someone becomes a [serial killer/ mass shooter] due to previous forms of abuse?

Not at all	Slightly	Moderately	Much	Very Much

How much do you believe someone becomes a [serial killer/ mass shooter] due to the impact of parents, family and friends?

Not at all	Slightly	Moderately	Much	Very Much

[New page]

**Moving forward, we would like to understand your opinions on the severity of punishments these criminals deserve.**

If a person is convicted of [serial killing / mass shooting]:

- How many years in jail should they receive? \_\_\_\_\_
- How strongly do you feel that they should be sentenced to life in jail?

Not at all	Slightly	Moderately	Much	Very Much

- How strongly do you feel that they should be sentenced to the death penalty?

Not at all	Slightly	Moderately	Much	Very Much

[New page]

**Next, we would like to ask a few questions about your views of the media.**

How many hours do you spend watching television a day? \_\_\_\_\_ hours

How often do you watch non-fiction crime shows, such as True Crime Documentaries?

Never	Almost Never	On Occasion	Often	Regularly

How often do you watch fiction crime shows/movies?

Never	Almost Never	On Occasion	Often	Regularly

How accurately do you believe these documentaries, shows and movies depict real life events?

Do not know	Not Accurately	Somewhat Accurate	Accurately	Very Accurately

[New page]

**You're almost done! Now, we would like to ask you about your beliefs on mental health.**

**To what extent do you agree or disagree with the following statements?**

One of the main causes of mental illness is a lack of self-discipline and will power.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

There is something about the mentally ill that makes it easy to tell them from normal people.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Mental patients need the same kind of control and discipline as a young child.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

The mentally ill should not be treated as outcasts of society.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

The mentally ill are a burden on society.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

It is best to avoid anyone who has mental problems.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

--	--	--	--	--

The mentally ill are far less of a danger than most people suppose.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

[New page]

**To end, we would like to ask you some questions about yourself.**

**What is your gender?**

Male

Female

Non-binary

Prefer not to say

Other: \_\_\_\_\_

**What is your age? \_\_\_\_**

**How would you best describe yourself?**

American Indian or Alaska Native

Asian

Black or African American

Native Hawaiian or Other Pacific Islander

White

Other: \_\_\_\_\_

Prefer not to say

**What's the highest level of education you've completed?**

No schooling completed

Nursery school to 8th grade

Some high school, no diploma

High school graduate, diploma or equivalent

Some college credit, no degree

Trade/technical/vocational training

Associate degree

Bachelor's degree

Master's degree  
Professional degree  
Doctorate degree

**What is your employment status?**

Employed for wages  
Self-employed  
Unemployed and looking for work  
Unemployed but not currently looking for work  
A homemaker  
A student  
Military  
Retired  
Unable to work

**What best describes your political affiliation?**

a. Democrat, Republican, Neither

**For those who answered Democrat/Republican:**

How strongly do you identify as a Democrat/Republican?

b. Slightly, Moderately, Very Much

**For those who answered Neither: Are you closer to being a Democrat or Republican?**

c. Closer to Democrat, Closer to Republican, Closer to being neither

**Thank you for completing our survey!**



Completion Date 28-Aug-2023  
Expiration Date 28-Aug-2026  
Record ID 57885776

This is to certify that:

**Jamie Smith**

Has completed the following CITI Program course:

Not valid for renewal of  
certification through CME.

**Responsible Conduct of Research (RCR)**

(Curriculum Group)

**Basic RCR + Human Subjects**

(Course Learner Group)

**1 - Basic Course**

(Stage)

Under requirements set by:

**Drew University**

**CITI**  
Collaborative Institutional Training Initiative

101 NE 3rd Avenue, Suite 320  
Fort Lauderdale, FL 33301 US  
[www.citiprogram.org](http://www.citiprogram.org)

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