Nature and Nurture

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13 July 2018

In 2016, a violent crime occurred every 25.3 seconds in the United States. A violent crime is that of which an offender or perpetrator uses or threatens to use force upon a victim. This includes both crimes in which the violent act is the objective, such as murder or rape, as well as crimes in which violence is the means to an end such as armed robbery. These included a murder every 30 minutes and a rape every 4 minutes in the United States. These are just American crime statistics, however, and there are other countries with more crime per capita than the United States. So the question that comes to mind is why is there so much crime in the world or, better yet, what causes so many people to want to commit a crime? With a little background in learning about psychology, you probably have heard of the big debate of nature versus nurture. This comes down to, is it the surroundings of a person growing up that shapes them into the person they are (nurture) or the person they are is because of what they were born with in their genes (nature)? The nature versus nurture argument is a very key point in determining whether a criminal is born that way or they choose that way because of the environment they grew up in, which will be examined in the coming paragraphs to show that there are genes that make people more likely to commit a crime, but the mixture of the wrong environment with a predisposed genotype is the reason people commit crime.

To begin with, it has been scientifically proven that there are similar characteristics in genotypes of criminals that cause for criminal behavior. For example, there was a study done in Finland in 2013 that found that their "genetic analysis of over 900 offenders" has revealed "two genes associated with criminal behavior" (Hogenboom). The people with these genes were thirteen times more likely to commit a crime than those who did not have the genes, but it has to be taken with a grain of salt. The two genes they found, often called the Warrior Genes because of their link with violent behavior, were the MAOA gene and a variant of CDH13. MAOA codes for controlling the amount of dopamine and serotonin to the brain and CDH13 is associated

with substance abuse and ADHD. The mixture of these can create a "dopamine hyperactivity" especially under the influence of drugs or alcohol, which most of the violent offenders studied in Finland were (Hogenboom). This study tells us that there definitely is something in a genotype that can make someone potentially want to commit a crime under the right circumstances, but a very small percentage of people with this genotype actually commit a crime. A study like this does not take into account any type of background of the criminals or the "nurture" aspect of a criminal. It furthers the point that a good combination of genes along with a bad background in the right circumstances can make a potential criminal, but there is not a lot can we do with this information at this time. Screening a person for this might show they are more likely to commit a crime but it is completely immoral to accuse or convict someone of being a criminal if they have not committed one. Back in the late nineteenth century and early twentieth century, the United States actually looked into perhaps limiting or committing people with genes associated with psychological problems. Top researchers believed that genes were the sole reason for criminal activity and that criminals could be identified by the features they were born with. Along with this information and a eugenics movement going on during the same time period, some decided to act by using sterilization to rid society of "criminals, idiots, imbeciles, and rapists" (Joseph 182). This is a main reason why advancing along the lines of trying to figure out the criminal gene will be very challenging because of the inhumane treatment that can inevitably take place when committing, or otherwise vilifying people even though they have not exhibited any adverse behavior.

Next, there are three important studies that scientists perform to determine the role of genetics. These studies are twin, adoption, and family studies, but the focus will be on twin and adoption studies because singling out what is genetic and what is environmental in family studies is very difficult. There have been many studies done on

twins separated and raised in different environments to see whether genes or the environment play a bigger role. These studies can perhaps say the most because two people with almost the same genotype raised in completely different environments should show which of the two is more dominant, right? Well that answer is still hard to come by because different studies come to vastly different conclusions as to genetics' role in the development in antisocial or criminal behavior. Twin studies compare the rate of criminal behavior of twins who are genetically identical or monozygotic twins (MZ) with twins who are not, or dizygotic twins (DZ) in order to assess the role of genetic and environmental influences (Crime Causation). These can be effective but it is hard to be able to find suitable samples of twins reared apart at birth to conduct these studies in MZ twins. A study done in Denmark of 3,586 twin pairings was able to draw some conclusions from the results they received. They concluded that "52 percent of the monozygotic twins were (probandwise) concordance for criminal behavior whereas only 22 percent of the dizygotic twins were (probandwise) concordance for criminal behavior" (Crime Causation). A higher percent in the monozygotic twins suggests that there is a higher probability that one can inherit some type of biological characteristics that make them more likely to commit a crime. More studies agree with these findings, although this design of study is limited in that the assumption of equal environments is often breached. The difficulty to find suitable samples of identical twins separated at birth from various backgrounds is problematic to the reliability of the data. Other studies though have found, based on their results, that there is no difference in these concordance rates so they could not conclude anything. One such study examined forty-nine MZ and eighty-nine DZ pairs, but concluded that there is no difference in the concordance rates. This led them to believe that hereditary factors "are of little significance" in terms of common crime (Jones). It is very difficult to separate nature and nurture aspects and because of this reason many of the other studies done have issues with the validity.

The next important study done for looking at genotypes and their link to criminal behavior are adoption studies. These studies look at the adopted person and their biological parents as well as their adoptive parents. In doing so, it is possible for one to look at the nature and nurture aspects as they are already separated out. This is presumed to be the most effective study that can be done because of the ability to look at both nature and nurture aspects at the same time and being able to tell which one prevails showing whether the genes or the environment played a larger role in someone becoming a criminal. The first adoption study done was in Iowa in 1972, in which fifty-two adoptees were studied (twenty-seven male). The adoptees were born between 1925 and 1956 to a group of forty-one incarcerated female offenders. They then matched "a group of control adoptees... sex, race, and approximate age at the time of adoption" to the study group (Crime Causation). Of the fifty-two born by the female offenders, seven had been convicted of crimes as adults compared to only one in the control group. This evidence, although a small sample size, seems to suggest that there is a heritable trait involved causing seven of the adopted children of the convicted females to also commit a crime compared to only one. They were separated at birth meaning there was no influence from their biological mothers to the nurture aspect of who they became, only the nature aspect showing they had some predisposition to commit a crime. A series of similar adoption studies were done during the whole 1980's, also in Iowa, which was conducted by Cadoret and colleagues and supported the original findings of Crowe. The next important adoption study done was perhaps one of the most influential because of its sample size. This comes from a study done in Denmark of 14,427 Danish adoptees, done in the early 1980's by Mednick, Gabrielli, and Hutchins. They focused on both the mother and father of the adopted person's biological and adoptive parents and the number of court convictions of the mother and father and were able to draw important conclusions between these links. They found that adopted-away sons had an elevated

risk of having a court conviction if their biological parent, rather than their adoptive parent, had one or more court convictions (Crime Causation). Only 13.5 percent of the sons had a conviction if neither their biological nor adoptive parents had a conviction. The number slightly grew to 14.7 percent if the adoptive parents were convicted of crimes but not the biological parents. Interestingly though, when the biological parents had been convicted but not the adoptive parents the rate grew all the way up to 20 percent of the adoptees having at least one conviction. As the number of convictions went up in their biological parents so did the rate of the children becoming convicted. These numbers do seem to suggest criminal behavior being linked to a component of genetics, but the combination of genes and environment seem to have major effects in the development of a criminal.

Last but not least, the effect of the environmental influence and gene-environment interactions need to be examined as well. Many researchers agree that criminals may have a certain predisposition in their genes and it is important to study, but the environmental factor may be, if not the most influential factor, and needs to be thoroughly examined as well. There are many factors of an environment to take a deeper look at. For instance, one of the most studied is perhaps the home life of someone growing up, but must also include some smaller pieces to be delved in to. All individuals do not come from the same backgrounds and Lowell Carr highlights six factors of a so called 'normal' family life. These six include first, structural completeness or presence of both natural parents, second, economic security, third, cultural conformity or same cultural backgrounds such as language, food, etc, fourth, moral conformity, fifth, physical and psychological conformity or no mentally ill or deranged family members, and last, functional adequacy or members having harmonious relationships with minimal friction. It is hard to find a home with all these characteristics but it does not mean there are not normal homes. When there are even a couple of these characteristics completely

gone or severely damaged it is shown to have a strong link to criminal behavior later on in life. Broken homes were studied deeply during the 1940's and the broad conclusion come to from those studies was "that 30 to 60 percent of delinquents come from broken homes (Sutherland, 1965: 176)" (Bura). As well as "Healy and Bronner's study of 4,000 juvenile delinquents... showed that about 50 per cent had a background of broken homes" (Bura). Another big factor studied is the concept of the social learning theory. At a young age, kids are very susceptible to learning based on what they see and start to act that way, believing it to be normal. Kids coming from a family where they see abuse or aggressive behavior from their parents or other family members start to believe that is normal behavior and start to act that way towards their parents and other people. Aggressive behavior is obviously linked to criminal activity so a kid can pick up on this at a very young age and it can spiral out of control to the point where they act that way continuously and eventually commit crime(s) when they become older (Jones). In 1996, Eysenck studied the Gene Environment interactions between certain genes that, with the correct environment, influence a behavior very strongly. Eysenck developed the PEN model which consisted of psychoticism, extraversion, and neuroticism. "Psychoticism was associated with the traits of aggressive, impersonal, impulsive, cold, antisocial, and un-empathetic. Extraversion was correlated with the traits of sociable, lively, active, sensation-seeking, carefree, dominant, and assertive. Finally, neuroticism was associated with anxious, depressed, low self-esteem, irrational, moody, emotional, and tense" (Jones). Eysenck believed that these three could be predictors of criminal behavior, and all three have been proven to be heritable. He called this specific gene environment interaction the general arousal theory of criminality. It has been shown that low arousal levels in the brain are very highly correlated to criminal behavior. He found that low arousal characteristics were very similar to the extraversion characteristics. This means that individuals who appear to be extraverts as well as possess low arousal

levels need to find ways to find stimulation because they do not already have enough in their brains. The conclusion that Eysenck came to was that, "individuals inherit a nervous system that is unresponsive to low levels of stimulation and as a consequence [they]... have to seek out... high-risk activities associated with antisocial behavior" such as drugs and ultimately, crime (Jones). This does not mean all individuals with low arousal levels or those who are extraverts could be criminals, but it does show how the "right" environment with certain genetics can impact someone seeking high risk activities.

The nature versus nurture argument is still unanswered because there are so many factors with both that have been shown to have a connection with criminals and the behavior they show. There is not enough evidence to conclude it is fully genetics' role in the shaping of a criminal, but that does not say that it is not proven the environment is the most influential factor either. There is perhaps more evidence supporting the genetics role in this paper but that does not mean that is the main factor. Is there a criminal gene? Well there is no one gene that someone is born with that codes them to be a criminal, however, there are certain disorders and behaviors that people are born with that have been shown to be linked with criminals and possibly makes them have a higher chance of being a criminal especially when coupled with adverse environmental factors. The studies that can be looked into more are those that study both aspects and how certain genes interact with certain environments, much like the one highlighted previously by Eysenck. Maybe in the future we will be able to know the type of person someone will be at a young age, but this does create many more obstacles and a slippery slope of labeling someone as a criminal before they have even committed a crime which feels eerily similar to some of the darkest times of our human history. At this time there is no criminal gene, but instead a certain genotype rose in the wrong environment causing someone to act criminally. The debate of nature versus

nurture will rage on, but it should not be so much of a debate as a discussion of both and instead be nature AND nurture.

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