Considerations of Genetic Influence on Criminality and Anti-Social Behavior

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Abstract

While the role of genetics in criminal and antisocial behavior has been a subject of research for several decades, there has been no conclusive evidence to verify that biological factors alone are the cause of these behaviors or that genetic predispositions guarantee the outcome of individuals’ behavior. This paper explores some of the past research on this topic and how it relates to ongoing studies, the social perception of criminality and antisocial behavior, and what effects it may or may not have on the criminal justice system.
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Nature versus nurture has long been at the heart of most psychological research and debate. With major advances in molecular biology and genetic research over the last decade, that debate is only increasing as empirical studies are conducted to seek any genetic or biological causation or correlations in individuals with antisocial personality and behavior disorders, as well as those who have engaged in criminal behavior. It is widely considered and accepted by the majority of the professional psychology community that both genes and environment greatly influence human behavior (Lowenstein, 2003). However, according to leading researchers in the field, a greater understanding of the gene/environment role in especially harmful or socially negative behaviors is both crucial and necessary to create successful intervention programs for those at risk to engage in antisocial behavior or criminal conduct (Johnson, 2007). Genetics are considered an important part of this progression because of past research. Alcoholism in particular, as well as impulsive behaviors, have been shown to have high heritability factors (Lowenstein, 2003). Because impulsivity and alcohol abuse often play a major role in criminality, genetics becomes an even bigger part of the discussion of how antisocial behaviors begin.

Even as recently as 2009, published articles on the subject of genetics and how they related to behavior were underscored with the implications that there is still much to be learned about how environmental influences and the structure of one’s genes affect maladaptive behavior (Van Hulle et al., 2009). There appears to be a great reluctance to tie anything to do with human behavior definitively to genetics alone, and with good reason, for there is insufficient evidence to support it. In fact, one gene to explain antisocial behavior alone is highly
unlikely (Dar-Nimrod & Heine, 2011; Lowenstein, 2003). Research indicates that a multi-gene interaction is more likely to explain the biological implications of antisocial disorders however the exact workings of this interaction remain inconclusive (Ferguson, 2010). Human behavior may never be able to be explained as an exact science but to ignore the scientific implications of its influences would create great negative consequences. While the genes that influence negative behavior are still the product of empirical research and unable to be physically controlled, taking genetics out of the nature vs. nurture debate would limit the result of treatments that could theoretically be used preventatively in those identified as predisposed to criminal behavior (Ferguson, 2010). Gene manipulation is still considered a future possibility by some researchers who feel that, if properly developed, these manipulations could be used to prevent the manifestation of violent and antisocial behavior (Lowenstein, 2003).

Genetics alone are not the only physiological reasons tied to antisocial and/or aggressive behavior. A positive relationship between high plasma testosterone levels and chronic aggressiveness has been shown in male prison inmates (DiLalla & Gottesman, 1991). This study also showed that inmates with higher testosterone levels had committed at least one violent crime during adolescence compared to those whose testosterone levels where lower who had not done so (DiLalla & Gottesman, 1991). The significance of the manifestation of aggressive and antisocial behaviors during adolescence is of interest to those studying genetics as well. Genes, as well as environment, express differently across childhood for different individuals. This fact leads to the need for more research about causation of antisocial behavior and whether or not those causes operate during different ages. These causal factors must be understood before more specific studies can be designed regarding the specific genes and environments that contribute to antisocial behavior (Van Hulle et al., 2009). In the case of the testosterone/inmate study, it is
unknown whether those who had committed violent acts during adolescence had higher testosterone levels than their peers during adolescence and whether or not other factors could have contributed to the aggressive behavior. This information would be pertinent because antisocial behavior tends to increase from childhood to adolescence (Lowenstein, 2003) and often, from adolescence to adulthood (Johnson, 2009).

Other physiological factors thought to contribute to aggressive and violent behaviors include insulin secretion, dopamine levels, as well as serotonin deficits (DiLalla & Gottesman, 1991; Lowenstein, 2003). Lower levels of serotonin metabolite 5-hydroxyindoleacetic acid (5H1AA) found in cerebrospinal fluid appear in repeat violent criminal offenders (DiLalla & Gottesman, 1991; Lowenstein, 2003) and faulty function of MAOA (Monoamine Oxidase A), which is an enzyme responsible in the control of serotonin and dopamine have shown some correlation with antisocial behavior among men who have suffered abuse as children (Pieri & Levitt, 2008). Scientists continue to study physiological bases for aggressive and violent behaviors that may be related to genetics as well as how and when those factors present during childhood and adolescence (DiLalla & Gottesman, 1991).

On the environmental side, there are many considerations regarding the onset and development of antisocial disorders. Interestingly, adults who demonstrate antisocial behavior performed poorly academically, leading researchers to question whether the antisocial behavior onset contributed to lack of school success or vice versa (Johnson, 2009). If school performance is a highly influential factor in the manifestation of antisocial behavior, preventative measures to ensure achievement by students at risk of developing it could, theoretically, lead to a reduction in adult antisocial behavior and criminality (Johnson, 2009). Children diagnosed with Attention Deficit Hyperactivity Disorder and who also have variations on a specific gene show higher rates
of antisocial behaviors than those without the gene variant. This variation has been implied by researchers to also affect the influence of prefrontal cortex development, the part of the brain thought to control aggressive impulses (Ferguson, 2010). Other environmental factors considered influential in the onset of antisocial behavior include alcoholism, brain injury and child abuse. While an abused child is considered at risk for exhibiting criminality later in life, it is unknown whether this is because criminal parents create an environment that tends to lead to modeling violent or abusive behavior or because the children already have a genetic predisposition toward aggressive behavior (DiLalla & Gottesman, 1991). The correlations between child abuse and later violent behavior by the abused are often reduced to abridged versions of truth when in fact, there may be and probably is much more to the story (DiLalla & Gottesman, 1991). Therefore, while researchers recognize the validity of environmental factors as an indicator of violent and abusive behaviors, there is also strong evidence to suggest there are physiological and genetic factors that must be explored as well (DiLalla & Gottesman, 1991). These factors are studied through genetic research.

Genetic research involves nuclear families, twins, and adoptees. The various groups are necessary in order to separate the biological and environmental influences. One such adoptee study indicated strong evidence in favor of the environmental effects on criminal behavior. Adoptees with both biological and adoptive criminal fathers were more likely (24%) to demonstrate criminal behavior compared to those with only a biologically criminal father (20%) (DiLalla & Gottesman, 1991). However, another adoption study showed that significantly more children of criminal mothers exhibited criminality as adults compared to those whose mothers were not. Twin studies indicate similar results with monozygotic twins having a much higher rate of criminality between them than those of dizygotic twins (Carey, 1992; DiLalla &
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Gottesman, 1991; Lowenstein, 2003). Genetic implications from twin studies are often considered unreliable because of the inability to separate environmental cohort effects (Carey, 1992; Lowenstein, 2003). Ultimately, the lack of longitudinal, large population studies leave a gap in the research regarding heredity versus environment in antisocial behavior development (Carey, 1992). Thus far, results from genetic research of families, twins, and adoptees have yielded little in the way of concrete empirical evidence of genetic causes of antisocial and criminal behavior (Lowenstein, 2003). Clearly, environment is a key component of determining violent and aggressive behaviors, but the heritable aspects make a large enough contribution to justify further research. The two seem to create an almost “chicken and the egg” argument because environmental effects differ from individual to individual because they differ genetically. Likewise, genetic differences may contribute to the differences in the individuals’ environment. Behavior itself is an expression of genetics, yet the expression of those genetics is often reliant upon the environment in which it manifests (Johnson, 2007).

Just as important as the research of genetic influence on criminal behavior is the perception of that research and its conclusions. The current public conceptualization of how genetics relate to criminality is often based on limited and incomplete empirical research. This is cause of some concern because, as one researcher stated, “Once people’s genetic essentialist biases have been activated, people come to view the relevant condition or outcome in different ways than if they had not considered an associated genetic foundation.” (Dar-Nimrod & Heine, 2011, p. 6). Genetic essentialism is the belief that individuals are simply at the mercy of their genes, with some consideration for environment or free will, but an often overstated emphasis placed on genetic contributions (Dar-Nimrod & Heine, 2011). Because genes express differently within individuals, assuming that because a person has the genetic makeup of someone with
antisocial disorder will lead them to develop it, is an erroneous way of viewing the genetic information. On the other hand, if someone has the genetic disposition of someone with Down Syndrome, it is presupposed, based on genetics alone, that the individual will have that particular disorder. The distinctions between mental health research and physical health research are often vastly different when it comes to how genetic research is used and should be differently interpreted as well. It has become almost a natural tendency of society to base all of an individuals’ behavior on genetics, but this may lead people to conclude that behavior outcomes are unavoidable and concrete: a dangerous ideology, especially when considering the effects that this attitude can have on the criminal justice system. There is also a risk to those considered genetically predisposed to antisocial behavior disorders as the very suggestion of an underlying disorder is powerful and could lead those individuals to have undue anxiety and fear (Pieri & Levitt, 2008).

By presupposing a cause and effect relationship between genetics and criminality, there is an almost automatic response of greater sympathy and lenience toward those who have broken the law. When participants in a study evaluated criminals based on experiential or biological factors, a greater degree of mercy was shown to those criminals who were presented as having underlying genetic factors that could have contributed to the perception of the behavior being uncontrollable. Motive is considered an important factor in the judicial system and an apparent lack of one can possibly lead to unjustified reduction of punishment or an abolishment of punishment for the accused altogether (Dar-Nimrod & Heine, 2011). Several actual judicial cases seem to support these claims. One such instance involved the comparison of two cases where two different attorneys were accused of inappropriately handling funds for their clients. Each attorney faced possible disbarment and both cases went to the California Supreme Court. The
accused in each case pleaded no contest and gave alcohol abuse as the reasoning behind their unethical behaviors. One of the few lone differences in these cases was that one attorney indicated that he suffered from hereditary alcoholism. Genetic implications were considered in the case and the attorney was given probation and not disbarred. The other attorney, who made no claims to genetic predisposition for alcoholism, was disbarred (Dar-Nimrod & Heine, 2011). These and other similar instances indicate that genetic essentialism is a kind of epidemic in today’s society. People are greatly influenced at the prospect of genes determining behavior and while there are genetic contributions that should be considered, it should also be noted that the way an individual perceives the role of genetics also influences the way they go about life and decision making (Dar-Nimrod & Heine, 2011). Mental illnesses are perceived differently by individuals when they are portrayed as having a biological/genetic basis as opposed to environmental causes (Dar-Nimrod & Heine, 2011). In the same vein, criminality and antisocial disorders may be viewed much more sympathetically by not only society, but the criminal justice system as a whole when they are also implied to have genetic origins.

On the opposite side of this equation, researchers sought insight with seven focus groups comprised of those professionals whose day to day work and careers might be influenced by criminal genetics research. The focus groups included family social workers, probation officers, and those in the legal profession in the UK Criminal Justice system (Pieri & Levitt, 2008). While most of the professionals seemed unwilling to accept a genetic theory of predisposition to criminality, most had no issue with accepting physiological reasons such as testosterone and other hormones for certain aggressive behavior. Learned behavior was mentioned by some, indicating that simply because a person is born with a particular trait didn’t mean that they could not learn to control it properly (Pieri & Levitt, 2008). Participants also seemed to disagree
amongst themselves over the concept that attention to genetic predispositions to violence and criminality would lead to a reduced sentence or acquittal of a crime. Several individuals indicated a concern that these scenarios would likely be a possibility, while others indicated they felt a more harsh punishment might be implemented simply because criminals with a genetic disposition to violence would be viewed as a continuous threat to society (Pieri & Levitt, 2008).

Obviously, there is, as of yet, no conclusive evidence to support the genetic foundation of criminal behavior. There is a need in a modern society plagued by violence to seek answers when tragedy continues to beset us at what often feels like an alarming rate of frequency. However, individuals must be cautious when seeking those answers lest they accept a one-size-fits-all approach to criminality. If genetic research into criminal and antisocial behavior has taught us anything thus far, it should be that we have much more to learn. The expression of genes is dependent on environment, as well as interactions with other genes and the complexities of that alone should influence us all to remember that most complex questions do not have simplistic answers. Even as recently as 2010, researchers have been quoted as saying, “The understanding of the human genome and its influences on human behavior remains preliminary.” (Ferguson, 2010, p. 161). This should remind us as a society that even after decades of genetic research, scientists have only begun to scratch the surface of how biological factors affect human behavior.
References


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