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Ethical, Legal and Social Issues Surrounding Research on Genetic Contributions to Anti-Social Behavior

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Abstract

Scientific study of genetic contributions to chronic antisocial behavior has stemmed from many lines of research in recent years. Genetic research involving twin, family, and adoption studies have traditionally been used to compare the health and behavior outcomes of individuals who share the same environment or hereditary lineage; several of these studies have concluded that heredity plays some role in the formation of chronic antisocial behavior, including various forms of aggression and chronic norm-defiance. However, the ethical, social, and legal environment surrounding research on the biological contributions to antisocial behavior in the United States is contentious. Although there has been some discussion in the last few decades regarding the ethical, social, and legal concerns around this type of research within academic and policy circles, analysis and discussion of these concerns rarely appear together. This paper explores the main themes that interact to form the basis of much of the resistance to positing biological contributions to antisocial behavior.

Keywords

aggression; antisocial behavior; physiological basis; ethics

Introduction

Scientific study of genetic contributions to chronic antisocial behavior has stemmed from many lines of research in recent years (for a comprehensive overview, see Baker et al., 2006). Genetic research involving twin, family, and adoption studies have traditionally been used to compare the health and behavior outcomes of individuals who share the same environment or hereditary lineage; several of these studies have concluded that heredity plays some role in the formation of chronic antisocial behavior, including various forms of aggression and chronic norm-defiance (Brunner et al., 1993; Joseph, 2001; Rhee et al., 2002; Tehrani, 2000;). Research has also focused on the genetic correlates of specific personality disorders (e.g., Attention Deficit Hyperactivity Disorder, Conduct Disorder, and Oppositional Defiance Disorder) and personality characteristics that may contribute to antisocial behavior, including impulsivity, reactive aggression, hyperactivity, and callousness (Holmes et al., 2001; Morley et al., 2003; Sloan, 2000). Studies involving other behavioral outcomes correlated with antisocial behavior, such as addiction and substance

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abuse, have also demonstrated significant genetic influence (Hicks et al., 2002; Kreek et al., 2005; Krueger et al., 2002).

However, the ethical, social and legal environment surrounding research on the biological contributions to antisocial behavior in the United States is perhaps more controversial than almost any other area of behavioral genetics. Indeed, past attempts to organize conferences and research initiatives around research in this area have resulted in sufficiently vociferous protests that they were shut down (Birch, 1995). Although there has been some discussion in the last few decades regarding the ethical, social, and legal concerns around this type of research within academic and policy circles, analysis and discussion of these concerns rarely appear together. This paper explores the main themes that interact to form the basis of much of the resistance to positing biological contributions to antisocial behavior.

Determinism

Public misunderstanding of the extent to which genetics determines behavior has been a significant concern across the field of behavioral genetics. The prevalence of Mendelian genetics in educational curricula is frequently blamed for a widespread misconception among non-scientific actors, at least in the U.S., that there is a one-to-one, or at most a-few-to-one, association between genes and behavior (Allchin, 2000). This approach is evidenced in how the media frames stories, with headlines like, 'Is crime in the blood?' and 'Study finds crime gene' (Anderson, 2002). The implications of this view are complex. In the least, it suggests, as Lewontin (1991) argues, that stratifications within those who are adjudicated and incarcerated for norm-deviant behavior are due to genetic causes rather than environmental influences or structural inequalities within socio-legal institutions (Martinez, 2011).

On an individual level, there is concern that even the misconception that individuals can inherit antisocial behavior can be a self-fulfilling prophecy. There is considerable historical precedent, long before genetics was a factor, for associating antisocial or norm-defiant behavior with heredity (Glaser, 1979). The persistence of this idea can be partially explained by the fact that inherited virtue was used to justify the hierarchal, patrilineal socio-political structures which marked most civilizations (Galton, 1869; White, 2007). These ideas both perpetuated fundamentally unjust social structures, many of which survive, and curtailed the idea of social mobility. Given that rebellion against class-based societies, and the promise of social mobility, is such a deeply rooted part of the civil ideology of the United States, it is not surprising that there should be so much antipathy towards even suggesting biological contributions to norm-defiant behavior.

Racism and Sexism

The prevalence of racial tension in the U.S. increases the sensitivity of any indication that there may be biological differences between racial groupings, especially when the implication is that one race is inherently biased towards certain behaviors (Wasserman, 1996). Historically, unsophisticated studies have purported to show inherited differences in cognitive ability or pro-social behavior between African Americans or Blacks and Caucasians (Hernstein, 1996; Jensen, 1969; Rushton, 1997). While it has been conclusively demonstrated that such studies had no scientific validity, their publication and support has formed an association between endemic racism and studies of heritability in cognitive ability and antisocial behavior. The implication, made explicit by some protesters at past conferences, is that all such research is merely an attempt to find scientific support for the inferiority of non-white races, in particular Blacks and Hispanics (Breggin, 1995; Williams, 1994).

The study of antisocial behavior has also focused on biological differences between the sexes. Since the 1960s, theories connecting XYY Syndrome, in which males receive an extra Y Chromosome, to prison populations and antisocial behavior have permeated academic discussion (Jacobs et al., 1965). Recent research has supported the idea that males are far more likely to develop antisocial behavioral tendencies than females, as they are exposed to and biologically affected by greater levels of risk in factors such as hyperactivity, social problems, and neurological effects from family or adolescent environments (Moffitt et al., 2001).

Controversial evolutionary theories on criminal behavior posit that males are more likely to exhibit criminal behavior, especially rape, due to natural selection and an evolutionary propensity to violence. The argument runs that, historically, men who used violence and force to dominate others gained more resources and sexual partners, making them and their progeny more likely to survive and maintain their genetic lineage (Thornhill & Palmer, 2000). At any level, portraying innate differences between men, women, and the development of antisocial behavior encompasses the danger of the naturalistic fallacy, the notion that what is found in or produced by nature is inherently “good” or morally justifiable (Wilson et al., 2003). A misunderstanding of this concept could be used to justify male antisocial behavior and lead to the perception and conclusion that men are less culpable than women for antisocial or criminal behavior, especially violence against women, which would cause severe problems within general public understanding of antisocial behavior and within socio-legal institutions.

Mental Illness and Stigma

One important research theme is the uncertain distinction between mental illness, which tends to be largely associated with lack of control and self-damage, and antisocial behavior, which is largely externalized and almost always involves physical, mental or property damage to others. There is understandable conflict with directly associating antisocial behavior with mental illness, as some researchers have in recent years (Fairchild et al., 2008; Fairchild et al., 2011), as it risks downplaying the intent or choice behind the antisocial act, as well as the stigma that this type of behavior is not socially or legally acceptable. Mental illness is associated with biological malfunction and an individual’s inability to control or contain manifestations of their illness. Associating antisocial behavior with mental illness could potentially destigmatize such behavior and label it as an unavoidable or acceptable result of illness, rather than a choice by the actor. As the structure of social order takes as its foundation the unacceptability of antisocial behavior, the resistance to linking antisocial behavior with mental illness is clear. Conversely, fostering the social stigma associated with antisocial behavior can have ill effects too. Farrington (1977) showed that the labeling of youth displaying antisocial behavior as delinquent had major adverse effects on the life course and eventual outcome of the youth (see also Adams et al., 1986). Furthermore, as recent current events have demonstrated, there is an increasing media tendency to immediately associate violent and homicidal behavior with mental illness, as in the case of Jarrod Loughner, who was convicted of a mass shooting in Tucson, Arizona in 2011 (Moisse, 2011; Pickert, 2011) and Adam Lanza, who opened fire in a Connecticut elementary school in 2012 (Walshe, 2011; Staff, 2013).

Medicalization

Another major theme in the biology of antisocial behavior is the extent to which positing biological contributions to such behavior has the effect of medicalizing norm-defiance and thus simultaneously reducing the role of personal responsibility and opening the door to pharmacological approaches to ‘curing’ the individual of aberrant behavior. The dangers of

medicalization feed back into the dangers of determinism in as much as individuals may blame their biology for their behavior, either with the intent to absolve themselves of personal or legal responsibility or as an explanation for why nothing can be done to change their behavior patterns (Muller-Hill, 2002; Rothstein, 1999). On a more sociological level, there is some hope that medicalization may reduce stigma associated with antisocial behavior, much as the medicalization of mental illness was intended to reduce the stigma associated with such disorders (Conrad & Slodden, 2013; Mehta, 1997; Olafsdottir, 2010; Pescosolido, 2013; Vilhelmsson et al., 2011). It is unclear, however, whether this reduction in stigma presents an unqualified benefit. A deeper understanding of the extent to which stigma against norm-defiance acts as a deterrent for its conduct would be helpful in untangling such interactions.

The second strand of medicalization involves the possibility of providing ‘treatment’ for antisocial behavior in the form of constructive or pharmacological therapy. Recently, research involving the use Attention Deficit Hyperactive Disorder medication to reduce criminality and curb impulsiveness and aggressive behavior has been discussed (Lichtenstein et al., 2012). Although there are no known plans at this time to actively develop pharmacological interventions specifically for antisocial behavior, due largely to the lack of strong data on the neurological origins of such behavior, the possibility is repeatedly suggested when biological contributions to antisocial behavior are mentioned. This association may be due, in part, to the perceived association between mental illness and antisocial behavior, or perhaps to the pharmacologically and technologically-centered nature of modern Western medicine to change or transform behavior (Elliot, 2004). Either way, while the possibility of prevention, intervention and/or treating individuals with biological risk factors may be suggested as a benefit there are practical and philosophical complications.

Evidence suggests that the compliance rate of individuals who have been prescribed pharmacological solutions for severe mental illness is problematic. How much more problematic would such regimes be if they were not intended to help the individuals emotional state, but rather to make the individual more norm compliant and acceptable to society? While the argument could be made that individuals with antisocial traits are frequently ‘unhappy’ due to their inability to integrate well in society, there is certainly no guarantee that this should be true, raising the vexed question of whether it is acceptable to change an individual’s personality in the service of social order. Aside from whether this would involve enforced medication, there is the question of how social order is defined and at what point its preservation outweighs the rights of the individual to their mental and physical identity. Already, the practice of forcibly medicating defendants in criminal trials in order to improve their fitness to stand trial is controversial (Ladds, 1994; Symonds, 1979). It is difficult to predict the reaction to prolonged forcible medication to improve prosocial behavior, although it is conceivable that the discussion would resemble the fraught debate over the chemical castration of convicted sex offenders (Meyerlii, 1997; Peters, 1992; Spalding, 1997).

Responsibility and Punishment

In the legal system, criteria for personal responsibility must be met in order to justify punishment. The legal criteria for responsibility reflects a folk psychological, rather than scientific, model of behavior, requiring that an act must be connected to a culpable mental state in order to establish liability (Morse, 2011). Some have speculated that behavioral genetics may undermine the foundations of criminal responsibility and punishment, if the research sufficiently supports a deterministic view of behavior – that a particular gene caused a person’s behavior or action (Farahany, 2006a; Smith, 2012; Vincent, 2011). If this

view prevails, it is speculated, we could not support the punishment of criminals who carried the genes for behavior connected to the criminal acts and the criminal justice system would undergo radical shifts in form and purpose. At the same time, many argue that behavioral genetics cannot be said to support deterministic views in a manner that should affect the criminal justice system (Morse, 2011). There is consensus in the scientific community that behavioral genetics research does not support contentions that behavior or action is caused by genes, and may, therefore, pose a poor fit with the legal system's goal of establishing whether a particular mental state was present in order to determine criminal liability. Behavioral genetics studies are meant to find a correlation between behavioral and genetic differences on a population, not individual, level. Furthermore, genetic differences are heavily mediated by adverse environments (Farahany, 2009). For example, the presence of the MAOA gene has been linked with increased aggression and antisocial behavior in humans (Shih, 1999). However, research has also found that the MAOA gene is significantly more likely to increase the rate of aggression in humans when combined with maltreatment during childhood; the MAOA gene influences vulnerability to environmental stress during childhood (Kim-Cohen et al., 2006).

Despite considerable concerns about whether behavioral genetic data can be appropriately applied to determinations of legal responsibility and punishment, such evidence has been presented in courts with increasing frequency (Farahany, 2006a). Genetic findings have been introduced by defense attorneys as well as prosecutors in attempts to show that a range of behaviors are genetically determined, such as a person's increased propensity for aggression or addiction (Farahany & Bernet, 2006). Initial assessments of the impact of genetic evidence in court indicate that judges and juries have been skeptical of such attempts to introduce genetic evidence to reduce an individual's legal responsibility (Jury Still Out, 2006). However, while behavioral genetic evidence may not do much to alter the finding of legal responsibility, such evidence does seem to have some effect in reducing sentences imposed, by influencing evaluation of mitigating factors for sentencing (Evansburg, 2001). In particular, behavioral genetic evidence has been used for this purpose during the sentencing phase of death penalty cases (Denno, 2011) although the effect is strongest when the behavioral genetic evidence is combined with other types of evidence that supports mitigating factors (Denno, 2009).

However, there is also reason to think that use evidence of biomechanical mechanisms, such as brain scans, can be a double-edged sword. While they may, in some cases, be useful as a mitigating factor in sentencing they may also cause judges or juries to view the defendant as so dangerous as to require indefinite incarceration (Aspinwall et al., 2012). As researchers identify more correlations between genes and behavior, there could be use of genetic information related to schizophrenia or bipolar disorder to establish criminal insanity defenses, among many other potential applications. There is a danger that genetic evidence may be presented inappropriately at court and in a manner that does not take into account the nuances of the interplay between environment and genetics. Since the use of such evidence seems unlikely to be stop, there is an urgent need consider how such evidence may be appropriately presented and utilized in the court system.

Privacy and Discrimination

The potential for misusing genetic research for violating privacy and perpetuating discrimination in a legal setting has been a both an academic and policy concern for years (Council for Responsible Genetics, 2008). For example, the U.S. Genetic Information Nondiscrimination Act (GINA) was passed in 2008 in an attempt to protect individuals from being discriminated against by their employers and health insurance issuers based on their genetic makeup. In part, the Act was motivated by the finding that the fear of future genetic

discrimination could dissuade individuals from volunteering to participate in the research on new genetic tests, therapies and other types of research (Press, 2008). In relation to abuses involving the legal system and antisocial behavior, Canadian Justice Charron highlighted in a 2006 court decision the rise of forensic genetic evidence and the danger it posed to individual privacy and security: “There is no question that DNA evidence has revolutionized the way many crimes are investigated and prosecuted... The importance of forensic development to the administration of justice can hardly be overstated. At the same time, the profound implications of government seizure and use of DNA samples on the privacy and security of the person cannot be ignored” (R. v. Rodgers, 2006 1 S.C.R. 554, 2006 SCC 15 at para. 4; Council for Responsible Genetics, 2008).

Forensic applications of genetic information in the legal system are not new, especially the use of genetic databases to collect and store the DNA of offenders. However, laws establishing and regulating these databases have been under constant scrutiny and, in many cases, litigation (Campbell, 2011; Kaye, 2009; Kim, 2011). In addition to other criticisms, some state laws provide either lax or non-existent limits on the non-legal use of the databases, allowing database information to be used to “assist in ...educational research or medical research or development”¹ or to advance “other humanitarian purposes”² and therefore allows personal genetic information to be utilized without consent (Simoncelli & Steinhardt, 2005). There is understandable worry that the genetic privacy of those involved in the criminal justice system, even those not convicted in many cases, are increasingly being violated by such research.

Allowing behavioral and genetic research on criminal DNA databases is a severely slippery slope. In 2007, a Congressional bill³ was introduced to create a separate DNA database of violent and sexual predators convicted of crimes against children. Although the bill was unsuccessful, databases like these could create a wealth of genetic information for researchers on specific forensic populations, such as child sex offenders, that could be used to study specific genetic associations to specific antisocial tendencies. However, findings from databases like these could also lead to specific phenotypic characteristics that are quite common, such as race, height, and hair or eye color, to be associated with a specific type of antisocial behavior. Large populations of individuals with these characteristics might be discriminated against or stigmatized in various ways, such as profiling by law enforcement or social labeling by society at large, because their physical characteristics were incorrectly linked to certain types of antisocial behavior.

Risk and Dangerousness

There are a number of legal proceedings in which evaluations of the risk and dangerousness are utilized, such as: involuntary civil commitment hearings, assessments of sexually violent predators, capital sentencing proceedings, bail and parole hearings, domestic violence assessments, and sex offender registration. There is often little judicial inquiry into the scientific validity of methods used to determine risk and dangerousness at these proceedings (Beecher-Monas & Garcia-Rill, 2006).

Several of the main concerns regarding the use of information regarding behavioral genetics in evaluations of risk and dangerousness are similar to those that arise regarding determinations of legal responsibility: whether the type of scientific evidence is an appropriate fit for the purpose for which it is used in legal proceedings and whether the

¹State of Alabama (ALA. CODE § 36-18-31 2007).

²State of Massachusetts.

³Save Our Children: Stop the Violent Predators Against Children DNA Act of 2007, H.R. 252, 110th Cong. (2007).

current presentation of such evidence at legal proceedings is premature and may mislead decision makers into thinking the data suggests more certainty regarding a connection between genes and behavior than can be supported scientifically (Beecher-Monas & Garcia-Rill, 2006). As noted above, genetic evidence has increasingly been submitted at the sentencing phase of trials and while it can serve to bolster claims for mitigating factors, it also appears to have the potential for increasing the judge or juries' perception that a person is highly dangerous and in need of long-term or indefinite confinement or incarceration (Aspinwall et al., 2012). Behavioral genetic screenings may also be increasingly used to evaluate children, and there is reason to worry about someone being labeled and tracked as dangerous before there is sufficient behavioral evidence that the child poses a long-term risk of dangerous behavior (Sheldrick, 1999). Some examples of genetic evidence that have been presented as part of risk assessment proceedings are expressions of the MAOA allele, XYY chromosome profile, and genetic markers related to substance addiction.

As genetic correlations to a variety of behaviors continue to be found, there is a need to consider how they may influence different types of legal determinations and proceeding. For example, the genetics of addiction behaviors continue to be identified (Crabbe, 2002; Dick & Agrawal, 2008) and have the potential to influence not just criminal proceedings, but also family law cases and social services eligibility. Indeed, some states have already implemented mandatory drug testing as a condition of receiving welfare payments, a policy that genetic predisposition to addiction may, in theory, be used to anticipate (Budd, 2010; Newell, 2011; Schaberg, 2012; Sulzberger, 2011). The search for genetic underpinnings of sexually predatory behavior has the potential to combine with the trend towards indefinite commitment of sexually violent offenders in a manner that leads to long-term confinement of people whose actual behavior would not have warranted long-term confinement without such evidence of risk of dangerousness (Lamparello, 2011). Because a person's behavior involves complex interactions that go beyond the mere presence of a genetic marker, there will be a need to proceed carefully and study whether the weight given to genetic evidence by judges and juries seems to be disproportionate to scientists' assessment of its predictive value. It will be important to ensure that more scrutiny and regulation of the scientific validity of genetic evidence is required for its presentation in legal proceedings.

Surveillance and Regulation

From a social policy perspective, there are additional concerns surrounding the use of behavioral genetic information to justify the increased surveillance of certain group (Rose 2010). Countries like Britain already surveil and regulate individuals who have a history of certain types of antisocial behavior. Introduced in 1998 in the UK, and used until very recently, civil Anti-Social Behaviour Orders (ASBOs) are individualized orders issued to individuals found to have exhibited antisocial behaviors – which the Crime and Disorder Act 1998 define as actions ranging from criminal behaviors like arson, vandalism, and looting, to other behaviors like begging, racism and suicide attempts – that seek to prohibit future antisocial behavior by barring the individual from performing specific actions, going to certain areas, or carrying or buying certain items (Crime and Disorder Act 1998; Anti-Social Behaviour Act 2003). In addition, the UK uses closed-circuit television (CCTV) to surveil public spaces with the goal of preventing crime, and it is estimated that 1.85 million cameras surveil public areas in the UK (Gerrard & Thompson, 2011). Both ASBOs and the CCTV systems have been controversial, and have produced criticisms about privacy, unwanted or unwarranted regulation, and blurring the line between criminal and noncriminal behaviors (for example, see Ashworth, 2004 and Greely et al., 2006).

With respect to biological contributions to antisocial behavior, research involving forensic collections of genetic information, such as DNA databases, also brings issues on the

surveillance and regulation of individuals with types of antisocial behavior. Would it be possible to use research on forensic databases to pinpoint genetic or biological contributions to antisocial behavior, and then surveil or regulate the behavior of individuals with genetic or biological predispositions to prevent their antisocial behavior by barring that person from performing specific actions, going to certain areas, or carrying or buying certain items? Conceptually this notion could be extended to imagine a *precrime* prophylactic used to thwart those who have not yet committed any antisocial acts, but have a “genetic propensity” to do so, from exhibiting any future antisocial behavior (Rose, 2010). Thus, ethical complications surrounding how to intervene or prevent antisocial behavior are tangible future concerns (Larsen, 2004, p. 14; Van Camp et al., 2007, p. 250).

Expertise

Expertise in evaluating behavioral genetics research to what extent it affects or influences antisocial behavior is a pervading theme across antisocial behavior research. This expertise includes not only opinions by clinicians and scientists published or given in court, but also includes how judges, juries, and the general public will evaluate and apply the research within a forensic setting. There is worry that jury members and judges do not possess the knowledge or expertise to make legal decisions based on genetic evidence of antisocial behavior, including the ability to recognize scientific validity of proposed evidence or arguments in court (Jacobs, 1992). Further, although not mandatory for state courts, the *Daubert v. Merrell Dow Pharmaceuticals* (1993) Supreme Court Decision established that judges must make an independent determination, without deferring to the scientific community, of the validity, and therefore the admissibility, of scientific evidence in court. This has created a burden on many trial court judges who must now attempt to weigh and understand scientific evidence, most of which have little or no scientific training. Although there have been some efforts to educate judges on scientific evidence since *Daubert*, such as conferences, programs and pamphlets, these resources are not extraordinarily exhaustive and most judges are still under qualified to understand the validity and importance of bioscientific research on antisocial behavior in court.

This becomes additionally complicated when a psychiatrist or scientist gives expert testimony on behavioral evidence in court, such as testimony claiming a defendant’s genetic or biological predisposition to specific types of antisocial behavior, to a judge or jury who, trusting those labeled “experts,” might take opinions expressed in expert testimony at face value or as fact without knowing the scientific reliability the testimony. Several studies (Ivkovi & Hans, 2003; Raitz et al., 1990; Vidmar et. al, 2001) have shown that jurors are very influenced and persuaded by expert testimony on scientific evidence, even if they do not fully comprehend it. Juries are thus very likely to put too much weight on behavioral genetic evidence when trying to understand a defendant’s antisocial behavior. This could cause a whole range of problems in jury trials regarding the sentencing and responsibility determination of the defendant.

Conclusion

In conclusion, we have reviewed the different themes, questions, and corresponding ethical, social, and legal concerns that arise out of research on the genetic contributions of antisocial behavior. Although discussions on these themes have existed for decades, and new genetic science has added dimensions to these conversations, little real progress has been made on how to handle these concerns within the medical and criminal justice systems. Indeed, the concerns raised here are only the “tip of the iceberg” arising from behavioral genetic research that the criminal justice and legal systems will have to tackle in future years. We

recommend a more comprehensive review of the current and future impact of data on biological contributions to antisocial behavior on contemporary social institutions.

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Highlights

- Genetic contributions to antisocial behavior are increasingly being examined.
- The ethical, social and legal issues surrounding this research are controversial.
- We survey themes that form resistance to this type of antisocial behavior research.