

**BIOLOGICAL MECHANISMS OF ANTISOCIAL BEHAVIOR  
AND MORAL RESPONSIBILITY**

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A thesis submitted to Johns Hopkins University in conformity with the requirements for  
the degree of Master of Bioethics

Baltimore, Maryland  
May 2021

## **Abstract**

We have long been concerned with understanding human behavior. Specifically, there has been an increased interest in biological explanations of antisocial behavior. These preliminary explanations, which stem from associations found in neuroscience, brain imaging and genetics, raise important ethical questions about free will, moral responsibility and blame.

It is difficult to say at this point if these explanations lead individuals to believe that antisocial behavior is determined (at least to some degree), and should mitigate attributions of responsibility and blame, or if they make claims about who the individual is and should aggravate attributions of responsibility and blame.

There are several reasons to completely disregard biological explanations of antisocial behavior in judgments about responsibility and blame. These include methodological issues with the science, misinterpretation of the scientific results, issues of human rights, disability, stigmatization, and exacerbation of racial and ethnic inequalities.

As science continues to improve, several of the reasons to disregard these explanations will become obsolete and bring this dilemma back to the forefront. Notably, individuals already form beliefs about free will and use them to ascribe moral responsibility and blame. Evidence suggests that these views are malleable, and may be influenced by the motivation to punish, to discourage violations of norms, beliefs about individual affect, political views, and the desire to avoid discomfort. Science provides a better foundation for claims of moral responsibility and blame, as good science is reproducible and objective. This may be helpful in combatting current issues

of racial and socioeconomic injustice that directly affect attributions of moral responsibility and blame.

Lastly, biological explanations of antisocial behavior may be crucial in creating a shift from punitive models of criminal justice to a focus on rehabilitation.

Ultimately, biological explanations of antisocial behavior may be able to differentiate which behavior is a product of disease or dysfunction, and which is not. Such a distinction, in combination with relevant application of moral values and principles, can help make more appropriate claims about mitigating or aggravating moral responsibility and blameworthiness for antisocial behavior.

**Primary Reader and Advisor:** Dr. Travis Rieder

**Secondary Reader:** Dr. Gail Geller

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“Step by step walk the thousand-mile road.”  
-Miyamoto Musashi

“Men are more moral than they think and far more immoral than they can imagine.”  
- Sigmund Freud

## **Acknowledgments**

I want to thank Dr. Travis Rieder and Dr. Gail Geller for providing constructive feedback and advice as I developed my ideas.

Dr. Rieder's feedback was instrumental in helping me develop the problem I wanted to address and find my own direction on the issues discussed.

Dr. Geller's suggestions were essential in developing my unique perspective. Additionally, her focus on clarity helped me to better communicate my ideas.

I would also like to thank my classmates, especially Caroline Lumpkins and Matthew Kennelly, who provided invaluable feedback at every stage of development of my ideas and often times shared writing workshops over zoom.

## **Introduction**

We, as a species, have a long-standing interest in understanding human behavior. This interest has led to the rise of the field of psychology, which attempts to use the scientific method to study and potentially explain human behavior. One of the interests in psychology relates to understanding antisocial behavior, that is behavior that violates the basic rights of others (Calkins & Keane, 2009), with disregard for the well-being of others. The behavior can be characterized as immoral and may or may not be criminal. With time, social sciences came to look at external explanatory factors for antisocial behavior. This has included early life experiences (Patterson et al., 1989) and socioeconomic deprivation (Duncan et al., 1994). Later, other scientific fields began to provide explanations for antisocial behavior stemming from correlational findings between the subject of their discipline and behavior.

Recently, biological explanations for antisocial behavior have even made their way into criminal proceedings, which have included the introduction of neuroimaging, electroencephalography and neuropsychological assessment as evidence in relation to responsibility (de Kogel & Westgeest, 2015). However, none of these have provided sufficient explanations of antisocial behavior for a consensus or the development of guidelines or a standard protocol (de Kogel & Westgeest, 2015).

## **Behavioral Genetics**

Recent advances in behavioral genetics have begun to identify significant associations between biology and antisocial behavior. A meta-analytic review found that more than half (56%) of the variance in anti-social personality and behavior can be

explained by genetic influences (Ferguson, 2010). This suggests the importance of determining whether and how behavioral genetics should inform our views of moral responsibility.

Recently, variations in serotonergic genes (e.g., serotonin transporter gene and monoamine oxidase-A gene) have been linked to anti-social behavior (Ficks & Waldman, 2014). A point mutation in the monoamine oxidase-A gene(MAOA) gene has been shown to lead to a complete deficiency of MAO enzymatic activity that has been named Brunner syndrome, which has behavioral manifestations that include aggression and impulsivity (e.g., arson, attempted rape and exhibitionism) (Brunner et al., 1993). A study of Finnish prisoners found that a low-activity genotype of monoamine oxidase A (MAOA) (as well as a CDH13 gene – which codes for a neuronal membrane adhesion protein) were associated with extremely violent behavior (i.e., 10 or more homicides, attempted homicides or batteries) (Tiihonen et al., 2015). Individuals who experienced maltreatment in childhood were found to be significantly more likely to engage in adult antisocial behaviors when they possessed a genotype associated with low MAOA activity (as opposed to high MAOA activity) (Caspi et al., 2002). Additionally, a meta-analysis found that a low-activity (as compared to high-activity) MAOA genotype in males (but not females) who experienced early maltreatment predicted antisocial behavior (Byrd & Manuck, 2014). These studies are likely only the beginning, with a wave of more research to better explain and identify genetic associations between specific variants and behavior to follow in the upcoming years.



## The “Double-Edged Sword” Effect

The rise of this science has created a tension between viewing genetic links to behavior as mitigating or aggravating of moral responsibility, (i.e., are the actions determined by individual biology or do they stem from one’s identity) (Tabb et al., 2019). This tension reflects two perspectives of the role genetics plays. On the one hand, a deterministic interpretation of behavioral genetics suggests that the individual was determined to behave in such a manner, and therefore could not have done otherwise. As with other deterministic explanations of previous behavior, this view suggests that an individual ought not to be held morally responsible for their anti-social behavior, or at least, that their responsibility ought to be mitigated (Tabb et al., 2019). On the other hand, genetic determinism also makes a potential claim about who this individual is (i.e., someone that carries out anti-social behavior) (Tabb et al., 2019). Such claims about an individual can appear to describe one’s personality, as it may be linked to patterns of behavior (and maybe even thoughts and feelings) that stems from individual biological factors (*The Cambridge Handbook of Personality Psychology*, 2009). In this, also lies a claim about future behavior – that this individual is going to continue to behave in an anti-social manner – a belief that aggravates attributions of individual moral responsibility for past anti-social behavior.

In the criminal setting, where moral responsibility is considered, behavioral genetics has led to a “double-edged sword” effect wherein genetic causes have had either a mitigating or aggravating effect on sentencing (Aspinwall et al., 2012; Cheung & Heine, 2015). This effect has encouraged experimentation in order to determine the

influence neurobiological genetic evidence may have on judgment of moral responsibility in criminal cases.

### **Biological Explanations of Behavior and Responsibility**

In order to assess the impact of biological explanations of behavior on sentencing, one study presented a hypothetical case (based on *Mobley v. The State*) to 181 U.S. state trial judges, where the convict was diagnosed with anti-social personality disorder (Aspinwall et al., 2012). The case described an individual convicted of aggravated battery, who hit a store manager with a gun while attempting a robbery and then went on to brag about it to other detainees. The judges received psychiatric testimony about the defendant's psychopathy. For half of the judges this included a neurobiological explanation of psychopathy that cited evidence about the low-activity MAOA genotype and brain function (and included that the defendant was tested for this genotype). Although the majority of judges focused on aggravating factors (86.7%), inclusion of the neurobiological explanation increased the proportion of judges listing mitigating factors (from 29.7 to 47.8%) and significantly reduced sentencing (from 13.93 years to 12.83 years) (Aspinwall et al., 2012). Notably, inclusion of the neurobiological explanation seemed to have no effect on attributions of legal responsibility, moral responsibility, or free will of the hypothetical defendant, which were all rated high (Aspinwall et al., 2012). This provides further evidence of the existence of the double-edged sword theory of biological explanations of behavior, as the judges maintained strong views on legal responsibility, moral responsibility and free will (of the hypothetical defendant), despite the neurobiological explanation, and yet this information reduced

sentencing and increased considerations of mitigating factors. It is difficult to reconcile the inconsistency between the endurance of the judge's views and the change in adjudicative outcomes.

To assess reproducibility and universality, an identical study was conducted in Germany (with 372 German judges) to a translation of the same vignette, but with strikingly different results (Fuss et al., 2015). Introduction of a neurobiological explanation (i.e., genetic) for the defendant's behavior as evidence significantly reduced the judges' estimation of legal responsibility but did not significantly reduce the prison sentence. In fact, an increased percentage of judges (from 6% to 23%) would order involuntary commitment in a forensic psychiatric hospital (Fuss et al., 2015). It is important to note that, even though sentencing someone to a forensic hospital or prison isolates the individual and prevents him or her from doing more harm to the general public, involuntary commitment in a forensic psychiatric hospital (as opposed to a prison) suggests diminished responsibility. The main reason to involuntarily commit someone is for the individual to receive psychiatric treatment, as opposed to punishment (which is an important attribute of prison sentencing). Sentencing to forensic psychiatric hospitals often involves finding someone not guilty by reason of insanity. A successful insanity defense means that the individual should not be held morally responsible or blameworthy for their actions (Bloechl et al., 2007). This further supports the double-edged sword theory, but in an inverse way to the Aspinwall et al., study of U.S. judges. The authors noted that involuntary commitment based on diminished or absent legal responsibility can often be for a longer period than a prison sentence in the German legal system (Fuss et al., 2015). The reduction of legal (and

likely moral) responsibility without a consequent reduction in sentences reflects an inconsistency, as one would expect that a reduction in attribution of responsibility would be associated with reduced negative consequences. A potential explanation for this dissonance may be because consequentialist reasoning would call for protecting the public from the individual while attempting to treat them (especially because biological explanations of behavior suggest there is causal some pathway that can be altered) despite diminished responsibility and blameworthiness.

Another study in Germany looked at the impact of biological explanations of antisocial behavior, but this time, in 317 law students. The researchers found similar results to the study with German judges in regards to attributions of legal and moral responsibility, as well as sentencing, of a defendant in a case of manslaughter (Guillen Gonzalez et al., 2019). Participants were presented with either no biological explanation of “psychopathy,” a neurological explanation (i.e., traumatic brain injury) or a genetic explanation (i.e., MAOA gene variant). The absence of a biological explanation was significantly associated with higher ratings of legal responsibility, however, there was no significant difference in prison sentencing, type of custody assigned, moral responsibility or free will (Guillen Gonzalez et al., 2019). A pairwise comparison of the student groups revealed that those who received a description containing an account of brain injury rated legal responsibility significantly lower than the students who did not receive any biological explanation (Guillen Gonzalez et al., 2019). No significant differences were observed between the group provided an account describing a MAOA gene susceptibility for psychopathy and the brain injury or no biological explanation groups (Guillen Gonzalez et al., 2019). Therefore, the specifics of different biological

explanations of antisocial behavior may have distinct impacts on views of responsibility and blame. Furthermore, there was no difference in the self-reported impact of the explanation of psychopathy on the participants' decision-making (Guillen Gonzalez et al., 2019). It is difficult to make sense of why legal responsibility would be rated lower, without a change in views on moral responsibility or free will, nor result in the change of consequences (i.e., duration of sentencing or type of custody). Perhaps the biological explanations for behavior identified factors that are thought to be out of the hypothetical defendant's control, which led to views of diminished legal responsibility, while the defendant's actions were morally evaluated based on factors other than whether he had control over his behavior, and thus, he was still held morally responsible and deserving of punishment. However, such an explanation is unlikely to resolve the logical inconsistency of the outcomes in this study. Diminished legal responsibility in this case suggests that the defendant's ability to control his behavior was diminished. Conversely, holding the defendant both morally responsible and deserving on punishment implies that he was free and in control during the wrongful act. Additionally, other than the biological explanations of behavior, there is nothing else to point to that would impact the decision-making process and result in different attributions of legal responsibility between the groups. The logical inconsistency lies in the contradiction between claims of legal and moral responsibility, which suggest that the defendant was both not and in control of his behavior.

One study found that introduction of either neuroimaging (showing brain damage) or neurological testimony (stating that the defendant's disorder began after a traumatic brain injury in a car accident) increased the likelihood of a "not guilty by reason of

insanity (NGRI)” verdict by participants (Gurley & Marcus, 2008). Notably, participants who reported being influenced by psychological and neurological testimony were significantly more likely to give a NGRI verdict than those who reported that this evidence did not influence their decision about the verdict (Gurley & Marcus, 2008). Therefore, individuals’ beliefs about the explanatory role of biological mechanisms in human behavior seem to affect their views about moral responsibility.

To expand the understanding of the public’s beliefs, a study of mock jurors looked at sentencing recommendations and impressions in a capital case (where the defendant is facing a potential death penalty) (Greene & Cahill, 2012). The study found that defendants who were deemed likely to be dangerous in the future were less likely to be sentenced to death when mock jurors were exposed to neuropsychological and neuroimaging evidence (Greene & Cahill, 2012). Additionally, neuropsychological and neuroimaging evidence was reported to have a mitigating effect on mock jurors’ negative impressions of the defendant (Greene & Cahill, 2012). In this study, it appears that participants wanted the defendant at least locked away. The reported mitigating effects suggest that the mock jurors may have viewed neurobiological explanations of behavior in a more deterministic light, which reduced the degree to which they held the defendant morally responsible or deserving of death. Locking someone away can have punitive motivations, but also may acknowledge that society ought to be protected from a dangerous individual (even if they are not held responsible), while the death penalty is solely motivated by punitive desert.

In a study of a representative sample of the U.S. population, introduction of evidence of a genetic predisposition for impulsive behavior (e.g., violence) did not affect

conviction (first- or second-degree manslaughter or murder), or the sentence, and participants who received evidence of childhood abuse alone or evidence of childhood abuse and of genetic predisposition imposed longer sentences (Appelbaum & Scurich, 2014). In addition, introduction of genetic and childhood abuse evidence produced the greatest fear of the defendant among study participants (Appelbaum & Scurich, 2014). The fear may stem from perceptions of the defendant as an individual who regularly engages in antisocial behavior and concern for future recurrence. In this sample, it is possible that views of future dangerousness motivated longer sentencing (in order to protect the public), regardless of considerations about moral responsibility and blameworthiness. Alternatively, longer sentencing may be a function of greater attributions of moral responsibility and blameworthiness.

Another study attempted to identify motivations for punishment in the context of biological explanations of antisocial behavior. The study showed that neurobiological evidence led to shorter prison sentences (i.e., mitigating) and longer terms of involuntary hospitalization (i.e., aggravating) than psychological evidence (Allen et al., 2019). This evidence supports the existence of the double-edged sword theory – contradictory views on responsibility, blame and what the offending individual deserves. The authors note that the motivation for these decisions were not well explained by motivations to treat defendants or to protect society from dangerous persons, but by “deontological motivations” related to what the defendant deserved and the duty to provide healthcare services (Allen et al., 2019). This suggests that views on moral responsibility and blameworthiness may have played a role in the sentencing, as the study participants were concerned with what the defendant deserves. It is certainly

more compassionate to want individuals to receive treatment rather than punishment for antisocial behavior, and these results hint that biological explanations of behavior may lead to motivational changes in justice (especially in criminal cases) from punitive retribution to rehabilitation.

One important critique of the existence of the double-edged sword theory has come from an analysis of real criminal cases. A study of 800 criminal cases from 1992 to 2012 that included neuroscience found that neuroscience evidence is more often introduced to mitigate punishments (i.e., sentencing), especially in cases where defendants face the possibility of the death penalty, a life sentence or a significantly long prison sentence (Denno, 2015). The current real-life implications suggest that it is important to determine how biological information ought to be used in the context of moral responsibility. It is noteworthy that the expectation for neuroscientific evidence is so strong in such criminal proceedings, that failure of defense attorneys to introduce it as mitigating evidence can be grounds for granting defendants' "ineffective assistance of counsel" claims by courts (Denno, 2015). The increase in the demand for introducing neuroscience in criminal proceedings, to better inform responsibility, conveys the urgency of determining how biological explanations of behavior ought to inform our views of moral responsibility.

A different analysis of existing cases critiqued the claim that neurobiological evidence is primarily introduced in the most serious (i.e., capital) cases. In a study of 1585 cases and 1800 judicial opinions that looked at the use of neuroscience in legal proceedings, results indicated that only about 40% of the cases were capital (where the death penalty can be considered if the defendant is found guilty), and 60% were for



other serious felony cases (e.g., drug possession, drug trafficking, violent assaults, robbery, fraud) (Farahany, 2016). This suggests that neuroscience is being introduced in cases where a variety (and different degrees) of criminal (and antisocial) behavior are being considered, further increasing the importance of determining how this information ought to inform our distinctions of responsibility and blame for antisocial behavior. This same study also found that, in criminal cases (capital and non-capital), the reversal rate was higher in cases where neurobiological evidence was introduced on appeal than the rate for all criminal appellate cases (Farahany, 2016). This suggests that there is some variation in the degree to which biological explanations of behavior may play a role in ascription of guilt, and concurrently moral responsibility.

Without consensus in studies of hypothetical cases, or in studies that looked at real criminal proceedings, it appears that the double-edged sword effect exists, and its associated dilemma of how we ought to utilize biological explanations of antisocial behavior to understand moral (and criminal) responsibility and blame needs to be addressed.

### **Escaping the Dilemma**

It is important to note that the answer to the dilemma is not a question of scientific understanding, but of ethical foresight. Inevitably, science will be able to tell us more and more about mechanisms, genes, and biological markers that are implicated or correlate with specific behavior. However, even though our understanding of the mechanistic processes involved in behavior is likely to improve, none of these discoveries will inform us if, or how, we ought to use this information to make moral

judgments about responsibility and blame. This is an extension of David Hume's is-ought gap, which states that we cannot derive normative statements (i.e., moral claims) from only descriptive statements (i.e., facts about the world) (Hume, 2007). Scientific explanations can be utilized, but the introduction of a moral claim, principle or value is necessary to draw a moral conclusion.

The simplest option to escape the double-edged sword dilemma is to simply ignore biological explanations of antisocial behavior when we make moral value judgments. Some believe that science cannot provide answers to difficult moral questions (Eastman & Campbell, 2006). However, science is not entirely morally neutral, since what we chose to study or fund is reflective of individual and societal values. Additionally, even though biological explanations may not tell us exactly how we ought to relate to details about the way the natural world works, science does not have to provide the entire answer to a difficult moral question to be useful for moral inquiries. Although science itself may not tell us how to make a specific moral judgment, it can provide extremely relevant information for moral decision making. To ignore such relevant information may doom moral decision making to be based on less desirable information (e.g., prejudice) or less justifiable reasoning (e.g., the status quo bias). The decision to use biological explanations of antisocial behavior to inform questions about moral responsibility is really an ethical concern (i.e., what is the right thing to do). Ultimately, we must choose what we should use to ground or support decisions of moral responsibility and blame, and this choice is based on moral principles and values, not scientific fact.

There is a major flaw with current biological explanations of antisocial behavior. The science they are grounded in (including genetics) does not tell us much about causality of behavior in general, let alone a specific action (Tatarelli et al., 2014). The neuroscience or genetics that attempts to address behavior is often a population-level science (i.e., correlation between neurological or genetic variations and behavioral variations in a population), and therefore do not meaningfully explain why a specific individual behaved in a specific way. It is difficult to mitigate responsibility without illustrating how a biological factor directly affected a specific behavior. However, sentencing may be influenced by public concerns (e.g., public safety, societal views on rehabilitation versus retribution), in addition to individual blameworthiness, and therefore may be more influenced by population-level science. This is likely why neurobiological or genetic evidence has had little effect on determination of guilt or innocence, and more of an impact on sentencing (Farahany, 2016). Furthermore, there is no currently established causal link between specific biological correlates and specific criminal (or antisocial) behavior, and future research aimed at establishing these correlates is methodologically limited (Urbaniok et al., 2012). For example, comparing individual cases or highly selective samples against voluntary controls does not provide enough evidence of causality or its direction (i.e., did the antisocial behavior lead to the presence of the biological correlate), nor are there ways to account for confounding variables (Eastman & Campbell, 2006; Urbaniok et al., 2012). In addition, biological correlates have not been able to show any predictive validity (Eastman & Campbell, 2006). This is particularly troubling because, at least in some of the studies and real-world cases, biological evidence has seemed to shape views of future dangerousness

and has aggravated sentencing (which may be motivated by desires to protect the public, irrespective of beliefs about free will, responsibility, blame or desert). The difficulty for biology to explain why a specific act occurred or its misinterpretation in predicting future behavior is worrisome, as moral decisions may be swayed by false ideas about reality.

Another important reason to steer away from biological explanations of antisocial behavior is that the science, and its implications for behavior, can easily be misrepresented and posited to have more validity than is true (Eastman & Campbell, 2006).. Misinterpretations of scientific findings, especially ones that overly presume the existence of a relationship where there is not one, are not uncommon. In fact, news articles written about scientific literature often run the risk of misrepresenting study results, and sometimes do so with catchy titles, in order to lure readers (Moore, 2006). There are also scientists who overemphasize the implications of their findings (intentionally or not) to help justify the importance of their work. Such misrepresentations exacerbate ethical concerns about basing moral decisions on faulty information.

The use of biological explanations in the evaluation of moral responsibility, especially in the case of antisocial behavior, raises important human rights and disability concerns. Genetic predisposition to antisocial behavior could come to be viewed as a “mental impairment” (Forzano et al., 2010). This may subsequently lead to individuals with identifiable predispositions to be seen as having a mental illness and a disability, which could lead to social stigma and maltreatment. At this point such labeling would be based on incomplete evidence, which is itself problematic (Forzano et al., 2010). This

labeling would be particularly problematic if antisocial behavior does not become manifest, for example if certain factors protect against phenotypic manifestation of the genetic predisposition. Additionally, although privacy issues (in this case, of personal health information) can often be addressed by policy and regulation, ensuing stigmatization is often much more difficult to combat (Wilson, 2015).

Biological explanations of behavior also may exacerbate racial and ethnic inequities and related stigma, especially in the US, where racial tensions are high, and raise additional human rights concerns (Berryessa et al., 2013; Wilson, 2015). For example, the presence and expression of genes can vary between different ethnic and racial groups, as has been seen with the MAOA gene (Caspi et al., 2002). An exacerbation of ethnic stigmatization has already been seen after a study involving the Māori population and the MAOA-L gene (Berryessa et al., 2013). This indigenous Polynesian ethnic group in New Zealand ties its history to a warrior culture, similar to other Polynesian groups, which the study utilized for stereotyping the group in relation to the “warrior gene” (Berryessa et al., 2013). Interest in biological explanations of undesirable (e.g., antisocial) behavior also creates opportunities to identify and control certain attributes of individuals, which is reminiscent of eugenics movements (De Paor & Blanck, 2016). Eugenics movements typically targeted individuals who were presumed to have inferior genetics or (potential and real) disabilities (De Paor & Blanck, 2016).

## Answers to the Dilemma

Despite reasons to avoid using science to inform our moral judgments of responsibility and blame regarding antisocial behavior, the dilemma about the appropriate use of science persists. It is important to acknowledge that over time science may improve to the point where it is authentically able to adequately predict and/or explain antisocial behavior. With some of the methodological issues resolved, the questions raised by this dilemma would once again come to the forefront. If this occurs, individuals may be more likely to be judged as morally responsible for their antisocial behavior, especially if they fail to obtain proper testing for relevant biomarkers, and preventative or remedial interventions (Eastman & Campbell, 2006). Justice issues associated with equal access to such testing and interventions would arise, as those with the means to access such testing or interventions could escape negative consequences, while those without access would not. Identification and stigmatization of individuals who are predicted to engage in antisocial behavior may also lead to preventive detention, especially for those without access to interventions (Eastman & Campbell, 2006). Preventive detention would be particularly worrisome, as it would treat individuals as morally responsible and worthy of punishment without any action having occurred (even if it is done under the guise of protecting the public). It is incumbent upon us to decide **now** how to ethically use biological explanations of antisocial behavior in evaluations of moral responsibility so that severe negative repercussions are avoided when some of the obstacles to the use of biological explanations are overcome. Otherwise, while a consensus on ethical use is being deliberated, these explanations will have more legitimacy, but be at risk of misuse.

Additionally, without further elaborating the criteria by which scientific explanations for antisocial behavior should or should not influence determinations of blameworthiness, individuals who ought not to be held responsible (and punished) will continue to be so, improperly.

Ensuring the science is utilized ethically now can also preempt many of the arguments against utilizing it in the first place. First and foremost, ethical use would demand that the science be translated appropriately and clearly, that confidentiality is maintained, that it does not infringe on human rights, that stigma is prevented, and that it is not utilized for malicious purposes (e.g., eugenics).

There are also unique reasons for using biological information to inform our moral value judgements. Biological information is consistent and reproducible. This has important justice implications, as it allows less room for bias and subjectivity stemming from cultural, religious or political views. The use of DNA testing in criminal proceedings can tell if a suspect's sample matches the DNA found at a crime scene. No matter how strongly cultural, religious or political opinion may want a particular suspect to be the responsible party, this cannot change the results of the DNA test. This kind of consistency can be important to making sure that antisocial behavior is judged morally consistently, and that social injustice does not continue to propagate our views of responsibility and blame. In the same spirit, improvement in biological explanations of antisocial behavior can lead to identifiable markers that can be used to distinguish individuals who ought not be held morally responsible. This is ultimately dependent on what we deem as mitigating explanations of antisocial behavior. The determination will not come from the science, but from ethics and moral judgements about details

provided by science. In order to overcome the current pitfalls arising from bias and subjectivity associated with cultural, religious or political views, the criteria for the normative distinction between mitigating and aggravating explanations of antisocial behavior must stem from ethical and just values and principles.

Biological explanations of antisocial behavior, especially with an emphasis on psychopathology, may justify a shift from punitive models of criminal justice to a focus on rehabilitation (Sabatello & Appelbaum, 2017). This shift would be consistent with some of the results from the studies of judges, law students and the lay public, as well as real world cases, in which consideration of behavioral genetic evidence mitigated responsibility, blame or punishment. This shift would likely come about from a more medicalized view of individuals who engage in antisocial behavior (e.g. criminal defendants) (Sabatello & Appelbaum, 2017). Medicalization of antisocial behavior could also be critical in changing opinions that favor rehabilitation (over punishment) as, hopefully, scientific discoveries lead to novel therapeutic targets and ethical ways of rehabilitating individuals who engage in antisocial behavior. This would be optimal from a consequentialist viewpoint, as punitive criminal justice is a large cost to individuals and the public, with few benefits. This would also be viewed favorably from a social justice lens, as marginalized and vulnerable groups disproportionately face the consequences of the current punitive model of criminal justice. However, there is concern that biological explanations of antisocial behavior would push us further into a punitive model of criminal justice (and further propagate social injustice), as some of the studies and cases involving behavioral genetic evidence led to greater perceptions of responsibility and blame, and sometimes resulted in even greater punishment (possibly



from increased perceptions of dangerousness). Biological explanation of antisocial behavior may also propagate stigma, discrimination and injustice by enabling easier identification of individuals with relevant psychopathology. The disconcerting distinction between a future that focuses on rehabilitation and treatment versus stigma, punishment and injustice further intensifies the need to determine and propel ethical and just use of science in this context.

### **Beliefs About Free Will and Responsibility**

Another reason to incorporate biological explanations of behavior is that people already make presumptions about whether individuals behave freely or not, which are not grounded in ethical or just moral principles and values. In fact, Clark et. al., found that individuals are more likely to report a belief in free will when considering an immoral action than a morally neutral one (Clark et al., 2014). The two immoral actions described include a corrupt judge who was caught for kickbacks (i.e., receiving money in exchange) from private juvenile detention centers for sentencing children to jail, and a robber who steals all of the valuables of a special education teacher (Clark et al., 2014). The authors strengthened their claim by showing that reading about immoral behaviors in the robbery case reduced individual perceptions of the benefits of anti-free-will psychological research (Clark et al., 2014). The investigators further strengthened their claim by showing that the real-world prevalence of immoral behavior (i.e., rates of national homicides and other crimes) predicted free will belief on a national level (Clark et al., 2014). The group also found evidence that the higher likelihood of believing in free will when considering an immoral action is due to heightened motivation to punish

the offending individual (Clark et al., 2014). The investigators were able to demonstrate this relationship when comparing the scenario of the robbery with a morally neutral action, and a staged cheating situation amongst students (Clark et al., 2014). The findings of these studies have been confirmed by additional studies and meta-analyses (Clark et al., 2019).

These findings suggest that a belief in free will functions to hold people morally responsible for immoral acts and helps justify punishing these individuals. The immoral actions described above can be considered a form of antisocial behavior, as the judge does not appear to consider the well-being of the children he is sentencing to jail in exchange for money, nor is the robber considering the well-being of the teacher. An innate drive to punish may lead us to believe that one acted freely, and thus deserves a full ascription of moral responsibility and punishment for their behavior. If there is a drive to punish antisocial behavior, and that drive is what leads to link free will with moral responsibility in a given situation, there is no reason to think that these beliefs approximate the truth about how freely an individual behaved nor that this is the morally correct view to have. Most importantly, the findings that punitive motivations lead to a higher likelihood of believing in free will when considering an immoral action suggest that the causal chain of judgments about free will, moral responsibility and punishment may not be in the direction that we presumed. One would expect that a belief in free will would lead to holding someone morally responsible for their antisocial behavior and motivate punishment. The results of these studies suggest that the desire to punish antisocial (i.e., immoral) acts and to hold people morally responsible for them motivates support for the important role that free will plays in one's behavior.

Clark et. al. proposed that belief in free will may help individuals justify punitive retaliation for immoral (or antisocial) behavior, and therefore alleviate the distress one might experience from deeming someone worthy of punishment (Clark et al., 2017). The authors found that the tendency to be motivated by punitiveness predicted increased levels of anxiety only for those individuals who were skeptical of free will (Clark et al., 2017). This suggests that some individuals may be able to alleviate some of their anxiety around evaluating immoral behavior by forming concrete beliefs about free will. The investigators also found that higher incarceration rates (i.e., real world punitiveness) were predictive of higher rates of mental health issues at a state level (Clark et al., 2017). Highly punitive treatment of immoral behavior may have a reciprocal effect on society's mental health. In an economic game, study participants who punished a partner who acted unfairly reported more distress than those who did not, but only when their partner did not have a choice but to act unfairly (Clark et al., 2017). These findings may be indicative of how individual uncertainty about free will and a moral agent's ability to do otherwise may evoke negative emotions in the punisher. Lastly, the authors found that punitive desires for wrong behavior led to reports of higher levels of distress only for those individuals who had their beliefs about free will undermined by inclusion of an argument against free will (Clark et al., 2017). This further suggests that affirming a more concrete belief about free will may alleviate the negative emotions one experiences when judging someone to be blameworthy and deserving of punishment. Of course, these findings do not provide a definitive explanation of beliefs about free will and its implications. However, if these findings do hold true, then it is worrisome that we hold individuals morally responsible for antisocial

behavior (based on beliefs about free will), blameworthy and deserving of punishment because it is distressful for us to do otherwise.

In an attempt to better understand the relationship between motivations for moral judgments and a belief in free will, a different group carried out a series of experiments. They corroborated Clark et al's findings that people tend to attribute more free will to those individuals who engaged in immoral behavior as opposed to morally neutral acts (Monroe & Ysidron, 2021). Through another experiment they found that attributions of free will can be changed (Monroe & Ysidron, 2021). Specifically, they found that when someone engages in behavior that deviates from expected norms, it is presumed that this deviation occurred as an expression of the individual's free will (Monroe & Ysidron, 2021). This is concerning, as changing beliefs about free will, moral responsibility and blame allow room for bias to influence how we view antisocial behavior. The worry is that factors which often characterize vulnerable and marginalized groups (e.g., race or socioeconomic status) will dominate these viewpoints and continue to propagate social injustices. It is also concerning if deviations from norms are what lead to a higher likelihood of attribution of free will, moral responsibility and blame as it is an assault on individuality and choice – the cornerstones of freedom. If people experience negative consequences (e.g., are held more responsible for an act and deserving of punishment) simply for behaving differently than they were expected to (i.e., according to norms) then the metaphysical existence (or absence) of free will is functionally irrelevant. Society will treat these individuals as if they acted freely and are morally responsible regardless, and thus, these individuals will reap all of the negative consequences from those claims.

Notably, political conservatives seem to have stronger belief in free will. To help better understand this, a series of experiments assessed whether stronger beliefs in free will among political conservatives were linked to a greater tendency to moralize, which would then lead to an increased motivation to assign blame (Everett et al., 2021). In a meta-analysis, conservatives were found to have a higher likelihood to moralize than liberals, even for moralization measures without political content (Everett et al., 2021). Also, conservative ideology was found to have a positive correlation with free will belief, and this relationship was significantly mediated by findings of blameworthiness (i.e., tendency to blame) (Everett et al., 2021). In addition, political conservatism was associated with higher attributions of free will for specific events, even though all of the events in the study were determined to be equally immoral for both liberals and conservatives (Everett et al., 2021). Although there was no difference in attribution of free will between conservatives and liberals when both groups saw an action as equally wrong, conservatives attributed less free will to an agent when they saw an action as less wrong than liberals (Everett et al., 2021). These results suggest that conservatives endorsed stronger beliefs in free will because of a motivation to blame, instead of it being a fixed belief. Furthermore, specific perceptions of wrongness were found to mediate the relationship between political ideology and free will attributions (Everett et al., 2021). Finally, both political conservatives and liberals were found to differentially attribute free will to identical actions (involving a potential moral violation) depending on who performed it (Everett et al., 2021). Specifically, study participants reported greater attributions of free will if the agent held the opposite political beliefs than them (Everett et al., 2021). All of these results are consistent with the authors' hypothesis that

political differences (i.e., conservative versus liberal) in beliefs about free will can at least partially be explained by a greater tendency among conservatives to moralize behavior, which can then increase the motivation to blame individuals for their behavior. If this is indeed the case, then, for at least some individuals, finding others morally responsible and blameworthy may stem from a desire to demean them. This would be counterproductive to ethically and justly distinguishing those worthy of being held moral responsibility and blame.

Beliefs in free will and moral responsibility also are influenced by affect, as shown in a meta-analysis (Feltz & Cova, 2014). The role of affect is concerning, as there is no consistency in affect across people that provides an objective foundation for these beliefs and their implications. On the contrary, it hints at capriciousness and creates more room for injustice.

Although none of these associations certainly or entirely explain differences in attributions of free will, blame and responsibility, they do continue to raise concerns about the malleable nature of these beliefs. If individuals will change their ascriptions of responsibility based on their affect or their own propensity to moralize and blame, because an agent holds contrasting political views to theirs, because they deviated from expected norms, or because of the distress they experience otherwise, it would be difficult to say that the resulting judgements are fair, let alone objective.

Ultimately, ethical inquiry needs to provide guidance about how biological explanations of antisocial behavior ought to be used in evaluations of moral responsibility and blame. Individuals already form beliefs about whether or not others had free will or should be held morally responsible and blameworthy for an act. The

malleable nature of these beliefs and the motivations to punish or alleviate one's own anxiety after punishing others are inappropriate for an ethical interpretation of behavior. It seems far more ethical to allow something more objective, such as science, to influence and inform our moral value judgements.

### **Disease, Dysfunction and Responsibility**

By better understanding the biological mechanisms involved in antisocial behavior, we may come to make appropriate distinctions about which behavior deserves a reduction in blame and responsibility, and which does not. Of course, moral claims, values or principles will still need to be utilized (to overcome the is-ought gap) in order to make normative judgements about responsibility and blame. Also, it is important to note that we do not need biological explanations of antisocial behavior to establish true causality for a specific event. What would be relevant is an explanation that, in combination with relevant moral principles or values, suggests that an individual's biology contributed to their behavior in a meaningful way that would mitigate their responsibility.

One potential way this may be actualized is to better distinguish which antisocial behavior is associated with disease or dysfunction (i.e, psychopathology) and which is not. Although this distinction already seems to exist for antisocial personality disorder (i.e., psychopathy) – which is categorized as a disease – there is still debate about whether it is appropriately defined as a psychiatric disorder, and if its presence should absolve or reduce individual moral responsibility for antisocial behavior (Malatesti & McMillan, 2014). This debate likely stems from a lack of scientific understanding of the

biological mechanisms involved in or that lead to the development of antisocial personality disorder, and the criticism that the criteria for the disorder are heavily influenced by values (Malatesti & McMillan, 2014). Advances in the biological understanding of antisocial behavior may help address the first criticism. The second criticism is not unique to antisocial personality disorder, in fact all classifications of disease incorporate values, which is not necessarily bad or likely to change (Sisti et al., 2013).

An example of an attempt at such a distinction is the neuromoral theory of antisocial, violent, and psychopathic behavior, which attempts to distinguish between different expressions of antisocial behavior, as characterized by differing degrees of neuromoral dysfunction (Raine, 2019). This model suggests that primary psychopathy (i.e., antisocial personality disorder), proactive aggression and continuous antisocial behavior over one's life are severely and significantly affected by neuromoral dysfunction, while secondary psychopathy, reactive aggression, and crimes involving drugs are relatively less affected (Raine, 2019). Individuals with primary psychopathy, proactive aggression and continuous antisocial behavior cognitively understand what immoral, and cognitive capacity is fundamental to views of responsibility. However, the dysfunction in their emotional moral capacity, which is important for decision-making, provides reasons for mitigating their responsibility and blameworthiness (Raine, 2019). The usefulness of this theory in evaluations of moral responsibility does not stand solely on whether the science it utilizes makes true claims about human behavior, but also on whether emotional moral capacity (and whether it is impaired) is fundamental to who we hold morally responsible and blameworthy.



The distinction in moral responsibility judgments based on psychopathology is not novel. This is part of the current criteria for an insanity defense, as individuals acquitted on the basis of an NGRI are not held morally responsible or blameworthy (Bloechl et al., 2007). The lack of an identifiable or demonstrable disease or dysfunction currently defaults to holding one responsible.

As the understanding of biological mechanisms of antisocial behavior improves, it will be up to ethical theory to appropriately define what dysfunction is (e.g., deviation from a norm or evolutionarily selected function, or harmfulness to self), as well as which psychopathology ought to mitigate moral responsibility and blameworthiness, and which should not.

### **Conclusion**

Science may well come to explain how and why antisocial behavior occurs. This will create room for a more objective understanding of how we ought to view such behavior. The reservations that exist about using biological explanations of antisocial behavior in attributions of moral responsibility can be addressed through proper utilization of science, ethical policy, and adequate protection of individual health information.

Judgments about free will, responsibility and blame are commonplace. There is evidence that suggests that these views are malleable, and may be influenced by the motivation to punish, to discourage violations of norms, individual affect, and political views. In light of these influences, the question of whether or not (and how) we should let biological explanations of antisocial behavior enter the conversation about

responsibility and blame is one for ethics. We must decide what ought to be at the foundation of our moral beliefs. I argue that science ought to be this foundation.

Without reliance on science, there is greater opportunity for undesirable drivers, as well as prejudice and bias, to dictate our morality. The implications of this are unimaginable, as our moral views play a role in everything from our individual interpersonal interactions to how large groups of people (e.g., nations) treat each other.

Science will facilitate more objective judgements rather than judgments that are dictated by people's preconceived opinions. Therefore, biological explanations of antisocial behavior should be incorporated into the discussion of moral responsibility, especially if we want the conversation to be driven by objective claims and morality, instead of bias.

One way to accomplish an ethical incorporation of science into judgements about moral responsibility is to first specify which biological explanations of antisocial behavior point to psychopathology. Then, relevant moral values or principles will need to be utilized to determine which biological explanations are worthy of mitigating or aggravating moral responsibility and blame. The challenge for ethics is to better define what is mitigating (or aggravating) about particular types of psychopathology. Currently, this definition is based on the cognitive capacity to distinguish right and wrong. There is reason to believe that biological explanations of antisocial behavior will bring to light other important features that will help better identify when moral responsibility and blame ought to be mitigated or aggravated.

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