



Behavioral Genetics and Attributions of Moral Responsibility

Kathryn Tabb^{1,2} · Matthew S. Lebowitz¹ · Paul S. Appelbaum¹

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Abstract

While considerable research has examined how genetic explanations for behavior impact assessments of moral responsibility, results across studies have been inconsistent. Some studies suggest that genetic accounts diminish ascriptions of responsibility, but others show no effect. Nonetheless, conclusions from behavior genetics are increasingly mobilized on behalf of defendants in court, suggesting a widespread intuition that this sort of information is relevant to assessments of blameworthiness. In this paper, we consider two sorts of reasons why this kind of intuition, if it exists, is not consistently revealed in empirical studies. On the one hand, people may have complex and internally conflicting intuitions about the relationship between behavior genetics and moral responsibility. On the other hand, it may be that people are motivated to think about the role of genetics in behavior differently depending on the moral valence of the actions in question.

Keywords Behavior genetics · Moral psychology · Social cognition · Moral responsibility · Motivated cognition

Introduction

Advances in genetics have identified a growing number of gene variants associated with behavioral traits. Even as the validity of many of these findings is debated and their significance challenged, researchers have begun to explore their impact on popular thinking about human behavior. One particularly important area of research concerns how relevant people hold genetics to be for ascriptions of praise and blame. As genetic explanations are increasingly deployed to account for behavior in forensic settings, it becomes all the more urgent to clarify whether people generally take genetic explanations to imply reduced moral responsibility, increased moral responsibility, or to be irrelevant to questions of desert. Taken together, however, empirical studies have failed as of yet to provide a clear answer. While some studies suggest that genetic causes lead people to mitigate

attributions of responsibility to a modest degree, other studies show no effect.

After briefly summarizing the literature in the following section, in our third section we consider what might lead people to see genetic information as relevant to attributions of responsibility, including moral responsibility. We then turn to two possible explanations for the lack of clarity in the data in our fourth section. On the one hand, as described in our fifth section, the inconsistencies could be due to the fact that people have conflicting intuitions about how genetic information should impact moral assessments in particular, such that different experimental contexts and tasks could trigger different sorts of intuitions, or conflicting intuitions could be triggered at the same time, canceling each other out. This is what has been referred to as the “double-edged sword” effect (Aspinwall et al. 2012; Cheung and Heine 2015). On the other hand, as described in our sixth section, people might be motivated to interpret genetic information itself differently—and in some cases to disregard it—depending on their pre-existing moral commitments. By laying out a loose taxonomy of these sorts of possible effects, we hope to suggest fruitful directions for further research that could help parse the extensive but ambiguous evidence that has been collected on the question so far.

✉ Kathryn Tabb
kct2121@columbia.edu

¹ Center for Research on Ethical, Legal and Social Implications of Psychiatric, Neurologic and Behavioral Genetics, Department of Psychiatry, Columbia University Medical Center, New York, NY, USA

² Department of Philosophy, Columbia University, 708 Philosophy Hall, MC: 4971, 1150 Amsterdam Avenue, New York, NY 10027, USA

How genetic attributions affect perceptions of responsibility: the existing data

Research on the impact of genetic attributions for responsibility assessments has focused on two broad categories of behavioral phenotypes: behavior-related health conditions such as obesity and mental disorders, and behaviors that violate social norms, such as criminal acts. One component of the social stigma attached to health conditions like obesity and mental disorders is the perception that they are manifestations of behaviors that are under individual control, and therefore blameworthy (Weiner et al. 1988). Accordingly when these conditions are seen as the result of genetics instead of choice, blame is mitigated. For example, meta-analyses have found evidence of a significant inverse relationship between blame and biological (including genetic) explanations for psychopathology, from both experimental and correlational studies (Kvaale et al. 2013a, b; Haslam and Kvaale 2015). Such effects have been documented in the context of anorexia nervosa (Crisafulli et al. 2008), generalized anxiety disorder (Lebowitz et al. 2014), attention-deficit/hyperactivity disorder (Lebowitz et al. 2012), addiction (Boysen and Vogel 2008; Lebowitz and Appelbaum 2017), and schizophrenia (Boysen and Vogel 2008; Phelan et al. 2002), among others. Similarly, genetic explanations for weight status have been linked to reductions in the blame ascribed to people for having obesity (Crandall 1994; Hilbert et al. 2008). More recently, Pearl and Lebowitz (2014) found in a correlational study that biological (including genetic) attributions were significantly negatively associated with self-blame among overweight and obese Americans.

Another set of behaviors that has been explored in this context is actions that violate social norms, often involving violent or otherwise antisocial behavior. Genetic explanations for criminal acts appear to be making their way into court with greater frequency (Denno 2011), with isolated case reports indicating that at least sometimes they may lead to reduced sentences (Feresin 2009). Researchers looking at these behaviors tend to focus on two outcomes that might be affected by genetic attributions: judgments about responsibility for behaviors (determination of guilt) and responses to such judgments (punishment). One of the most influential studies was by Aspinwall et al. (2012), who presented judges in the U.S. with a vignette describing an aggravated battery by a defendant who had been diagnosed as a psychopath, with half the judges being told about a causal biological pathway and half not. Although there were no differences between the two groups in the extent to which they thought the defendant had moral and legal responsibility for the behavior, there was a small but significant effect on prison sentences, with those judges

who had received genetic and neuroscientific information reducing sentencing from roughly 14 years to approximately 13 years.

This study by Aspinwall et al. stirred speculation about whether the criminal justice system might be transformed by the increasing availability of genetic information, but subsequent studies have failed to show much effect. A direct attempt to replicate the findings with judges in Germany showed an impact of genetic information on perceived legal responsibility, but no impact on judgments about moral responsibility, perceptions of free will, or sentencing decisions (Fuss et al. 2015). In a series of vignette studies with the general population, Appelbaum et al. found no effect of genetic explanations on what punishments were deemed warranted for a range of behaviors that violated social norms both inside and outside of the forensic context (Appelbaum and Scurich 2014; Appelbaum et al. 2015; Scurich and Appelbaum 2016). Using similar methods, Cheung and Heine (2015) also found little difference in the sentencing of defendants whose behavior was explained genetically, though they did find differences in willingness to apply certain criminal defenses (like the insanity plea), and to make ascriptions of diminished control. This reinforces the earlier conclusions of Dar-Nimrod et al. (2011), who found that evolutionary explanations of behavior related to sex (which are intrinsically genetic in nature) failed to impact subsequent decisions about bail and punishment for sex-related offenses in a set of hypothetical scenarios.

Taken as a whole, the literature to date on the effects of genetic attributions suggests inconsistent effects on perceptions of responsibility, with genetic explanations generally associated with reduced ascriptions of responsibility for behavior-related health conditions, but not with consistent effects on reactions to norm-violating behavior such as criminal wrongdoing. Moreover, despite the widespread intuition that the presence of a genetic cause for norm-violating behavior should be mitigating—as suggested by the increasingly frequent introduction of such evidence on behalf of the accused in criminal trials—there has been only limited evidence of an effect on mitigation (Aspinwall et al. 2012; Cheung and Heine 2015). The lack of an effect in cases of wrongdoing may be because people simply tend not to see genetic causes as mitigating. But the evidence about cases of behavior-related health conditions suggests that genetic explanations do deflect blame in some circumstances. Instead, perhaps no consistent effect is observed in cases of socially deviant behavior because genetic explanations motivate our judgments about responsibility in multifaceted, unexpected, and inconsistent ways, making patterns hard to detect. A proper analysis of the empirical findings to date may require us to untangle distinct sets of intuitions that are invoked in response to genetic explanations, and which may, in some cases, mask each other. A good place

to start is to explore the range of plausible intuitions people might have about how genetic attributions *should* affect moral judgments.

Genetic attributions and moral reasoning

The difference between common judgments about responsibility for genetically-mediated health conditions and for genetically-mediated norm-violating behaviors indicates that different intuitions are being drawn on in each set of cases. Insofar as norm-violating behaviors are assessed within an ethical framework, it is reasonable to conclude that moral intuitions are playing more of a role in judgments about these behaviors than in cases of genetically-caused disorders and disabilities, where people may commonly respond with disapproval or distaste but not with a distinctly *moral* disapprobation (though they may respond in a *moralizing* manner). Accordingly, our common moral intuitions may be a good place to look to explain the puzzling lack of consistent effects of genetic explanations for norm-violating behaviors.

Studies show that moral responsibility is commonly attributed on the basis of two sorts of factors. On the one hand, it is often taken to hinge on whether an action is reflective of who an agent “really is”—that is, on whether the agent truly identifies with the values the action represents (Pizarro et al. 2003). On this view, an agent is seen as more responsible for a bad action when it is in line with his or her deepest self. Even if the action is determined by extrinsic circumstances, like blackmail or a disease, if the agent values the action in the right way he or she can be blamed for it (insofar as this account is compatible with a broader determinism, it comprises what in philosophy is called a *compatibilist* account—see, e.g., Frankfurt 1971). There is some evidence that identification with an action is popularly seen as prime grounds for assessing responsibility, even if the agent could not have acted otherwise (Woolfolk et al. 2006). If moral responsibility assessments are made on the basis of this sort of identification, it could help explain why people seem to continue to hold agents culpable even when told their actions are determined (Nahmias et al. 2005).

Insofar as people commonly approach moral responsibility in terms of whether the action being judged was in line with who the agent “really is,” genetic information seems relevant to moral judgments. The appeal to bloodlines to establish a criminal’s character in forensic settings is far older than the advent of behavioral genetics. Before genes for violence were brought to bear on legal verdicts, the idea that some people were “bad seeds” whose immoral actions grew out of their essential character—perhaps shaped somewhat by their surroundings—played a role in courtrooms and in the popular imagination. Sir Francis Galton and others

in the nineteenth century investigated the heritability not only of particular dispositions and characteristics but of “the criminal character” more broadly, reflecting on the potential for limiting “the propagation of supremely vicious or supremely virtuous natures” (Galton 1865, p. 323). Anxieties about these deeply rooted sources of antisocial behavior motivated sterilization statutes for “defective delinquents” well into the twentieth century (e.g., Goddard 1911).

The entrenchment of these sorts of anxieties about heritable character might explain why, despite the popularity of “the gene for” talk (in which particular traits are assumed to be caused by particular genes), people think of genes as shaping not just dispositions or characteristics but identity more broadly. In recent decades, according to Dar-Nimrod and Heine (2011b, p. 829), “people’s conceptualization of genes increasingly has come to represent a placeholder for the psychological essence that has been described in the essentialism literature.” The individual’s genome is taken not only to cause characteristics and typical behaviors, but to represent the very essence of the individual’s identity. Dar-Nimrod and Heine refer to this widespread commitment as *genetic essentialism*. Insofar as the genome is seen as the essence of the individual, it will be seen as the source of what makes the individual “who they really are.” According to criteria for moral responsibility that rely on actions being in alignment with the deep self, then, genetic essentialism provides grounds for tracing culpability back to the particular biological level of the gene.

The second broad class of intuitions about moral responsibility accord with a deterministic view of desert, in which agents are responsible for their actions when they could have acted otherwise—that is, when their actions are the result of their choices (Schlenker et al. 1994; Sarkissian et al. 2010; Gray et al. 2012). Therefore, factors constraining an agent’s choice may be seen as exonerating; fiction is replete with cases where it comes as some comfort that the protagonist’s action was not maliciously intended, but rather resulted from blackmail, from a personality-altering tumor, or from mind-control. If these external forces are powerful enough to overcome free choice, the protagonist might be understood to be “no longer himself,” or no longer an agent at all. This sort of fascinating if fearful prospect has led to an abiding appetite for plots about zombies and demonic possession. In these cases, the role of agents’ choices in the causal chain leading up to the action is what condemns or exonerates them.

For genetics to be viewed as relevant to moral responsibility so conceived, it would need to be the case that people think of genotypes as extrinsic causes that can compromise agency. And indeed, Dar-Nimrod and Heine (2011a) have argued that if actions are viewed as a result of genetic causes, those causes will be taken to be mitigating with respect to moral responsibility because of *genetic*

determinism: the notion that behavioral genetics identifies genes that restrict human freedom by guaranteeing certain behavioral outcomes. Insofar as they understand culpability to require the ability to do otherwise, people may believe that actions resulting from genetic causes are not really *choices*; as Dar-Nimrod and Heine have put it, “behaviors with moral implications lose their moral force if people view those behaviors as beyond the individual’s volition” due to their genetic origins (2011a, p. 807). There is evidence that the belief that physiology determines behavior in this way is widespread among laypeople (Monterosso et al. 2005; Phelan et al. 2002). It may be that genetically-caused actions are viewed as the result of a disposition to act that was immutable from birth, itself the result of discrete and natural causes that ultimately constrain the agent. Alternatively or in tandem, it may be that genetic causes are viewed as capable of forcing behaviors on people, much like genes for a degenerative disease can force certain physical states on their carriers. Either way, the intuition that genetic causes should mitigate moral responsibility suggests that genes are commonly viewed as an *extrinsic* determining factor acting on the will, either in the sense of constraining one’s choices from the outset or in the sense of causing one to act in ways at odds with one’s deepest commitments.

Conflicting intuitions about the genetic causes of norm-violating behavior

As argued above, genetic essentialism—by definition—entails that the genome is constitutive of the self, forming the deepest core of the agent that is the wellspring of his or her moral commitments. If people are fundamentally genetic essentialists, we might expect therefore that they would see an agent as responsible for an action when it is in line with the agent’s behavioral genetic profile. This sort of intuition draws on the first criterion for moral responsibility attributions given above in the previous section, that actions are praiseworthy or blameworthy when the agent’s deep self endorses them. But there is a tension between the moral reasoning encouraged by genetic essentialism and that encouraged by genetic determinism. While genetic determinism seems to draw on intuitions about the moral relevance of one’s capacity to do otherwise to characterize the genome as an external constraint on human agency, genetic essentialism seems to draw on intuitions about the moral relevance of one’s most essential self to uphold the genome as a source of moral culpability. Where genetic determinism will lead people to find genetic causes mitigating, genetic essentialism might lead people to see behavioral genetics as informative about people’s real selves, and therefore as grounds for establishing their responsibility.

Genetic determinism is often treated as synonymous with genetic essentialism or as a component of it (Dar-Nimrod and Heine 2011a). But once they are distinguished, it begins to seem likely that they might regularly pull people in conflicting directions when it comes to attributions of praise and blame for genetically caused behaviors. Examining how powerful each of these intuitions is, and how each interacts with common modes of reasoning about moral responsibility, can go some of the way towards resolving the inconsistencies among studies described above.

It has recently been hypothesized that the lack of impact of genetic explanations on assessments of culpability is the result of conflicting patterns of reasoning, resulting in what has been called the “double-edged sword” effect (Aspinwall et al. 2012). The two edges of the sword have been characterized as the mitigating and the aggravating effects of genetic evidence on punishment. While there has been speculation about what would cause each type of effect, both generally have been attributed to prudential reasoning appropriate for the courtroom, such as expectations about recidivism and standards for assessing *mens rea*. In line with the previous discussion, we might understand the mitigating effects of genetic information as resulting more broadly from determinist intuitions, which would suggest that defendants in criminal cases could not have done otherwise given their genes. On the other hand, determinism might also lead to more severe sentencing, insofar as genetic causes suggest that the defendant will continue to be so determined, and thus have a heightened risk of recidivism. Genetic essentialism could also encourage the view that genetic causes should be taken as aggravating, insofar as the resulting actions express who the defendant really is, implying both a guilty mind and a higher likelihood of recidivism.

Despite the tensions between them, it would seem that people commonly draw on both genetic determinism and genetic essentialism in their judgments about desert. In a way this is not surprising, since empirical evidence suggests that people draw on both the criterion of being able to do otherwise and the criterion of acting in line with one’s deepest motivations during moral assessment, depending on context (Woolfolk et al. 2006; Feltz and Millan 2015). Indeed, Nichols and Knobe (2007) have suggested that while people report, in high numbers, believing that the freedom to act otherwise is required for blame- and praise-worthiness, when certain affective conditions apply people are quick to assign guilt even in cases where that freedom is restricted. The result is that when people follow their intuitions about moral responsibility, they may avail themselves of both determinist and compatibilist criteria without being loyal exclusively to either (Doris et al. 2007). So it makes sense that genetic determinism and genetic essentialism will also be used, sometimes alternatively and sometimes in tandem, to reason about moral responsibility. When we

turn to considering how genetic information might contribute to assessments of moral responsibility, we need to consider how genes might be imagined relevant both to assessments of whether an agent could have done otherwise and to assessments of whether an agent identified with their action in the appropriate way.

Motivated cognition about the genetic causes of norm-violating behavior

The previous section considered ways in which people might be likely to apply genetic explanations to assessments of moral responsibility, but the evidence reviewed in our second section suggests that genetic information is not affecting such assessments as much as researchers had expected. Attempts to directly manipulate judgments about the relevance of genetics for moral reasoning have produced little impact. In the previous section we reviewed one possible explanation for these modest effects: people do in fact have multiple strong intuitions about the relevance of genetic explanations, but these intuitions, taken in aggregate, cancel each other out. In this section we consider another possibility that is also compatible with the evidence. It may be that attempts to experimentally manipulate judgments about the impact of genetic causes on behavior fail because genetic attributions are incompatible with certain sorts of reasoning about moral responsibility. In other words, the modest effects of genetic explanations may be due not only to the conflicting effects of common intuitions about them, but also to the overriding power of more general moral commitments. It is possible that moral judgments not only have the capacity to be affected by genetic information, but also to influence the way in which genetic explanations are themselves received.

In this section, we suggest some common ways of reasoning about morally valenced behavior that might cause people to be varyingly receptive to genetic explanations. Taken together, these psychological processes provide another plausible explanation for the data that show genetic explanations to have little or no effect on assessments of culpability. Rather than establishing that genetic information is reasoned to be irrelevant to blameworthiness, or that it is always interpreted in a manner that can be characterized as a balanced double edge, these data could instead support the inference that in certain situations, genetic attributions for certain sorts of behavior are simply not accepted.

It is well documented that reasoning can be motivated not just by epistemic factors such as the value of evidence or the trustworthiness of testimony, but also by non-epistemic factors impacting the reasoner (for an overview see Ditto et al. 2009). Extrinsic motivations affecting assessments of moral responsibility might range from a desire to think the best about someone to needing grounds on which to exact

revenge; these sorts of motivations can lead factual information to be ignored, misinterpreted, or misremembered (Pizarro et al. 2006). In particular, there are two different processes that have been proposed in the moral psychology literature that might be relevant to the reception of genetic information.

One effect that has been proposed is the existence of a common belief that other people typically contain a fundamentally good core, or moral “true self” (Newman et al. 2015; Strohminger et al. 2017). What aspects of a person’s behavior are attributed to this true self will depend on the moral commitments of the person making the judgment. So, for example, politically conservative individuals might judge agents to be truer to themselves when they exemplify conservative values rather than liberal values (and the other way around) (Newman et al. 2013). Mental states attributed to an agent are more likely to be considered as arising from her “true self” when they lead to actions believed to be good. On the other hand, the motivation to preserve the goodness of the true self might lead people to locate factors that cause morally bad actions outside of the true self.

With respect to the role of genetic attributions in moral responsibility judgments, the “good true self” account would predict an asymmetry in how genetic information is received. If people think of genetics as constitutive of the inner core of human nature—that is, as making up who we “really are”—they would be comfortable with attributing prosocial behavior to genetic causes, while resisting accounts that attribute antisocial behavior to genes. This is because the former would not compromise the fundamental goodness of the true self, while the latter would. If people think of genes as influencing behavior without constituting the essence of human nature, this sort of asymmetry would not be expected, and the attribution of both pro- and antisocial behavior to genetics would be equally likely.

True self intuitions working in tandem with genetic essentialism could explain why genetic causes of health conditions are taken to be relevant to responsibility judgments, while they do not seem to be taken as relevant for assessments of responsibility for norm-violating behaviors. In the latter case, genetic essentialist intuitions might encourage people to feel that behavior perceived as evil or corrupt *cannot* be genetic, no matter what researchers might tell them in the experimental context. If evil behavior is not easily attributed to the true self, explanations that require such attributions to the genome are likely to be rejected, and explanations that locate the bad characteristic somewhere extrinsic to the genome are likely to be preferred. In contrast, people would have no such reason to reject genetic attributions for pathologies or disabilities, which are not viewed as representative of a “morally bad” true self (though they might be thought relevant to people’s identities in other ways). This picture is supported by the current evidence, though more

research is needed to determine whether genetic explanations are adopted in the case of prosocial behavior more than in cases of norm-violating behavior, as this theory would predict.

A second effect which potentially could explain how moral judgments can sway assessments of responsibility is through what has been called “blame-validation processing” (Alicke 2000). This refers to a tendency of people, when observing harmful events, to construct their evaluative standards and their perceptions of the events in ways that allow them to assign blame (Alicke 2000). This account is in line with research demonstrating that agents are perceived to act more freely when they commit bad acts than morally neutral or good acts (Alicke 1992). Indeed, according to Clark et al. (2014), belief in free will itself can be motivated by a desire to attribute blame for bad acts to justify punishment. This reverses the typical picture of moral responsibility attribution, in which judgments of praise or blame follow from assessments of how freely an action was taken (Appelbaum et al. 2015; Genschow et al. 2017).

The “blame validation” effect could also generate an asymmetry in judgments about genetic causation as a function of a behavior’s moral valence. We would not expect people to be motivated to reject genetic explanations if they were not interpreted as mitigating agency and individual responsibility, because the “blame validation” account refers specifically to people’s tendency to “de-emphasize mitigating circumstances” when assigning blame (Alicke 2000, p. 568). So we might expect that if genetic causes were seen as just one influence on behavior among others, rather than a fundamental threat to agency, judgments about moral responsibility in light of genetic attributions would be symmetrical. But if genetic explanations are seen as mitigating moral responsibility more generally, perhaps due to determinist intuitions about genetics, the “blame validation” framework would predict that people would be more resistant to genetic explanations for norm-violating actions than for prosocial ones. We might also expect that people would be more inclined to apply genetic explanations to good behavior rather than bad behavior, because they would not be motivated to defend their right to blame in the first instance.

In line with current evidence, we might also posit that people would be more inclined to exclude genetic causes from their reasoning about morally charged situations than morally neutral ones. In cases where people are asked about degrees of appropriate punishment, if they believe the punishment to be warranted they will be disinclined to adopt causal attributions that would mitigate the responsibility of the wrong-doer. On the other hand, in situations where they are evaluating responsibility in less morally charged circumstances, or those in which the question of punishment has not been raised, there will be no such motivation. In other

words, it may be that genetic attributions are readily adopted in cases of the assessment of causal responsibility (such as pursuing a certain lifestyle that leads to illness) but less readily in cases of the assessment of moral or legal responsibility (such as being on trial for a crime).

Both the “blame validation” account and the “good true self” account maintain that assessments of responsibility for prosocial and norm-violating actions can be motivated by certain commitments that we hold about agency and just desert. When coupled with the desire to believe that bad actions are caused by superficial rather than fundamental aspects of human nature, or with the desire to hold people responsible for their bad actions, genetic determinism and genetic essentialism might lead to asymmetries in how information is interpreted and how judgments about responsibility are rendered. In cases of bad behavior, both psychological processes might lead people to doubt genetic attributions from the get-go, before the double-edged sword effects described above can take effect. In other words, it may be that a desire to punish encourages people to reject genetic explanations for wrongdoing, in order to avoid seeing behaviors as determined. It may also be that a desire to see people as fundamentally good encourages a similar rejection of genetic explanations for antisocial behaviors, because such interpretations imply an essentially morally bad genetic core. Further studies are needed to establish whether cognition about genetic explanations of norm-violating behavior in particular is motivated in these ways, which in turn could help clarify in what sense people are essentialists or determinists about behavioral genetics.

Conclusions

Genes seem to be understood both to constitute and compromise our innermost selves. “It’s in her genes” is a shorthand way of saying a given disposition or behavior is paradigmatic of “who she is,” suggesting that our genes are understood as “determining the will”—that is, as causing our choices—in a manner that can *preserve* agency. At the same time, there is evidence that genes are understood as an external, overriding force capable of *compromising* agency, by stopping us from acting in certain ways and forcing us to act in others. It has been suggested that these conflicting intuitions about how genes affect agency can work against each other in the forensic setting. For example, determinist and essentialist intuitions may contribute to a “double-edged sword” effect in which genetic causes are seen as simultaneously mitigating and aggravating.

We have argued for an additional possibility: that evidence for the mitigating effects of genetic information might not be robust because people simply reject genetic explanations out of hand when the moral stakes

of accepting them become too high. Rather than simply dismissing these sorts of motivated judgments as irrational or biased, however, we should attend to them, as they provide crucial evidence for the ways people think about behavioral genetics and agency. Furthermore, it is worth considering what a rational response to behavioral-genetic information *should* be. As Dar-Nimrod and Heine have argued, predictions about future behaviors drawn on the basis of genetic predispositions are commonly riddled with interpretive fallacies, fallacies that the authors attribute to widespread determinist intuitions about genetics (2011a, p. 805). It has been argued that these sorts of indefensible judgments are made not only by laypeople but by behavioral geneticists themselves (Turkheimer 2016). People may be right in thinking that genetic causes cannot be easily integrated into assessments of responsibility.

While we may worry about inconsistent intuitions and cognitive biases in thinking about genetics and agency, there is currently no scientific or philosophical consensus on what sort of approach would serve us better. Turkheimer (2015, p. S36) has noted that in most cases our best genetic evidence does not provide more predictive power about future behavior than phenotypic information about a proband's family tree. And even if behavioral genetics had more concrete conclusions to offer, it is not obvious how a scientific "is" about the causes of behavior should be turned into a moral "ought." Since all behavior is influenced by genes, attributions of responsibility for specific actions will never "fall out" of the science in an obvious way. Instead, genetic explanations will be integrated uneasily into established narratives about causation, agency, and desert. Understanding the complex motivations and intuitions affecting the way genetic explanations are interpreted is essential for assuring that forensic decisions (and others involving genetic information) are made in a way that is clear-eyed and just. The first step, then, is to assess how genetic information is absorbed and applied, and to this end evidence of inconsistent, contradictory, or seemingly irrational intuitions may be the best data we have.

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Compliance with ethical standards

Conflict of interest Paul S. Appelbaum declares he has no conflict of interest. Matthew S. Lebowitz declares he has no conflict of interest. Kathryn Tabb declares she has no conflict of interest.

Ethical approval This article does not contain studies with human participants or animals performed by any of the authors.

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