



Responsible and responsive bioethics: A review of James Tabery's *Beyond Versus: The Struggle to Understand the Interaction of Nature and Nurture*

I

James Tabery's *Beyond Versus: The Struggle to Understand the Interaction of Nature and Nurture* is an important contribution to the philosophical and scientific discussions on the interdependence of genetic and environmental factors in the generation of complex behavioural and disease traits in humans. Tabery accomplishes 3 things. First, he explores the reasons for the persistence of the nature vs nurture debate, despite the widespread acknowledgment that human traits are dependent on both. This exploration takes us to the eugenics controversy of the 1930s, the race and IQ controversy of the 1970s, and the debate over the causes of depression in the 21st century. Tabery argues that the polarization in these discussions should be attributed to an "explanatory divide"—a disagreement over how explanation works in science. Such disagreement has led to 2 very different concepts of interaction, hence the persistence of polarization. Next, he uses the resources of contemporary philosophy of science to bridge the explanatory divide. Finally, he evaluates the ethical issues involving genetic testing for genes that are implicated in the interactions of nature and nurture. His arguments in this third section point readers towards meta-bioethical concerns about how responsible bioethics ought to be practiced in a rapidly changing scientific landscape—in this case, genetics. My commentary will focus on this section.

In what follows, I begin by reviewing Tabery's careful analysis of some bioethicists' misinterpretation of the results of interaction research. In particular, he suggests that there are negative implications of falsely interpreting the findings of studies so as to represent nature as the only determinant of the development and variation of traits, taking the claims about "Genetic Predisposition to Violence" as an example. Going a step further, I interpret Tabery's analysis as a caution to bioethicists to avoid what I call "genenthusiasm," ie, the propensity to grant causative power (exclusively) to genes in trait expression and ignore/neglect the gene-environment interaction as a relevant causal power despite clear scientific evidence for the latter. Next, I examine Tabery's discussion of the potential benefits of interaction research (when understood correctly) and question how parents ought to adjudicate several factors influencing a child's future behavior in the presence of multiple scenarios. Finally, I voice some

concerns about the future of interaction research and its implications to families from a feminist bioethical standpoint.

II

Interactions between nature and nurture underpin understandings of medical traits, cognitive traits, and behavioural traits. The causal mechanism in which such interactions occur, as well as the variation in these traits in a given population, are of interest for the development of research in understanding human nature and for the development of effective interventions to promote desirable traits (such as cognitive abilities), and decrease the prevalence or degree of undesirable ones (such as medical diseases.) Such interventions may target both "nature," (eg, pre-implantation genetic diagnosis for Huntington's Disease) and "nurture" (eg, adoption of a dog.) As Tabery writes, "a genetic test for a gene implicated in a gene-environment interaction could guide how to intervene on the environment. Likewise, information about an environment implicated in a gene-environment interaction could suggest which gene will fare better or worse".¹ The issue of intervention is, thus, intimately tied to bioethical considerations, leading to the question: How can we use the research on gene-environment interaction to change the world we live in?

Tabery addresses some bioethicists' false interpretation of genetics studies in a way that represents nature as the only determinant of the development and variation of traits and lays out the negative ethical implications. He takes claims about "Genetic Predisposition to Violence" as an example of such mischaracterizations. In the chapter entitled "Disarming the "Genetic Predisposition to Violence": The Dangers of Mischaracterizing Interaction," Tabery evaluates bioethicists' response to a study by Terrie Moffitt and Avshalom Caspi (M&C) on the relationship between the MAOA gene and antisocial behaviours such as violence and criminality. Bioethical commentators, he says, have credited M&C with finding a genetic predisposition to violence and advocate for screening for the genetic predisposition. In his view, the data do not identify a genetic predisposition to violence. As the results of the study are misinterpreted, subsequent bioethical discussions about the ethical implications of interaction research are misdirected.

M&C's study considers whether the interaction between the MAOA gene and child maltreatment, such as physical abuse, sexual abuse, and neglect, is implicated in the expression of violent behavior. The length of the MAOA gene is correlated with low and high MAOA activity: short gene generates low activity; long gene generates high activity. In their study, M&C combine the difference between low

and high MAOA with varying degrees of exposure to childhood maltreatment. The results suggest the following:

*Males from the Dunedin study who carried the low-MAOA variant of the MAOA gene were much more vulnerable to the effects of childhood maltreatment. Low MAOA males who were maltreated were more likely to be convicted of violent offences than the high MAOA males who were maltreated.*²

Bioethicists in philosophy, medicine, and law have taken these results to suggest the low MAOA variant means genetic predisposition to violence. Further, with no scientific basis for such (mis)interpretation, they argue (1) parents who are interested in pre-implantation genetic diagnosis during in vitro fertilization should avoid the low-MAOA embryos, and (2) states interested in a policy of newborn screening should monitor and intervene in low-MAOA children.³⁻⁵

Tabery says the overarching conceptual framework these bioethicists use to diagnose the bioethical issues is misguided, because the assumption that M&C have identified a genetic predisposition to violence is wrong. He writes:

*The concept of a genetic predisposition captures cases where a genetic difference between groups consistently increases the probability of individuals from one of these groups developing a trait regardless of the measured environment. But in Moffitt and Caspi's study, the environmental conditions were crucial for assessing the relationship between the low MAOA and the high-MAOA groups with regard to risk of violent crime convictions and antisocial behavior. Prior to an individual actually experiencing... exposure to childhood maltreatment, there is simply no way to assess whether an individual with low-MAOA activity will be more or less prone to antisocial behavior than an individual with high-MAOA activity.*²

Tabery suggests differential susceptibility is a better concept to interpret the findings of the M&C study. The presence of a genetic difference between various groups (eg, high and low MAOA) both increases and decreases the probability of individuals from 1 group developing a particular trait depending on the measured environmental condition. The low-MAOA individual is less likely to be convicted of a violent offence in environments with no childhood maltreatment and simultaneously more likely to be convicted of a violent offence in environments with probable and severe childhood maltreatment.

Bioethicists' misinterpretations may lead them to devise intervention strategies with harmful consequences. For example, as Tabery points out, some bioethicists suggest monitoring low MAOA individuals immediately after birth using either pharmaceutical or social-behavior interventions. For example, Brooks-Crozier recommends social behavior interventions whereby "all children would be screened for their MAOA status at birth," with abnormal test results (ie, low MAOA) reported to the child's healthcare provider and the state department of health; an individualized family service plan would be developed for the low MAOA child and family to prevent the

development of antisocial behavior.² For Tabery, selective intervention may become a self-fulfilling prophecy: both the child and the family will expect and thus cause the development of an antisocial personality by virtue of the diagnosis and intervention designed to prevent it. Children with the abnormal test result will come to think of themselves as abnormal, with parents worried by the appearance of social services who visit regularly to prevent criminal violence from materializing in their child.

I take Tabery's apt analysis a step further, inviting reflection on how responsible bioethics ought to be practiced. Mischaracterizing the results of interaction research casts a wider net of problematic and dangerous effects than Tabery notes here, perhaps due to the complexity of the larger matrix in which scientific information (warranted or unwarranted) is disseminated in the broader culture. I use what I call "genethusiasm" to illustrate my argument.

Genethusiasm, as noted earlier, is the propensity to be blinded by the promises of genetics research on the contribution of genes and environment in trait expression in a way that favours gene contribution, despite clear scientific evidence indicating a joint gene-environment contribution. An example is bioethicists' misinterpretation of M&C's study as having found the genetic disposition to violence. In this instance, genethusiasm directly affects and harms potential parental, social, and policy related decisions about genetic testing, as well as social narratives about undesirable (or desirable) traits, such as violent behavior. Social narratives about violence may have a wide range of influence, from increasing stigma against people who exhibit violent behavior, to increasing self-stigma among those punished for violent behavior, thereby hampering their efforts to improve and flourish, to the distribution of research funding.

By narratives of undesirable traits, I refer to the selective representations of the states of affairs in an individual's life pertaining to his/her undesirable traits, which are organized in a more or less coherent and meaningful manner. Social narratives about an individual subject's violent behavior, therefore, are used by others to make sense of her behavior in the intrapersonal and interpersonal contexts of her life (eg, "She is violent because she was raised by alcoholic parents;" or "He is violent because he was raised by child protection services.") The narratives through which others make sense of an individual's violent behavior shape the way they respond to it (eg, more tolerance and sympathy based approach, vs a punitive approach.)

Scientific accounts of undesirable traits, in this case, violent behavior, in addition to offering methods of intervention, serve as epistemic sources through which society creates narratives about violent behavior. In other words, those who observe or are affected by this behavior are inclined to take the causal framework offered by the sciences in social narratives. A genethusiastic (mis)interpretation of scientific results of a study, therefore, may lead individuals to rely on the available genetic explanations of violence (and the intervention strategies offered), at the expense of ignoring the influence of environmental factors on violent behavior, as relayed by complete scientific evidence.

Making sense of undesirable traits through narratives is neither novel, nor specific to violence. Consider, for example, the extent literature on illness narratives.⁶⁻⁹ As Arthur Frank reminds us, personal

narratives repair the damage that illness has done to an ill person's sense of where she is in life and where she might be going.⁶ Similarly, the tendency to create narratives about undesirable traits can be associated with the desire to make sense of something as unfathomable, confusing, and dangerous as violent behavior. Individuals create narratives to execute some control over uncertainty and find the courage to address difficulties.¹⁰ Cultures have traditionally provided people with a stockpile of religious, moral, and social stories to help them answer the great "why" questions associated with violence and relevant acts. For instance, in mythology, the goddess Hybris is inevitably present in and denoted by "hubris" whose primary meaning is pride, defiance (of destiny, gods), arrogance, outrage, and leads the person displaying it to destruction. For instance, Prometheus' act of stealing the fire from the gods and giving it to humans was an act of hubris (inspired by the goddess Hybris), outrageous, defying, arrogant, but not violent (other than figuratively, as every act of transgression can be said to be "violent"). In his *Fables*, Aesop tells us Polemos (War) married Hybris (Violence) and because he loved Hybris and he still follows her everywhere she goes. The moral of Aesop's fable is that one should never allow violence to influence one's actions, as war will directly follow.

In our contemporary age, many of these traditional sources are widely regarded as lacking credibility. We now have a multiplicity of scientific approaches to violent behavior and advance technologies that disseminate scientific research into popular culture. Individuals draw from the various scientific frameworks to create their narratives. Scientific inquires that feed these narratives have transformed as well. For instance, Freud first characterized aggression as a component of the sexual instinct used in the service of mastery; later, however, he identified aggression as a response to psychological threats, such as loss, and considered it useful/instrumental for self-preservation.¹¹ What Freud calls *Bemächtigungstrieb*, roughly translated as the drive to master/possess, is a non-sexual drive which includes a destructive tendency that is only secondarily (and not necessarily) related to sexuality. The most significant contribution of Freud on the matter of aggression is perhaps that he identified self-aggression as being the principle of aggression turned towards the others, thus changing the way aggression was seen till then, as something one does to another rather than to oneself. Thus, grief, mourning, melancholy, guilt, and various masochistic tendencies are all forms of self-aggression. Aggression is self-aggression because the aggression drive (*Aggressionstrieb*) is described as part of the death drive which is located in the person, and it is also linked with sexuality.¹² Winnicott rejected this and differentiated between normal aggression as a constructive and essential ingredient of normal development necessary for separation and individuation, and pathological aggression as a reaction to environmental trauma and loss.¹³ Social narratives on violence, for instance, once focused on the individual's development, relationship with parents, etc., but advancements in genetics and neuroscience facilitated the use of "smallism" in narratives of violence, ie, over-emphasizing the building blocks of bodies such as neurons and genes in scientific explanations and underestimating more integrated and complex phenomena.¹⁴ Thus, many appeal to the vocabulary of genes and neurotransmitters to make sense of violence.

In short, social narratives created under the influence of genethusiasm represent violence as indexed to an individual's genetic make-up, disregarding the actual results of interaction research illustrating the contribution of both environment and genes.

My second point is normative: violence narratives represent society's perception of violence and their direct responses to it. The question becomes how narratives can help the development of the individual's psychological and social skills to reduce his/her violent behavior. In this regard, the optimism expressed by genethusiasts in the effectiveness of genetic intervention to address violent behavior is not only scientifically unwarranted but ethically problematic, as such narratives may increase stigma against those who exhibit violent behavior, by deeming their condition irreversible (because it is genetic, and they are beyond the point where genetic interventions can be useful.) These individuals may further be isolated from the community, precluding any opportunity to improve. In addition, facing such stigma, they may develop self-concepts such as "dangerous," "unfit for work," "someone to be avoided in relationships", leading to impoverished self-esteem and self-efficacy. Finally, genethusiastic social narratives may lead to unjust distribution of public resources: more research funding may be allotted for the development of genetic interventions as opposed to social services.

This wider influence of scientific research in addressing undesirable traits brings up meta-bioethical questions about how bioethicists must evaluate the ethical implications of rapidly changing scientific disciplines and technological advancements. Tabery's observation of some bioethicists' misinterpretation of M&C's Dunedin study and his recharacterization of the results is a good illustration of how responsible bioethics must be practiced, the first step of which is correct representation of the status of the actual research.

III

In the final part of his book, Tabery employs his account of "differential susceptibility" and considers whether and how the interaction research (when understood correctly) might inform common parental decisions, such as getting a dog, sending kids to daycare, or whether to respond with empathy when a child is frustrated or to direct punishment at her misbehaviour following a temper tantrum, as well as the ethical implications of this possibility. Here, I would ask Tabery how parents ought to adjudicate several factors influencing a child's future behavior in the presence of multiple scenarios. In particular, I raise some concerns with his discussion on the potential benefits of genetic testing for developing strategies to reduce temper tantrums.

Tabery reviews a number of studies that illustrate gene environment interaction in expression of certain traits, such as allergies and childhood behavioural problems. In all cases, environmental variables can be actively shaped by parents when they make decisions about the experiences of their child's early life. The cases involve extreme interaction effects: the riskier genetic group in 1 environment becomes the least risky group in elsewhere.

My focus is on Tabery's discussion of the interaction between parenting styles and DRD4 gene in the expression of childhood

externalizing behavior, including defiance, aggression, and disruption, which is predictive of serious behavioural problems later in life—juvenile delinquency in adolescence and antisocial behavior in adulthood. Tabery looks at Marian Bakermans-Kranenburg and Marinus van IJzendoorn's (B&I) study where they investigate the impact of different parenting styles on children with long and short variants of DRD4 gene.

High sensitivity parenting involves an empathy-oriented approach to discipline; when a child misbehaves (say, with a temper tantrum), a high sensitivity parent will empathize with the child's frustration, reason with the child about the source of the frustration, and distract her by focusing her attention on something else less aggravating. High-sensitivity parenting is said to lead to an increased sense of security and attachment for the child. Low-sensitivity parenting, in contrast, involves a punishment-oriented approach to discipline; when a child misbehaves, a low sensitivity parent, rather than empathizing, reasoning, or distracting, is more likely to coerce the child, using potential punishment as a warning against continued misbehaviour. Low-sensitivity parenting is thought to lead to insecurity and decreased attachment for the child.

In the B&I study cited by Tabery, children with the long variant of DRD4 showed a drastic decrease in externalizing behavior when exposed to high-sensitivity parenting, whereas children with the short variant saw no such decrease when exposed to high sensitivity parenting; in fact, their externalizing behavior score slightly increased when exposed to high sensitivity parenting. Tabery suggests tests for genes such as DRD4 might become sought after by parents wanting more information about their children; for example, they may prevent or decrease a child's chances of developing a disease or an undesirable trait. Tabery considers a hypothetical couple with 2 children, Vince and Jeff. The parents want to take advantage of the M&I results on the connection between DRD4 gene and parental styles to address the younger son Jeff's externalizing behavior. A low-sensitivity parental style was effective in addressing and reducing Vince's temper tantrums but does not work for Jeff. It turns out Jeff has the long variant of DRD4, so they switch to high sensitivity treatment.

Tabery argues the incorporation of genetic information to parenting will alter what counts as "treatment" and such a shift will have both advantages and disadvantages. On the one hand, it "would empower parents by putting treatment, which was previously the exclusive purview of medical professionals, directly into the hands of parents." On the other hand, it "would transform the way parents conceive of certain parental decisions, reshaping how parents think about the rationale for various childcare choices." Parents normally discipline a child in to teach her to distinguish between appropriate and inappropriate behavior. But the discipline becomes reconceptualized as a treatment for the child's DRD4 gene. Tabery suggests that the act of reconceptualization is not inherently bad but that it has consequences.

Going back to the vignette earlier, while high sensitivity parenting may reduce Jeff's externalizing behavior, Tabery warns that the benefits of genetically informed intervention must be weighed against the various social, familial, and psychological costs. First, as Tabery points out, it may lead to a sense of injustice in the older child Vince, who is subject to low sensitivity parenting, causing his resentment of both his parents and Jeff. Second, high sensitivity parenting may reduce

Jeff's externalizing behavior but lead to some unintended consequences, such as problems of adjustment in environments where he is not treated with high sensitivity (eg, transition from home care to daycare). Similarly, high sensitivity parenting might intrude into Jeff's psychological and emotional development by stifling his independent thinking and self-expression. He may be unable to function with autonomy in environments where he is expected to behave autonomously.

Considering the complexity of these scenarios in child development, Tabery cautions a "genetic guide to parenting" may not trump other guides to parenting:

Parents will have to enter genetic information into these decisions with great care. If parents think the "genetic guide to parenting" bears more weight than other factors, there is a genuine risk of medicalizing those decisions and replacing genetic determinism with gene-environment determinism.²

What measures should be taken, then, by parents to correctly interpret scientific information and adjudicate the ethical implications of including genetic information in their decisions? How might genethusiastic social narratives, also disseminated by some bioethicists, affect their decisions? What does "great care" entail here? Should parenting involve being a bioethicist?

This brings me to my final point. To explain my concerns about the well-being of parents in the context of parental decision-making, I turn to the insights of feminist bioethics. In traditional bioethics, the ethical implications of genetic research are often regarded as primarily concerning the future of the embryo or child. Traditional bioethics is frequently charged as being mostly interested in the welfare of the *child-as-adult-to-be*, in Samantha Brennan's words.¹⁵ The bioethicists commenting on the MAOA gene influence on violent behavior (discussed earlier) are illustrative; they seek to reduce violent behavior in a *child-as-adult to be* by introducing intervention strategies today. My concern is the relative disregard of the current well-being of the child, ie, *child-as-child*, as well as the well-being of parents.

First, consider the well-being of *child-as-child*. What does it consist of? Emphasis on the *child-as-adult-to-be's* well-being disregards the "intrinsic" goods of childhood and sets parental responsibility as the promotion of the goods of the *child-as-adult-to-be*. Intrinsic goods of childhood include "unstructured play, nurturing relationships, physical activity, and emotional well-being".¹⁵ Making decisions based on the child's genetic information in order to maximize his future well-being may come at the expense of neglecting his current well-being. Parents must balance things that are good for the *child-as-adult* with those beneficial for the *child-as-child*. Such thinking should enter the complex matrix developed by Tabery in the incorporation of genetics information into parental decisions.

Next, consider the well-being of parents, again, an aspect of family-making that is seldom the topic of discussion in traditional bioethics. While the idea that parent-child relationships are very important for child's emotional and intellectual development is rarely contested, the idea that such relationships play a significant role in the flourishing of adults (who choose to be parents) is not generally considered. I do not have space here to discuss how child-parent relationships

contribute to flourishing but can ask how interaction research's influence on parental decision making can affect the well-being of parents.

The pressures of contemporary parenthood often leave parents exhausted. Women, as frequently the primary caregivers, are susceptible to societal and medical pressures, including what kind of birth method they ought to choose or whether they ought to choose breastfeeding as a nutrition method. These represent pressures to make the best decision for children, but at the same time, they objectify their bodies and medicalize the various practices involved in child rearing. As Sue Sherwin says in *No Longer Patient*, medical practice is an important instrument in the continuing disempowerment of women (and members of other oppressed groups) in society.¹⁵ Pressures on parents and their bodies do not end here. Every day, parents are presented with another strategy to address their child's allergies and temper tantrums, or to enhance their children's capacities for being good at school, sports practice, social relationships, etc. In short, there are multiple pressures about the right way of making parental decisions.

In the end, we are left with a number of serious ethical questions. If information is available and affordable, does this mean, parents ought to acquire information about their child's genes? Must they do so to fulfil their parental responsibilities? Would failure to abide by the guidelines that come out of the results of scientific studies prevent parents from flourishing? More importantly, how should bioethicists respond to the rapidly changing scientific landscape? Should they wait until we have more conclusive results about genes and their interaction with the environment before talking about their bioethical implications? Perhaps, as Tabery aptly suggests, one of the functions of the bioethicist is to get ahead of the science so that they provide an ethical evaluation of some technological advancement before we find ourselves in the middle of it.

ACKNOWLEDGEMENTS

I would like to acknowledge the anonymous reviewer for their helpful comments on this article.

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