

Better Living Through Chemistry? A Reply to Savulescu and Persson on ‘Moral Enhancement’

ROBERT SPARROW

ABSTRACT In ‘Moral Enhancement, Freedom, and the God Machine’, Savulescu and Persson argue that recent scientific findings suggest that there is a realistic prospect of achieving ‘moral enhancement’ and respond to Harris’s criticism that this would threaten individual freedom and autonomy. I argue that although some pharmaceutical and neuro-scientific interventions may influence behaviour and emotions in ways that we may be inclined to evaluate positively, describing this as ‘moral enhancement’ presupposes a particular, contested account, of what it is to act morally and implies that entirely familiar drugs such as alcohol, ecstasy, and marijuana are also capable of making people ‘more moral’. Moreover, while Savulescu and Persson establish the theoretical possibility of using drugs to promote autonomy, the real threat posed to freedom by ‘moral bioenhancement’ is that the ‘enhancers’ will be wielding power over the ‘enhanced’. Drawing on Pettit’s notion of ‘freedom as non-domination’, I argue that individuals may be rendered unfree even by a hypothetical technology such as Savulescu and Persson’s ‘God machine’, which would only intervene if they chose to act immorally. While it is impossible to rule out the theoretical possibility that moral enhancement might be all-things-considered justified even where it did threaten freedom and autonomy, I argue that any technology for biomedical shaping of behaviour and dispositions is much more likely to be used for ill rather than good.

In an article recently published in *The Monist*, Julian Savulescu continues his program of promoting the radical reshaping of humanity.¹ Not content with having argued that we should embrace the use of enhancement pharmaceuticals in sport² — and other arenas of human activity³ — and that we are morally obligated to use genetic technologies to have the ‘best child possible’,⁴ Savulescu, with his most recent co-author, Ingmar Persson, is now arguing that we should pursue ‘moral enhancement’.⁵ Thus, in ‘Moral Enhancement, Freedom, and the God Machine’, Savulescu and Persson:

(1) argue that recent scientific findings suggest that there is a realistic prospect of achieving moral enhancement;

and,

(2) respond to the criticism of this project, put forward (somewhat bizarrely given his tremendous enthusiasm for most other types of human enhancement) by John Harris, that such moral bioenhancement would threaten individual freedom and autonomy.⁶ Savulescu and Persson argue that enhancement of moral dispositions such as altruism and a sense of justice would not threaten freedom, that some uses of moral bioenhancement may promote autonomy, and that some instances of

biological manipulation of the mental states of others may be justified even where they undermine both freedom and autonomy.

In this reply, I take issue with both parts of their paper.⁷ First, I will argue that while there is indeed evidence that certain pharmaceutical and neuroscientific interventions can alter behaviour and emotions in ways that we may be inclined to morally evaluate positively, describing this as ‘moral enhancement’ presupposes a particular, contested, account of the what it is to act morally, and also implies that entirely familiar drugs such as alcohol, ecstasy, and marijuana are also capable of making people ‘more moral’. In their enthusiasm for the prospect of moral enhancement, Savulescu and Persson run together three different sorts of cases wherein biomedical interventions might alter dispositions and/or behaviour. Some necessary conceptual clarification reveals that describing what pharmaceutical or surgical interventions might achieve as ‘moral enhancement’ is more controversial than Savulescu and Persson allow.

Second, I will argue that, while Savulescu and Persson do establish the theoretical possibility of using drugs to promote autonomy in the ‘Ulysses and the Sirens’ type cases they discuss, wherein individuals use pharmaceuticals to modify their own behaviour and/or motivations, the real concern about moral enhancement is — to borrow a phrase made famous in another context by John Rawls — ‘political not metaphysical’. That is, the threat posed to freedom by biomedical manipulation of behaviour and/or motivations arises out of the prospect that the ‘enhancers’ will be wielding power over the ‘enhanced’. Drawing on the notion of ‘freedom as non-domination’, developed by Philip Pettit⁸, I will argue that individuals’ may be rendered unfree even by a hypothetical technology such as Savulescu and Persson’s ‘God machine’, which would only intervene if they chose to act immorally. Finally, I shall make some observations about the idea that moral enhancement might be all-things-considered justified even where it did threaten freedom and autonomy. While it is impossible to rule this out as a theoretical possibility, I will argue that, in the real world, any technology for biomedical shaping of behaviour and dispositions is much more likely to be used for ill rather than good.

Disambiguating ‘Moral Bioenhancement’

When Savulescu and Persson write of influencing ‘people’s moral dispositions and behaviour’ through biological manipulation, in the service of an argument for ‘moral bioenhancement’, they run together three different types of cases. Only by adopting a very particular — and controversial — account of what it is to make someone ‘more moral’ is it plausible to describe such manipulation as moral enhancement.

First, much of their discussion proceeds as though altering *behaviour* — to prevent someone acting immorally or to ensure that they do the right thing in some particular circumstances — is moral enhancement. Yet the use of the sedative gas can prevent someone completing an assault and we would hardly think that this was a case of moral enhancement. At the very least, moral bioenhancement must improve people’s motivations.

However, second, even altering feelings as well as behaviour seems to fall significantly short of making people better persons — as is implied by the claim that suitable drugs could make people ‘more moral.’ We are, in fact, all familiar with drugs that can

alter how we feel. Savulescu and Persson concentrate on 'sexy' drugs like oxytocin, propranolol and serotonin but anyone who has had a few glasses of beer or smoked marijuana knows that drugs can make us feel love where we would otherwise feel apathy or brave where we would normally be scared. In some circumstances, these chemically influenced emotions may even motivate us to do the right thing. Yet, again, it stretches credulity to call this 'moral enhancement'. In part, this is because we recognise what the authors acknowledge in their brief discussion of Himmler: that moral behaviour is context dependent. Sentiments that might promote moral behaviour in one set of circumstances may promote immoral behaviour in another. A stiff shot of whiskey might allow us to summon up the 'courage' required to do the right thing in some particular instance but it will not succeed in making us more moral. Even drugs like methylenedioxymethamphetamine (MDMA/'ecstasy'), which encourage feelings of compassion and empathy, will lead people to behave *less* morally in many circumstances where acting morally requires agents to follow abstract moral principles or respond to the demands of distant others rather than those close to them.

Yet at least it is plausible to think that we could use drugs to alter our (or others') feelings. What is less clear is whether any of the chemicals that Savulescu and Persson adumbrate cause people to (third) act *for the right reasons*, as is required by many accounts of what it is to act morally. Savulescu and Persson appear to conceptualise 'acting for the right reasons' according to an 'externalist' model, such that all that matters is that individuals do the right thing in their particular situation. However, on the face of it, at least, the claim that we are acting *for the right reasons* implies that our motives for action are tracking the reasons that we have to act. Acting 'for the right reasons' therefore requires that agents should respond in the right way to counterfactuals: if we praise someone for helping another person who is in need, our assessment that their action is morally admirable rests upon the thought that they should not have been motivated to help them in the same way if the other person were not in need. Moreover, according to many accounts of moral action — and, in particular, some Kantian accounts — morality requires agents to act on the basis of reasons that they themselves acknowledge and embrace. Thus, according to a more Kantian account of morality, in order to count as a moral enhancement a given pharmaceutical would need to cause us to have the appropriate beliefs about what moral action would consist in, not only in the current circumstances that we face but also in others that are both relevantly similar and dissimilar. It would be a good drug, indeed, that made us feel love only for what is worthy of love and brave only in the service of a just cause.⁹

This brief discussion suggests that the larger theoretical differences between advocates of moral enhancement, such as Savulescu and Persson, and their critics play an important role in shaping attitudes towards moral enhancement.¹⁰ Those with consequentialist leanings may be inclined to hold that any intervention that makes it the case that people are more likely to behave in ways that we evaluate positively will count as moral enhancement. Thus, if we don't want people to murder each other, then we can simply dope them up with a chemical that fills them with love for their fellow man and call the result 'moral enhancement'. However, virtue ethicists and deontologists are likely to interpret claims about 'moral enhancement' or making people 'more moral' as claims about a transformation of the agent. Enhancing an individual's moral agency would therefore require more than simply reshaping their inclinations — it would require improving their capacity to act for the right reasons.

Freedom, Autonomy, and Moral Bioenhancement

Let me now turn to the question of the relation between moral bioenhancement and freedom and autonomy. Savulescu and Persson argue that moral enhancement need not reduce freedom and can serve to promote autonomy. While they may be correct in cases wherein people use pharmaceuticals to modify their *own* dispositions and/or behaviour, their argument neglects the political dimensions of freedom in cases where enhancement is imposed upon other people.

Savulescu and Persson begin by arguing, by analogy with the ‘naturally virtuous’ and with moral education, that biologically manipulated behaviour and motivation is compatible with freedom. They then defend the claim that enhancement will not threaten freedom via a clever construction of two alternatives. If free will is compatible with determinism (i.e. compatibilism is true), then — they argue — choices that are determined by biomedical manipulation can also be free. If free will is not compatible with determinism (i.e. incompatibilism is true), and the actions of the naturally virtuous are free, then this freedom will, they suggest, also resist constraint by neurological states that are induced artificially.

However, insofar as it addresses only the relationship between freedom and the availability to an individual of alternative courses of action, this argument is too swift. Freedom is also a relation between persons: it is political not (just) metaphysical. When we ask whether someone is acting freely or not, we are (also) asking whether it is appropriate to hold them responsible for their actions. Are the choices of those whose motivations and behaviour have been biologically manipulated really their own or do they reflect the will of another? Answering this question requires us to look at the political relations between individuals, and between individuals and social structures, and analyse where power lies.

In this regard, there is a significant *disanalogy* between moral education and the biological manipulation of behaviour and motivation, as Jürgen Habermas has emphasised in his work on genetic enhancement of human beings.¹¹

Moral education, even moral education of a young child, proceeds — for the most part — via language and, as such, is fundamentally structured by the logic of communicative action.¹² As an address to another member (or potential member) of a linguistic community, education acknowledges a fundamental moral equality between educator and educated. Implicit in this relationship is the requirement that the educator must, if called upon to do so, be able to justify the norms that have shaped the educational project and its content with reasons that the person being educated should accept. In doing so, the interaction is also open to the possibility that the person being educated will respond with counterarguments of sufficient force to change the mind of the educator. This requirement to be responsive to the demands of reason persists even if it is, in fact, impossible for the person being educated to offer arguments in reply to the activities of their educators in this particular case (as is obviously the case with infants and their parents, for instance).

Biomedical interventions to reshape the agency of others, on the other hand, operate in an instrumental or technical mode. They involve a subject acting towards an object and as such are fundamentally structured by a profound inequality. Whereas communicative action can be evaluated according to the extent to which it approaches the egalitarian relationships in an ‘ideal speech situation’, the only appropriate metric for evaluating technical action is efficacy.

The difference in the logic of moral education and biomedical manipulation has important implications for the impact of each sort of intervention on the freedom of those they affect. Insofar as it is — as I have argued — conditioned by respect for the agency of the person being educated, moral education is compatible with the freedom of the educated; indeed, it may well enhance their agency. Biomedical interventions, on the other hand, achieve their effects by treating the patient as object and thereby reduce their freedom. Their new desires and aptitudes are foisted upon them by the will of another. Importantly, moral education and biomedical manipulation have these differing implications for the freedom of those they affect, even if they bring about precisely the same neurobiological effects and are, consequently, equally efficacious.¹³ The argument that biomedical manipulation of behaviour and dispositions must be compatible with freedom because moral education is compatible with freedom is therefore too swift. The impact of changes in their neurobiology on the freedom of an agent is a function of the causal history of the changes or — more accurately — of the ethics and politics of the relations between persons that brought them about.

In fact, Savulescu and Persson do go on to discuss the political or inter-personal aspects of freedom. They concede that when biomedical interventions into the lives of others result in them acting other than they were initially inclined to, they reduce their freedom. However, Savulescu and Persson try to temper the opposition between freedom and moral enhancement by discussing the case of a 'God machine', which would only intervene to prevent people forming the desire to carry out seriously immoral actions. While this technology would indeed take away humanity's 'freedom to fall' it would not, they argue, infringe upon individuals' freedom as long as they chose to act morally.

Savulescu and Persson here underestimate the tension between the power of some and the freedom of others. As Philip Pettit has argued, a 'republican' conception of freedom emphasises the importance of 'non-domination' as a central component of what it means to be free.¹⁴ Pettit invites us to consider the hypothetical case of a slave ruled over by a benevolent but powerful master. If he wanted to, this slave-owner could intervene in every part of his slave's life and thwart all their plans and projects. Yet because he happens to be (for the moment, at least) benevolent, he refrains from exercising his power at all and permits his slave to go about their life unconstrained. Pettit points out that we have a strong intuition that slaves ruled over by such a master are not free because they are subject to his power — regardless of whether or not he exercises it.

The application of this case to the ethics of the God machine is obvious. Even though the God machine only acts to alter an individual's motivations when he or she intends to commit a seriously immoral action, the techniques it uses to do so could also be used to control individuals' motivations more generally. The God machine 'dominates' its subjects. Thus it is not solely the case that people subject to the power of the God machine are not 'free to fall'. In removing the freedom to fall, the God machine removes their freedom altogether.

These concerns about interpersonal relations do not touch Savulescu and Persson's claim that it might sometimes be possible to enhance autonomy through biomedical manipulation of motivation and behaviour in the special case where individuals enhance themselves. Savulescu and Persson are right that people may sometimes increase their ability to achieve their higher-order desires by self-medicating. At worst here, we have the

tyranny of an earlier self over a later self — and, within limits, we think that people have this right. Thus, Savulescu and Persson are correct to hold that, at least in this case, biological modification of dispositions and behaviour may respect — and may even enhance — autonomy. Again, however, it is worth observing that this form of moral enhancement also does not require any especially sophisticated knowledge of pharmacology or neuroscience. Rather than having his crew lash him to the mast, Ulysses could have drunk so much wine that he was incapable of standing to move to the helm of the ship when he heard the Sirens.

The Real World of Moral Bioenhancement

Savulescu and Persson's final claim is that even if technological constraints on immoral behaviour were to occur at the cost of the freedom and autonomy of (some) individuals, the imposition of such constraints might nevertheless be justified by the benefits of protecting society against immoral activity. They point to Mill's harm principle as evidence that restrictions on liberty to avoid harm to others are uncontroversial and point out that — as far as methods of constraint go — the God machine appears relatively benign. Given the weighty harms that result from immoral activities, we cannot rule out the possibility that the use of a sufficiently nuanced and powerful technology of moral enhancement could be all-things-considered justified. However, if there were ever a *deus ex machina* in the context of a philosophical argument, the God machine is it. There is little we can learn from considering this case about the ethics of the application of more mundane technologies to reshape dispositions and behaviour.

Interestingly, Savulescu and Persson begin their paper by insisting that we cannot rely on a technological solution to the problems — they claim — humanity is facing in the modern era. Yet, ultimately, this is precisely what they plump for. Rather than putting their faith in artificial intelligences solving all the world's problems, as some of their colleagues at the Institute for the Future of Humanity do, however, Savulescu and Persson look to a progressive neuroscience to work its magic on us.¹⁵

There is a serious 'bootstrapping' problem here, which the authors acknowledge in an earlier paper but do not address.¹⁶ If human beings are collectively incapable of rising to the ethical challenges posed by our existing technologies, what reason do we have to trust that individuals or the institutions that they create will use any putative technology of moral enhancement for that purpose? This question is especially pressing given that any technology capable of reliably altering motivation and behaviour could be used for a much larger range of ends than making people more moral: most obviously, it could be used by authoritarian regimes to make people more docile.¹⁷ Indeed, this latter project seems likely to be much easier to realise than the goal of increasing people's proclivity to act for the right reasons. Before it would be wise to trust governments with this power we would first need to ensure that we have stronger democratic institutions to limit abuses of power, mechanisms for regulating the application of technologies both nationally and internationally, and a citizenry that is sufficiently educated and inclined to respect the rights of others so as to be able to resist the efforts of demagogues who might argue that there was an urgent need to suppress their political enemies. Yet, if we have all this, one wonders if Savulescu and Persson's pessimism about our ability to confront our precarious existential situation without moral enhancement is justified.

Indeed, the idea that the phenomena that concern Savulescu and Persson¹⁸ — anthropogenic climate change, war, terrorism, and the threat from weapons of mass destruction — can be attributed solely to human nature and could be solved simply by prescribing everyone a few well-chosen drugs is ludicrous. To attribute these problems to our evolved biology is to imply that we could understand history and politics without reference to economics, sociology, or political science.¹⁹ Many of the ‘threats’ that exercise Savulescu and Persson either have not existed, or have been adequately dealt with, within particular societies for extended historical periods without any resort to biomedical manipulations of human psychology. These phenomena are driven by social and political dynamics arising, for the most part, out of the deep structural economic and political inequalities that exist both within and between nations today — and there is little reason to believe that they could not be solved by addressing these structural issues while leaving human nature as it is now. Removing the institutional incentives that reward selfish behaviour and the pursuit of short-term goals over long-term goals would do more to produce ‘more moral’ behaviour than any program of biomedical interventions.

Not only does choosing to resort to moral enhancement to try to solve the world’s ills evince an implausible combination of technological utopianism, naïve sociobiology, and political pessimism, it would also be politically dangerous. There is, inevitably, a certain amount of elitism implicated in the very idea of moral enhancement.

To begin with, the project of moral bioenhancement implies that those people directing it know what being more moral consists in. Despite the best efforts of its advocates to make only the most minimal claims about the benefits of altruism, a sense of justice,²⁰ and the absence of distorting emotions or cognitive biases, such as racism,²¹ any actual program of enhancement would inevitably require taking a position on controversial questions about the relative importance of each of these and the desirability of different combinations of dispositions. Thus, any state that embarked upon moral bioenhancement would thereby be committed to moral perfectionism. Even if the particular program of moral enhancement was endorsed by a democratic majority, it would involve imposing the majority view on the minority. In so far as the motivation for moral bioenhancement is the perceived moral failings of ordinary human beings, there is every danger that it would involve imposition of a minority view.

Moreover, the project of moral bioenhancement presumes both that we can make real and long-lasting differences to individuals’ moral capacities *and* that we have some means of determining if/when and how much we have succeeded in doing so. The moment it becomes plausible to claim on the basis of investigations of genetics or neurochemistry, etc., that some portion of the population are ‘more moral’ than other citizens, the door opens to argue, as Plato did, that society should be ruled by those who are most capable of determining the correct answers to moral questions. Even if, in societies with stronger democratic traditions in ancient Greece, we might be disinclined to conclude that those who were not morally enhanced should have no vote, it’s not hard to imagine how an argument might be made for a differential suffrage, with the votes of the more morally enhanced having more weight, especially given the consequentialist tone of the larger literature surrounding enhancement. Of course, if it could be shown that some citizens really were morally superior to others, perhaps it would just follow that they should rule — or at least have more power. It doesn’t follow, however, that we, here, now, contemplating this prospect, should be happy about it: those already committed to

an egalitarian politics might conclude that we have reason to avoid wanting to bring such a situation about.

The most pressing danger associated with moral bioenhancement, though, is the potential for a *bogus* science of moral enhancement to serve as a fig leaf for the pursuit of power and the interests of those already convinced of their own merit. Throughout history — and around the world today — dictators and oligarchs have argued that they deserve to be in power by virtue of being the only candidates who can safeguard the interests of the nation or the people. The moment a ‘science’ of moral bioenhancement emerges we can expect such persons to claim that it reveals them to be morally enhanced. Given the role that wishful thinking plays in scientific observation, and confirmation bias plays in the assessment of results, and the controversial nature of the question of what it means to be more moral, there is every prospect that even a science of moral bioenhancement that is ultimately fraudulent would generate ‘results’ that appeared plausible and were difficult to falsify. While rule by those who are actually morally enhanced *might* be justified, promoting the rule of those who only claim to be enhanced would be a disaster.

When it comes to thinking about the implementation of any real-world program of moral enhancement, then, the political issues over-determine the ethical questions. Without an educated, empowered, and rights-respecting citizenry, moral enhancement will be too dangerous to attempt. With such a citizenry, it will most likely be unnecessary. The urgent imperative in the current moment is not moral enhancement but social justice — the pursuit of which is perhaps less novel and is certainly less headline grabbing than ‘moral bioenhancement’ but is much more likely to address the problems that Savulescu and Persson profess to be concerned about.

Conclusion

Future progress in neuroscience may well reveal more about the underlying neurology and neurochemistry of the moral emotions and may even make it possible to manipulate them. However, as I have argued here, the claim that altering people’s behaviour and emotions is sufficient to constitute moral bioenhancement presupposes an essentially consequentialist account of what it is to make people ‘more moral’. Virtue ethical and Kantian accounts of the nature of morality are likely to set the bar for moral enhancement much higher. Moreover, unless what moral enhancement requires is that the enhanced are more likely to act in ways which track the moral reasons bearing on their particular circumstances — and perhaps even then — we do not need any particularly sophisticated science to make people more moral: the timely application of even familiar drugs like alcohol, ecstasy or marijuana in the appropriate circumstances would count as moral enhancement.

Savulescu and Persson are correct to insist that, should it become available, biomedical manipulation of dispositions and behaviour, where self-administered, might be compatible with autonomy. However, they greatly underestimate the threat posed by the technologies they imagine to human freedom, both conceptually and in practice. For the foreseeable future, if we are concerned about the problems of war, global warming, and terrorism, *et cetera*, it is to politics rather than neuroethics that we should turn.²²

Robert Sparrow, School of Philosophical, Historical and International Studies, Faculty of Arts, Monash University, Clayton, Victoria 3800, Australia. robert.sparrow@monash.edu

NOTES

- 1 Julian Savulescu and Ingmar Persson, 'Moral enhancement, freedom and the God machine', *The Monist* 95,3 (2012): 399–421.
- 2 Julian Savulescu, Bennett Foddy & Megan Clayton, 'Why we should allow performance enhancing drugs in sport', *British Journal of Sports Medicine* 38 (2004): 666–670. doi: 10.1136/bjsm.2003.005249.
- 3 Julian Savulescu, 'Justice, fairness, and enhancement', *Annals of the New York Academy of Sciences* 1093 (2006): 321–338. doi: 10.1196/annals.1382.021.
- 4 Julian Savulescu, 'New breeds of humans: The moral obligation to enhance', *Reproductive BioMedicine Online* 10, Supp 1 (2005): 36–39; Julian Savulescu, 'Procreative beneficence: Why we should select the best children', *Bioethics*, 15,5 (2001): 413–426.
- 5 In a breath-taking display of intellectual leveraging, they have even argued (Ingmar Persson & Julian Savulescu, 'The perils of cognitive enhancement and the urgent imperative to enhance the moral character of humanity', *Journal of Applied Philosophy* 25,3 (2008): 162–177; Ingmar Persson & Julian Savulescu, 'Moral transhumanism', *Journal of Medicine and Philosophy* 35,6 (2010): 656–669) that we need moral enhancement in order to cope with the ethical and political challenges posed by the very technologies of cognitive enhancement that they have promoted elsewhere.
- 6 John Harris, 'Moral enhancement and freedom', *Bioethics* 25,2 (2011): 102–111.
- 7 This reply to their paper in *The Monist* was written and submitted for consideration for publication by the *Journal of Applied Philosophy* before the publication of Persson and Savulescu's book-length treatment of these issues in 2012 (Ingmar Persson & Julian Savulescu, *Unfit for the Future: The Need for Moral Enhancement* (Oxford: Oxford University Press, 2012)). Given that Persson and Savulescu suggest in the second paragraph of their article that they are summarising the argument of their book, I hope that my treatment in this article will also be relevant to the argument therein. However, as it was not practical to revise the current manuscript in light of the publication of the book, I leave it up to the reader to decide how effective the arguments in this article are against Persson and Savulescu's larger project.
- 8 Philip Pettit, *Republicanism: A Theory of Freedom and Government* (Oxford: Clarendon Press, 1997).
- 9 There are two sorts of biomedical interventions which — it might be argued — might be capable of improving an agent's capacity to respond to the relevant moral reasons. In so far as a cognitive enhancement might increase an individual's ability to follow a chain of moral arguments where they lead, this might also constitute 'moral' enhancement. Perhaps more plausibly, pharmaceuticals or other biomedical manipulations which removed or ameliorated emotional states, such as rage or irritation, which interfere with moral reasoning might also be thought to make agents more responsive to the moral reasons that bear on their actions (Thomas Douglas, 'Moral enhancement', *Journal of Applied Philosophy* 25,3 (2008): 228–245). Once more, however, this does not appear to require any especially dazzling science: sedatives, anti-anxiety medication such as beta-blockers, or (again) alcohol, may serve this purpose in some instances. Moreover, even in these cases I am inclined to think that if an agent does the right thing because they have taken such a drug, the causal role played by the drug reduces the extent to which it is appropriate to say that they have acted 'for' the reasons they come to embrace.
- 10 Nicholas Agar, 'Enhancing genetic virtue?', *Politics and the Life Sciences* 29 (2010): 73–75. doi: http://dx.doi.org/10.2990/29_1_73.
- 11 Jürgen Habermas, *The Future of Human Nature* (Cambridge: Polity Press, 2003).
- 12 Jürgen Habermas, *The Theory of Communicative Action, Vol 2. Lifeworld and System: A Critique Of Functionalist Reason* (Boston, MA: Beacon Press, 1987).
- 13 Habermas has been accused of exaggerating the difference between education and biomedical manipulations of persons (see, for instance, his discussion, in the postscript to *The Future of Human Nature* (op. cit.), of the objections raised when he first presented the ideas in this book at a workshop at NYU). However, as my account here has emphasised, Habermas is best understood as making a claim about the *fundamental logic* of each type of intervention rather than a claim about the extent to which each type is effective or is capable of being resisted by those subject to them. This claim remains credible even if Habermas exaggerates the extent to which moral education always occurs through conversation and neglects the extent to which it may

involve brute conditioning, and also downplays the extent to which children might resist and respond to genetic interventions.

14 Pettit op. cit., pp. 21–25.

15 Nick Bostrom, 'Ethical issues in advanced artificial intelligence', *Review of Contemporary Philosophy* 5,1–2 (2006): 66–73.

16 Persson and Savulescu 2010 op. cit.

17 Hans-Joerg Ehni & Diana Aurenque, 'On moral enhancement from a Habermasian perspective', *Cambridge Quarterly of Healthcare Ethics* 21,2 (2012): 223–234. doi: 10.1017/S0963180111000727.

18 Savulescu & Persson 2012 op cit.; Persson & Savulescu 2010 op cit.

19 Ehni & Aurenque op cit., p. 230.

20 Persson and Savulescu 2008 op cit.

21 Douglas op cit.

22 Thanks are due to Toby Handfield for reading and commenting on an early draft of this article.