

Can We Biotechnologically Construct a Morally Better Human?

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摘要 Abstract

在西方與東方的哲學和宗教思想中，人類尋求道德上的提升有著悠久傳統。然而，一些生命倫理學家認為，在面臨可能導致人類滅絕或近乎滅絕的重大威脅時——例如核戰、環境破壞及迅速擴大的社會經濟差距等，傳統的道德提升方法顯得不足。因此，他們常基於美德倫理學，提出通過促進和利用生物技術介入來改變人類道德行動者的認知和情感能力以及性情，以作為傳統方法的替代或補充。本文將比較分析如亞里士多德的德性理論中所推薦的在家庭和更廣泛的社會中進行道德教育等傳統的間接的道德增強手段，以及如藥物、神經刺激或基因介入等直接的生物技術手段。可通過生物技術進行操作

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的認知和情感因素包括：資訊處理和推理、記憶、認知偏見、侵襲性、仇外、自我中心主義、共情或同情、誠實、團結、和諧、利他主義、感恩、公平、羞愧、寬恕及對誘惑的抵抗。我們提出了幾個關於直接生物技術方法的憂慮，例如他們對自主性、真實性和能動性的潛在影響，並呼籲通過有意社會設計來增強道德教育的傳統方法，以引導行動者作出更好的道德決策和培養美德性情。我們認為某些生物技術的道德增強方法能夠在不損害個體能動性、自主性與真實性的前提下，通過協調其一階與二階欲望，從而克服意志薄弱的問題。然而，即便從原則上存在支持甚至鼓勵道德生物增強的依據，但一旦這類技術手段進入公開市場，仍會面臨諸多或難逾越的現實挑戰：其一，需開展相關倫理研究以推動這類生物技術干預手段的開發；其二，要確保最能從中獲益的群體能以非隱蔽、非脅迫的方式獲取該技術；其三，必須保障此類干預手段能有效促使個體在認知與情感層面的道德傾向產生穩定且積極的轉變。

The quest to morally enhance human beings has a long tradition in both Western and Eastern philosophical and religious thought. Yet some bioethicists have argued that traditional approaches to moral enhancement are inadequate in the face of threats such as nuclear war, environmental devastation, and exponentially increasing socio-economic gaps, which may result in the extinction or near-extinction of humankind. Often using the language of virtue ethics, they have thus promoted the development and utilisation of biotechnological interventions to alter human moral agents' cognitive and emotive capacities and dispositions as either a replacement for or a complement to traditional approaches to moral enhancement. In this article, we analytically compare traditional indirect means of moral enhancement, such as moral education within families and wider societies, as recommended within Aristotelian virtue theory, with direct biotechnological means such as pharmaceutical, neurostimulatory, or genetic interventions. Cognitive and emotive factors that may be amenable to biotechnological manipulation include information processing and reasoning, memory, cognitive biases, aggression, xenophobia, ego-centredness, empathy/sympathy, truthfulness, solidarity,

agreeableness, altruism, gratitude, fairness, shame, forgiveness, and resistance to temptation. We raise several concerns with respect to direct biotechnological methods, such as their potential harmful impact on autonomy, authenticity, and agency, and call for the enhancement of traditional methods of moral education by devising more intentional social designs to nudge agents towards better moral decision-making and the cultivation of virtuous dispositions. Nevertheless, we contend that certain biotechnological methods of moral enhancement could facilitate – without undermining – individuals’ agency, autonomy, and authenticity by aligning their first- and second-order desires to overcome the moral ‘weakness of will’ problem. However, even if there are principled reasons to allow, or even encourage, moral bioenhancement, various practical concerns could prove insurmountable if such means were made available on the open market, including the need for ethical research to develop these biotechnological interventions; the need to ensure their accessibility to those who would most benefit, without covertness or coercion; and the need to ensure their effectiveness in creating stable, positive alterations to an agent’s cognitive and emotive moral disposition.

【關鍵字】道德提升 生物道德進益 能動性 自主
真實性 德性 亞里士多德

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Introduction: From Moral Enhancement to Moral Bioenhancement

In *The Republic*, Plato imagined a society where the moral character of its guardians and citizens would be cultivated through a diligent education in literature, mathematics, music, and physical training. The result would be to cultivate virtues like courage, temperance, self-discipline, and justice (Plato 2000). Similar ideals also existed in Confucian philosophy, where transformative rituals (Li 禮) are pathways to virtue (Ivanhoe 2000). The project of moral enhancement, therefore, is an old endeavor. Humans have always aspired to make themselves better both in skill and character.

What is new in our era is the possibility and availability of biotechnological interventions to assist the cultivation of virtue. Cognitive (Greely et al. 2008) and physical enhancement (Sinclair and LaPlante 2019) has been extensively discussed and received sustained attention in neuroethics, largely because of the widespread non-medical use of stimulants like Ritalin and modafinil among students and professionals, as well as performance enhancing drugs among athletes (Savulescu, Foddy, and Clayton 2004). These interventions are already socially visible and experimentally testable, which has made cognitive and physical enhancements the face of enhancement debates. Unlike these other forms of enhancement, moral enhancement has been largely debated, but more in philosophical discourse than in practice. Thomas Douglas catalyzed the debate in 2008 by asking whether biomedical interventions could, under some conditions, be ethically justified as a means of moral improvement (Douglas 2008). His work opened the door to serious consideration of pharmacological and neurostimulatory means of reducing aggression and increasing empathy. This, in turn, led to a surge of interest, particularly as Ingmar Persson and Julian Savulescu tied moral bioenhancement to existential risk mitigation. They created a sense of urgency with arguments that our moral psychology is dangerously out of step with our technological capabilities. They argue that technologies such as nuclear and biological weapons, deliberate alterations of the natural environment, and immense socio-economic inequalities give us the power to wreak “ultimate harm”—the extinction or near-extinction of humanity—while our natural moral instincts remain tribal, parochial, and unreliable:

[T]he ideology of human equality must exercise a stronger motivational influence and overcome the limitations of our altruism and sense of justice ... we must also overcome the bias towards the near future, our numbness to the suffering of great numbers, and our weak sense of responsibility for our omissions and collective contributions (Persson and Savulescu 2012, 105-6).

They thus contend that “it is imperative that scientific research explore every possibility of developing effective means of moral bioenhancement, as a complement to traditional means” (Persson and Savulescu 2012, 2). This argument has framed moral bioenhancement as both permissible and necessary for our survival.

Moral Enhancement through a Virtue-Theoretic Lens

Although the overall aim of moral bioenhancement proponents such as Persson and Savulescu may appear to be grounded in a purely consequentialist framework—avoiding human-caused “ultimate harm”—moral enhancement proposals are also sometimes articulated within a virtue-theoretic framework. There has even been interdisciplinary “Genetic Virtue Project”—involving philosophers, psychologists, and geneticists—seeking to discover ways in which forms of genetic manipulation may *complement*, not *replace*, the Aristotelian model for virtue acquisition:

Thus, the hope of the GVP is not to make persons virtuous but to make them better equipped to *learn* how to be virtuous. In this sense, the GVP is in agreement with Aristotle’s view that “the virtues arise in us neither by nature nor contrary to nature; we are naturally receptive of them, but we are completed through habit.” To this it may be added that some people are more naturally receptive, that is, able to learn, than others (Walker 2009, 39).

As noted here, for Aristotle, moral virtues are not innate but are developed and cultivated through habituation. In other words, individuals become virtuous by repeatedly performing right actions until those actions become constitutive of a fixed character; they become second nature. Moral enhancement is thus a process of shaping both reason and desire through consistent practice. It also involves confronting moral conflicts and choosing rightly even in difficult circumstances, a capacity Aristotle calls prudence (*phronesis*). Prudence enables an individual to discern, deliberate, and choose the right course of action for the right reasons. Prudence cannot be separated from moral virtue, for as Aristotle writes, “virtue makes the goal correct, and prudence the things promoting the goal [correct]” (Aristotle 1999, bk. VI, ch. 12).

Virtues are thus not mindless habits. The virtuous person does not act in accordance with moral norms merely because they are required to, but because they have come to see and feel rightly about which goods are worth pursuing and what dispositions of character will help us attain choiceworthy goods. We are born with the potential for virtue, but its realization depends on repeated moral practice: “the virtues arise in us neither by nature nor against nature. Rather, we are by nature able to acquire them, and we are completed through habit” (Aristotle 1999, bk. II, ch. I). Through habituation, one learns to recognize what is good, to embrace it, and to despise what is bad.

The interdependence between prudence and habituation reveals why moral virtue cannot be achieved solely through biotechnological

interventions. Even though moral bioenhancement may influence emotion or behavior, such interventions do not adequately engage on their own an agent's rational deliberation, will, or confrontation with moral conflicts, as we will analyze. All of which are processes through which virtue is formed. For Aristotle, becoming virtuous can only be realized through the formation of character, which is a lifelong project of moral education, habituation, and self-development that no external intervention can replicate, though perhaps some biotechnological interventions may help facilitate.

Direct and Indirect Moral Enhancement

There are two general approaches to moral enhancement: *direct* and *indirect*. Direct moral enhancement “aims at bringing about particular ideas, motives, or behaviors,” whereas indirect forms of enhancement “aim at making people more reliably produce the morally correct ideas, motives or behaviors without committing to the content of those ideas, motives and/or actions” (Schaefer 2015). Building on this distinction, many biomedical approaches, such as pharmacological and neurostimulatory interventions, can reasonably be classified as direct, since they all attempt to infuse specific moral dispositions. Their inclination is outcome-specific in that they do not improve capacities for moral reasoning and action without directing the outcome.

Pharmacological methods aimed at altering one's cognitive or emotive dispositions are the most immediate form of biomedical moral enhancement. Relevant cognitive enhancements relate to information processing and reasoning, memory, and cognitive biases (Buchanan 2011, 75). Morally relevant emotional dispositions that may be amenable to alteration include aggression, xenophobia, and ego-centeredness. Furthermore, it may be possible to positively enhance dispositions toward empathy/sympathy, truthfulness, solidarity, agreeableness, altruism, gratitude, fairness, shame, forgiveness, and resistance to temptation (Bostrom 2005; Douglas 2011; Persson and Savulescu 2012; DeGrazia 2014). For example, studies show that increasing the neurotransmitter serotonin makes subjects less willing to cause harm (Crockett et al. 2010; cf. Crockett and Rini 2015; Crockett 2016). Oxytocin has a similar effect, lowering willingness to harm others by amplifying feelings of guilt and shame (Zheng, Wang, Yang et al. 2024). In another study, oxytocin was found to have the potential to mitigate moral disengagement by increasing perceptions of moral responsibility and group-based guilt in individuals predisposed to avoiding such feelings, thereby promoting compensatory behaviors toward victims (Zhiai and Mengsi 2024).

Neurostimulatory approaches use electrical or magnetic techniques, such as transcranial direct current stimulation or transcranial magnetic stimulation, to modulate brain activity linked to moral judgment and behavior (Darby and Pascual-Leone 2017). These techniques work by delivering mild electrical currents or magnetic pulses to targeted regions of the brain, thereby altering neural excitability in areas associated with empathy, impulse control, and harm reduction (Ye et al. 2015). For example, stimulating the right dorsolateral prefrontal cortex has been shown to increase fairness in economic decision-making tasks and can also influence the way people attribute intentions and moral responsibility (Nihonsugi, Ihara, and Haruno 2015).

Genetic moral enhancement, although still largely speculative, may have the potential to alter the blueprint of human behavior by editing genes that influence our moral virtues (Faust 2008). Though, while behavioral genetics presumes as a fundamental law that behavioral traits are heritable, neither genes nor one's familial environment account for the variation seen among complex behavioral traits. In fact, identical twins raised in the same household may differ quite extensively in their behavioral dispositions due to the influence of non-shared peers and various "wild cards of life" (Gazzaniga 2005, 44-49). All of these approaches to direct moral enhancement raise questions about authenticity, autonomy, safety, and fairness, which we will elucidate below.

Indirect moral enhancement aims at helping agents more reliably produce morally correct judgments, motives, and behaviors without predetermining the content. In practice, this means strengthening the agent's own capacities for deliberation, impulse regulation, and consistency between judgment and action; one strategy, if attainable, would involve mitigating cognitive biases that inhibit moral reasoning, such as confirmation bias, conformation bias, framing bias, and the fundamental attribution error (Schaefer 2015). Here, the focus is not on imposing fixed moral content but nurturing the faculties through which we discern and embody good and evil. Indirect moral enhancement closely resembles the paths of character formation envisioned in classical virtue theory. Aristotle describes virtue as the product of repeated actions that influences one's dispositions, emphasizing the importance of both moral education through external teachers—parents, legislators, virtuous exemplars—as well as the value of external goods, not as the source of human flourishing or virtue, but as useful means that assist one in doing virtuous actions and thereby cultivating virtuous habits (Aristotle 1999, bk. I, ch. 8; bk. II, ch. 1; bk. X, chs. 8-9). Confucius's account of ritual and moral

cultivation also exemplifies indirect moral enhancement (Ivanhoe 2000).

No one would assert that a moral agent must simply accept who they are—in terms of their emotional and cognitive states that inform their moral motivations—and not strive at all to morally improve oneself; the salient question is *how* one ought to go about improving one’s moral character. The relevant issue is not the simple distinction between utilizing “natural” versus “unnatural” means to alter one’s character. Rather, the issues at stake include which means will have the optimal effect in terms of *permanence*—or at least semi-permanence—to ameliorate dependence upon extrinsic means that may not always be available and to preserve an agent’s authentic pursuit of genuine human flourishing. With respect to the former concern, recall that one of Aristotle’s criteria for a virtuous action is that it “must proceed from a firm and unchangeable character” (Aristotle 1999, bk. II, ch. 4). As we will elucidate below, there may not be a sound *in principle* objection to altering one’s morally relevant emotional and cognitive states through pharmacological or other means; but it remains to be seen whether this would be the most *efficacious* means of attaining reliable improvement in one’s moral character.

Arguments in Favor of Moral Enhancement

Moral bioenhancement proponents such as Persson and Savulescu argue that traditional, indirect methods of developing moral virtue through education, training, reflection, habits, and socialization are insufficient to confront the existential moral challenges we face today. A first line of argument is *risk driven*, pointing toward global threats such as nuclear and biological warfare, as well as the effects of human-caused climate change, as evidence that a radical approach to enhancing morality through biotechnological means is needed (Persson and Savulescu 2012).

Second, there is the *harm reduction* argument: if direct means of moral bioenhancement can reliably reduce aggression or increase harm aversion, we should at least explore them. Douglas agrees and argues that if it is safe, freely chosen, and effective, then moral bioenhancement would be permissible (Douglas 2008). Parker Crutchfield goes further by arguing that if moral bioenhancement were to be compulsory, it should be administered covertly as a more ethically justifiable way to attain a morally improved species while avoiding resistance and preserving the illusion of autonomy (Crutchfield 2019).

Third, there is the argument that bioenhancement could augment traditional methods and help reduce *moral weakness of will*—termed *akrasia* by Aristotle (1999, bk. VII, chs. 1-10) and *incontinentia* by Thomas Aquinas (1948, IIA-IIae, q. 53, a. 5)—by strengthening one’s ability to act on their moral convictions (Earp, Douglas, and Savulescu 2017). This, in our view, is the most promising line of argument that we will explore further below.

Lastly, proponents argue that the goal of moral enhancement justifies the use of direct biotechnological means, as the value of a *virtuous character* is not diminished by the means of its acquisition. Abram Brummett and Crutchfield point out that objections to moral bioenhancement on the basis of the process of attaining virtue are internally inconsistent, because they imply that virtue must always be acquired through struggle; yet, the traditional understanding of God held by Jews, Christians, and Muslims, who is morally perfect, has not developed virtue through such a process of struggle (Brummett and Crutchfield 2022). Consider that, for Aristotle, authentic virtues are not cultivated solely through individual effort, involving merely strength of will or pure reasoning, but are essentially intertwined with various factors external to one’s will that may be subject to enhancement through one’s social environment—we will discuss such “social design” approaches to indirect moral enhancement below. This premise opens the possibility of various factors external to one’s will, though still internal to the agent—cognitive and emotive dispositions—also being subject to enhancement without thereby rendering the cultivated virtues inauthentic. This is acknowledged by the foremost proponents of moral bioenhancement:

Biomedical interventions that improve our moral decision-making needn’t (and are unlikely to) take the form of ... a magical virtue pill. They will instead simply modulate the various processes that are already operative in moral judgment and action. (Kahane and Savulescu 2015, 138)

... moral bioenhancement conceived as amplifying the motivational power of certain moral reasons doesn’t bypass the agents’ deliberation and decision on the basis of these reasons. (Persson and Savulescu 2015, 53)

Moral bioenhancement proponents even contend that the type of cognitive/emotive manipulation envisioned, far from dictating an agent to make particular moral choices, would rather enhance their capacity to autonomously formulate and

act upon rationally-informed reasons for action. (Schaefer et al., 2014)

Critiques of Moral Bioenhancement

The proposals advanced by proponents of moral bioenhancement have been met with a wide range of objections, raising concerns about the permissibility of the entire endeavor. A primary critique centers on the impact of bioenhancement on *moral agency*, *autonomy*, and *authenticity*. John Harris argues that freedom entails not only the ability to act rightly but also the possibility of acting wrongly and that moral bioenhancement takes away the freedom to fall: “Without the freedom to fall, good cannot be a choice; and freedom disappears and along with it virtue. There is no virtue in doing what you must” (Harris 2011, 104).

Harris’s argument is echoed by Massimo Reichlin, who notes that bioenhancement risks making agents act from induced states rather than reasons they can rationally endorse, thereby restricting their moral freedom and weakening their ability to act authentically (Reichlin 2019). Recent empirical research has given weight to these philosophical concerns about authenticity and praiseworthiness. One study shows that observers systematically judge altruistic actions as less praiseworthy when they result from moral bioenhancement compared to traditional, effortful self-improvement (Lucas et al. 2024). There are also concerns about fragility and risks of bioenhancement. The case for oxytocin illustrates this fragility: while it can increase in-group trust, it simultaneously exacerbates bias, exclusion, or even hostility toward outsiders (De Dreu et al. 2011).

Harris Wiseman argues that current research endeavors have generated a “myth of the moral brain,” in which the potential for moral improvement has been reduced to mere neurobiological manipulation focused primarily on emotive dispositions (Wiseman 2016). Rather, Wiseman argues, we must acknowledge that such forms of moral bioenhancement are limited in scope, do not take account of the complex nature of moral decision-making, and will only be successful provided that the subject desires to be so enhanced. In short, no form of neurobiological manipulation can make a fundamentally immoral person, who joyfully wallows in their immorality, into a saint.

Wiseman warns against the simple dyadic nature/nurture reductionism that predominates media reports of moral enhancement “breakthroughs,” and which even infects the reasoning of neurobiological scientists who design experiments that reinforce this reductionist view of the human person by how they interpret and report the experimental results obtained. On the contrary, Wiseman promotes

the recognition that there is a complex interplay between a person's neurobiological structure, which is not fixed but open to manipulation, and the wider "psychological, social-environmental, political, economic, and religious/spiritual" context in which a person makes moral decisions (Wiseman 2016, 21). He criticizes current research endeavors that have focused on narrowly-construed relationships between certain neurochemical reactions and restrictedly-defined behaviors—for instance, purported causal links between oxytocin and moral traits such as empathy, trustworthiness, and generosity (Wiseman 2016, 88-95). Instead, Wiseman contends that "attempts to augment moral functioning by biological means must always be understood, even at their most optimal, as partial efforts, nudges, in the service of more traditional morally formative means, and certainly not as containing any kind of world-salvatory power" (Wiseman 2016, 29).

Inmaculada de Melo-Martin and Arleen Salles (2015) concur that, rather than an agent being "morally" enhanced, what may realistically be achieved is "motivational" enhancement—that is, overcoming the "moral weakness of will" problem. This creates a chicken-and-egg scenario, however, since one must already be appropriately motivated to seek enhancement of their moral motivations to align more concretely with what they know they ought to do or refrain from doing. Persson and Savulescu admit this "bootstrapping problem" concerning the proper application of biomedical techniques of moral enhancement: "it is human beings, who need to be morally enhanced, who have to make a morally wise use of these techniques" (Persson and Savulescu 2010, 668). Wiseman refers to this as the "moral scaffolding problem" (Wiseman 2016, 185). In line with this criticism, we will later describe a volitional framework in which moral bioenhancement may function effectively as a means of motivational enhancement to help agents overcome the moral weakness of will problem, not by *bestowing* a moral scaffold upon such agents, but rather by *facilitating* within such a scaffold their second-order desires to determine their first-order volitions.

As we have throughout this article, Wiseman references Aristotelian virtue theory as providing a model of the complex nature of moral decision-making—involving multiple levels of desires and volitions—and neo-Aristotelians such as Alasdair MacIntyre have emphasized the inherently socially contextual nature of human moral reasoning and the practices, supported by social institutions, that effect the cultivation of virtues (MacIntyre 1999, 2007). Wiseman thus contends,

If moral behavior is a situationally-embedded, profoundly embodied, and often deeply social or relational affair ... then, actually, study into ‘the moral brain’ will not be able to take a single step forward until it recognizes that this ‘moral brain’ is something which exists inside a moral person who lives in a moral world populated with other moral people. (Wiseman 2016, 114-115)

Hence, Wiseman concludes, effective moral enhancement should be “understood as part of a larger person-centered approach, which does not neglect psycho-social dimensions of the person’s life, but rather sees moral enhancement as needing to be subtly integrated within that complex web” (Wiseman 2016, 226). Yet, the question raised by Persson and Savulescu remains whether biotechnological interventions are needed to *complement* traditional means of moral enhancement (Persson and Savulescu 2012, 2).

Argument for Traditional Means of Moral Enhancement

What would be left of our agency if our ability to make moral decisions becomes pyrrhic? When moral traits such as generosity, patience, benevolence, and courage come from external sources, are we still able to claim that we are acting morally and receive merited praise from others? This is not to deny that external support has no role in moral development altogether. Indeed, Aristotle himself acknowledged that certain external goods—such as wealth, political power, and friendship—facilitate the cultivation and full exercise of virtue (Aristotle 1999, bk. I, ch. 8; Hirji 2021). Yet, these supports must not be mistaken or substituted for the exercise of agency itself. They should be understood as conditions that enable agency to flourish and be meaningfully expressed; the route by which we become moral matters as much as the outcome (Schaefer 2015).

Immanuel Kant argues that the moral worth of an action lies not in its outcomes but in the rational will that freely chooses in accordance with duty. He describes autonomy as the self-legislation of the moral law and the core of human dignity, which cannot be substituted or engineered by external manipulation, however well-intentioned (Kant 1998). Following Kant, Zuzanna Lutrzykowska extensively analyzes how the praiseworthiness of moral development depends not only on what we achieve but on how we achieve it, through volitional acts, not pharmacological engineering (Lutrzykowska 2021).

One of the arguments for moderate forms of bioenhancement is that they are simply a temporary aid that helps agents align their behavior with their better judgment, helping them to overcome the moral weakness of will problem. Karolina Kudlek and Patrick Smith explore this view by comparing it to self-binding strategies, similar to Odysseus tying himself to the mast to avoid being lured overboard by the sirens' call; but even in that analogy, there is a loss of agency that must be morally accounted for (Kudlek and Smith 2022). Echoing the Kantian concern about loss of agency, Kudlek and Smith characterize moral bioenhancement as more problematic than such self-binding cases insofar as the former does not simply constrain certain choices, like Odysseus avoiding the sirens, but also targets our reasoning and volitional faculties and risks treating agency itself as an object of manipulation. The agent thereby becomes a passive recipient of behavioral conditioning and not a moral subject striving autonomously for virtue.

The cultivated, often through struggle, inner dispositions informing our choices are equally as important as the outcome. A person who refrains from harming another because of cultivated self-restraint has demonstrated their moral agency. The same act, if directly caused by an external means outside of internal efforts, is without depth of character and pyrrhic. Again, following Aristotle, external supports may function as *scaffolding* for an agent's moral growth; for example, one may initially be heteronomously restrained by law or social admonition not to harm others, which then later grows into an inculcated virtue that one can now exercise autonomously. Bioenhancement interventions, however, risk substituting for that growth altogether. Traditional means of developing virtue, however slow and arduous, preserves one's agency and authorship that makes moral decisions and virtue meaningful. What we sometimes admire in moral exemplars is not simply that they act well, but that they *chose* well, often in the face of competing factors such as self-interest, fear, and other constraints.

One might object that this emphasis on struggle unfairly diminishes the praiseworthiness of those who seem naturally inclined toward virtue, or those who act rightly without evident effort. Aristotle's distinction between the four types of ethical subjects helps address this objection with an understanding of the relationship between effort, virtue, and praiseworthiness. He distinguishes between the virtuous (*spoudaios*), the continent (*enkrates*), the incontinent (*akrates*), and the vicious (*kakos*) (Aristotle 1999). The focus lies between the virtuous individual, who acts rightly with harmonious desire and no internal struggle, and the continent individual, who acts rightly only through a conscious, effortful mastery of desires. While

Aristotle clearly holds the virtuous person as the ideal, the continent individual's struggle is itself a profound achievement insofar as they constantly choose well in the face of self-interest, fear, and other constraints. The praiseworthiness of their actions derives from the exercise of their will. Moral bioenhancement creates a fifth category not envisioned by Aristotle—perhaps he would call it the *technos*—an individual who exhibits outward behavior consistent with the virtuous or continent person but who has arrived there without the process of habituation, practical reasoning, or self-mastery that defines both the virtuous and the continent. The bioenhanced individual cannot be said to have the harmonious desires of the *spoudaios*, earned through a lifetime of good practice; nor would they have the hard-won, self-cultivated virtue and strength of the will of the *enkrates*. The distinction, then, is not between virtue acquired through struggle and virtue acquired with ease, but between dispositions that are authentically one's own and those that are externally derived.

Enhancing Traditional Means of Moral Enhancement

As noted above, a standard criticism of traditional methods of moral enhancement is that they are slow, inconsistent, and often vulnerable to failure; hence, there is a need to supplement them with bioenhancement (Persson and Savulescu 2012). This framing rests on an illusion that present and future biotechnological interventions are the solution to faster, consistent, and successful moral betterment. However, this is a false dichotomy. To say that traditional means of moral formation are insufficient is to recognize that they require *improvement*. An overemphasis on biotechnological interventions risks ignoring ways in which time-tested methods of moral enhancement have, and could be further, enhanced. Education, for instance, has not remained stagnant, but has been modernized through evidence-based pedagogy, new teaching methods, and insights from cognitive science. In the same way, traditional means of moral enhancement can be renewed and refined while resisting the urge to subordinate them to biotechnological means. Moral enhancement should not be limited to laboratories alone, but cultivated in our minds, classrooms, families, religious and political institutions, and the broader human culture.

Aristotle claims that “the legislator makes the citizens good by habituating them, and this is the wish of every legislator; if he fails to do it well, he misses his goal. Correct habituation distinguishes a good political system from a bad one” (Aristotle 1999, bk. II, ch. 1).

Responsibility for enhancing individuals' moral dispositions does not fall only upon the state, though; in fact, modern liberal democracies tend to shy away from "legislating morality," even though laws against racial segregation and gender discrimination, as well as legal recognition of same-sex marriages and other LGBT rights, are doing just that—that is, shaping a nation's moral ethos through legislation. Laws alone, however, cannot effectively shape the hearts and minds of a citizenry; for individuals may vehemently object to such laws even though they adhere to them out of fear of reprisal. More local means of forming individuals' moral reasoning patterns and behavioral dispositions include one's familial upbringing, the example put forth by respected mentors, and teachings—reinforced by rituals, disciplines, and moral exemplars—of various religious systems. If immense effort and resources can be poured consistently into developing biomedical interventions despite their cost and dangers, it is inconsistent to dismiss traditional methods as futile and inadequate. Rather, as Persson and Savulescu themselves frame it, moral bioenhancement should "complement," not supplant, traditional methods (Persson and Savulescu 2012, 2).

Aristotle emphasized that virtues are acquired by repeated habits: "men become builders by building houses, harpers by playing on the harp. Similarly we become just by doing just acts, temperate by doing temperate acts, brave by doing brave acts" (Aristotle 1999, bk. II, ch. 1). This foundational insight also finds contemporary support in behavioral psychology, which shows that small, repeated acts can crystallize into durable traits (Wood and Runger 2016; Lally et al. 2010). Building on these principles, an effective educational program would not just teach the abstract meaning of virtues but would develop experiences for their consistent and deliberate practice. The focus would be on daily exercises that nurture moral habits—such as empathy, compassion, and honesty—until they become second nature. For instance, students might engage in reflective exercises that ask them to consider the perspectives and feelings of others, especially after conflicts. They could be encouraged to identify and acknowledge acts of kindness they have received or witnessed. Similarly, they might analyze situations where a truthful response was difficult and uncomfortable, reflecting on the long-term value of integrity over the ease of short-term comfort. The mechanism behind this approach is that these seemingly small, repeated acts serve as cognitive and behavioral rehearsals. Each time one consciously performs a compassionate action or reflects on an honest choice, they are actively strengthening the neural pathways associated with that virtue.

Another method is the use of *social designs* to reinforce a virtuous life: the intentional structuring of policies, institutions, and

environments in ways that ethically nudge individuals toward morally desirable behavior. This could be done in a way that promotes compassion, for example, by creating public spaces that encourage community interaction. This is not a replacement for agency, as it can undermine one's autonomy when used manipulatively. Far from Crutchfield's argument that if biotechnological interventions are truly necessary to address our moral shortcomings, they should not only be compulsory but also covert (Crutchfield 2019), employing nudges through social designs treats autonomy as indispensable (Engelen and Nys 2020). The goal is to create a social environment that would make prosocial actions easier.

Human beings are narratively driven, and our moral development has always been shaped not only by direct instruction but also by the background of moral cues; Aristotle himself counseled those wishing to cultivate virtue to identify persons they view as embodying virtue (*phronimos*) and to emulate them (Athanasoulis 2024). Consider subliminal nudges in popular media. Cartoons, films, games, literature, and other forms of media already exert a powerful influence on the imagination and moral sensibilities of audiences across generations. For children, they provide early lessons about friendship, fairness, and justice; for adults, they can emphasize and reinforce cultural norms, inspire empathy, or challenge values. Not all such influences are beneficial, however, as there is evidence that advertising subtly fosters consumerism (Sustainability Directory 2025) and social media algorithms create echo chambers that can foster public outrage and polarization (Beardow 2021).

The most egregious example of an insidiously orchestrated set of social influences was the Nazi propaganda machine devised by Joseph Goebbels. By manipulating school textbooks, cinema, music, the press, and even religious preaching to extol the "virtues" of racial purity, national unity, masculinity (with respect to courage and physical strength), and femininity (with respect to the bearing and raising of children), as well as propping up Adolf Hitler as the exemplar of Aryan virtues and a model of strong leadership, a morally deformed "Nazi conscience" was systematically cultivated among the German populace (Koonz 2005). It is important to emphasize how this form of social influence—propaganda—even if done for a benevolent purpose, sublimates moral agency, as Jacques Ellul illuminates,

To be effective, propaganda must constantly short-circuit all thought and decision. It must operate on the individual at the level of the unconscious. He must not know that he is being shaped by outside forces (this is one of the conditions for the success of propaganda), but some central core in him must be reached in order to release the

mechanism in the unconscious which will provide the appropriate—and expected—action (Ellul 1973, 1).

Ellul continues, “A person subjected to propaganda does not remain intact or undamaged: not only will his opinions and attitudes be modified but also his impulses and mental and emotional structures” (Ellul 1973, 161), concluding, “Propaganda strips the individual, robs him of a part of himself, and makes him live in an alien and artificial life, to such an extent that he becomes another person and obeys impulses foreign to him. He obeys someone else ...” (Ellul 1973, 169).

Precisely because of this power to fundamentally undermine one’s moral agency, it is imperative to deliberately reorient such nudges toward virtuous ends, as well as to guard against such nudges becoming distorted into propaganda. As such, this imperative is not to be confused with advocating for covert manipulation, but rather arguing for social designs that will openly promote the development of ingrained dispositions toward empathy, compassion, honesty, etc. There is nothing inherently wrong with carefully embedding these moral cues, whether through subliminal messages, prosocial words, symbolic images, or community programs, provided they are designed to cultivate virtue without coercion or manipulation. Such forms of enculturation can be found in time-honored cultural and religious traditions, often oriented around civic holidays, liturgical celebrations, and other forms of communal leisure (Pieper 2009).

Enhancing a Moral Agent’s Capacity to Overcome *Akrasia*¹

Moral bioenhancement proponents contend that, while traditional moral education may instruct one about the *content* of morality, one must also be *motivated* to adhere to such content with sufficient strength to overcome “selfish, nepotistic, xenophobic, etc., biases and impulses” (Persson and Savulescu 2012, 117). Persson and Savulescu thus conclude,

The moral enhancement that we are recommending is largely a matter of motivating ourselves to do what we already believe to be right, of overcoming our moral weakness of will (Persson and Savulescu 2012, 123).

(1) This section is derived from Eberl 2018.

The potential for moral bioenhancement rests on the same fundamental precondition required for traditional forms of moral enhancement to be successful: a predisposed will on the part of the subject to be enhanced. It is crucial to remember that a potential “subject” of enhancement is also an agent who ultimately has a degree of control over their own moral dispositions and behaviors. Such control, as noted earlier, should not be attenuated by neurobiological “reprogramming” insofar as autonomy in moral decision-making and volition is a hallmark of human dignity from both classical—e.g., Augustine (1993) and Aquinas (1948, Ia, q. 83)—and modern—e.g., Kant (1998)—as well as contemporary perspectives (Harris 2011).

With this concern about the inherent value of moral autonomy in mind, Wiseman criticizes various means of moral bioenhancement insofar as their supportive experiments methodologically presuppose a reductionist view of moral decision-making, primarily by disregarding the dispositional foundation of moral decisions (Wiseman 2016, 66-78). Using Schaefer’s earlier distinction, Wiseman counsels against such hard (or “direct”) moral enhancement proposals, which seek specifically to modify moral behavior directly, and instead proposes that such means may be utilized to support soft (or “indirect”) moral enhancement, which acknowledges the multi-factorial nature of moral decision-making and humbly seeks to alter merely one aspect of such. Even so humble a change, however, may have a significant impact on an agent’s moral dispositions, which will assist them in making decisions and following through volitionally on such decisions in ways that are more in line with both personal—in the sense of aligning with one’s second-order desires—and societal expectations.

Virtue theorists would agree that an agent must not merely know what they ought or ought not to do but must also have a cultivated disposition toward actually doing what they know they ought to do and refraining from what they ought not. This is the “moral weakness of will” problem. We will analyze this problem utilizing Harry Frankfurt’s (1971) framework of first- and second-order desires and volitions, with the goal for moral agents of aligning the former with the latter. The question at hand will then be whether moral bioenhancement may be effective in facilitating the appropriate dispositions to be cultivated within agents to help them overcome moral weakness of will.

Consider Douglas’s examples of “Andrew,” “Bryony,” and “Chloe,” all of whom recognize that they ought to overcome certain inclinations they deem to be morally undesirable, such as racial bias or a lack of generosity, which will lead them to better moral actions (Douglas 2014). The capacity to attain this level of self-awareness and higher-order desire is what Frankfurt contends distinguishes a person,

as a moral agent with freedom of will, from a wanton driven only by their, sometimes competing, first-order desires (Frankfurt 1971). Persons are able to form second-order desires about which first-order desires they want to determine their will, when alignment is attained the second-order desires become second-order volitions. A person does not simply have the freedom to act on what may be merely their first-order desires—for example, an alcoholic may have the freedom to drink but yet be volitionally frustrated because he desires not to will to drink—but “is also free to want what he wants to want”—that is, to possess genuine freedom of will (Frankfurt 1971, 17). An alcoholic may never be able to eliminate his first-order desire to drink; yet, he has the capacity to formulate a second-order desire not to will to drink and, with the help of an effective rehabilitation program, can effectuate his second-order desire as determinative of his will when confronted with an occasion to drink—wherein his freedom and dignity as a person lies.

Andrew, Bryony, and Chloe all display their personhood and exercise freedom by their capacity to formulate second-order desires to have certain first-order desires of theirs to be determinative of their respective wills; such second-order predispositions of their wills cannot be biomedically engineered—at least not without obtunding one’s autonomy or presupposing an even higher-order volitional predisposition—and would be a necessary precondition for any moral bioenhancement proposals to succeed (Wiseman 2016, 61-63). The question at hand is whether certain means of moral bioenhancement might assist Andrew, Bryony, and Chloe in aligning their first- and second-order desires and thereby overcome the moral weakness of will problem. One framework for responding to this question is classical virtue theory, which holds that moral improvement essentially consists in developing one’s capacity for “rational self-governance” (Kraj 2013, 113-14) to become an “independent practical reasoner” (MacIntyre 1999). Self-reflective cognizance of one’s first-order desires and the capacity to formulate effective second-order volitions about which of those desires is ultimately determinative of one’s will is an essential precursor to being an autonomous, virtuous, dignified person.

Once one’s second-order desires are established, however, direct biotechnological means may help align one’s first- and second-order desires such that the latter are effectuated as an agent’s actual volitions. For instance, refractive alcoholism has been treated in limited trials by deep-brain stimulation (Müller et al. 2009; Heldmann et al. 2012; Ho et al. 2018); though such interventions may be more accurately construed as moral therapy than enhancement. The point is that there are principled reasons by direct biotechnological means of moral

enhancement could be effective in ways that do not undermine moral agency, autonomy, or authenticity.

Practical Concerns with Moral Bioenhancement

Even if we were to accept *in principle* that certain moderate forms of bioenhancement could help facilitate the cultivation of virtue, there remain various *practical* concerns that may ultimately obviate the utilization of such interventions. First, for any form of bioenhancement, there may be a barrier of getting “from here to there” with respect to designing ethical experiments in accord with current human subjects research regulations (Hyman 2014). But even if IRB-approved enhancement experiments become available, there may not be much motivation or justification on the part of parents to enroll their children in, or subject embryos or fetuses to, such research (Tonkens 2015).

The next thing to note is that any biotechnological intervention will have concomitant risks or potential harms, from the most minor—such as the pain of a needle prick—to significant allergic reactions or irreparable damage to neural tissue. When we consider vulnerable populations like pregnant women, children, the elderly, or individuals with comorbid conditions who may not be able to use these interventions safely, the risks of moral bioenhancement rise even higher.

We should also examine the dangers of dependency and misuse. We noted above how serotonin levels, when increased, have a direct impact on harm aversion (Crockett 2010). However, it is important to recognize that such interventions are also vulnerable to issues of dependency, unknown side-effects, and lack of economic access, which cannot be overlooked. What would be the next course of action when prescriptions run out or cease to be affordable? Or when the body becomes adapted and develops tolerance in ways that blunt and nullify its intended effect? The solution cannot be merely to escalate the dosage or engineer a more potent version of the same intervention, as this would only repeat the cycle of diminishing returns. This trajectory would be creating a dependency on an endless chain of stronger and more costly enhancements, which does not address the questions of how to cultivate stable and enduring moral capacities.

These concerns undermine the *permanence* and *stability* of the changes wrought through moral bioenhancement in comparison to traditional methods. Consider an individual who is disposed toward impatience but has a desire to cultivate a disposition towards patience. She may utilize a traditional method for altering her response to stressors—for example, when her child is aggravating her, she may

leave the room, close her eyes, and count to ten while taking deep breaths—or she may take a hypothetical pill that alters her neurochemistry such that she becomes less prone to becoming aggravated. Does utilizing the latter means decrease the agent’s moral *merit* in becoming a more patient parent? As we have argued above, it does not inherently decrease her merit insofar as her choice to take the pill comes from the same laudable desire as choosing more traditional means of making oneself more patient. The relevant question is which means would be more efficacious in leading to a sustainable and authentic change of *character*. Perhaps taking the pill on numerous occasions over time would lead to a permanent change in the agent’s neurochemistry such that she would eventually no longer need to take the pill; but we can only hypothesize at this point whether that would be the case.

A notable concern is that such a pill, once marketed, would be taken for all sorts of reasons, some of which would *inhibit*, instead of *facilitating*, an agent’s authentic and stable change of character to become a more patient person. As has been witnessed in the case of anti-depressants and pharmaceutical analgesics—such as oxycontin—it is difficult to regulate the prescription or black-market attainment of such drugs once they are approved. Whether this well-founded concern should lead to a general prohibition of such pharmaceutical enhancements, or whether stricter, more paternalistic, regulations may be called for to ensure that they are being prescribed and utilized properly, warrants further discussion outside the scope of the present analysis.

With respect to the concern that an alteration of an agent’s character be both *authentic* and *effective*, Fabrice Jotterand points out that the theory underlying moral enhancement “appears reductive and one-sided” insofar as it focuses on the manipulation of an agent’s motivational and emotional states to the neglect of an agent’s capacity for *moral reasoning*, which requires knowledge of the *content* of morality. Importing Alasdair MacIntyre’s (2007) contemporary Aristotelian account of moral virtue, Jotterand concludes,

... it appears difficult to determine, on a transhumanist account, what level of emotional control for moral behavior is adequate or what degree of altruism, empathy, or solidarity insures sociability. The way human beings make moral decisions requires the interaction of a complex network of emotional, cognitive, and motivational processes that cannot be reduced just to moral emotions or technological control (*moral capacity*) but also to practical reasoning (i.e., the source of *moral content*). (Jotterand 2011, 7)

This is not to deny that there is an emotive component to moral virtue. Aristotle, in fact, explicitly defines virtue, in part, as having the appropriate degree of feeling in a given context: “Some vices miss what is right because they are deficient, others because they are excessive, in feelings or in actions, whereas virtue finds and chooses what is intermediate” (Aristotle 1999, bk. II, ch. 6). In applying his general concept of virtue to someone who is brave, Aristotle concludes, “Hence whoever stands firm against the right things and fears the right things, for the right end, in the right way, at the right time, and is correspondingly confident, is the brave person; for the brave person’s actions and feelings accord with what something is worth, and follow what reason prescribes” (Aristotle 1999, bk. III, ch. 7).

This passage affirms Jotterand’s complaint that moral bioenhancement programs capture merely one aspect of the cultivation of an agent’s moral character. For no type of bioenhancement could rightly inform someone of what the moral worth of some end may be, or what would be the most appropriate means toward achieving that end. At best, a manipulation of one’s aggressive tendencies may help moderate their reaction such that they are less prone to act rashly; but there will be a corresponding danger of eliminating one’s aggressive tendencies altogether, which would preclude one’s ability to act bravely in appropriate contexts.

Not all proponents of moral bioenhancement, however, suffer from the narrow focus that Jotterand properly accuses others of holding. As noted above, some biotechnological interventions may *complement*, not *replace*, the Aristotelian model for virtue acquisition (Walker 2009). It may thus be possible to positively assist certain individuals to cultivate moral virtue by enhancing particular emotional states or facilitating the practical reasoning process when limited by neurological constraints (Fröding 2011; Pols and Houkes 2011; Rakić 2012). Nevertheless, the same cautions noted above remain applicable and it may be difficult to ascertain—both externally and subjectively—whether one is being *helped* to cultivate virtue through their own efforts of practical reasoning and psychological self-mastery or being offered a mere *simulacrum* of true moral virtue. The risk of *inauthentic* cultivation of moral virtue may be simply too difficult to avoid due to the inherent inability to effectively regulate access to various forms of enhancement once they become marketable. We thus conclude, in agreement with John Shook, that “complete skepticism toward the possibility of moral enhancement cannot be justified; only modest endorsement of specific kinds of moral enhancement seems wise; and cautious cynicism against enthusiastic hopes for dramatic moral enhancement feels appropriate” (Shook 2012, 12).

Conclusion

The debate surrounding moral enhancement is often framed as a standoff between tradition and technology. This framing is misleading insofar as it suggests that they are equivalent paths to the same end of creating a morally better human being. They are not. Moral bioenhancement is not merely a different method for achieving moral improvement: It is a fundamentally different category of intervention that takes away from the essence of what it means to become virtuous. Aristotle shows how this is so. Virtue is not merely a set of behaviors; it is a *hexis* brought about through habituation. The journey from the state of *akrasia* (weakness of will) to *enkrateia* (self-control) and finally to *arete* (virtue) is one of internal conflict. Moral bioenhancement directly alters dispositions without this struggle, producing an outcome that merely mimics virtue.

The prognosis of relying on external interventions without cultivating the habits needed to sustain virtue is troubling. We should also consider the risk of regression or even becoming worse off once the external aid is withdrawn. As long as this is a problem, the supposed “effectiveness” of moral bioenhancement proves only as durable as the dosage (when pharmaceutical means are used) and as consistent as the economic systems that make it accessible (whether pharmaceutical or direct neural interventions). By contrast, the much criticized “slowness” of traditional methods of moral enhancement should be understood and accepted as the conditions and requirements of permanence and stability; perhaps “the thorny and arduous path of moral progress” optimally inculcates stable moral dispositions (Zarpentine 2013). Habituation takes time because it rewires the self from within. Insights from educational psychology and contemplative science already show that structured programs can bring about reliable and enduring results (MLERN 2012). As studies involving oxytocin show (De Dreu et al. 2011), such interventions often carry built in trade-offs that weaken their promise. This suggests that moral progress achieved through bioenhancement risks producing only fleeting improvement. What ultimately endures are the virtues cultivated through deliberate effort, and therefore, in order to ameliorate the existential threats identified by Persson and Savulescu, we should publicly commit to investing more in traditional forms of moral enhancement.

Nevertheless, moral agents who have a sound ethical orientation that informs their second-order desires may confront the moral weakness of will problem in aligning their first- and second-order desires such that the latter are effectuated as *volitions*. In such cases,

direct biotechnological means may be effective in creating such alignment such that moral agents may will and act more autonomously and authentically in accord with their cultivated moral character. Other forms of human enhancement—e.g., physical or cognitive enhancements—may increase one's capacity to attain competitive, positional goods and thereby risk increasing socio-economic disparities and other societal harms, as well as fostering character traits such as self-centeredness, ambition, and pride to a degree discordant with virtue. Moral bioenhancement, however, serves to increase one's capacity to cultivate virtuous traits that would, among other altruistic benefits, help reduce socio-economic disparities or at least ameliorate the negative effects of such disparities. It would thus be not only permissible but commendable for someone with a second-order desire to morally improve themselves to utilize biotechnological means to assist their overcoming of *akrasia*; yet, given the attendant risks of any biotechnological intervention, as well as the imperative to respect agents' autonomy, moral bioenhancement should never be administered compulsively or covertly.²

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