

Genetic Enhancement

By Walter Glannon (2001)

Gene therapy must be distinguished from genetic enhancement. The first is an intervention aimed at treating disease and restoring physical and mental functions and capacities to an adequate baseline. The second is an intervention aimed at improving functions and capacities that already are adequate. Genetic enhancement augments functions and capacities “that without intervention would be considered entirely normal.”¹ Its goal is to “amplify ‘normal’ genes in order to make them better.”² In chapter 1 [of *Genes and Future People*], I cited Norman Daniels’s definitions of health and disease as well as what the notion of just health care entailed. This involved maintaining or restoring mental and physical functions at or to normal levels, which was necessary to ensure fair equality of opportunity for all citizens. Insofar as this aim defines the goal of medicine, genetic enhancement falls outside this goal. Furthermore, insofar as this type of intervention is not part of the goal of medicine and has no place in a just health care system, there are no medical or moral reasons for genetically enhancing normal human functions and capacities.

Some have argued that it is mistaken to think that a clear line of demarcation can be drawn between treatment and enhancement, since certain forms of enhancement are employed to prevent disease. Leroy Walters and Julie Gage Palmer refer to the immune system as an example to make this point:

In current medical practice, the best example of a widely accepted health-related physical enhancement is immunization against infectious disease.

With immunizations against diseases like polio and hepatitis B, what we are saying is in effect, “The immune system that we inherited from our parents may not be adequate to ward off certain viruses if we are exposed to them.” Therefore, we will enhance the capabilities of our immune system by priming it to fight against these viruses.

From the current practice of immunizations against particular diseases, it would seem to be only a small step to try to enhance the general function of the immune system by genetic means. ... In our view, the genetic enhancement of the immune system would be morally justifiable if this kind of enhancement assisted in preventing disease and did not cause offsetting harms to the people treated by the technique.³

¹ Jon Gordon, “Genetic Enhancement in Humans,” *Science* 283 (March 26, 1999): 2023–2024.

² Eric Juengst, “Can Enhancement Be Distinguished from Prevention in Genetic Medicine?” *Journal of Medicine and Philosophy* 22 (1997): 125–142, and “What Does Enhancement Mean?” in Erik Parens, ed., *Enhancing Human Traits: Ethical and Social Implications* (Washington, DC: Georgetown University Press, 1998): 27–47, at 27. Also, Dan Brock, “Enhancements of Human Function: Some Distinctions for Policymakers,” *Ibid.*, 48–69.

³ *The Ethics of Human Gene Therapy*, 110. Instead of distinguishing between treatments and enhancements, Walters and Palmer distinguish between health-related and non-health-related enhancements. But I do not find this distinction to be very helpful.

Nevertheless, because the goal of the technique would be to prevent disease, it would not, strictly speaking, be enhancement, at least not in terms of the definitions given at the outset of this section. Genetically intervening in the immune system as described by Walters and Palmer is a means of maintaining it in proper working order so that it will be better able to ward off pathogens posing a threat to the organism as a whole. Thus, it is misleading to call this intervention “enhancement.” When we consider what is normal human functioning, we refer to the whole human organism consisting of immune, endocrine, nervous, cardiovascular, and other systems, not to these systems understood as isolated parts. The normal functioning in question here pertains to the ability of the immune system to protect the organism from infectious agents and thus ensure its survival. Any preventive genetic intervention in this system would be designed to maintain the normal functions of the organism, not to restore them or raise them above the norm. It would be neither therapy nor enhancement but instead a form of maintenance. Therefore, the alleged ambiguity surrounding what Walters and Palmer call “enhancing” the immune system does not impugn the distinction between treatment and enhancement. ...

To further support the treatment-enhancement distinction, consider a nongenetic intervention, the use of a bisphosphonate such as alendronate sodium. Its purpose is to prevent postmenopausal women from developing osteoporosis, or to rebuild bone in women or men who already have osteoporosis. Some might claim that, because it can increase bone density, it is a form of enhancement. But its more general purpose is to prevent bone fractures and thus maintain proper bone function so that one can have normal mobility and avoid the morbidity resulting from fractures. In terms of the functioning of the entire organism, therefore, it would be more accurate to consider the use of bisphosphonates as prevention, treatment, or maintenance rather than enhancement.

Some might raise a different question. Suppose that the parents of a child much shorter than the norm for his age persuaded a physician to give him growth hormone injections in order to increase his height. Suppose further that the child’s shortness was not due to an iatrogenic cause, such as radiation to treat a brain tumor. Would this be treatment or enhancement? The question that should be asked regarding this issue is not whether the child’s height is normal for his age group. Rather, the question should be whether his condition implies something less than normal physical functioning, such that he would have fewer opportunities for achievement and a decent minimum level of well-being over his lifetime. Diminutive stature alone does not necessarily imply that one’s functioning is or will be so limited as to restrict one’s opportunities for achievement. Of course, being short might limit one’s opportunities if one wanted to become a professional basketball player. But most of us are quite flexible when it comes to formulating and carrying out life plans. Robert Reich [4' 11"], the treasury secretary in President Clinton’s first administration, is just one example of how one can achieve very much in life despite diminutive stature. If a child’s stature significantly limited his functioning and opportunities, then growth-hormone injections should be considered therapeutic treatment. If his stature were not so limiting, then the injections should be considered enhancement.

Admittedly, there is gray area near the baseline of adequate functioning where it may be difficult to distinguish between treatment and enhancement. Accordingly, we should construe the baseline loosely or thickly enough to allow for some minor deviation above or below what would be considered normal functioning. An intervention for a condition near the baseline that would raise one's functioning clearly above the critical level should be considered an enhancement. An intervention for a condition making one's functioning fall clearly below the baseline, with the aim of raising one's functioning to the critical level, should be considered a treatment. For example, an athlete with a hemoglobin level slightly below the norm for people his age and mildly anemic may want to raise that level significantly in order to be more competitive in his sport. To the extent that his actual hemoglobin level does not interfere with his ordinary physical functioning, an intervention to significantly raise that level would be an instance of enhancement. In contrast, for a child who has severe thalassemia and severe anemia, with the risk of bone abnormalities and heart failure, an intervention to correct the disorder would be an instance of treatment.

The main moral concern about genetic enhancement of physical and mental traits is that it would give some people an unfair advantage over others with respect to competitive goods like beauty, sociability, and intelligence. Unlike the cognitively disabled individual considered earlier, we can assume that their mental states would not be so different and that they would retain their identity. Enhancement would be unfair because only those who could afford the technology would have access to it, and many people are financially worse off than others through no fault of their own. Insofar as the possession of these goods gives some people an advantage over others in careers, income, and social status, the competitive nature of these goods suggests that there would be no limit to the benefits that improvements to physical and mental capacities would yield to those fortunate enough to avail themselves of the technology. This is altogether different from the example of immune-system enhancement. There would be no diminishing marginal value in the degree of competitive advantage that one could have over others for the social goods in question and presumably no limit to the value of enhancing the physical and mental capacities that would give one this advantage. Not having access to the technology that could manipulate genetic traits in such a way as to enhance these capacities would put one at a competitive disadvantage relative to others who would have access to it.

Advancing an argument similar to the one used by those who reject the treatment-enhancement distinction, one might hold that competitive goods collapse the categorical distinction between correcting deficient capacities and improving normal ones. This is because competitive goods are continuous, coming in degrees, and therefore the capacities that enable one to achieve these goods cannot be thought of as either normal or deficient.⁴ Nevertheless, to the extent that any form of genetic intervention is motivated by the medical and moral aim to enable people

⁴ Kavka develops and defends the idea that competitive goods are continuous in "Upside Risks: Social Consequences of Beneficial Biotechnology," in Carl Cranor, ed., *Are Genes Us? The Social Consequences of the New Genetics* (New Brunswick, NJ: Rutgers University Press, 1994), 155-179, at 164-165.

to have adequate mental and physical functioning and fair equality of opportunity for a decent minimum level of well-being, the goods in question are not *competitive* but *basic*. In other words, the aim of any medical intervention by genetic means is to make people better off than they were before by raising or restoring them to an absolute baseline of normal physical and mental functioning, not to make them comparatively better off than others. Competitive goods above the baseline may be continuous; but the basic goods that enable someone to reach or remain at the baseline are not. Given that these two types of goods are distinct, and that they result from the distinct aims and practices of enhancement and treatment, we can affirm that enhancement and treatment can and should be treated separately. We can uphold the claim that the purpose of any genetic intervention should be to treat people's abnormal functions and restore them to a normal level, not to enhance those functions that already are normal.

As I have mentioned, genetic enhancement that gave some people an advantage over others in possessing competitive goods would entail considerable unfairness. A likely scenario would be one in which parents paid to use expensive genetic technology to raise the cognitive ability or improve the physical beauty of their children. This would give them an advantage over other children with whom they would compete for education, careers, and income. Children of parents who could not afford to pay for the technology would be at a comparative disadvantage. Even if the goods in question fell above the normal functional baseline, one still could maintain that such an advantage would be unfair. It would depend on people's ability to pay, and inequalities in income are unfair to the extent that they result from some factors beyond people's control. ...

One suggestion for resolving the fairness problem (short of banning the use of the technology altogether) would be to make genetic enhancement available to all. Of course, how this system could be financed is a question that admits of no easy answer. But the more important substantive point is that universal access to genetic enhancement would not be a solution. Indeed, the upshot of such access would provide a reason for prohibiting it.

Universal availability of genetic enhancement would mean that many competitive goods some people had over others would be canceled out collectively. The idea of a competitive advantage gradually would erode, and there would be more equality among people in possession of goods. There would not be complete equality, however. Differing parental attitudes toward such goods as education could mean differences in the extent to which cognitive enhancement was utilized. Some parents would be more selective than others in sending their children to better schools or arranging for private tutors. ...

Yet, suppose that we could manipulate certain genes to enhance our noncompetitive virtuous traits, such as altruism, generosity, and compassion.⁵ Surely, these would

⁵ Walters and Palmer present this thought-experiment in *The Ethics of Human Gene Therapy*, 123–128. As they note, Jonathan Glover introduced this idea in *What Sort of People Should There Be?* (Harmondsworth: Penguin, 1984).

contribute to a stable, well-ordered society and preserve the principle of fair equality of opportunity. Nothing in this program would be incompatible with the goal of medicine as the prevention and treatment of disease. But it would threaten the individual autonomy essential to us as moral agents who can be candidates for praise and blame, punishment and reward. What confers moral worth on our actions, and indeed on ourselves as agents, is our capacity to cultivate certain dispositions leading to actions. This cultivation involves the exercise of practical reason and a process of critical self-reflection, whereby we modify, eliminate, or reinforce dispositions and thereby come to identify with them as our own. Autonomy consists precisely in this process of reflection and identification. It is the capacity for reflective self-control that enables us to take responsibility for our mental states and the actions that issue from them. Given the importance of autonomy, it would be preferable to have fewer virtuous dispositions that we can identify with as our own than to have more virtuous dispositions implanted in us through genetic enhancement. These would threaten to undermine our moral agency because they would derive from an external source.⁶

Even if our genes could be manipulated in such a way that our behavior always conformed to an algorithm for the morally correct course of action in every situation, it is unlikely that we would want it. Most of us would rather make autonomous choices that turned out not to lead to the best courses of action. This is because of the intrinsic importance of autonomy and the moral growth and maturity that come with making our own choices under uncertainty. The dispositions with which we come to identify, imperfect as they may be, are what make us autonomous and responsible moral agents. Enhancing these mental states through artificial means external to our own exercise of practical reason and our own process of identification would undermine our autonomy by making them alien to us.

In sum, there are four reasons why genetic enhancement would be morally objectionable. First, it would give an unfair advantage to some people over others because some would be able to pay for expensive enhancement procedures while others would not. Second, if we tried to remedy the first problem by making genetic enhancement universally accessible, then it would be collectively self-defeating. Although much competitive unfairness at the individual level would be canceled out at the collective level, there would be the unacceptable social cost of some people suffering from adverse cognitive or emotional effects of the enhancement. Third, inequalities resulting from enhancements above the baseline of normal physical and mental functioning could threaten to undermine the conviction in the fundamental importance of equality as one of the bases of self-respect, and in turn social solidarity and stability. Fourth, enhancement of noncompetitive dispositions would threaten to undermine the autonomy and moral agency essential to us as persons.

⁶ Drawing on the work of Lionel Trilling and Charles Taylor, Carl Elliott discusses cognitive and affective enhancements that undermine what he calls the “ethics of authenticity” in “The Tyranny of Happiness: Ethics and Cosmetic Psychopharmacology,” in Parens, *Enhancing Human Traits*, 177–188. Also relevant to this issue is Harry Frankfurt, “Identification and Externality,” in Frankfurt, *The Importance of What We Care About* (New York: Cambridge University Press, 1989): 58–68.