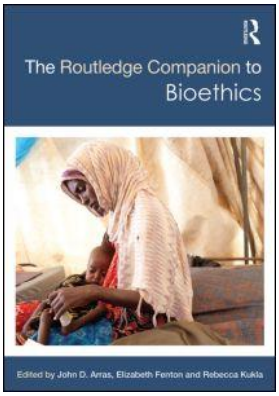

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HUMAN ENHANCEMENT

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Introduction

Human enhancement is the focus of an intensifying philosophical interest. Partly this is a consequence of advances in technology that promise to realize possibilities once considered the stuff of science fiction.

To examine the moral implications of human enhancement, we first require a definition of what it is to enhance a human being. We present a conceptual pluralism that acknowledges two ways to define human enhancement. These concepts highlight different moral problems and opportunities that emerge from the application of powerful genetic and environmental technologies to human beings. Distinct moral issues arise in respect of different means, degrees, and targets of enhancement. We begin by describing various *means* by which humans may be enhanced. Philosophical interest in human enhancement has tended to focus on enhancement by the modification or selection of human genetic material. This focus risks overlooking a variety of other ways in which humans may be enhanced. Enhancement can also occur through environmental means. Cochlear implants, electronic hippocampi, prosthetic legs, and traditional methods of education all involve the modification of human brains or bodies, and thus are all examples of environmental enhancements.

Next we examine the significance of different *degrees* of enhancement. Enhancement encompasses interventions many would be reluctant to consider enhancement at all, for example formal education, something that results in the improvement of cognitive capacities. More obvious cases of enhancement include injecting synthetic erythropoietin (EPO) to win the Tour de France, which results in improved physical endurance, as well as radical human enhancements: Imagine someone who lives for thousands of years and can instantly memorize the complete works of Shakespeare. Opponents of human enhancement offer a range of objections often in relation to the moral significance of the degree of enhancement undertaken. Francis Fukuyama objects that genetic enhancement of too great a degree poses a threat to human nature. Jürgen Habermas contends that genetic enhancement beyond human norms infringes on the autonomy of its subjects. Meanwhile, the most ardent proponents of human enhancement advocate enhancement of so great a degree that recipients should no longer be considered human. We will discuss these positions (and others) with a view to assessing the moral significance of varying degrees of enhancement.

We conclude the chapter with a discussion of the debate that has arisen in respect of a particular *target* of enhancement—human moral capacities. Moral disposition enhancement has the goal of improving the moral value of an individual's actions or

character. Another variety of moral enhancement, moral status enhancement, improves an individual's moral priority—their moral entitlement to beneficial treatment and protection against harm.

We do not aspire to cover the debate about human enhancement in its entirety. The following should be taken as a broadly representative, philosophically interesting sample of themes from the contemporary debate.

What Does It Mean to Enhance a Human Being?

There are two ways in which we can understand human enhancement. The broader of the two accounts defines enhancement as improvement. One enhances whenever one improves. If a genetic alteration improves cognitive powers then it is a genetic enhancement. We call this *enhancement as improvement*. A narrower account limits the range of improvements properly considered to be enhancements. According to the concept of *enhancement beyond human norms* a cognitive improvement counts as an enhancement if it shifts an individual's cognitive powers from a point within the range properly considered normal for humans either to a higher point within that range or to a point beyond it.

An example serves to illustrate one significant difference between the two concepts. Injections of synthetic EPO boost the body's supply of red blood cells. Consider two circumstances in which you might inject EPO. You might be suffering from severe anemia resulting from a shortage of red blood cells. You inject EPO to make good that shortage in order to avoid compromised organ function. Alternatively, you might be a competitor in a long-distance cycling event. Your body's supply of red blood cells is normal. You inject EPO to gain a competitive advantage.

Both are examples of enhancement as improvement. Both improve capacities. But the purpose of the first is not enhancement beyond human norms. The appeal to norms in this account divides improvements into therapies and enhancements. When someone with anemia is given synthetic EPO the purpose is to restore the supply of red blood cells to a level properly considered normal for human beings. This is therapy. Proponents of this account reserve the label "enhancement" for the second case. We can suppose that the competitor enters the event with a normal supply of red blood cells. In this case the injection is not therapy. Its purpose is to increase physical endurance. The enhancing injections of EPO shifts the supply of red blood cells from a point within the spectrum of normal either to a higher point on that spectrum or to a point beyond it. Here we can consider "human norms" to refer to the capacities prior to the injection of EPO. It boosts the supply of red blood cells beyond a normal level even if the destination level lies within the normal range rather than outside of it. Many performance-enhancing Tour de France cyclists have used EPO to achieve levels of red blood cells toward the high end of the normal range rather than beyond it.

We should expect some vagueness when employing the concept of normality. The normal range of human capacities lacks precise boundaries. Other distinctions also exist along a continuum and admit borderline cases. For example, the division between the bald and the hirsute is vague, but this vagueness does not prevent us from understanding and utilizing the distinction. There are cases that lie on the boundary between therapy and enhancement. They pose practical problems for those who seek to use the therapy/enhancement distinction. But their existence does not invalidate the distinction or undermine its usefulness.

How should we understand the concept of normality? One way is statistical. This seems to carry little or no normative weight. It is statistically "normal" for humans to be right-handed, but that does not imply that it is bad to be abnormal in this respect; one is not worse off for being left-handed simply because this attribute is statistically abnormal. Another way to understand normality appeals to biology. When a heart pumps in a way that is biologically normal it performs at the level selected for by natural selection. Levels of cardiac function below biological norms tend to have bad consequences for the wellbeing of the organism of which the heart is a part.

There is no necessary connection between biologically abnormal function and reduced wellbeing. Suppose that neuro-anatomists were to discover that some cases of non-heterosexual sexual orientation resulted from a common functional abnormality in the development of the brain. It would be absurd to present this obscure biological fact as trumping the claims of non-heterosexual people to be living fully contented lives. Our understanding of the moral relevance of abnormal biological functioning must be contextual. We understand that certain varieties of abnormal biological functioning—for example, levels of red blood cells that result in anemia—tend to reduce likely wellbeing. It's clear that others do not.

There is more than one way in which we can make the distinction between therapy and enhancement morally significant. Some philosophers—for example Habermas and Fukuyama—present it as marking the difference between genetic interventions that are permissible and those that are impermissible. They say that gene therapies are permissible but genetic enhancements are not. As we shall see, there are a variety of attempts to explain why it might be impermissible to use genetic technologies to shift someone from within the normal range of human capacities either to a higher point within that range or to a point beyond that range.

Other philosophers make different uses of the distinction between therapy and enhancement. According to Buchanan et al. (2000), the category of therapy corresponds approximately to those genetic interventions that the liberal state should seek to provide to its citizens. These enable normal participation in society. A liberal state is subject to no obligation to commit resources to make enhancements available. This does not imply a requirement to ban them. It does seem that people who have traits that fall below human norms can claim greater priority for provisions to raise them up to human norms than people whose capacities are currently normal. For example, people who have hearing loss face barriers to normal participation in society. We make cochlear implants and hearing aids available to the hearing impaired. We should also make available gene therapies for deafness. Analogous reasoning does not apply to genetic modifications that would permit super-normal hearing—having super-normal hearing is not a prerequisite for normal participation in society.

We have two concepts of human enhancement that may enable us to recognize different moral problems and prospects. We offer the following guideline in making these judgments.

> A *human enhancement consistency test*: Suppose that we decide a given human enhancement is morally permissible, impermissible, or obligatory. We should say the same of comparable enhancements. If not, we need to explain why the difference makes a difference in moral assessment.

There are three ways in which we might apply the human enhancement consistency test. These correspond to three ways in which enhancements can vary. The test may be

applied in respect of differences in the *means* by which humans are enhanced, the *capacities* that are the targets of enhancement, and the *degrees* to which they are enhanced.

Different Means of Enhancement

Much of the philosophical debate about human enhancement has focused on means that involve the selection or modification of genetic material. The most opportune time to attempt genetic enhancement is very early in development. A change to the DNA of a single cell human zygote will be transferred to every cell in the resulting human being. Suppose that the intention is to genetically enhance cognition. A change to the DNA of a very early embryo will manifest itself in every brain cell.

One genetic modification that presented as a candidate for human enhancement involves the NR2B gene (Tang et al. 1999). Although the function of this gene remains to be fully clarified, it is thought to be especially active during the brain's development. Mice who have had an additional copy of the gene introduced into their genomes—so called Doogie mice, named for the 1980s TV boy genius Doogie Howser MD—significantly outperform controls at a variety of cognitive tasks. The gene exists in humans, so it's possible that the introduction of an additional copy of NR2B into human genomes would have corresponding effects on intelligence.

Enhancement by the selection of genetic material has an ugly history. It is how Francis Galton, the nineteenth century founder of eugenics, imagined humans being enhanced. Galton was ignorant of DNA, but he presumed to see the effects of good hereditary factors in the successes and virtues of some individuals and bad hereditary factors in the perceived failings and vices of others. He envisaged a program of human selective breeding in which the hereditarily "good" would be encouraged to maximize their reproductive outputs. People assessed as having poor quality hereditary material would be discouraged or prevented from reproducing.

The faults of Galtonian eugenics were many (see Kevles 1998; Paul 1995). There were scientific errors. It is simply false that racial and social class groupings sort hereditary material according to quality. Galtonian eugenics also involved errors in moral reasoning. There were abuses of reproductive liberty. Galtonian eugenicists would foist on some an obligation to have children while preventing others from doing so. Eugenicists tended to assume monistic views about human flourishing. They denied the widely held pluralism according to which there are many different versions of the good life, none of which deserves primacy over all the others. Contemporary defenders of enhancement by selecting or modifying genetic material should sharply distinguish their goals from those of Galtonian eugenics.

A focus on enhancement by genetic modification underrepresents the diversity of ways in which humans might be enhanced. Human enhancement may be achieved by methods other than the modification or selection of genes. For example, the power of education to bring about enhancement as improvement is established. Given its ubiquity, education may seem an odd thing to consider as an enhancement. But it is straightforwardly a case of enhancement as improvement.

A prominent liberal argument for genetic enhancement urges consistent treatment of genetic and environmental means of human enhancement (Harris 1998). This argument draws support from a modern understanding of human development. It firmly rejects widely held beliefs in genetic determinism. According to this common misunderstanding of development, many human traits are causally fixed by genes. Genetic

determinism seems to license talk of intelligence genes and genes for conservative political beliefs. It makes sense to describe traits as genetic or environmental only when addressing variation in a population. When we say that eye color is genetic we are saying that variation in eye color in a population is predominantly a consequence of variation in genes. It is simply wrong to apply language properly used to describe variation in populations to individuals. When described in a population sense, eye color is a genetic trait. But this doesn't mean that the brown color of an individual's eyes is determined or fixed by his or her genes. Environmental contributions are essential. What is true of eye color is also true of the ability to play chess. Alterations to either trait can result from changes to genetic influences. They can also result from changes to environmental influences.

This interactionist model has implications for the enhancement choices of parents. Parents in liberal societies already make choices about education that they hope may enhance their children. For example, some choose to send their children to private schools. This is a case of enhancement as improvement: Parents hope elite educational opportunities will improve their children's capacities. According to the liberal argument they should be able to make choices about their children's genomes. There are limits. Many states prohibit educational choices deemed incompatible with a child's welfare—it is illegal to refuse to provide your child with an education. Similar restrictions should apply to the genetic choices of prospective parents.

For some indication of the potential power of education to enhance beyond human norms, consider the work of the psychologist K. Anders Ericsson on the acquisition of skills by "deliberate practice" (Ericsson *et al.* 1993). Those who undertake deliberate practice do more than practice hard or a lot. They practice in a way designed to extend their skills. They thereby avoid some of the plateaus in achievement that many of us experience when we, or our teachers, decide that we can perform a skill well enough. Perhaps the most striking examples of the power of deliberate practice to produce enhancement beyond human norms are the three chess champion sisters, Susan, Sofia, and Judit Polgár. Their father insists that the girls showed no particular aptitude for chess. He subjected them to a program of extended deliberate practice—thousands of hours of highly structured instruction in the game—that turned the sisters into some of the world's strongest players.

Deliberate practice is a means of enhancement that differs from genetic modifications that have the same stated aim. The human enhancement consistency test suggests an obligation for those who find a moral difference between the enhancement of chess skills by deliberate practice and their enhancement by genetic modification to justify this difference. The liberal argument in favor of enhancement provides a *prima facie* reason to believe there is none.

Some of the issues that arise with respect to genetic enhancement may not arise with environmental enhancement. Genetic enhancement is still a comparatively new technology; the possibility of unintended side effects of genetic interventions is one reason to be more cautious when pursuing genetic enhancements than when pursuing equivalent enhancements via environmental means. Even where there are differences, the enhancement consistency test should lead us to acknowledge some issues shared by both genetic and environmental enhancements. For example, there is a concern about the distributive justice of human enhancement of both kinds. If the wealthy are permitted to fit out their children's genomes with enhancements, then we seem faced with an exacerbation of current social inequalities. The same concerns are pertinent to enhancements resulting

from deliberate practice. Suppose wealthy parents identify enhancements leading to social success. They provide their children with programs of deliberate practice that enhance beyond human norms. Parents working hard to feed and clothe children are unlikely to have the means to implement such programs. Children enhanced beyond human norms by programs of deliberate practice may enjoy the same unfair advantages over the unenhanced as would genetically enhanced children.

The (possibly near) future may bring more extreme environmental enhancements. For example, the inventor and futurologist Ray Kurzweil advocates enhancement by grafting cybernetic implants and prostheses to our brains and bodies. As he sees it, the early stages of this merger between human and machine will be motivated by a desire to fix parts of our brains and bodies that have become diseased. Some profoundly deaf people are now fitted with cochlear implants that directly stimulate their auditory nerves. There is work on a prosthetic hippocampus that may someday restore memories ravaged by Alzheimer's disease. These examples can be considered both as improvements and as therapies. According to Kurzweil the integration of technology into our brains and bodies is the first significant step toward radical human enhancement. These enhancements (or therapies) can be seen as precursors to more radical human enhancement. The procedures that introduce these devices into human brains fall on the environmental side of the distinction between genetic and environmental enhancement. They involve no modification or selection of human genetic material, yet their effects could result in beings enhanced to much greater degrees than are possible via purely genetic means.

Is It Impermissible to Genetically Enhance Beyond Human Norms?

A number of philosophers, including Habermas and Fukuyama, have argued that genetic enhancement beyond human norms is impermissible. These philosophers argue for the moral relevance of both the degree of enhancement and the means by which it is obtained. They allow that some non-genetic means of enhancement beyond human norms are acceptable, as well as therapeutic genetic interventions.

Fukuyama (2002) argues that genetic enhancement is wrong because it corrupts human nature. He presents an account of human nature as fixed by human genes. It is, according to him, "the sum of the behavior and characteristics that are typical of the human species, arising from genetic rather than environmental factors" (Fukuyama 2002: 130). Fukuyama views those who aspire to genetically enhance beyond human norms as seeking to alter what has hitherto remained relatively invariant throughout human history and across the full gamut of human cultures. Fukuyama offers an explanation of the importance of his genetic conception of human nature. He connects it to a property of humans he calls Factor X. Factor X is not constituted by "the possession of moral choice, or reason, or language, or sociability, or sentience, or emotions, or consciousness, or any other quality that has been put forth as a ground for human dignity" (Fukuyama 2002: 171). Rather it is all of these attributes together. Factor X is supposed to capture "something unique about the human race that entitles every member of the species to higher moral status than the rest of the natural world" (Fukuyama 2002: 160). The shared human genome is what joins them and therefore entitles us to respect. According to Fukuyama, enhancement threatens to undermine our human dignity by intruding on its genetic foundations.

Fukuyama seems to be relying on a genetic determinist model of human development. Yet, there is a tension between his emphasis on genes and the interactionist model of development. It is mistaken to present the characteristics typical of human species as more strongly connected with human genes than with human environments. Embedding a cybernetic device in a brain could result in dramatic cognitive improvements without altering genes. Fukuyama's implicit reliance on genetic determinism, as well as being unsupported by empirical findings, fails to appreciate the magnitude of enhancements that are possible via purely environmental interventions.

There is however a deeper reason to think that appeals to human nature fail to gain traction in the debate about human enhancement. When we speculate about the harms potentially inflicted by extreme cybernetic or genetic enhancement, we are thinking of human nature as an essential property of human individuals. Norman Daniels (2009) challenges this way of thinking by arguing that we should acknowledge human nature as a population concept. Viewed this way, human nature does not describe any relatively invariant property of human individuals, which could be under threat from the wrong kind of modification. Human nature encompasses a very wide range of genetic variability and diverse gene–environment interactions. Daniels says of a modification that might push an individual human outside of the range of traits properly encompassed by human nature: "By itself, this does not alter human nature. It creates freaks." Daniels continues that "If it operated on a population level, we might well . . . count it as a change in human nature" (Daniels 2009: 37). So long as enhanced beings remain rare then enhancement cannot alter human nature. The concept of human nature seems, therefore, oriented at the wrong level of explanation to explain any harms to individuals that may follow from too much enhancement.

Earlier we described the liberal suggestion that attempts to enhance by altering genetic influences deserve similar treatment to attempts to enhance by environmental means. Habermas (2003) thinks he has found a moral difference between the two types of developmental influence. He proposes that there is something problematic in the manner of the intervention required to enhance a child-to-be. Prospective parents who presume to genetically enhance their children illegitimately present themselves as co-authors of their children's lives. "The programming intentions of parents who are ambitious and given to experimentation . . . have the peculiar status of a one-sided and unchallengeable expectation" (Habermas 2003: 51). Habermas claims this is the difference between genetic and environmental enhancement. Children confronted with a parental plan to enhance by means of an educational program can rebel. Had the Polgár sisters taken every opportunity to hurl chess pieces at daddy's head, doubtless he would have given up on his plan to manufacture chess geniuses. A particularly determined parent may quash any resistance, but they cannot rule out its very possibility. According to Habermas, genetic enhancement differs in this respect. There is simply no possibility of having a say over how your early embryo is genetically modified. There is, according to Habermas, an asymmetry between genetic enhancers and the genetically enhanced, an asymmetry in tension with the egalitarian aspirations of liberal societies. Tomorrow's citizens would become "defenseless objects of prior choices made by the planners of today" (Habermas 2003: 48). Habermas does not object to therapeutic uses of genetic selection or modification. He claims these interventions do not impose specific or idiosyncratic plans on the lives of future citizens; they do not constrain the child's future choices about the course his or her life will follow.

This challenge has drawn responses from defenders of liberal views about genetic enhancement. If important human traits emerge through the interaction of environmental

and genetic factors, then it is simply impossible to make a football star by selecting or modifying embryonic DNA. If you discover, as a young teenager, that your parents have sought to replicate in your genome what they deem to be the relevant parts of Pelé's genome, then you must live with the fact that your embryonic DNA was modified. But it still remains possible for you to prevent those genetic modifications from having the effects on your development sought by your enhancers. You can choose to play badminton instead of football. Your parents' enhancement agenda does not prevent you from making uses of your genetic advantages that run counter to their plans.

The Lure of Radical Enhancement

How far should we pursue human enhancement? Transhumanism is a social and intellectual movement that "affirms the possibility and desirability of fundamentally improving the human condition through applied reason, especially by developing and making widely available technologies to eliminate aging and to greatly enhance human intellectual, physical, and psychological capacities" (The Transhumanist FAQ). Some transhumanists argue that we should enhance beyond the point where we are no longer human. We should become "posthuman." Far from seeing our humanity and human natures as warranting protection from enhancement technologies, human nature is something that we should readily abandon if in doing so we can attain more valuable lives. For transhumanists, the notion of human nature implies a collection of limitations on how long we can live and how intelligent we can be. Contrary to Fukuyama's claims, in this age of rapidly advancing technology transhumanists consider retaining our human nature as an obstacle to flourishing rather than a necessary condition for it.

Some allies of the transhumanists have offered concrete proposals not only for how we can enhance beyond human norms, but how we can achieve radical human enhancement. Here radical enhancement involves improving significant attributes and abilities to levels that *greatly exceed* what is currently possible for human beings. The contrast here is with moderate enhancement which aims to improve significant attributes and abilities to levels *within or close to* what is currently possible for human beings. Ray Kurzweil (2005) hopes to radically enhance human cognitive powers. He looks to accelerating the pace of improvement of information technologies. According to Kurzweil, humans will soon be benefiting from these advances, swapping out computationally inefficient disease-prone biological brain tissue for electronic chips. Kurzweil expects that the exponential improvement of information technologies will soon bring into existence a mind "about one billion times more powerful than all human intelligence today" (Kurzweil 2005: 136).

Nicholas Agar (2010) challenges the wisdom of radical enhancement. He questions the value to human beings of billion-fold enhancements of our cognitive powers and millennial lifespans. Agar advances an account of the valuing of future experiences or achievements that requires that we currently have some capacity to identify with them. This is a prudential claim. Radical enhancements may make us worse off by replacing valuable distinctively human experiences with radically enhanced experiences. These enhanced experiences can be considered objectively more valuable than our current experiences, but they are nonetheless of reduced value to us from our current human perspective.

There is one way we could imaginatively engage with radically enhanced experiences and therefore properly value them. We could undergo radical enhancement. Beings whose intellects are thousands of times more powerful than ours have their own

distinctively valuable experiences. If we became them then we would value these radically enhanced experiences. Agar (2014) presents these as transformative changes akin to changes presented in the movie *Invasion of the Body Snatchers*. A human who is body snatched and survives the process would acquire new kinds of experience that she is likely to view as extremely valuable. Radical human enhancement involves a less extreme transformative change. But we should acknowledge that it has some of the same consequences for our values. Radical human enhancement is likely to cut us off from many of the ways we currently value our lives and experiences. Many of our most significant achievements are judged relative to explicitly anthropocentric standards. Running a four-minute mile or sending humans into space can be impressive achievements relative to anthropocentric standards. There are degrees of enhancement that will make such achievements seem trivial. Agar endorses moderate enhancements—those that fall within or just beyond the limits of current human variation. A gain of 15 IQ points that results from a genetic modification enhances in a way that does not rule out imaginative engagement. Such enhancements are compatible with the way humans are currently able to value their experiences.

The Possibility of Moral Enhancement

Recently there has been some discussion about the possibility of moral enhancement. There are two kind of moral enhancement. The aim of moral *disposition* enhancement is to increase the moral value of an agent's actions or character. Humans whose moral dispositions are enhanced may be more likely to do good deeds or to act from motives that we judge to be moral or virtuous.

Thomas Douglas (2008) argues that the moral permissibility of moral disposition enhancement is a challenge to the bioconservative thesis. This is the claim that enhancement by biomedical means is always impermissible. Douglas offers examples of what he claims are permissible moral enhancements through biomedical means. These moral bioenhancements could give us morally better motives by reducing the influence of counter-moral emotions—emotions that interfere with what we view as good moral thinking. These emotions include triggers of impulsive violent aggression and of racial prejudice. Douglas argues that if moral bioenhancement is permissible then it follows that an unqualified bioconservative thesis must be false.

Julian Savulescu and Ingmar Persson (2012) have a more practical interest in moral disposition enhancement. They appeal for urgent enhancement of human moral dispositions so that we may muster an adequate response to the problem of climate change. This problem seems to be exacerbated by a human inability to work together to properly address what is now widely appreciated as a threat to the entire human species. Savulescu and Persson think that making humans more moral will increase the likelihood that humans can look beyond their many disagreements and successfully cooperate to address the problem. They tentatively propose some candidate biomedical moral enhancers. There is some evidence that oxytocin can boost trust and gratitude, and that members of the selective serotonin reuptake inhibitors class of drugs increase cooperativeness (Savulescu and Persson 2012: 118–20). Both the proposals of Douglas and Persson and Savulescu fit best within the conception of enhancement as improvement. An increase in human cooperation could be conducive to the end of avoiding catastrophic climate change. This is true no matter where any individual is currently situated, whether it is within or below the spectrum of normal human dispositions to cooperate.

John Harris (2011) challenges this view on the grounds that moral enhancement via biomedical means undermines autonomy and the value of moral agency. Harris claims that without the "freedom to fall" our moral actions lack the intrinsic value that comes with having the choice to act immorally. He endorses the use of traditional means of moral improvement such as education and moral instruction, both of which can be considered as commonplace moral enhancements. The key difference is traditional means of moral enhancement are deliberative; they involve cognitive reasoning processes and coming to form beliefs that we can articulate and defend. According to Harris, moral enhancement by biomedical means bypasses our reasoning processes and directly affects our behavior without being subject to rational review. This is problematic in two ways. It may prevent us from performing certain moral good actions. For example, reducing impulses towards violence is not morally valuable if it results in failure to defend those unjustly threatened with harm. In addition, Harris points out that "ethical expertise is not 'being better at being good', rather it is being better at knowing the good" (Harris 2011: 104). According to Harris, morally good action must originate in the right kind of way from an agent's moral judgments.

Moral disposition enhancement is supposed to increase the moral value of an agent's actions or character. Moral *status* enhancement improves an individual's entitlement to beneficial treatment and reduces eligibility for certain forms of harmful treatment. In discussions of moral status, there is typically a distinction made between persons, beings capable of practical rationality, and non-persons, beings capable of suffering, but which lack these more complex cognitive capacities. Might a significant increase in the morally relevant capacities of persons result in beings with a moral status higher than persons, i.e., post-persons?

Allen Buchanan (2011) rejects this inference. He argues that personhood is a threshold concept. A certain level of practical rationality is required to satisfy the criteria for personhood. However, once this point is reached, no quantitative increase of the relevant capacities can result in an improvement in a being's moral status. This means that no matter what degree of enhancement humans undergo, we cannot obtain a higher moral status than personhood. With a large enough degree of enhancement we may become post-human, but there will never be post-persons.

Some philosophers have accepted Buchanan's challenge and offered accounts of beings with status superior to persons. For example, Jeff McMahan (2009) offers examples of beings that might have moral statuses superior to persons. McMahan observes that many people think that we have a moral status higher than animals because we are capable of free action and they are not. He offers a hypothesis about beings with moral statuses superior to our own that makes sense on the assumption that robust libertarian freewill is philosophically coherent. Suppose that beings whose free acts are not causally determined are metaphysically possible and furthermore that humans are not free in this strong sense. We are free only in a weaker compatibilist sense compatible with the operation of deterministic laws. McMahan suggests that we might credit beings free in the libertarian sense with a status superior to our own. "They would have a psychological capacity that we lack but that most people have believed that we have and that is what distinguishes us morally from animals" (McMahan 2009: 604). David DeGrazia (2012) describes a "Future with Post-persons" scenario set in the year 2145. DeGrazia's putative post-persons are better than current human persons in a variety of ways—they reason better than us, have far superior moral dispositions, and so on. He contends that "post-persons have about as much justification in believing that they have higher moral

status than persons as persons have in believing that they have higher moral status than animals" (DeGrazia 2012: 138).

Agar (2012) takes a different approach. He proposes that we may be unable to conceive of beings with status higher than our own. The ability to fully understand the criteria for post-personhood may be beyond current human cognitive capacities. For example, giving a non-person the ability to fully grasp why the capacity for practical reason grants a superior moral status may lead it to actually satisfy these criteria. It is therefore to be expected that we will struggle to fully grasp the criteria for possessing a moral status higher than our own. Agar offers an inductive inference for the possibility of post-persons. We currently acknowledge differences in moral status in virtue of differences in properties possessed by different categories of things. Inanimate objects such as rocks have zero moral status. Sentient non-persons have an intermediate moral status. Persons currently possess the highest moral status. We therefore have good inductive grounds to believe in the possibility of beings with moral statuses superior to our own.

Conclusion

Two concepts of enhancement are required to cover the complexities of differing means, degrees, and targets of enhancement. We have outlined moral considerations that arise from pursuing enhancements through different means, and suggested a consistency test for morally evaluating different enhancements. We applied the consistency test to a variety of different means, degrees, and targets of human enhancement. Our discussion of different means of enhancement included the modification of genetic influences and the modification of environmental influences. We surveyed different degrees of enhancement ranging from those within human norms to those far beyond them. We discussed enhancement that takes as its target human moral capacities.

This chapter has sampled lines of argument from what is an exciting and increasingly thematically diverse philosophical debate. The debate is fast moving. A philosophical snapshot of the human enhancement debate 10 years hence is likely to reveal new dangers and opportunities. These questions will become increasingly important to consider as the pace of technological progress opens new avenues for human enhancement. We ought to consider them before it is too late for our answers to contribute to shaping the future trajectory of humanity.

Related Topics

Chapter 20, "The Ethics of Biomedical Research Involving Animals," Tom L. Beauchamp
Chapter 39, "Medicalization, 'Normal Function,' and the Definition of Health," Rebecca Kukla

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