

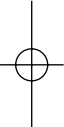


Introduction

Human Enhancement Ethics: The State of the Debate

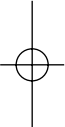
Nick Bostrom and Julian Savulescu

Background



Are we good enough? If not, how may we improve ourselves? Must we restrict ourselves to traditional methods like study and training? Or should we also use science to enhance some of our mental and physical capacities more directly?

Over the last decade, human enhancement has grown into a major topic of debate in applied ethics. Interest has been stimulated by advances in the biomedical sciences, advances which to many suggest that it will become increasingly feasible to use medicine and technology to reshape, manipulate, and enhance many aspects of human biology even in healthy individuals. To the extent that such interventions are on the horizon (or already available) there is an obvious practical dimension to these debates. This practical dimension is underscored by an outcrop of think tanks and activist organizations devoted to the *biopolitics* of enhancement. Already one can detect a biopolitical fault line developing between pro-enhancement and anti-enhancement groupings: transhumanists on one side, who believe that a wide range of enhancements should be developed and that people should be free to use them to transform themselves in quite radical ways; and bioconservatives on the other, who believe that we should not substantially alter human biology or the human condition.¹ There are also miscellaneous groups who try to position themselves in



¹ See e.g. Bostrom, N. 2006. 'A Short History of Transhumanist Thought', *Analysis and Metaphysics*, 5: 63–95 (<http://www.nickbostrom.com/papers/history.pdf>).

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<http://www.nickbostrom.com>



between these poles, as the golden mean. While the terms of this emerging political disagreement are still being negotiated, there might be a window of opportunity open for academic bioethicists to influence the shape and direction of this debate before it settles into a fixedly linear ideological tug-of-war.²

Beyond this practical relevance, the topic of enhancement also holds theoretical interest. Many of the ethical issues that arise in the examination of human enhancement prospects hook into concepts and problems of more general philosophical significance—concepts such as human nature, personal identity, moral status, well-being, and problems in normative ethics, political philosophy, philosophy of mind, and epistemology. In addition to these philosophical linkages, human enhancement also offers thought-fodder for several other disciplines, including medicine, law, psychology, economics, and sociology.

The degree to which human enhancements constitute a distinctive cluster of phenomena for which it would be appropriate to have a (multidisciplinary) academic subfield is debatable, however. One common argumentative strategy, used predominantly to buttress pro-enhancement positions, is to highlight the continuities between new controversial enhancement methods and old accepted ways of enhancing human capacities. How is taking modafinil fundamentally different from imbibing a good cup of tea? How is either morally different from getting a full night's sleep? Are not shoes a kind of foot enhancement, clothes an enhancement of our skin? A notepad, similarly, can be viewed as a memory enhancement—it being far from obvious how the fact that a phone number is stored in our pocket instead of our brain is supposed to matter once we abstract from contingent factors such as cost and convenience. In one sense, *all* technology can be viewed as an enhancement of our native human capacities, enabling us to achieve certain effects that would otherwise require more effort or be altogether beyond our power.

Pushing this thought further, one could argue that even mental algorithms such as we use to perform basic arithmetic in our heads, and learned skills such as literacy, are a kind of enhancement of our mental software. When we learn to calculate and read we are literally reprogramming the

² For one early discussion, see Glover, J. 1984. *What Sort of People Should There Be?* (Harmondsworth: Penguin).

micro-structure of our nervous system, with physiological effects just as real as those resulting from the ingestion of a psychoactive drug, and often more durable and with more profound consequences for our lives. At the limit of this line of reasoning, *all* learning could be viewed as physiological enhancement, and *all* physical and organizational capital could be viewed as external enhancements. Stripped of all such “enhancements” it would be impossible for us to survive, and maybe we would not even be fully human in the few short days before we perished.

If the concept of human enhancement is stretched to this extent, it becomes manifestly unfit for service as an organizing idea for a new and distinctive field of ethical inquiry. This need not trouble enhancement advocates who maintain that there is no morally significant difference between novel biomedical enhancements and all the other more familiar ways of enhancing. Those who object to human enhancement, however, must resist this inflationary interpretation of what enhancement is, drawing a line somewhere to distinguish the problematic new types of enhancements from the unobjectionable use of shoes, clothes, tea, sleep, PDAs, literacy, forklifts, and the bulk of contemporary medicine.

Such a line need not be sharp. Many important and useful philosophical terms are vague. Nevertheless, two challenges must be met. First, some account needs to be given of what counts as an enhancement—an account that must be reasonably intelligible and non-arbitrary, capturing something that might plausibly be thought of as a kind. Second, given such an account, it needs to be shown that it tracks a morally relevant distinction. Unless these two challenges can be met, it would appear misguided to organize our ethical thinking in this area around the concept of enhancement. “Enhancement” might still be useful to flag a patch of territory consisting of a variety of loosely related practices, techniques, and prospects. But it would hardly make sense either to pledge allegiance to such a flag, or to devote oneself to opposing what it stands for. Instead, our ethical judgments would have to track different and finer distinctions that would reflect the concrete circumstances and consequences of particular enhancement practices: Precisely what capacity is being enhanced in what ways? Who has access? Who makes the decisions? Within what cultural and sociopolitical context? At what cost to competing priorities? With what externalities? Justifiable ethical verdicts may only be attainable following a specification of these and other similarly contextual variables. To accept

this conclusion is to accept a kind of *normalization* of enhancement. That is, at a fundamental normative level, there is nothing special about human enhancement interventions: they should be evaluated, sans prejudice and bias, on a case-by-case basis using the same messy criteria that we employ in other areas of practical ethics.³

The contributors to this volume bring to the table a variety of perspectives, from both sides of the debate and from both Eastern and Western, secular and religious traditions. We have organized the chapters into two roughly distinguishable groups. First, those dealing with the ethics of enhancement more or less in general, and with associated issues such as the normative significance of human nature. Second, those focusing on the ethics of some particular type of enhancement. This is followed by a final chapter that addresses enhancement medicine as a practical (scientific) challenge.

Enhancement in general

NORMAL DANIELS asks what it would take to change *human nature*. He argues that this is a taller order than might at first appear to be the case. Human nature, says Daniels, is a dispositional selective population concept. It is *dispositional* in the sense that the same human nature will manifest as very different phenotypes depending on the environment in which it is placed. It is a *population* concept in the sense that to characterize human nature we must aggregate across individual variation. And it is *selective* in the sense that some traits (e.g., rationality) are often claimed to be more central to human nature than others (e.g., nasal hair). On this account, we cannot modify human nature unless we act on a population level. Furthermore, the intervention must affect traits central to that nature. To Daniels, this suggests that “genetic interventions are less likely to be threats than environmental interventions that undermine our human capabilities or nature.”

It has been argued that human germ-line engineering must be opposed on grounds that it would change human nature. George Annas, in particular, has been promoting the need for a new U.N. “Convention on the Preservation of the Human Species”, which would realize itself in an

³ Even ethical theories that are simple in their structure—such as hedonism—become complex and messy in their application to many real-world predicaments.

international treaty to ban “species altering” research. Annas claims that “cloning and inheritable genetic alterations can be seen as crimes against humanity of a unique sort: they are techniques that can alter the essence of humanity itself.” The chapter by ERIC JUENGST offers a critique of this view.

Juengst notes that species are not “static collections of organisms that can be ‘preserved’ against change like a can of fruit; they wax and wane with every birth and death and their genetic complexions shift across time and space.” Interpreted strictly, a ban on altering the human species would cover too much since almost everything we do as humans might affect the genetic composition of the next generation. (Taken literally, such a ban would seem to require the universal adoption of cloning as the sole method of reproduction.) Yet if the proposed ban on “species altering” is given a more relaxed reading—as, say, a proscription of interventions that would alter our “taxonomically defining” traits or that would significantly alter human nature—then it would fail to serve its intended purpose. For under this interpretation, even most germ-line modifications, genetic enhancements, and reproductive manipulations, like cloning, would not be species altering.

RYUICHI IDA presents an Asian bioconservative perspective on human enhancement. Ida tells us that, “in Japan,”

we respect the view of ‘As it stands’ . . . This attitude expresses respect for Nature and for the natural state of the baby. . . Ethical appeals to the human welfare or individual happiness to justify the use of science of technology may have intuitive force in the West, but may seem alien to a non-Western audience.

Ida distinguishes between “natural improvement” such as may come about through training and study, and “unnatural improvement” such as may result from taking anabolic steroids. The latter kind of improvement, he believes, may not be permissible because it depends on and fosters an instrumentalist or dualistic view of human beings. On this view, as Ida points out, it is not only newfangled enhancement interventions such as memory enhancing drugs or genetic engineering that are morally suspect. Much of what Westerners now consider to be normal therapeutic medicine is also problematic:

Oriental medicine has as its basic principle the reestablishment of the balance of body and soul. All the diseases come from the imbalance of the patient. It is true that this type of medicine does not practice big operations, like organ transplants, or brain operations. Oriental medicine sees the conditions that might call for

such interventions as natural, simply a consequence of human mortality, and it accordingly sees such a patient as entering a stage of returning to nature, i.e. dying.

Ida notes that in East and South East Asia, Buddhism and Confucianism often have a dominant role in daily life, and the life style and social practices are still rooted in agricultural traditions.

While the sensibilities that Ida describes may seem somewhat alien to Western bioethicists—especially the idea that there are any kind of *ethical* grounds for recoiling from “big operations” and organ transplantations—a position quite close to that of Ida has recently been articulated by MICHAEL SANDEL, an American political philosopher who has served on the President’s Council on Bioethics during the George W. Bush administration. Sandel warns that enhancement and genetic engineering represent a kind of “hyperagency”—a dark Promethean aspiration to remake nature to serve our purposes and satisfy our desires. We are at risk, Sandel believes, of losing our “openness to the unbidden”:

The problem is not the drift to mechanism but the drive to mastery. And what the drive to mastery misses and may even destroy is an appreciation of the gifted character of human powers and achievements . . . To acknowledge the giftedness of life is to recognize that our talents and powers are not wholly our own doing, despite the effort we expend to develop and to exercise them.

When put in this way, however, the objection becomes a concern about a contingent and speculative psychological effect of the practice of enhancement. One could imagine an enhancement user who is under no illusion that her talents and powers are wholly her own doing, understanding clearly that without the contributions from Nature, God, or Fortune she would be literally nothing.

Perhaps one solution would be for the FDA to require appropriate labeling of enhancement products. A bottle of memory-boosting pills could come with the inscription:

MAY CAUSE CONSTIPATION, DRY MOUTH, SKIN RASHES, AND LOSS OF OPENNESS TO THE UNBIDDEN. IF SYMPTOMS PERSIST AFTER 48 HRS, CONSULT YOUR PHYSICIAN AND/OR YOUR SPIRITUAL ADVISOR.

A more philosophically sophisticated response to Sandel’s argument is on offer in the chapter by FRANCES KAMM. She considers whether, as Sandel

claims, the desire for mastery motivates enhancement and whether such a desire could be a ground for its impermissibility. Kamm also examines Sandel's views about parent/child relations, and how enhancement would affect distributive justice and the duty to aid. She also discusses the therapy/enhancement distinction and criticizes some recent attempts to explicate this distinction in a way that would allow it to carry normative weight, including attempts by Sandel and by P. H. Schwartz.

The therapy/enhancement distinction comes in for further scrutiny in the chapter by JOHN HARRIS. He critiques the idea, developed by Norman Daniels and others, of using the notion of normal or "species typical" functioning as the dividing line separating morally high-priority interventions (those aimed at preserving or restoring normal functioning) from morally low-priority interventions (those aimed at enhancing normal functioning). Arguing from a consequentialist position, Harris concludes that

[t]he overwhelming moral imperative for both therapy and enhancement is to prevent harm and confer benefit. Bathed in that moral light it is unimportant whether the protection or benefit conferred is classified as enhancement or improvement, protection or therapy.

Harris also briefly touches on some other objections to enhancement, including the "playing God" objection, which he gives short shrift. This objection is treated in more detail in the chapter by TONY COADY. The objection may, but need not, rely on theological assumptions. Coady distinguishes three traditions in Christian theology regarding the relationship between human beings and the natural order: domination, stewardship, and co-creation. According to the domination model, humans were created to lord it over nature. According to the stewardship model, the role of humans is to act to preserve the natural order. And in the metaphor of co-creation, God has called human beings into a creative partnership in the ongoing creation of the world. The domination model has been criticized as insensitive to ecological concerns; the stewardship model for according an unduly passive role to a species endowed with as much initiative and creativity as ours; and the co-creation for downplaying the distance between God and creatures. Coady thinks that all three models have an element of truth in them, and that "the dialogue between them exhibits the tensions that need to be kept in view by believers in negotiating the mystery of humanity's place in the created order".

In its secular interpretation, the critique of playing God seems primarily a criticism of an attitude (*hubris*) and only derivatively of a program or proposal. Coady suggests that when people worry about the application of the latest scientific and technological discoveries and put this worry in terms of “playing God”, they are concerned that these applications may embody an unjustified confidence in knowledge, power, and virtue beyond what can reasonably be allowed to human beings. Overzealous transhumanists do not have a monopoly on this vice, as Coady writes:

The temptation to act in ways that ignore or make light of the in-built constraints on human knowledge, power and benevolence is certainly one to which all humans are prone, including bishops, theologians and priests. Indeed, those who believe that they are privy to God’s purposes through revelation, inspiration or tradition or all combined are perhaps especially open to the temptation. We should recall in this connection the sad history of religious wars, crusades, inquisitions, the preaching of erroneous doctrines and the failure to preach important truths. I am a Catholic, and my own Church has its blemishes in all these regards.

ERIK PARENS, in a similarly conciliatory spirit, suggests that proponents and critics of enhancement technologies, while often talking past one another, have more in common than they realize. Parens believes that both groups proceed from a “moral ideal of authenticity”, although they differ in how they understand this ideal, and he believes that these different understandings of authenticity “grow out of two different but equally worthy ethical frameworks, which stand in a fertile tension with each other”.

It may be apropos to mention a recent psychological study, which found that people are much more reluctant to enhance traits believed to be fundamental to self-identity (e.g., social comfort) than traits considered less fundamental (e.g., concentration ability)—consistent with the idea that beliefs about authenticity may be an important shaper of attitudes towards enhancement.⁴ However, the same paper also found that perceptions about authenticity could be easily manipulated. Advertisement taglines that framed enhancements as enabling (“Become Who You Are”) rather

⁴ Riis, J., Simmons, J. P. and Goodwin, G. P. Forthcoming. ‘Preferences for Enhancement Pharmaceuticals: The Reluctance to Enhance Fundamental Traits’, *Journal of Consumer Research* (http://papers.ssrn.com/sol3/papers.cfm?abstract_id=967676). For one attempt to leverage psychological findings to draw philosophical conclusions for the enhancement debate, see Bostrom, N. and Ord, T. 2006. ‘The Reversal Test: Eliminating Status Quo Bias in Bioethics’, *Ethics*, 116: 656–80 (<http://www.nickbostrom.com/ethics/statusquo.pdf>).

than enhancing (“Become More Than Who You Are”) eliminated the preference for non-fundamental over fundamental trait enhancements. We can rely on big pharmaceutical companies for our drugs, and on marketing firms for our authenticity.

The chapter by ARTHUR CAPLAN considers some general arguments against enhancement made by bioconservatives (“anti-meliorists” in Caplan’s terminology), including concerns about authenticity and the worry that the happiness and satisfaction achieved through engineering is seductive and will lead to a deformation of our character and spirit. Caplan argues that neither of these arguments provides a sufficient reason for opposing enhancement or optimization either of ourselves or our children. He concludes that what we must do is “take each proposed enhancement technology under consideration and decide whether what it can do is worth whatever price it might exact”.

Minor enhancements, such as a nootropic giving us a temporary 10 or 20 per cent boost in our ability to memorize facts when studying for a medical exam, is one thing; but what about more radical forms of enhancement? What of enhancements that would give us some significant non-human characteristics? Or ones that could make us “post-human”? These questions are addressed in a chapter by JULIAN SAVULESCU. In particular, Savulescu discusses the views put forward in “The human prejudice”, a posthumously published paper by the late philosopher Bernard Williams. Williams argued that a prejudice in favor of our human conspecifics is morally acceptable, by contrast to certain other prejudices such as racism and sexism. Savulescu argues that Williams’ defense of speciesism fails. Savulescu also shows how the issues raised in this debate connect to fundamental problems in normative ethics and in metaethics—such as internalism vs. externalism about normative reasons; the criteria for moral status; submaximization vs. satisficing; and the role of partiality and special relations in determining our moral duties.

Enhancements of certain kinds

Even if there is no moral reason to forgo enhancement in general, there might still be aspects of some particular types of enhancement that are morally problematic.

One morally charged context of enhancement is reproduction. There are many methods, low- and high-tech, by which we influence the character of new persons being brought into the world. At one end of the spectrum, mate choice has an obvious effect on what our children will be like, and the quality of prospective offspring is one factor that can influence our choice of romantic partners. According to evolutionary psychology, sexual attraction is often keyed to a subconscious assessment of the genetic quality of a potential mate (along with other factors). These factors can also be taken into account when we consciously deliberate to select among romantic prospects. We can also achieve “eugenic” objectives by exerting choice over the timing of conception—for example, by taking into account the increasing risk of birth defects associated with conceiving at an older age. Further, maternal nutrition and drug use can affect the fetus, and abortion can be used to terminate pregnancies when chromosomal abnormalities or other serious defects are detected. For couples undergoing in vitro fertilization, preimplantation genetic diagnoses can be used to select embryos without the need for abortion. The number of genetic conditions that can be assayed will increase with advancing technology; it will likely become possible to select not only *against* genetic defects but also *for* gene combinations correlating with positive desirable traits. It is also likely that more active forms of genetic interventions will become feasible, such as gene therapy either on zygotes, gametes, or even on the reproductive systems of adults, which could increase the likelihood that resulting embryos will have genetic endowments correlating with desirable attributes. After birth, parents and society continue to shape the character and capacities of children through means including education, nutrition, and rearing.⁵

The context of reproduction involves making choices that directly and intimately affect not only the decision-maker but also the resulting children. This introduces distinctive moral elements that are not usually present to the same extent in cases where a competent adult makes a free and informed decision to enhance herself. Another complicating moral element in reproduction is that our choices may determine which of several possible persons come into existence. According to many ethical theories, there are fundamental moral differences between cases in which our actions affect

⁵ Savulescu, J. 2006. ‘Genetic Interventions and the Ethics of Enhancement of Human Beings’. In *The Oxford Handbook on Bioethics*, ed. B. Steinbock (Oxford: Oxford University Press), 516–35.

some person who already exists or will come to exist independently of our actions, and cases in which our actions result in the creation of a new person who would not otherwise have existed.

Negative selection—selection against disability—has come under criticism, especially from some members of the disability community. Positive selection—selection for some desired trait in our offspring other than absence of disability or disease—has generated even broader unease in the public at large. DAN BROCK examines a series of arguments for the claim that selection of children is morally wrong, including expressivist concerns, the “playing God” objection, the worry that selection might undermine our unconditional acceptance of children, the critique of the notion of “perfection”, and the allegation that selection is in a bad sense eugenics. Brock argues that selection of our children is not in itself morally problematic, and concludes that “If negative or positive selection should be rejected, it will have to be for other reasons, not simply because selection of our children is wrong.”

Some other moral considerations relating to genetic selection and genetic engineering of offspring are evaluated in the chapter by PETER SINGER. The objection that genetic selection would be bad for the child does not work, Singer argues. Of greater concern are some of the potential societal effects that such enhancement could have. If Robert Nozick’s proposal to establish a “genetic supermarket” (i.e. letting prospective parents make their own reproductive choices, within wide moral limits) were adopted, it could lead to resources being squandered in a competitive pursuit of positional goods.⁶ Positional goods, such as height, are ones whose goodness for those who have them depends on other subjects not possessing them. An enhancement that had no effect other than making the user six inches taller would provide no net benefit if universally applied. It might, on the contrary, result in net losses inasmuch as food consumption would increase, vehicles would need to be redesigned, etc. But as Singer notes, many enhancements would provide benefits that are not merely positional. A related concern is that genetic selection might aggravate inequality. In principle there are many ways in which this concern could be assuaged: the technology could be made available to all, or only to the worst off; or other compensating social policies could be put in place. (In practice, whether

⁶ Nozick, R. 1974. *Anarchy, State and Utopia* (New York: Basic Books), 315 n.

any such measures were implemented would depend on the outcome of political struggles.) Singer points out that bans on genetic enhancement would have limited effect if couples wishing to avail themselves of such opportunities could simply travel to another state or another country in order to do so. Moreover, nations that prohibit their citizens from using genetic enhancement might lose out in terms of economic competitiveness and fall behind countries that embrace enhancement.

SUSUMU SHIMAZONO discusses attitudes to prenatal selection in Japan, where screening is less accepted and less widely practiced than it is in many Western countries such as France, the United States, and the United Kingdom. In the mid-nineties, approximately 90 per cent of fetuses with Down's syndrome were aborted in these countries, while less than 10 per cent of affected Japanese fetuses were aborted.⁷ This is not because Japanese culture is especially averse to abortion: some 350,000 abortions are performed there annually. So what is the explanation? Shimazono suggests several factors. In Japan, acceptance of abortion was historically driven not so much by women's rights as by a concern to control population growth for Malthusian reasons. To the extent that screening and selective abortion is a manifestation of women's rights and reproductive freedom, the practice might therefore have less historical backing than in the West. Shimazono also notes that while Westerners place great confidence in "reasoning power that has become independent from nature and body" and stress self-determination of sovereign selves as indispensable for the value of freedom, Japanese culture places less weight on individual autonomy and is more critical of the arrogance typically associated with modernization and modern scientific technology. "Differences in the perceptions of prenatal genetic diagnosis among different nations", Shimazono concludes, "suggest that the culture and historical background of each nation affect people's bioethics."

It would be a mistake to suppose that there exists a unified Asian outlook or Eastern set of values that is opposed to genetic selection. Consider, for example, the situation in Singapore, whose former Prime Minister Lee Kuan Yew spoke frequently about the heritability of intelligence and its

⁷ The exact figures vary between studies; for a review see Caroline Mansfield, Suellen Hopfer, Theresa M. Marteau, "Termination rates after prenatal diagnosis of Down syndrome, spina bifida, anencephaly, and Turner and Klinefelter syndromes: a systematic literature review", *Prenatal Diagnosis*, 19(9): 808–12.

importance for the country's future, and whose government introduced measures explicitly designed to encourage university graduates to have more children.⁸ And of course, attitudes can vary sharply even within a country, as anyone familiar with public bioethics in the United States is well aware.

One context in which enhancement is already in use and with proven efficacy is sports. This makes it an interesting case study. One should, however, be careful not unduly to generalize conclusions based on the model of athletic performance enhancement, because competitive sport is characterized by certain features that are not present in many other enhancement contexts. The advantage that an athlete gets from doping is a purely positional: he might win the race, but this benefit comes at the expense of all the other athletes who rank lower as a result. Moreover, a sport (or a game more generally) is a peculiar kind of activity that is essentially constituted by more or less arbitrary conventions.⁹ In golf, the goal is not simply to get the ball down in the hole—*that* could be achieved easily by picking up the ball and placing it in the hole by hand—rather, the goal is to sink the ball while following a set of rules whose justification may be a combination of tradition, entertainment value, and fairness; but not (narrowly construed) instrumental utility. These and other factors combine to make sports ethics a distinct subfield of practical ethics.

TORBJÖRN TÄNNSJÖ draws a trisinction between “negative” interventions, aimed at curing a disease or eliminating a disability; “positive” interventions, aimed at improving the functioning of a human organism within the range of natural variation; and “enhancement”, by which he means an intervention aiming to take an individual beyond normal functioning of a human organism. In medicine in general, he says, we can accept both positive measures and enhancement. In sports medicine, however, both positive measures and enhancement are viewed with suspicion. Tännsjö believes that the rationale behind this suspicion

has to do with a very special aspect of the ethos of elite sport, the idea that in elite sport we search for the limits of what a human being can do, together with

⁸ Chan, C. K. and Chee, H. L. 1984. ‘Singapore 1984: Breeding for Big Brother’. In *Designer Genes: I.Q., Ideology and Biology, Institute for Social Analysis (Insan)*. Chan, C. K. and Chee, H. L. (eds.), (Malaysia: Selangor), 4–13. (Reference from Singer, this volume.)

⁹ Cf. Suits, B. 2005: *The Grasshopper: Games, Life and Utopia* (Ontario: Broadview Press).

a very special notion of justice according to which we are allowed to admire the individual who has drawn a winning ticket in the natural genetic lottery and excels.

Tännsjö himself, however, does not accept this special notion of justice, so he is unwilling to embrace the ethos of elite sport. Without this ethos, he thinks, there is no need for a special medical ethics for sports medicine. It is enough if elite sport “provides us with good entertainment: fierce, fair, and unpredictable competition—a sweet tension of uncertainty of outcome.” However, he suggests that if we do want to add something to this, it could be the following:

In elite sport we can test out the results of such enhancements and see, not where the limits are of the (given) human nature, but how far we can push them. We can enjoy what we see at the competition, and we can feel admiration for all the scientific achievements that have rendered possible the performances. And we can thank the athletes for taking the inconvenience to test them out before us.

CHRISTINE OVERALL, focusing particularly on life extension, argues that social category identities are relevant for the ethics of enhancement. One’s membership in social categories such as sex, race, and socioeconomic class, she says, largely determines whether or not one has access to the benefits of life enhancement and whether or not one can pay the costs of these enhancements, making questions of access and exclusion important. It would also be a mistake to ignore the ways in which various enhancement practices could affect social attitudes towards various groups. Overall makes the point that enhancement could be used in equality-promoting ways by giving opportunities to disadvantaged groups that they could not otherwise have had. She criticizes bioconservative bioethicist Daniel Callahan’s view that older patients should be denied life-saving treatments on grounds that the normal human life cycle is already enough for a full life. Overall points out that the fullness of a life is not a simple function of age; since, for example, people living in disadvantaged circumstances might have been deprived of important experiences even if they have lived for a long time. Life extension could be the only way in which an old person who has lived a deprived life could get a fair shot at having a full life. One might also add that even for somebody who is living a rich and flourishing life, there may not be any point at which the life becomes “full” in the sense that it could not possibly become better still if it were continued; and even if there were such a point there is no guarantee that it would coincide with

one's seventieth birthday or whatever the "natural lifespan" is taken to be. (Even a tree-life takes much more than three score and ten to complete, so why not a human life?¹⁰)

Francis Fukuyama, who in a widely-cited article nominated transhumanism as "the world's most dangerous idea", believes that liberal democracy depends on the fact that all human beings share the same essence, which in Fukuyama's view consists in some undefined "factor X".¹¹ Were we to engage in enhancement we might unwittingly alter this factor X and thereby destroy the basis of human dignity and the idea of equality underpinning the liberal democratic ideal. In this volume, DANIEL WIKLER, building on his own earlier work, considers specifically the prospect of cognitive enhancement and asks whether civil liberties presuppose roughly equal mental abilities.

Wikler begins by noting that egalitarians need not, and do not, assume that everybody has the same cognitive capacities, or even the same genetic predisposition to intelligence. One must distinguish the empirical claim of human equality of capacities (which is false) from the normative claim that all competent human persons should have the same civic status (which might well be true). Wikler then draws our attention to the paternalism with which we treat human beings with severe or moderate cognitive impairments. Mentally incompetent adults may be barred from voting and from making certain financial decisions, and may even be denied freedom of movement. Now, suppose that cognitive enhancement produced a sizeable population of human beings as intellectually superior to what is now a normally-intelligent person as the latter is to someone who is now regarded as mentally incompetent. In this situation, could we remaining "normals" be rightfully subjected to similar kinds of paternalistic restriction that in the present world are uncontroversially imposed on humans who are mentally incompetent? After distinguishing between a relativistic view and

¹⁰ For arguments for the radical extension of the human lifespan, see Bostrom, N. 2008. 'Letter from Utopia', *Studies in Ethics, Law, and Technology*, 1 (<http://www.nickbostrom.com/utopia.pdf>), and Bostrom, N. 2005: 'The Fable of the Dragon-Tyrant', *Journal of Medical Ethics*, 31: 273–7 (<http://www.nickbostrom.com/fable/dragon.pdf>).

¹¹ Fukuyama, F. 2002. *Our Posthuman Future* (New York: Farrar, Straus and Giroux), 149. For a critique of Fukuyama's view, see Bostrom, N. 2004: 'Transhumanism: The World's Most Dangerous Idea?', *Foreign Policy*, September/October (<http://www.nickbostrom.com/papers/dangerous.html>), Bostrom, N. 2005: 'In Defence of Posthuman Dignity', *Bioethics*, 19: 202–14 (<http://www.nickbostrom.com/ethics/dignity.pdf>), and Bailey, R. 2005: *Libertarian Biology* (New York: Prometheus Books).

a threshold view of what qualifies an individual for full civic status, Wikler answers his own question with a tentative *yes*: under certain circumstances at least, a future population of cognitively superior agents might have a duty to treat remaining normals paternalistically.

ROBIN HANSON addresses one particular intellectual attribute: truth-orientation. He reviews three types of enhancement that might strengthen our truth-orientation: more recording and standardized statistics on our lives, prediction markets on major disputed topics, and techniques or modifications that could render our minds more transparent. Trends towards these kinds of enhancement, he suggests, could reduce the epistemic vice of self-deception and bias—a vice that can be especially dangerous in a modern world with nuclear weapons and other powerful technologies. Yet, as Hanson notes, self-deception and bias are quite central features of our present psyches, their prevalence having been demonstrated in many studies as well as, according to Hanson, by the ubiquity of persistent disagreements even among agents who have mutual knowledge of each other's opinion. We might balk at the prospect of living without illusions when we realize how jarringly different such lives would be from our accustomed condition. If so, we might also be tempted to seek to regulate the behavior of others, including our distant descendants, for example by trying to prevent the development of the technologies that would make an illusion-deprived condition feasible.

Hanson warns against the danger of moral arrogance. Aside from the moral importance of autonomy, he adduces also an epistemic reason for why we should be wary of imposing our moral views on others. Just as we can be, and frequently are, overconfident in our beliefs regarding empirical questions, we can also be, and no doubt frequently are, overconfident in our moral beliefs. We often deceive ourselves into thinking that our moral convictions are better supported by reason than they really are, and better supported than the moral convictions of those who disagree with us. This warning applies particularly when we are tempted to regulate the behavior of future generations of people:

We should also be especially wary of moral arrogance regarding the moral behavior of our distant descendants, as those descendants will have a clear information advantage over us; we cannot listen to them as we could when arguing with a contemporary. Our descendants will know of our advice, and also of many other things we do not know. In addition . . . they may well have a stronger truth orientation than us.

The argument from moral arrogance, Hanson suggests, might cut especially against those who think we should limit truth-orientation enhancements:

The warning to beware of our self-deception regarding our moral abilities would seem to apply with a special force to those who argue the virtues of self-deception. After all, does not the pro-self-deception side in a debate seem more likely to be self-deceived in this matter?

Enhancement as practical challenge

Several of the authors represented in this book, including Francis Kamm and Norman Daniels, express concerns about the difficulty of succeeding and ensuring sufficient safety when attempting to enhance complex systems. In the final chapter of the book, NICK BOSTROM and ANDERS SANDBERG tackle this practical challenge of enhancement heads on.

Bostrom and Sandberg observe that there is a widespread popular belief in the “wisdom of nature”, which we ignore at our peril. Many people prefer “natural” remedies and “natural” food supplements, and willingly embrace “natural” ways of improving human capacities such as training, diet, and grooming. Interventions seen as “unnatural” or “artificial”, by contrast, are commonly viewed with suspicion—at least until they become familiar enough to become assimilated into the category of the natural. This attitude seems to be especially pronounced in relation to unnatural ways of enhancing human capacities, which are viewed as unwise, short-sighted, and hubristic. The belief in the wisdom of nature, Bostrom and Sandberg suggest, can also manifest as diffusely moral objections against enhancement.

Bostrom and Sandberg then propose that the belief in the wisdom of nature is partially true. A human being is a marvel of evolved complexity, and when we manipulate complex evolved systems which are poorly understood, our interventions often fail or backfire. Bostrom and Sandberg seek to encapsulate the grain of truth contained in the belief in the wisdom of nature in form of the Evolutionary Optimality Challenge. When somebody proposes an intervention alleged to enhance some biological function of capacity, we should pose ourselves the following challenge: “Why, if this intervention is such a good thing, have we not already evolved to be that way?”. Developing this evolutionary heuristic, Bostrom and Sandberg go on to explain and exemplify three categories of potential answers to the

challenge question: changed tradeoffs, value discordance, and evolutionary restrictions. For some proposed enhancement interventions, a satisfactory answer to the evolutionary optimality challenge can be found in one of these categories, giving us a green light to proceed: we can see precisely why in the particular case at hand we can reasonably hope to improve on nature. For other proposed interventions, the heuristic gives a red light, suggesting that the intervention may not work, or may have long-term and perhaps subtle side-effects. In such cases, we may need to rethink our enhancement idea or at least proceed with extreme caution.

The heuristic that Bostrom and Sandberg develop (inspired by the field of evolutionary medicine) is primarily empirical and practical in nature: it is intended to help researchers and enhancement users identify and evaluate promising enhancement interventions by providing a method for thinking through what evolutionary considerations can tell us about their likely effects on our minds and bodies. As such, the heuristic has no moral content. Yet if Bostrom and Sandberg are correct in surmising that anti-enhancement intuitions which surface as moral sentiments are sometimes rooted in an implicit belief in nature's wisdom, then the heuristic can also contribute to ethical discourse by allowing for a more transparent and constructive way of acknowledging and taking into account these hidden and subtle prudential concerns.

Conclusion

Human enhancement has moved from the realm of science fiction to that of practical ethics. There are now effective physical, cognitive, mood, cosmetic, and sexual enhancers—drugs and interventions that can enhance at least some aspects of some capacities in at least some individuals some of the time. The rapid advances currently taking place in the biomedical sciences and related technological areas make it clear that a lot more will become possible over the coming years and decades. The question has shifted from “Is this science fiction?” to “Should we do it?”¹²

¹² It remains important, however, to distinguish between what is possible today, what may become feasible soon, and what would require radical new technological capabilities to achieve. And in answering the question of what is possible today, it is also important to distinguish proof-of-concept in a laboratory study from applications that are ready to be rolled out for widespread use.

This book presents a wide variety of perspectives relevant to answering this question. Christine Overall, in an assessment which seems to be supported by many of our authors, opines that given the enormous variation, moral generalizations about all enhancement processes and technologies are unwise, and they should instead be evaluated individually. Whether we should employ a particular enhancement depends on the reasons for and against that particular enhancement. Creating superimmunity to all known biological and viral insults is very different from practicing sports doping; choosing the personality traits of our offspring through genetic selection is very different from taking a pill that temporarily boosts our ability to concentrate. On this line of reasoning, it is time to take a further step, from asking “Should we do it?” to analyzing the “it” and asking a number of much more specific questions about concrete actions and policy options related to particular enhancement issues within a given sociopolitical-cultural context. The result of this will not be a yes or no to enhancement in general, but a more contextualized and particularized set of ideas and recommendations for how individuals, organizations, and states should move forward in an enhancement era.¹³

Where do we go from here? We believe that the enhancement debate needs to be developed simultaneously in two directions: both, as we might say, downwards and upwards. The “downwards” direction is the one just suggested: zooming in on issues of more limited scale by disaggregating and contextualizing enhancements, and addressing the particularities of the choices faced by various stakeholders and decision-makers. The “upwards” direction is to address ethical and pragmatic challenges that emerge when we zoom out and consider the roles that enhancement of various types of capacity could play in the long term and big-picture future of humanity. This would require discussing how enhancement—including the prospect of future more radical enhancement—might interact with other macro-trends and global problems and prospects such as economic growth and inequality, existential risks and global catastrophic risks, molecular nanotechnology, artificial intelligence, space colonization, virtual reality, surveillance technology, democracy and global governance, along with the deep epistemological, methodological, and moral questions that arise

¹³ Savulescu, J. 2003. ‘Human–animal transgenesis and chimeras might be an expression of our humanity’, *Am J Bioethics*. Summer, 3(3): 22–5.

when one attempts to think about these interlocking issues in a serious and critical manner.¹⁴ These two directions may seem to be in tension to one another, but in fact they simply point to two coexisting intellectual frontiers, each with important and worthy problems to be addressed. A danger we see for enhancement ethics is its getting stuck in the middle. An uncritical acceptance of “enhancement” as an analytical category and as an organizing idea for our inquiries risks obscuring the heterogeneity of potential enhancement applications and the need to situate them within the micro-context of particular policy decisions, as well as within the macro-context constituted by other big-picture challenges for humanity in the twenty-first century. In some circumstances, regulated access may be fairer and safer than prohibition.¹⁵ In other cases, enhancements could be selected to address inequality or social injustice,¹⁶ or deployed at a population level for societal benefit. One spokesperson for the US Military, which is actively exploring the potential of human enhancement technology, said

The world contains approximately 4.2 billion people over the age of twenty. Even a small enhancement of cognitive capacity in these individuals would probably have an impact on the world economy rivaling that of the internet.¹⁷

It seems likely that this century will herald unprecedented advances in nanotechnology, biotechnology, information technology, cognitive science, and other related areas. These advances will provide the opportunity

¹⁴ See e.g. Bostrom, N. 2007. ‘Technological Revolutions and the Problem of Prediction’. In *Nanoethics: The Ethical and Social Implications of Nanotechnology*. Allhoff, F., Lin, P., Moor, J. and Weckert, J. (eds.), Wiley-Interscience (<http://www.nickbostrom.com/revolutions.pdf>), and Bostrom, N. 2007. ‘The Future of Humanity’. In *New Waves in Philosophy of Technology*. Berg Olsen, J. K., Selinger, E. and Aldershot, S. R. (eds.) (Basingstoke: Palgrave Macmillan).

¹⁵ Savulescu, J., ‘It Is Time to Allow Doping at the Tour de France’, *The Telegraph*, 30 Jul. 2007. <http://www.telegraph.co.uk/sport/main.jhtml?view=DETAILS&grid=A1YourView&xml=/sport/2007/07/30/sodrug130.xml>, accessed 8 February 2008. ‘Doping true to the Spirit of Sport’, Julian Savulescu, *Sydney Morning Herald*, Aug. 8, <http://www.smh.com.au/news/opinion/doping-true-to-the-spirit-of-sport/2007/08/07/1186252704241.html>, accessed 8 Feb. 2008. J Savulescu, B Foddy, and M Clayton, ‘Why we should allow performance enhancing drugs in sport’, in *British Journal of Sports Medicine*, Dec. 2004; 38: 666–70. Savulescu, J., and Foddy, B., 2007. ‘Ethics of Performance Enhancement in Sport: Drugs and Gene Doping’, in *Principles of Health Care Ethics*, Second Edition, Ashcroft, R E., Dawson, A., Draper, H. and McMillan, J. R. (eds.) (London: John Wiley & Sons, Ltd), 511–20.

¹⁶ Savulescu, J. 2006. ‘Justice, Fairness and Enhancement’. In *Progress in Convergence: Technologies for Human Wellbeing*, eds. Sims Bainbridge, W. and Roco, M. C. *Annals of the New York Academy of Sciences* vol. 1093 doi: 10.1196/annals.1382.021, Ann. N.Y. Acad. Sci. 1093: 321–38.

¹⁷ Army: Proposal Submission, at <http://www.dodsbir.net/solicitation/sttro8A/armyo8A.htm>, accessed 8 Feb. 2008.

fundamentally to change the human condition. This presents both great risks and enormous potential benefits. Our fate is, to a greater degree than ever before in human history, in our own hands.

To decide whether we have reason to promote a particular enhancement will require wisdom, dialogue, good scientific research, good public policy, and academic debate. This book represents one of the first steps to advancing academic discussion of enhancement from a variety of analytic philosophical perspectives. It is neither our expectation nor our primary objective that readers will be persuaded either to support or oppose enhancement. Rather, our hope is that the book will cause its readers to reflect more deeply on one of the most important and challenging issues of the new century.¹⁸

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¹⁸ We are grateful to Rebecca Roache for valuable comments on an earlier version of this introduction.

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