# Resolved: The non-therapeutic use of human enhancement technologies is immoral

# Topic Introduction

**Resolved: The non-therapeutic use of human enhancement technologies is immoral**

 This topic poses a timely, specific question about what the moral implications are of technologies that modify human beings beyond their given capacities or abilities. The wording of this topic is very important to understand its boundaries and scope.

 Human enhancement technologies are any device, medical intervention, treatment, or substance that expands or increases a human being’s physical or mental capabilities. The limiting term ‘non-therapeutic’ means that this topic is not about technologies that are responsive to a medically diagnosable condition that might be considered a deficit to a person. This means that the topic is not about artificial heart valves, usage of Adderall by individuals experiencing ADHD, or replacing amputated extremities with prosthetic limbs. Instead, this topic is likely considering technologies such as germ line genetic modification (used strictly for the purpose of increasing a person’s abilities beyond their otherwise natural, normal baseline), cybernetic implants, or the un-prescribed usage of nootropics.

 Most affirmative arguments on this topic will center on either the in viability of human beings or the potential unintended consequences of non-therapeutic enhancements. Many philosophical traditions place a unique primacy on human beings as the moral and epistemological basis for the world. Similarly, many religious traditions teach that protecting the purity or intactness of the human body is a moral imperative. From these starting points, many different arguments might be advanced about the importance of human-ness as it currently exists. In a different stream, many bioethicists have raised concerns about the unintended consequences of modifying human beings beyond their natural state. Included in these potential affirmative scenarios are grey goo, eugenics, the construction of new social hierarchies, and overpopulation.

 Negative arguments on this topic will likely focus on the potential benefits of human enhancement and the moral rightness of allowing individuals to control what they do with their own body. While the latter of these strategies will seek to garner offense through a focus on concepts of liberty, privacy, and individualism the former offers many different areas of focus. Authors from a variety of academic disciplines advance extending the human life span, decreasing violence and aggression, adapting to a changing global climate, and the minimization of social inequality as potential positive consequences of embracing human enhancement.

 Finally, transhumanism is a philosophical approach that debaters will want to familiarize themselves with on both sides of this topic. Transhumanists argue (often on philosophical grounds) that there is an imperative to ‘evolve’ homo sapiens into a new form of life via emergent technology. Philosophers have written both in support and opposition of transhumanism, often in bombastic prose.

# Further Reading

Allhoff, F., Lin, P., Moor, J., & Weckert, J. (2010). Ethics of human enhancement: 25 questions & answers. Studies in Ethics, Law, and Technology, 4(1).

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Haraway, D. J. (1985). A manifesto for cyborgs: Science, technology, and socialist feminism in the 1980s (pp. 173-204). San Francisco, CA: Center for Social Research and Education.

Koch, T. (2010). Enhancing who? Enhancing what? Ethics, bioethics, and transhumanism. Journal of medicine and Philosophy, 35(6), 685-699.

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Persson, I., & Savulescu, J. (2010). Moral transhumanism. Journal of Medicine and Philosophy, 35(6), 656-669.

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# \*\*\*AFF\*\*\*

## \*\*\*AC\*\*\*

**I affirm: “Resolved: The non-therapeutic use of human enhancement technologies is immoral”**

**The wording of the resolution indicates that the highest value to be upheld in this round is Morality.**

**The best standard to uphold morality is Personalism. Williams and Thomas explain in 2016**

Williams, Thomas D. and Bengtsson, Jan Olof, "Personalism", The Stanford Encyclopedia of Philosophy (Summer 2016 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/sum2016/entries/personalism/>. Williams, Thomas D. and Bengtsson, Jan Olof, "Personalism", The Stanford Encyclopedia of Philosophy (Summer 2016 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/sum2016/entries/personalism/>.

Personalism posits ultimate reality and value in personhood — human as well as (at least for most personalists) divine. It emphasizes the significance, uniqueness and inviolability of the person, as well as the person’s essentially relational or communitarian dimension. The title “personalism” can therefore legitimately be applied to any school of thought that focuses on the reality of persons and their unique status among beings in general, and personalists normally acknowledge the indirect contributions of a wide range of thinkers throughout the history of philosophy who did not regard themselves as personalists. Personalists believe that the human person should be the ontological and epistemological starting point of philosophical reflection. They are concerned to investigate the experience, the status, and the dignity of the human being as person, and regard this as the starting-point for all subsequent philosophical analysis.

**Contention 1: Non-Therapeutic Human Enhancement leads to eugenics**

UMS 15

UNESCO Media Services. UNESCO panel of experts calls for ban on “editing” of human DNA to avoid unethical tampering with hereditary traits (https://en.unesco.org/news/unesco-panel-experts-calls-ban-editing-human-dna-avoid-unethical-tampering-hereditary-traits). October 2015.

At the close of a meeting at UNESCO in Paris, independent experts of the Organization’s International Bioethics Committee (IBC) published a report “Updating its Reflection on the Human Genome and Human Rights.” In it, the experts argue that “gene therapy could be a watershed in the history of medicine and genome editing is unquestionably one of the most promising undertakings of science for the sake of all humankind.” But the IBC report cautions that “this development seems to require particular precautions and raises serious concerns, especially if the editing of the human genome should be applied to the germline and therefore introduce hereditary modifications, which could be transmitted to future generations” The IBC therefore called for a moratorium on this specific procedure, at its meeting, on the human genome and human rights. Recent advances have opened the door to genetic screening and testing for inherited diseases, gene therapy, the use of embryonic stem cells in medical research and the possibility of cloning and genetic “editing” for both medical and non-medical ends. “Interventions on the human genome should be admitted only for preventive, diagnostic or therapeutic reasons and without enacting modifications for descendants,” says the IBC, arguing that the alternative would “jeopardize the inherent and therefore equal dignity of all human beings and renew eugenics.” The IBC reports that rapid advances in genetics are making “designer babies” an increasing possibility, prompting calls among scientists and bioethicists for a wider public debate about the power of science to modify genetically human embryos in the laboratory, so as to control inherited traits, such as appearance and intelligence.

**Contention 2:** **Non-Therapeutic Human Enhancement creates the worst, most destructive forms of individualism.**

Foht 15

The Case Against Human Gene Editing: Conservatives and progressives both have reasons for opposing it. By Brendan Foht December 4, 2015 Brendan P. Foht is an associate editor of The New Atlantis: A Journal of Technology and Society. http://www.nationalreview.com/node/428024/print

But conservatives are uniquely suited to point out that gene editing unites two errors characteristic of our age: genetic perfectionism and an overemphasis on individual autonomy. First, we conservatives understand that the family is the foundational unit of society, and that its basic structure — a married man and woman having children whom they love and care for unconditionally — should not be tinkered with by social or biological engineers. The eugenics movement put an abstraction, the human gene pool, above that fundamental unit of society, the family. Second, biotechnologies like gene editing risk combining the problem of genetic perfectionism with an extreme emphasis on individual autonomy. Gene editing is thought to offer a way for parents to maximize their control over the properties of their offspring, transforming a relationship that should be characterized by unconditional love and acceptance into one in which children are seen as products of their parents’ desires and wishes, to be provisionally accepted and molded in accord with parental preferences.

**Contention 3: Non-Therapeutic Human Enhancement produces new forms of oppression**

**Subpoint A: Moral status**

Douglas 2013

Douglas, T. (2013). Human enhancement and supra-personal moral status. Philosophical Studies, 162(3), 473–497. http://doi.org/10.1007/s11098-011-9778-2. Douglas is a prof. at Balliol College, University of Oxford.

We (existing human persons) have moral reasons not to encourage certain human enhancements: those that would create supra-persons.3 Some protagonists in the ethical debate about human enhancement appear to have been moved by this line of thinking—from (1) and (2) to (3). In a critique of transhumanism, the movement most strongly committed to human enhancement, Fukuyama (2004, p. 42) writes that Underlying [the] idea of the equality of rights is the belief that we all possess a human essence that dwarfs manifest differences in skin color, beauty, and even intelligence. This essence, and the view that individuals therefore have inherent value, is at the heart of political liberalism. But modifying that essence is the core of the transhumanist project. If we start transforming ourselves into something superior, what rights will these enhanced creatures claim, and what rights will they possess when compared to those left behind?

**Subpoint B: Techno Poverty**

Wolbring 2008

Dr Gregor Wolbring is a biochemist, bioethicist, health researcher, futurist and disability studies and governance of science and technology scholar with appointments at a number of universities, May 28th, 2008, NanoWerk [http://www.nanowerk.com/spotlight/spotid=5848.php](http://www.nanowerk.com/spotlight/spotid%3D5848.php),

Those deemed healthy by most people today, but who cannot afford or don’t want the technological enhancements, will became the new class of 'techno-poor disabled.' Billions of people that today are seen as healthy will become disabled not because their bodies have changed, but precisely because they have not changed their bodies in accordance with the transhumanist norm.

## \*\*\*AFF CARDS\*\*\*

#### Habermas says NTHE is bad, two reasons

Zizek 03

Slavoj Žižek , “Bring me my Philips Mental Jacket” in London Review of Books Vol. 25 No. 10 · 22 May 2003 Accessed online @ <http://www.lrb.co.uk/v25/n10/slavoj-zizek/bring-me-my-philips-mental-jacket> on 11/2/09

In a talk he gave in Marburg in 2001, Habermas repeated his warning against biogenetic manipulation. There are, as he sees it, two main threats. First, that such interventions will blur the borderline between the made and the spontaneous and thus affect the way we understand ourselves. For an adolescent to learn that his ‘spontaneous’ (say, aggressive or peaceful) disposition is the result of a deliberate external intervention into his genetic code will undermine the heart of his identity, putting paid to the notion that we develop our moral being through Bildung, the painful struggle to educate our natural dispositions. Ultimately, biogenetic intervention could render the idea of education meaningless. Second, such interventions will give rise to asymmetrical relations between those who are ‘spontaneously’ human and those whose characters have been manipulated: some individuals will be the privileged ‘creators’ of others.

#### Don’t trust their authors

Foht 15

The Case Against Human Gene Editing: Conservatives and progressives both have reasons for opposing it. By Brendan Foht December 4, 2015 Brendan P. Foht is an associate editor of The New Atlantis: A Journal of Technology and Society. http://www.nationalreview.com/node/428024/print

All too often, deliberations about new biotechnologies seem to focus on managing public opinion so that scientists won’t have to worry about the pesky obstructions of democratic oversight or moral arguments. Those who take a strong moral stance against the manipulation of human genetics or the destruction of human embryos are generally not welcome at these kinds of meetings. After all, the suggestion that we should not pursue some scientific avenues because they represent the unjust exploitation of human beings spoils the whole idea of coming to a consensus about how best to “move forward.”

#### NTHE= Destruction of human dignity

Douglas 2013

Douglas, T. (2013). Human enhancement and supra-personal moral status. Philosophical Studies, 162(3), 473–497. http://doi.org/10.1007/s11098-011-9778-2. Douglas is a prof. at Balliol College, University of Oxford.

A typical adult human enjoys a special moral status. This status is often thought to confer certain basic rights or claims—for example, to self-determination and freedom from some forms of non-consensual interference. I will use the term ‘persons’ to refer to the class of beings with the moral status (or one of the moral statuses) characteristic of currently typical adult humans. Many believe that our nearest primate relatives fail to qualify as persons; their moral status is lower than ours. This difference is often attributed to their lesser mental capacity. Perhaps it is due to their lacking rationality, practical rationality, or the capacity for moral agency. But if chimpanzees and other primates possess lower moral status than persons in virtue of their lesser mental capacity, we might speculate that beings with greater mental capacity than us would possess a higher moral status than persons—a supra-personal moral status. This possibility has long been a topic of theological speculation.1 More recently it has been attributed practical significance in one of the liveliest debates in contemporary philosophical bioethics: it has been taken to ground an objection to the enhancement of certain human capacities. Some drugs have been shown to enhance aspects of mental functioning in healthy individuals (de Jongh et al. 2008). To date, the demonstrated effects have been small. But further advances in neuropharmacology, brain–machine interface technologies and genetics may, in the future, enable the creation of beings whose mental capacity substantially exceeds our own, perhaps to a degree similar to that by which our capacity exceeds that of our nearest primate relatives. This has led some authors to speculate that The technological enhancement of human mental capacities could result in the creation of beings with supra-personal moral status (‘supra-persons’).2 Arguably, mere persons could be permissibly harmed for the sake of these supra-persons in ways that they may not be permissibly harmed for the sake of one another. For example, perhaps persons could permissibly be used, without their consent, in medical experiments designed to aid supra-persons. Or perhaps persons could be rightly excluded from the democratic institutions of the supra-persons. This raises the concern that The creation of supra-persons would harm ordinary, unenhanced humans.

# \*\*\*NEG\*\*\*

## \*\*\*NC\*\*\*

**I Negate: “Resolved: The non-therapeutic use of human enhancement technologies is immoral”**

**The wording of the resolution indicates that the highest value to be upheld in this round is Morality.**

**And, the best standard for achieving Morality in a contemporary context is consequentialism, or seeking the best outcomes for the most people, according to Bok in 98:**

Sissela Bok (Professor of Philosophy) 1998 Applied Ethics and Ethical Theory, Ed. David Rosenthal and Fudlou Shehadi.

The same argument can be made for Kant’s other formulations of the Categorical Imperative: “So act as to use humanity, both in your own person and in the person of every other, always at the same time as an end, never simply as a means”; and “So act as if you were always through actions a law-making member in a universal Kingdom of Ends.” No one with a concern for humanity could consistently will to risk eliminating humanity in the person of himself and every other or to risk the death of all members in a universal Kingdom of Ends for the sake of justice. To risk their collective death for the sake of following one’s conscience would be, as Rawls said, “irrational, crazy.” And to say that one did not intend such a catastrophe, but that one merely failed to stop other persons from bringing it about would be beside the point when the end of the world was at stake. For although it is true that we cannot be held responsible for most of the wrongs that others commit, the Latin maxim presents a case where we would have to take such a responsibility seriously—perhaps to the point of deceiving, bribing, even killing an innocent person, in order that the world not perish.

**Contention 1: Traditional approaches to morality don’t work in the context of human enhancement**

**Sub Point A: Non-Therapeutic Human Enhancement requires the modification of existent systems of ethics. Without modification these systems will collapse.**

Miah 2012

Ethics Issues Raised by Human Enhancement By Andy Miah 2012 (https://www.bbvaopenmind.com/en/article/ethics-issues-raised-by-human-enhancement/?fullscreen=true) Andy Miah, Chair in Science Communication & Digital Media, in the School of Environment & Life Sciences, University of Salford, Manchester. He is also Global Director for the Centre for Policy and Emerging Technologies, Fellow of the Institute for Ethics and Emerging Technologies, United States, and Fellow at FACT, the Foundation for Art and Creative Technology, United Kingdom. He is author of Genetically Modified Athletes (2004 Routledge), co-author of The Medicalization of Cyberspace (2008, Routledge) and editor of Human Futures: Art in an Age of Uncertainty (2008, Liverpool University Press). He has published over 150 academic articles in refereed journals, books, magazines, and national media press on the subjects of cyberculture, medicine, technology, and sport. He regularly interviews for the media and has published in the Washington Post, the Huffington Post and a range of British broadsheet newspapers.

The prospect of human enhancement has attracted considerable attention from scholars, the media and policymakers alike, each of whom have debated the ethical and moral desirability of such circumstances and the practical social and legal implications arising from a culture of human enhancement. Indeed, over the last 10 years alone, various governments have investigated these prospects, interested in understanding the magnitude of these trends for society. One cannot understate the breadth of these implications, as both advocates and critics of human enhancement agree that they will change fundamental parameters of human existence (Fukuyama 2002, Harris 2007). In a world where achievements are brought about more by technological intervention than effort, the entire system of justice that underpins society is brought into question. Alternatively, if a patient can ask a doctor to ensure that their medicine has an enhancing rather than simply reparative outcome, then the role of medicine and health care, along with the relationship between the doctor and patient changes considerably. Determining the legitimacy and desirability of such changes is crucial to a global economy, as the transformation to health care and welfare that is implied by human enhancement has critical implications for how society is organized. Thus, healthier people will mean the prospect of longer lives, which in turn will mean a growing ageing population. These circumstances will have an impact on various social provisions and the broader economic infrastructure of a society, requiring people and governments to revise their expectations about the duration of the working life, the economics of pension funds, and the provision of health insurance, among other things. It may influence what kinds of lives people lead, such as when they have children, or what kind of career they pursue. Thus, the consequences of human enhancement pervade all aspects of modern life, creating demands on social systems that may bring about their collapse, if they are not rethought. This is why it is important for governments to understand the rise of human enhancement technologies, in order to address their overarching implications for the future of humanity.

**Sub Point B: Philosophically, there is nothing unique about human enhancement**

Bostrom and Roache 2008

“Ethical Issues in Human Enhancement” by Nick Bostrom and Rebecca Roache [Published in New Waves in Applied Ethics, eds. Jesper Ryberg, Thomas Petersen & Clark Wolf (Pelgrave Macmillan, 2008): pp. 120-152] [pdf]. Available online: https://www.nickbostrom.com/ethics/human-enhancement.html

Let us address the latter part of this objection first. One response is that, whilst the idea of extending lifespan by directly addressing the mechanism that causes us to age may be fairly novel, attempts to prolong life are all around us. Medicine, seatbelts in cars, health warnings on cigarettes, and the fluorescent jackets that roadside labourers wear are all designed to prolong the life of those who use them. If prolonging life is to be discouraged, we should not only forego enhancement, but also rethink the way we live and commit to less cautious lifestyles.

**Contention 2: The consequences of Non-Therapeutic Human Enhancement are a net good**

**Sub Point A: Non-Therapeutic Human Enhancement can solve all suffering, that makes it a moral imperative**

Pearce 09

Interview with David Pearce, Oxford trained Philosopher, author, and researcher. , September 16, 2009, Genomic Bodhisattva, in H+ Magazine, written by James Kent accessed online @ <http://www.hplusmagazine.com/articles/bio/genomic-bodhisattva> on 10/29/09

 “May all that have life be delivered from suffering,” said Gautama Buddha. But is this scientifically feasible? As a teenager, I read The Selfish Gene. Suffering exists only because it helps our DNA leave more copies of itself. I also stumbled across the electrode studies of Olds and Milner on the reward centers of the brain. Uniquely, the experience of pure pleasure shows no physiological tolerance: an important clue. Yet a whole civilization based on intracranial self-stimulation doesn’t seem sociologically feasible. Only two other options struck me as viable: pharmacology and genetic engineering. It’s hard to see how therapeutic drugs could abolish mental and physical pain altogether unless we’re willing to medicate our children from birth. By contrast, germline gene-therapy can potentially deliver a cure. Study of the genetics of mood disorders convinced me that we could edit our source code to recalibrate the hedonic treadmill. In principle, postgenomic medicine can genetically alter our “hedonic set-point” so we enjoy life-long mental health based on gradients of intelligent bliss. A new system of motivation may emerge. More practically, the imminent reproductive revolution of designer babies is likely to exert immense selection pressure in favor of “happy” genotypes. Of course transhumanists have more ambitious goals than abolishing suffering. Thus I predict our super-intelligent descendants will be fired by gradients of bliss orders of magnitude richer than today’s peak experiences every moment of their quasi-immortal lives. But getting rid of all (involuntary) suffering strikes me as the basis of any future civilization. I can’t conceive anything more morally urgent.

**Sub Point B: Non-Therapeutic Human Enhancement can solve extinction and violence**

Pearce 09

Interview with David Pearce, Oxford trained Philosopher, author, and researcher. , September 16, 2009, Genomic Bodhisattva, in H+ Magazine, written by James Kent accessed online @ <http://www.hplusmagazine.com/articles/bio/genomic-bodhisattva> on 10/29/09

Proactive gene-modification to enrich our capacity for empathy strikes me as morally admirable. “Docile” is a loaded word; if you’d said “pacific” instead, I’d agree. In an era of weapons of mass destruction and bioterrorism, human survival may even depend on it. Until humans establish self-sustaining bases beyond the Earth on the Moon and Mars, the extinction of intelligent life itself is a non-negligible possibility. Britain’s Astronomer Royal, Martin Rees, estimates the probability of human extinction before the year 2100 is around 50 percent! The world’s predators aren’t confined to violent criminals or the mentally ill: they include “statesmen” holding senior positions of political and military power. The genetic source of most human predatory behavior has been identified: the Y chromosome. However, this is one risk factor we’re probably stuck with for a long time to come. Competitive alpha male dominance behavior is perhaps the greatest underlying threat to what we call civilization. Human history to date attests to the gruesome effects of testosterone-driven male behavior.

## \*\*\*NEG CARDS\*\*\*

#### A2: NTHE =/= Medicine

Miah 2012

Ethics Issues Raised by Human Enhancement By Andy Miah 2012 (https://www.bbvaopenmind.com/en/article/ethics-issues-raised-by-human-enhancement/?fullscreen=true) Andy Miah, Chair in Science Communication & Digital Media, in the School of Environment & Life Sciences, University of Salford, Manchester. He is also Global Director for the Centre for Policy and Emerging Technologies, Fellow of the Institute for Ethics and Emerging Technologies, United States, and Fellow at FACT, the Foundation for Art and Creative Technology, United Kingdom. He is author of Genetically Modified Athletes (2004 Routledge), co-author of The Medicalization of Cyberspace (2008, Routledge) and editor of Human Futures: Art in an Age of Uncertainty (2008, Liverpool University Press). He has published over 150 academic articles in refereed journals, books, magazines, and national media press on the subjects of cyberculture, medicine, technology, and sport. He regularly interviews for the media and has published in the Washington Post, the Huffington Post and a range of British broadsheet newspapers.

One of the difficulties with the human enhancement debate is the lack of consensus around what counts as an enhancement. It is often argued that the ethically questionable practice of human enhancements may be distinguished conceptually from the more accepted practice of human repair or therapy. However, it is misleading to suggest that medicine has always confined itself to just repair, or that there is agreement on the acceptability of how medicine is typically practiced today. Indeed, contemporary medical practice draws on a definition of health that is informed by the broader socio-cultural conception of well-being, which acknowledges that health is not always adequately described by examining just physiological deficiencies. Instead, a lack of good health may be explained by lifestyle conditions, which require social rather than medical solutions. Alternatively, such practices as in-vitro fertilization to treat infertility, abortion to avoid the possible psychological trauma of bearing a child, or physician-assisted suicide to ease the suffering of people at the end of the lives, are each examples of medicine applying a definition of health that transcends merely biological dysfunction. Yet, there is ongoing controversy about whether these interventions are consistent with the proper role of medicine. Equally, it is untrue to presume that the conditions treated by therapeutic medicine can be detached from some lifestyle that a patient has led. Whether it is alcohol consumption, sunbathing, smoking, lack of exercise, or playing high-risk sports, the lives people lead contribute to their eventual need for medical care. To this end, the proper role of medicine is the business of making people well for a particular kind of life they wish to lead, rather than just making people healthy in some abstract sense. A dancer may need physiotherapy to treat an injury arising from their profession, or a student may need cognitive enhancers to address anxiety caused by the prospect of difficult exams. While not each of these examples can be treated equally in terms of whether they justify medical attention, they reveal how it is not possible to consider medical interventions that are divorced from the environment within which a medical risk becomes a health care need. In this respect, one may identify two different definitions of health, one which relies on biomedical markers of medical need, and another which draws attention to the biocultural characteristics of ill health. For the former, one may be more inclined to discuss the biological indicators of good or ill health, while the latter will discuss health as a social concept, whereby medical intervention is explained with recourse to the social and cultural conditions that determine an assessment over whether a subject is leading a healthy life or in need of medical assistance. Good examples of this are various forms of disability which, beyond the medical treatment of the condition, require various societal changes to ensure that the debilitating effects of the condition are not exacerbated by feelings of exclusion or an inability to function within the social world. In sum, it is erroneous to suggest that medicine simply treats people therapeutically, insofar as this can be contrasted with enhancement. Indeed, medicine undertakes preventive measures with healthy subjects, before any health care need is apparent, as in the case of childhood inoculations. These examples reveal how humanity is generally predisposed to pursue new forms of medical intervention that can prolong survival. However, these instances are not generally the subject of debates on human enhancements. To get closer to this concept, it is useful to consider another example—the fluoridation of tap water, which is commonly practiced in numerous countries which aim to reduce levels of teeth and gum decay. Over the years, the amount of fluoride within the drinking water of many countries has risen, as dietary habits and ingredients, along with dental hygiene standards, may have decreased. However, the more general point is that, from a purely economic perspective, one of the most effective contributions a nation may make to the oral health—and thus general health—of its citizens it is to include fluoride in the water. In each of these examples, we encounter medical interventions that test the boundaries between therapy and enhancement and each reveals that the line is far from clear.

#### A2: Loss of humanity!

Miah 2012

Ethics Issues Raised by Human Enhancement By Andy Miah 2012 (https://www.bbvaopenmind.com/en/article/ethics-issues-raised-by-human-enhancement/?fullscreen=true) Andy Miah, Chair in Science Communication & Digital Media, in the School of Environment & Life Sciences, University of Salford, Manchester. He is also Global Director for the Centre for Policy and Emerging Technologies, Fellow of the Institute for Ethics and Emerging Technologies, United States, and Fellow at FACT, the Foundation for Art and Creative Technology, United Kingdom. He is author of Genetically Modified Athletes (2004 Routledge), co-author of The Medicalization of Cyberspace (2008, Routledge) and editor of Human Futures: Art in an Age of Uncertainty (2008, Liverpool University Press). He has published over 150 academic articles in refereed journals, books, magazines, and national media press on the subjects of cyberculture, medicine, technology, and sport. He regularly interviews for the media and has published in the Washington Post, the Huffington Post and a range of British broadsheet newspapers.

In response, it is important to acknowledge how the biological characteristics of the human species have always been changing. Beyond the broad evolutionary claim, the last 100 years have brought about dramatic changes in living conditions that have transformed what kind of health people can expect to enjoy. In short, what is considered to be normal health today is radically different from what it was 200 years ago. Today, people in developed countries can expect to survive many previously life-threatening conditions, while life expectancy and even such biological parameters as height have changed considerably. Many of these changes have become constitutive features of modern medicine and have been achieved by scientific discoveries or insights that are again far removed from debates about human enhancement, such as knowledge about sanitation and hygiene. Yet, these examples have certainly enhanced humanity, bringing into question, again, where one focuses the current debate about the ethical concerns arising from human enhancements.

#### No distinction between NTHE and regular medicine

Bostrom and Roache 2008

“Ethical Issues in Human Enhancement” by Nick Bostrom and Rebecca Roache [Published in New Waves in Applied Ethics, eds. Jesper Ryberg, Thomas Petersen & Clark Wolf (Pelgrave Macmillan, 2008): pp. 120-152] [pdf]. Available online: https://www.nickbostrom.com/ethics/human-enhancement.html

Enhancement is typically contraposed to therapy. In broad terms, therapy aims to fix something that has gone wrong, by curing specific diseases or injuries, while enhancement interventions aim to improve the state of an organism beyond its normal healthy state. However, the distinction between therapy and enhancement is problematic, for several reasons. First, we may note that the therapy-enhancement dichotomy does not map onto any corresponding dichotomy between standard-contemporary-medicine and medicine-as-it-could-be-practised-in-the-future. Standard contemporary medicine includes many practices that do not aim to cure diseases or injuries. It includes, for example, preventive medicine, palliative care, obstetrics, sports medicine, plastic surgery, contraceptive devices, fertility treatments, cosmetic dental procedures, and much else. At the same time, many enhancement interventions occur outside of the medical framework. Office workers enhance their performance by drinking coffee. Make-up and grooming are used to enhance appearance. Exercise, meditation, fish oil, and St John’s Wort are used to enhance mood. Second, it is unclear how to classify interventions that reduce the probability of disease and death. Vaccination can be seen as an immune system enhancement or, alternatively, as a preventative therapeutic intervention. Similarly, an intervention to slow the aging process could be regarded either as an enhancement of healthspan or as a preventative therapeutic intervention that reduces the risk of illness and disability. Third, there is the question of how to define a normal healthy state. Many human attributes have a normal (bell curve) distribution. Take cognitive capacity. To define abnormality as falling (say) two standard deviations below the population average is to introduce an arbitrary point that seems to lack any fundamental medical or normative significance. One person might have a recognizable neurological disease that reduces her cognitive capacity by one standard deviation (1σ), yet she would remain above average if she started off 2σ above the average. A therapeutic intervention that cured her of her disease might cause her intelligence to soar further above the average. We might say that for her, a normal healthy state is 2σ above the average, while for most humans the healthy state is much lower. In contrast, for somebody whose “natural” cognitive capacity is 2σ below the average, an intervention that increased it so that she reached a point merely 1σ below the average would be an enhancement. As a result, an enhanced person may end up with lower capacity than even an unenhanced person with subnormal cognitive functioning; and therapeutic treatment may turn a merely gifted person into a genius. In cases like these, it is hard to see what ethical significance attaches to the classification of an intervention as therapeutic or enhancing. Moreover, in many cases it is unclear that there is a fact of the matter as to whether the complex set of factors determining a person’s cognitive capacity is pathological or normal. Does having a gene present in 20% of the population that correlates negatively with intelligence constitute a pathology? Having a large number of such genes might make an individual cognitively impaired or even retarded, but not necessarily through any distinctive pathological process. The concepts of “disease” or “abnormality” may not refer to any natural kind in this context. These concepts are arguably not useful ways of characterizing a constellation of factors that are normally distributed in a population, as are many of the factors influencing cognitive capacity or other candidate targets for enhancement. A concept that defined enhancement as an improvement achieved otherwise than by curing specific disease or injury would inherit these problems of defining pathology. Fourth, capacities vary continuously not only within a population but also within the lifespan of a single individual. When we mature, our physical and mental capacities increase; as we grow old, they decline. If an intervention enables an 80-year-old person to have the same physical stamina, visual acuity, and reaction time as he had in his twenties, does that constitute therapy or enhancement? Either alternative seems as plausible or natural as the other, suggesting again that the concept of enhancement fails to pick out, in any clear or useful way, a scientifically significant category. Fifth, we may wonder how “internal” an intervention has to be in order to count as an enhancement (or a therapy). Lasik surgery is a therapy for poor vision. What about contact lenses? Glasses? Computer software that presents text in an enlarged font? A personal assistant who handles all the paperwork? Without some requirement that an intervention be “internal”, all technologies and tools would constitute enhancements in that they give us capacities to achieve certain outcomes more easily or effectively than we could otherwise do. If we insist on an internality constraint, as we must if the concept of enhancement is not to collapse into the concept of technology generally, then we face the problem of how to define such a constraint. If we believe that enhancements raise any special ethical issues, we also face the challenge of showing why the particular way we have defined the internality constraint captures anything of normative significance. Sixth, even if we could define a concept of enhancement that captured some sort of unified phenomenon in the world, there is the problem of justifying the claim that the moral status of enhancements is different from that of other kinds of interventions that modify or increase human capacities to the same effect.

#### Only NTHE can extend human life

Bostrom and Roache 2008

“Ethical Issues in Human Enhancement” by Nick Bostrom and Rebecca Roache [Published in New Waves in Applied Ethics, eds. Jesper Ryberg, Thomas Petersen & Clark Wolf (Pelgrave Macmillan, 2008): pp. 120-152] [pdf]. Available online: https://www.nickbostrom.com/ethics/human-enhancement.html

To make further radical gains in human life expectancy, it will become necessary to slow or reverse aspects of human aging. If the processes of senescence are left unchecked, then there comes a point in each individual’s life where cellular damage accumulates to such a degree that pathology and death become inevitable. Preventing and curing specific diseases can only have a limited impact on life expectancy in a population that already lives as long as people do in the industrialized world. If we cured all heart disease, life expectancy in the US would increase by only about 7 years. Curing all cancer would result in a gain of some 3 years[4]. Curing all heart disease and all cancer would result in a gain less than the sum of their individual contributions (perhaps 8 or 9 years). The reason for this is that older individuals become increasingly susceptible to a wide range of sickness. If it is not heart disease today, and not cancer tomorrow, then it will be stroke the day after, or pneumonia. The aging process itself is ultimately the cause of most deaths in industrialized nations, and, increasingly, in the developing world. While the proximate cause of death may be heart failure or cancer or some other specific pathology, it is senescence that is ultimately responsible, by making us gradually more vulnerable. Were it not for aging, our risk of dying in any given year might be like that of somebody in their late teens or early twenties. Life expectancy would then be around 1,000 years.

There is another reason why life extension enthusiasts particularly favour research into anti-aging and rejuvenation medicine. It is that a successful retardation of senescence would extend healthspan, not just lifespan. In other words, retarding senescence would enable us to grow older without aging. Instead of seeing our health peak within the first few decades of life before gradually declining, we could remain at our fittest and healthiest indefinitely. For many, this represents a wonderful opportunity to experience, learn, and achieve many things that are simply not possible given current human life expectancy.

#### NTHE solve overpopulation problems

Bostrom and Roache 2008

“Ethical Issues in Human Enhancement” by Nick Bostrom and Rebecca Roache [Published in New Waves in Applied Ethics, eds. Jesper Ryberg, Thomas Petersen & Clark Wolf (Pelgrave Macmillan, 2008): pp. 120-152] [pdf]. Available online: https://www.nickbostrom.com/ethics/human-enhancement.html

That radical life extension could lead to overpopulation has its roots in two separate worries: that overpopulation would result from existing people living longer, and that overpopulation would result from longer-lived people having more children than people today. Regarding the first worry, we can note that population growth has slowed over the past fifty years, with less developed countries accounting for 99% of current growth[10]. Researchers have found that, in general, increasing the standard of living and education of people living in poverty leads to a decrease in birth rate. Working to improve the lives of the millions living in poverty worldwide would, therefore, be a far more effective and humane means of tackling the issue of overpopulation than impeding efforts to develop life extension technology—especially when we consider that this technology is likely to be available first in developed countries, many of which are seeing their population decline. In response to the worry that longer-lived people will have more children, increasing lifespan would not increase the number of people being born unless there is also an increase in the number of years in which people—particularly women—can reproduce. If this happened, however, it is unclear whether the net effect would be to increase the size of the population. Since 1990, the number of US women under 30 to give birth to their first child has been declining, with birth rates increasing for those over 30[11]. The average age of first-time mothers is at an all-time high. There is, therefore, a trend of postponing childbirth until later in life; a trend particularly evident among well-educated women, who choose to develop their careers before starting a family. However, since women’s fertility begins to decrease after the age of 35, there is a pressure on women to have children before it is too late, and so there is a limit to how long childbirth can be postponed. Were it possible to widen the window of years in which women could conceive, this limit would be increased, and so we could expect the current trend of postponing childbirth to continue beyond the age at which fertility currently decreases for women. This might result in a reduction in the number of births per year. Along with the fact that, with enhanced people living longer, there would also be fewer deaths per year, the net effect of radical life extension on population size is far from obvious.

#### NTHE inevitable, accepting them is key

#### Pesce 2001

Mark Pesce, one of the early pioneers in Virtual Reality is a writer, researcher and teacher. The co-inventor of VRML, he is the author of five books and numerous papers on the future of technology. "Becoming Transhuman", feature length film & spoken word performance, premiered at Mindstates II, Berkeley, California, 26 May 2001. (cite info from: <http://markpesce.com/index_msie.html>). Text accessed @ <http://www.webearth.org/bt.pdf> on 10/29/09. Presented: Berkeley, California, (26 May 2001)

Yet, like human birth, the transhuman is inevitable. There is no going back, no reversal of history into the archaic, and no place to hide. In the twinkling of an eye, we shall all be changed. Therein lies the terror of the situation, a terror so encompassing we have done everything, both as individuals and as a civilization, to ignore it, like an infant believing that which can not be seen will not be. We have cut ourselves off from the glory and the horror of the world, ignoring the incredible cornucopia of discovery, that promise of the near future, and shield our eyes from the specter of the gun, held forth in a child’s hand, spraying out hatred at the speed of sound. Haunted by hungry ghosts, we forget that, in the Bardo, the wrathful demons chase us because they love us, because we are attached to what they represent. To move forward, we must remove our blinders, think the unthinkable, endure the unendurable. It’s an essential requirement for our continued survival.

#### There is an ethical imperative to evolve

Bostrom 02

(Nick, PHD, Prof. of Philosophy, Oxford. “transhumanist ethics”. No date given, latest source citation in footnotes is from 02)

<http://www.nickbostrom.com/ethics/transhumanist.pdf>

The prospect of there being great values outside of the human sphere constitutes us a strong reason, which we could call the “transhumanist imperative”, to seek to develop such technologies and use them to expand human capacities so that we can begin to explore the wider realm of modes of being.

#### NTHEs align with Buddhist ethics

Pearce 09

Interview with David Pearce, Oxford trained Philosopher, author, and researcher. , September 16, 2009, Genomic Bodhisattva, in H+ Magazine, written by James Kent accessed online @ <http://www.hplusmagazine.com/articles/bio/genomic-bodhisattva> on 10/29/09

Yet Gautama Buddha’s interest clearly lay in finding the most effective techniques to end suffering, not in delivering some God-given truth. Buddhism isn’t like revealed religion. Gautama Buddha seems to have been pragmatic. Let’s try what works. If presented with contemporary biotechnology, I doubt he’d insist we go though the traumas of thousands of rounds of rebirth. I think he’d embrace genetic medicine as a priceless gift and urge us to extend its use to ensure the welfare of all sentient beings, not just ourselves.

#### There is an obligation to provide NTHE to those that can’t afford them

Bostrom 02

(Nick, PHD, Prof. of Philosophy, Oxford. “transhumanist ethics”. No date given, latest source citation in footnotes is from 02)

<http://www.nickbostrom.com/ethics/transhumanist.pdf>

Further, society need not be a passive bystander. We can move to counteract some of the inequality-increasing tendencies of enhancement technology with social policies. One way of doing so would be by widening access to the technology by subsidizing it or providing it for free to children of impecunious parents. In cases where the enhancement has considerable positive externalities, such a policy may actually benefit everybody, not just the recipients of the subsidy. In other cases, one could attempt to support the policy on the basis of social justice and solidarity.

#### Humanist ethics fail in the context of NTHE

Zizek 03

Slavoj Žižek , “Bring me my Philips Mental Jacket” in London Review of Books Vol. 25 No. 10 · 22 May 2003 Accessed online @ <http://www.lrb.co.uk/v25/n10/slavoj-zizek/bring-me-my-philips-mental-jacket> on 11/2/09

Do we today have an available bioethics? Yes, we do, a bad one: what the Germans call Bindestrich-Ethik, or ‘hyphen-ethics’, where what gets lost in the hyphenation is ethics as such. The problem is not that a universal ethics is being dissolved into a multitude of specialised ones (bioethics, business ethics, medical ethics and so on) but that particular scientific breakthroughs are immediately set against humanist ‘values’, leading to complaints that biogenetics, for example, threatens our sense of dignity and autonomy.

#### No impact to ‘human-ness’

Bostrom 2006

Nick Bostrom, “Why I want to be a post human when I grow up” (Future of Humanity Institute Faculty of Philosophy & James Martin 21st Century School Oxford University[Published in: Medical Enhancement and Posthumanity, eds. Bert Gordijn and Ruth Chadwick (Springer, 2008): pp. 107-137. First circulated: 2006]

Be that as it may; for even if it were “part of human nature” to push ever onward, forward, and upward, I do not see how anything follows from this regarding the desirability of becoming posthuman. There is too much that is thoroughly unrespectable in human nature (along with much that is admirable), for the mere fact that X is a part of human nature to constitute any reason, even a prima facie reason, for supposing that X is good

#### A2: Human-ness

**Turn: saying we can’t evolve humanity devalues human dignity**

Kaveney 09

Roz Kaveney, Journalist, “Transgender, Transhuman, Transbeman: Uploading with Martine Rothblatt” published October, 09 in H+ magazine, accessible online @ <http://www.hplusmagazine.com/articles/enhanced/transgender-transhuman-transbeman-uploading-martine-rothblatt>

the philosophical opponents of uploading are mostly biological essentialists, people who believe that there is an absolute value in remaining true to an original biological form. The underlying logic of this position is that we are not clever enough to realize all the bad consequences of changing the naturally-evolved order in any way. They think — and they have always thought — that we will come to regret any change to this. This argument is absurd, because it is contradicted by fact. Similar people argued in the Eighteenth and Nineteenth centuries that vaccination would make people more like cows. They were against transplants. Similar arguments were used against gender reassignment/confirmation surgery — both Martine and I have an interest to declare here, since we are both trans. Everything that humans have done since we first evolved intelligence, from growing crops and domesticating dogs onwards, has involved humans tinkering with the natural order.

# \*\*\*MISC CARDS\*\*\*

#### Now Key

Miah 2012

Ethics Issues Raised by Human Enhancement By Andy Miah 2012 (https://www.bbvaopenmind.com/en/article/ethics-issues-raised-by-human-enhancement/?fullscreen=true) Andy Miah, Chair in Science Communication & Digital Media, in the School of Environment & Life Sciences, University of Salford, Manchester. He is also Global Director for the Centre for Policy and Emerging Technologies, Fellow of the Institute for Ethics and Emerging Technologies, United States, and Fellow at FACT, the Foundation for Art and Creative Technology, United Kingdom. He is author of Genetically Modified Athletes (2004 Routledge), co-author of The Medicalization of Cyberspace (2008, Routledge) and editor of Human Futures: Art in an Age of Uncertainty (2008, Liverpool University Press). He has published over 150 academic articles in refereed journals, books, magazines, and national media press on the subjects of cyberculture, medicine, technology, and sport. He regularly interviews for the media and has published in the Washington Post, the Huffington Post and a range of British broadsheet newspapers.

Over the last 30 years, the evolutionary status and trajectory of the human species has been brought into question by rapid progress within the fields of nanotechnology, biotechnology, information technology and cognitive science. These NBIC sciences suggest ways in which technology could allow people to make themselves “better than well” (Elliot 2003, Kramer 1994) by using human enhancements to transform what we regard to be species-typical functioning for human beings. Such enhancements may include brain modifications to increase memory or reasoning capabilities, alterations to biochemistry to increase resilience to the environment or the creation of new capacities. It may also include living for much longer or alterations to our appearance to make us more attractive or more aesthetically distinct.1 Such interventions as laser eye surgery that can yield better than perfect, high definition vision, or the use of cognitive enhancers, such as Ritalin, to help students study for exams, each suggest how humanity is entering a transhuman era, where biology is treated as something to be manipulated at will, depending on one’s lifestyle interests rather than health needs. Yet, questions remain about how far society is prepared to accept these kinds of applications and what ethical issues they create.

#### Universal ethical approaches fail, need specific context

Miah 2012

Ethics Issues Raised by Human Enhancement By Andy Miah 2012 (https://www.bbvaopenmind.com/en/article/ethics-issues-raised-by-human-enhancement/?fullscreen=true) Andy Miah, Chair in Science Communication & Digital Media, in the School of Environment & Life Sciences, University of Salford, Manchester. He is also Global Director for the Centre for Policy and Emerging Technologies, Fellow of the Institute for Ethics and Emerging Technologies, United States, and Fellow at FACT, the Foundation for Art and Creative Technology, United Kingdom. He is author of Genetically Modified Athletes (2004 Routledge), co-author of The Medicalization of Cyberspace (2008, Routledge) and editor of Human Futures: Art in an Age of Uncertainty (2008, Liverpool University Press). He has published over 150 academic articles in refereed journals, books, magazines, and national media press on the subjects of cyberculture, medicine, technology, and sport. He regularly interviews for the media and has published in the Washington Post, the Huffington Post and a range of British broadsheet newspapers.

As such, an overview of the ethics of human enhancement must first take into account the fact that one can, at best, provide only a compendium of general concerns that may be engaged by specific examples of enhancement. Equally, while some ethical concerns involve clearly identifiable stakeholders, for others the possible interested parties are much more diffuse. For example, if asking whether a doctor is acting ethically when enhancing a patient, one might refer to their professional code of ethics to assist in answering this question. Very few other stakeholders are relevant to this moral dilemma, though it may also involve appealing to the moral conscience of the doctor. In contrast, if asking whether germ-line genetic enhancement is morally sound, then it may be necessary to consider the interests of the patient along with other members of her family, community, society, and perhaps even the entire world’s population—along with future generations. This is because such interventions may have an effect on a much wider population, due to the possible transference from one generation to the next that such modifications imply.

#### Moral =/= Ethical

Miah 2012

Ethics Issues Raised by Human Enhancement By Andy Miah 2012 (https://www.bbvaopenmind.com/en/article/ethics-issues-raised-by-human-enhancement/?fullscreen=true) Andy Miah, Chair in Science Communication & Digital Media, in the School of Environment & Life Sciences, University of Salford, Manchester. He is also Global Director for the Centre for Policy and Emerging Technologies, Fellow of the Institute for Ethics and Emerging Technologies, United States, and Fellow at FACT, the Foundation for Art and Creative Technology, United Kingdom. He is author of Genetically Modified Athletes (2004 Routledge), co-author of The Medicalization of Cyberspace (2008, Routledge) and editor of Human Futures: Art in an Age of Uncertainty (2008, Liverpool University Press). He has published over 150 academic articles in refereed journals, books, magazines, and national media press on the subjects of cyberculture, medicine, technology, and sport. He regularly interviews for the media and has published in the Washington Post, the Huffington Post and a range of British broadsheet newspapers.

Furthermore, it is necessary to clarify the relationship between moral and ethical, as they are often conflated within debates about human enhancement. Generally speaking, one would discuss ethical issues in the context of a specific practice community, such as the ethical code underpinning medical practice. Alternatively, morality is concerned with broader questions of value for which there may be no formal codes that are broken. For example, one might have a general moral concern about the prospect of a society comprised of genetically enhanced people, though this may be come about without violating any specific ethical code. In cases of moral violations, it is more difficult to determine whether any specific principle has been violated by an action, or whether the moral concerns arising from this outweigh the benefits that may arise from it. To this end, it is more difficult to derive an uncontested answer as to what people ought to do, which is why a common response to difficult ethical dilemmas is to rely on consensus of opinion, via some form of representative democratic decision. Nevertheless, one may find assistance in deriving ethical principles by studying human societies and the norms that have emerged around behaviour within culture. Through subjecting such discoveries to a process of philosophical scrutiny, one may develop a clearer sense of the ethical principles that should govern decision-making within practical contexts. Moreover, by examining the practice communities where ethical decision-making takes place, it may be clearer which of these principles are most salient. In this respect, effective ethical reasoning requires taking into account both normative ethical principles and practical ethical decision-making.

#### Let individuals decide

Miah 2012

Ethics Issues Raised by Human Enhancement By Andy Miah 2012 (https://www.bbvaopenmind.com/en/article/ethics-issues-raised-by-human-enhancement/?fullscreen=true) Andy Miah, Chair in Science Communication & Digital Media, in the School of Environment & Life Sciences, University of Salford, Manchester. He is also Global Director for the Centre for Policy and Emerging Technologies, Fellow of the Institute for Ethics and Emerging Technologies, United States, and Fellow at FACT, the Foundation for Art and Creative Technology, United Kingdom. He is author of Genetically Modified Athletes (2004 Routledge), co-author of The Medicalization of Cyberspace (2008, Routledge) and editor of Human Futures: Art in an Age of Uncertainty (2008, Liverpool University Press). He has published over 150 academic articles in refereed journals, books, magazines, and national media press on the subjects of cyberculture, medicine, technology, and sport. He regularly interviews for the media and has published in the Washington Post, the Huffington Post and a range of British broadsheet newspapers.

It is uncontroversial to claim that there are good reasons for why human beings seek to enhance themselves throughout their lives. Indeed, as noted earlier, humans have always sought to enhance themselves, where some of the more familiar methods include education, exercise or a good diet. Undertaking these pursuits may lead to much greater capabilities than one would otherwise have and may also lead to an advantage over those who choose not to indulge in such practices. To this end, what is it, if anything, that distinguishes these accepted methods of enhancement from those that cause moral concern, such as using drugs or genetic modification? First, it is important to note that it is inadequate to devise moral rules that apply to people in general. Rather, people always operate within different social contexts, where different moral and ethical expectations exist. Thus, a university student may also be a musician, a youth group leader for a religious community, and a part-time sales assistant at a retail outlet. In each of these spheres, the moral expectations may differ, while there may also be a sense of there being an abstract self-identity that operates across each of these domains. There are not always formal ethical codes that govern our existence. Instead people make decisions based on loose, often poorly defined moral frameworks, which nevertheless may guide their actions and organize social conduct. This is an important realization to take into account when attempting to determine what may be an ethical choice for someone, as any action may violate the ethical expectations of one practice, while not the other. Equally, it would be naïve to suggest that this university student can make general decisions about their well-being without being mindful of how it affects their ability to operate within any one of these practices. For example, using a cognitive enhancer to pass an exam may violate a university code of ethics, but it may be considered an enrichment of his performance within the orchestra, where there is greater ambivalence over the whether such enhancement is ethical. These nuances that define individual lives are an important reminder that there are not always formal ethical codes that govern our existence. Instead people make decisions based on loose, often poorly defined moral frameworks, which nevertheless may guide their actions and organize social conduct.

#### Misc.: definition of types of HPE

Tracinski 2017

The Future of Human Augmentation and Performance Enhancement By Rob Tracinski

April 04, 2017 (http://www.realclearscience.com/articles/2017/04/04/the\_future\_of\_human\_augmentation\_and\_performance\_enhancement.html)

Yet those enhancements are coming, and some of the technology is here or nearly here. We had better start giving serious, realistic consideration to how it can be used, how it will be used, and what we should think about it. The concept of human augmentation, which is also called human performance enhancement or HPE, tends not to receive much attention because it is diffuse. It encompasses a range of technologies across very different disciplines. It's helpful to gather them together under one heading and survey the different ways in which we humans might potentially alter our own nature. There are five main areas where we are currently pursuing human augmentation.

1. Bionics and Prosthetics This is the form of human augmentation that is already being tested out for a small number of special users. You can even go to a Cyborg Olympics, a competition to test whose bionic limbs and robotics exoskeletons are the best. [T]he Paralympics celebrates exclusively human performance: athletes must use commercially available devices that run on muscle power alone. But the Cybathlon honors technology and innovation. Its champions will use powered prostheses, often straight out of the lab, and are called pilots rather than athletes. The hope is that devices trialed in the games will accelerate technology development and eventually be used by people around the world.

Note that this is not about improving or enhancing existing human capabilities so much as it is about restoring capabilities to those who have lost them. But that is largely due to the limits of the technology, to the fact that a bionic arm is still much less dexterous than a normal human arm. At some point, however, this technology will become good enough that it will offer the prospect of enhancing existing human abilities. We're a very long way from the point where anyone would be tempted to amputate a normal limb in order to replace it with a cybernetic version, though that is the ultimate vision of a few scientists and entrepreneurs, and it is already reflected in some fictional portrayals. Will Rossellini, the CEO of a neurotechnology company who also served as an adviser for the latest Deus Ex video game, predicts that "our bodies are going to look more like cars in the future, where we are making parts that will fit into anybody's system, where we are upgrading parts the way we upgrade a cell phone." The more likely alternative that is already being implemented in real life is the use of robotic exoskeletons, which don't replace the normal human body but give it extra strength and in some cases extra dexterity. They are already being used to help the paralyzed walk or as a robotic glove to help those with limited strength or range of motion in their hands. And exoskeletons are beginning to be used in industrial applications and in the military, which sees a lot of value in a system that could help a soldier travel farther and faster and carry heavier loads with less fatigue. The ultimate goal for military applications is an armored robotic super-suit—yes, like in "Iron Man." As I quipped a number of years ago, the future is less likely to look like the Terminator movies, with soft, weak unenhanced humans battling indestructible killer robots, and will look more like the climactic battle in Aliens, where Sigourney Weaver dons a massive industrial forklift suit to battle the alien monster. Or, on a more prosaic level, it will look more like Keahi Seymour, the engineer who has created stilt-like bionic boots that allow him to run at astonishingly fast speeds. We think of industrial and military applications for bionic enhancements, but also think of, say, Ultimate Frisbee played with bionic extensions for the legs and hands. As we contemplate integrating machines with the human body, we face a number of difficult hurdles. These machines need better power supplies so that bionically enhanced humans don't have to be tethered by power cords. For all of the recent advances in battery technology, the human body is still far more advanced when it comes to carrying its own fuel and power supply. Moreover, to operate like real human limbs, or alongside real human limbs, robotic enhancements need a sensitive sense of touch. Both of these problems are dealt with in a recent attempt to create an artificial skin that detects touch and derives power from sunlight. But there's still a very long way to go. So let's sum up: The Promise: An end to physical disabilities, with bionics replacing lost eyes, ears, and limbs—and the prospect of enhancing the able-bodied with super-human strength, speed, and stamina. The Questions: Would people eventually feel pressure or temptation to remove healthy limbs or organs in favor of enhanced bionic replacements, and would that be a good thing?One of the biggest challenges is to coordinate our bionic or robotic augmentations with the brain—to send signals back and forth across the barrier between our mechanical enhancements and our biological nervous system—so that you will be able to pilot a robotic exoskeleton with the same ease with which you move one of your own limbs.The need for such an interface leads us to the next major category of human augmentation.2. Brain-Computer InterfacesBrain-computer interfaces, or BCIs, are being tested for use in controlling artificial limbs for the disabled, and for communication with those who are "locked in" due to spinal cord injuries—or even for reversing paralysis through a "neural bypass" that allows the brain to communicate directly with the muscles. This is beginning on a small scale. Arguably, the world's first real cyborgs are people with cochlear implants to restore their hearing. Retinal implants are about 30 years behind but are improving.Brain-computer interfaces have to overcome some basic problems. External systems, like brain-scanning headsets, should in theory be able to detect activity in the brain with enough detail to tell when you are thinking of a certain word, or when you are thinking about moving in a particular direction. This capability is being explored as a way of controlling your avatar in virtual reality, for example, and it has even spawned a Star Wars-themed "force training" toy that works by detecting a certain type of concentration. But these headsets can't project information back into the brain, and they still have very limited detail and resolution."The quality and fidelity of the data depends upon how many EEG sensor contact points will be able to make a direction connection to the skin on your scalp. The more sensors that available will provide better data, but may be more inconvenient to use. Since the most crucial contact points are at the same place as to where the VR straps are at, then using EEG input for a input to a VR experience may require a custom integrated headset. Internal implants face their own set of limitations. Metal and electronics don't tend to mix well with flesh and chemicals, and the formation of scar tissue over implanted electrodes degrades their function over time. There have been recent experiments with implants that sit on top of the brain and project magnetic fields into it, which can be focused very precisely, sending signals from an artificial retina into the brain.Project this out far enough and you might get virtual reality and augmented reality coming from inside your head. Or phone calls coming to you as voices in your head. Or you will find yourself talking to someone and notice that they get a far-off look in their eyes for a moment, and that's because they're looking up a fact on Google so they can bring it back into your conversation.This technology, whenever it arrives, will revolutionize how we interface with our devices and with the growing digital world around us. The best interface with our technology is not to point and click and scroll through menus. The best interface is no interface. It's to interact with our devices the way we interact with our hands and feet and eyelids. We just think it and it happens.As Elon Musk explains it, "We're already cyborgs. Your phone and your computer are extensions of you, but the interface is through finger movements or speech, which are very slow." The prospect is to augment our thinking more swiftly and directly by connecting it to the cloud and even to the Internet.

But could this also change the very way we think? In augmenting our brains, will we alter them? What if you could use all of the Internet as an extended memory bank—and would that be a particularly wise thing to do? Certainly, getting ranked first in Google search results would become even more valuable if companies knew the results were being beamed directly into people's heads. And imagine the fierce editing wars when people use Wikipedia as a kind of collective memory. That is, more so than we do already. These are issues we are already struggling with just because people spend a lot of time squinting at hand-held electronic devices. Bringing the devices into our brains magnifies the issues in scope and intensity. Let's sum up: The Promise: Faster, seamless access to information and to interaction with our machines. The Questions: Will this result in an even greater dependence on our devices? Could it lead to a real life version of this cartoon?Even when we want to, it will be harder to tune out our devices when they're a part of us. So will the future of BCIs make it even harder for people to slow down and interact with the real world?These enhancements aren't ready yet, but a lot of capital is being poured into them. Elon Musk just announced the launch of Neuralink which is working on a "neural lace" brain-machine interface. He joins another Silicon Valley entrepreneur, Bryan Johnson, whose Kernel start-up is working on the same problem.But Kernel isn't just trying to make neural interfaces for our machines. It's also experimenting with ways to change and enhance the functioning of our brains. That's an even more radical notion and leads us to the next form of future human enhancement.3. NeurotechnologyThis is the most speculative technology of all, because we still know so little about how the human brain works, which limits our ability to affect that function in a beneficial way.Current efforts, particular under Bryan Johnson's Kernel, are focusing on "neuroprosthetics" to enhance memory by breaking the code for the storage and retrieval of memories in a part of the brain called the hippocampus, which can then be augmented by an implant.Notice that neuroprosthetics are following the same path as mechanical prosthetics: they are being proposed first as an attempt to restore normal functioning to the impaired. Which makes sense. If it is morally and practically questionable to remove a healthy limb in favor of an enhanced bionic replacement, think how much more questionable it would be to intervene in a healthy brain in pursuit of some speculative new enhancement. So it makes sense that this technology will be tested out first in patients who are already facing the progressive loss of their mental faculties and thus have less to lose by trying to stem the deterioration.At some point, however, this technology is going to be perfected to the point where it will be considered a valuable enhancement. What if you could, for example, draw on perfect recall of all the events in your life—every meeting, every conversation, every piece of music? What if you could sort through data more rapidly and notice new connections?Elon Musk has suggested that this is what we will need to do to keep artificial intelligence from making us obsolete, but I think Bryan Johnson's perspective is more interesting: that the difference between us and the machine will be moot. Johnson hails an era of HI, human intelligence, seamlessly augmented by AI, artificial intelligence.[I]t is already obvious that humans and AIs will be able to form a dizzying variety of combinations to create new kinds of art, science, wealth and meaning. What could we do if the humans in the picture were enhanced in powerful ways? What might happen if every human had perfect memory, for instance?In short, we are poised for an explosive, generative epoch of massively increased human capability through a Cambrian explosion of possibilities represented by the simple equation: HI+AI. When HI combines with AI, we will have the most significant advancement to our capabilities of thought, creativity and intelligence that we will have ever had in history.To sum up:The Promise: Building enhanced mental function, possibly even some form of super-intelligence, into our own brains instead of building it into a separate computer. The Questions: What are the side-effects and potential long-term consequences of altering our brain functions with implants? Consider one of the reasons steroids are banned in most sports. When one player begins taking steroids, this can enhance his performance so dramatically that everyone else feels the need to take them to remain competitive—but then everyone ends up experiencing the side effects, both immediately and in the long term. So one reason for banning steroids is to keep athletes from ruining their bodies in an attempt to keep up with their enhanced rivals.When it comes to neurotechnology, we can call this the Total Recall Principle, after the 1990 film in which a friend advises Arnold Schwarzenegger's character (in somewhat earthier language), "Don't mess with your brain." If you think it's going to take us a long time to trust self-driving cars, it's going to take us much longer to trust machines to help us drive our brains.Speaking of steroids, that brings us to our next form of enhancement. Using electronic implants to affect our brain functions is a radical and difficult step. Instead, we could just try doing it the old-fashioned way: with pharmaceuticals.4. NootropicsWe are all familiar—some of us more so than others—with psychotropic drugs that affect mood and perception. Nootropic drugs (from nous, the Greek word for "mind") are drugs that affect and in theory enhance the process of thinking. The term was coined in 1972 by a Romanian chemist who sought drugs that would enhance learning and memory.Nootropics have developed something of a fan base in Silicon Valley, where acute mental function is revered and rewarded as much as physical strength and stamina are in the NFL. Hence the Silicon Valley executive who takes "a mixture of exotic dietary supplements and research chemicals that he says gives him an edge in his job without ill effects: better memory, more clarity and focus and enhanced problem-solving abilities. 'I can keep a lot of things on my mind at once.'"The problem: "long-term safety studies in healthy people have never been done. Most efficacy studies have only been short-term." What you tend to get is a lot of anecdotal evidence from committed enthusiasts, but it is hard to tell how much of this is just a placebo affect among people who would be motivated high achievers in any case.In effect, nootropics are supposed to be steroids for the brain, and that comparison ought to prompt some cautious reflection, because the effect of steroids is well known—including a list of deleterious side effects, particularly from long-term use. This already includes impacts on mental function and mood. On a more everyday level, we can observe the effect of well-known drugs that boost mental stamina or alertness, from caffeine to amphetamines. A period of heightened alertness and concentration tends to be followed by a crash in which the same characteristics that were briefly enhanced are now depressed. What the drug giveth, the drug taketh away. And the body can develop resistance to a drug's effects. Methamphetamine addicts who start taking the drug so they can party all night end up taking it just to be able to get out of bed in the morning.A normal, healthy body and brain are delicately balanced self-regulating systems, and we have to be very cautious about interfering with that balance. Benefits gained at one place for one moment tend to be canceled out elsewhere.Let's sum up: The Promise: Super-smarts, like that pill in the movie Limitless (which is, in fact, based on a real drug). The Questions: What's the catch? What are the side effects? And how big is the benefit, really? Is this just "brain training" all over again—a fad that thrives on anecdotal evidence but doesn't have much actual data to show its effectiveness?One writer's experiment with Nuvigil, the real-life inspiration for Limitless, gives us an idea. He reported noticeably increased mental function—combined with extreme physical lethargy and difficulty sleeping, so that he found he didn't miss the drug when he stopped taking it.All the augmentations we've discussed so far seek to enhance our natural endowments by adding on to them. But what if we can change our natural endowments themselves, at their source, on the genetic level?That leads us to the last major area of human enhancement.5. Gene EditingBack in the 1980s, we first starting hearing a lot about the promise of genetic engineering and gene therapy, the idea of being able to edit human genetic code and propagate the new code throughout the body. Reports at the time indicated that it might take another ten to fifteen years before the technology was practical. It turned out to be more like 30 years—but it's finally here, thanks to CRISPR.A lot of other things had to happen, too. The speed and cost of sequencing the human genome need to collapse, which it has. And we need to have an enormous amount of data about which genes code which characteristics—something we're still working on. The final piece is the ability to edit DNA at will and propagate the change through multiple cells. And that's what CRISPR has just given us. This has led to speculation that in the future, "writing code" won't just mean software for computers. It will mean coding DNA.As usual, this technology is being used first for curing diseases, including personalized medicine for cancer treatment and repair of congenital defects.But the wider possibility for augmentation is obvious. Humanity is the product of a multi-billion-year experiment in testing out genetic variations. We can survey our species and find people with genes that make them taller, smarter, faster, stronger, and so on—and not just by a little bit. There are people in the world who are genetic outliers, born with a capacity for truly extraordinary performance. If we can identify those extraordinary genetic endowments and figure out how to patch them in to our existing genetic code, giving us these enhanced qualities.It is not clear whether it will be possible to do that by changing an adult's existing DNA. The technology is likely to be applied first to human embryos, creating "designer babies" at the behest of ambitious parents who want their children to be ready to excel from the womb.If we won't do it, the Chinese probably will.The limitation of this technology is that DNA is incredibly complex. There are 3 billion base pairs in the human genome, and just reading and comparing the genomes from a significant number of individuals involves staggering amounts of data storage. Because each genetic change can potentially interact with the others, the effects of gene editing may not be predictable or immediately obvious, particularly as we progress beyond fixing a single mutation that is known to cause a specific disease.Moreover, there is no ethical way to experiment with all of these combinations and their effects, which could involve creating a whole cohort of human children who are supposed to be enhanced but end up with genetic problems that degrade their bodies and shorten their lives. This is not something we want to be doing by trial and error.To sum up: The Promise: Picking and choosing extraordinary abilities out the gene pool and putting them all together in ultra-capable new humans. The Questions: There is the risk that in re-engineering our own DNA, we will introduce problems instead of improvements, and that we won't know this ahead of time.