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FROM COGNITIVE TO MORAL ENHANCEMENT: A POSSIBLE RECONCILIATION OF RELIGIOUS OUTLOOKS AND THE BIOTECHNOLOGICAL CREATION OF A BETTER HUMAN

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Abstract: Religious outlooks on the use of new bio-technologies for the purpose of cognitive enhancement of humans are generally not favorably disposed to interventions in what is regarded as ordained by God or shaped by nature. I will present a number of perspectives that are derived from these outlooks and contrast them to the liberal standpoint. Subsequently, I will discuss two views that are compatible with religious outlooks, but that do not exclude cognitive enhancement altogether. They only pose significant moral limitations to it. These two views are: 1) cognitive enhancement of the human ought to be preceded by moral enhancement; 2) cognitive enhancement is morally permissible only as a means to moral enhancement. I will argue in favor of the superiority of the second view and assert that this view might be a sound platform for defining the relationship between religion(s) and bioethics in the decades and centuries to come.

Key Words: religious outlooks, moral enhancement, cognitive enhancement, new bio-technologies

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Classical standpoints

The "Bio-conservative" Standpoint

In this paper I will present two classical standpoints on enhancement in general and on cognitive enhancement in particular: the "bio-conservative standpoint", which has a background in various religious perceptions, and the "liberal standpoint". In the second and third chapter I will present two perspectives that are compatible with religious outlooks but that do not exclude cognitive enhancement: in the second chapter I will present the view that cognitive enhancement ought to be preceded by moral enhancement, while in the third chapter I will elaborate on the view that cognitive enhancement is morally permissible only as a means to moral enhancement. The concluding chapter will assert the supremacy of the latter view. It will also argue that this view has the potential of bridging the gap between religious outlooks and bioethics in the time to come.

The most essential religious complaints against cognitive enhancement are summarized in the statement that "man is not supposed to play God"[1]. "Playing God" implies here not only that those who are guilty of this charge are assuming divine powers, but that they do that in the absence of divine wisdom. As formulated in *Beyond Therapy*, the mere playing at being God is the "hubris of acting with insufficient wisdom"[2]. If "God" is replaced by "nature", the raised allegation implies an improper disposition towards the naturally given[3]. These standpoints are generally labeled as "bio-conservative" and have either a direct religious background or are derived from religious perspectives.

Many other misgivings about enhancement in general, and cognitive enhancement in particular, build on the alleged sanctity of the natural. The argument of the "dignity of human activity" asserts the improper artificiality of improving performance in ways other than through the perfection of what is given to us by nature. The argument of "identity and individuality" warns that such an artificial alteration of our natural gifts is an encroachment upon our identity and a violation of our individuality[4]. In addition to these objections, (cognitive) enhancement has been criticized for a variety of other reasons as well. First, it might pose a health risk. If the body is an integrated whole, interventions in one of its systems to make it function "better than well" may put another system in peril. Second, enhancement might be unfair. Steroids taken by athletes to perform better or a similarly motivated use of methylphenidate (*Ritalin*, *Concerta*) among students who take an exam might give them an unfair advantage over their competitors/colleagues. Since one might argue that our natural endowments are not distributed fairly either, so that enhancement is morally justified in order to rectify such a distribution,

the argument comes down again to our treatment of what is given to us by nature: are our natural gifts sanctified or are we allowed to make changes in them? Third, (cognitive) enhancement opens up the issue of the inequality of access to means leading to it. Some people have easier access to the benefits of biotechnology than others. Furthermore, some cannot afford medicines for the treatment of serious illnesses, while others use the same medicines for the purposes of morally dubious types of enhancement. Finally, enhancement might have an adverse impact on our freedom. That can be the case when biotechnology is used by some people for the purposes of barefaced coercion of other people. The *forceful* administration of anabolic steroids upon athletes is an example. Illustrative in that regard is the example of the practices of some totalitarian Communist regimes of the past. But coercion of a similar type occurs also in democratic societies. One should think of parents imposing their will on their children through neuro-pharmacological interventions or through control upon genotype via embryo selection – all with the intention to have "better children"[5].

For critical statements on enhancement in general or cognitive enhancement in particular, useful are Annas[6], Elliott[7], Kass[8], Fukuyama[9], Habermas[10] and Sandel[11]. In one way or another, they all cite threats to what has been shaped by nature as the essential reason for their view of enhancement technologies as morally impermissible.

Annas and Elliott critically assess the utilization of enhancement technologies in general. Annas argues that the misuse of science is neither limited to World War II and the Nazis, nor to chemical, biological and nuclear weapons, but that genetic engineering also threatens our very survival as a species. Elliott addresses the American fascination with enhancement technologies, such as Prozac, Viagra and Botox. Although used as remedies for social phobias, they frequently appear to adversely affect the users' self-consciousness.

Kass, Fukuyama, Habermas and Sandel emphasize what they see as threats to human nature, dignity and freedom as the basis for their concern about enhancement. Kass alleges that contemporary bioethics, obsessed with the principles of liberty and equality, overlooks the real problem with today's biotechnological advances: the threat of degradation of human dignity. Fukuyama also argues that human dignity can be lost if human nature is altered by enhancement technologies. Habermas devotes much of his attention to the impact of enhancement technologies on our notions of what is to be human and what is to be moral. According to Habermas, genetic alteration imperils our autonomy and standing as moral agents. Sandel critically assesses our drive to master nature where reproduction is concerned – a drive that, he believes, threatens to make us incapable of appreciating life as a gift.

The Liberal Standpoint

As already noted, most of the above objections to enhancement are either directly or indirectly derived from religious outlooks. The one that alleges its potential of having an adverse impact on our freedom leads us, however, to a central argument in favor of enhancement. Liberal proponents of this type of intervention warn, namely, that coercion can be exercised by *refusing* enhancement to someone who wishes to be subjected to it. In fact, the enlargement of human possibilities is a step to greater freedom, because it enables us to learn and earn more, thereby increasing the number of options we have in our lives. Therefore, it is not biotechnologies but the state that is the primary potential culprit for denying our pursuit of happiness through self-improvement. The liberal standpoint has been developed in a variety of formulations, including those by Harris[12], Savulescu[13], Bostrom-Ord[14], Hughes[15], Cakic[16] and Chan-Harris[17].

Since human well-being is essential, it is not just treatment and prevention of disease that is relevant. Biological interventions to *increase* opportunity and happiness are morally justified as well. More than that: if it is our duty to treat and prevent disease, it is also our duty to intervene in what is given to us by nature in order to provide an individual with the best prospects for having the best possible life[18].

Arguments in favor of the moral *permissibility* of enhancement can be found in Agar[19] and Kamm[20]. Agar argues that enhancement should be permissible but not obligatory. Unlike authoritarian eugenics that embraces a monistic outlook on human excellence, liberal eugenics encourages a pluralistic view. This view is marked by an absence of compulsion which distinguishes it from the eugenic practices of the Nazis – practices that were based on the concept of a single desirable genome. Kamm argues against the position Sandel defended in "The Case Against Perfection", developing her line of reasoning into a consideration of what can be safely enhanced. Moreover, she makes an attempt to prove that, contrary to Sandel's view, the motivation of enhancement by the desire for mastery is not a satisfactory ground for asserting its impermissibility. The focal point in Kamm's argument is not different from Agar's: an emphasis on the moral permissibility rather than on the moral duty of enhancement.

Agar's and Kamm's deliberations in favor of the moral tolerability of enhancement are reframed by Harris and Savulescu into the contention that we have a moral *duty* to enhance. Harris argues that it is not only feasible to use genetic technology to make people healthier, more long-lived and intelligent, but that it is in most cases our moral duty as well. Moreover, a drastic augmentation of our mental and physical powers will

influence the very course of evolution. New types of regenerative medicine appear to open up the possibility of human tissue to repair itself, techniques that can radically extend life expectancy are becoming available, while new drugs can improve concentration and memory and enable us to function successfully with less sleep. Harris emphasizes that he wishes these enhancement techniques to make people healthier, more long-lived and cognitively upgraded, supporting the idea that we should enhance ourselves in almost any way we desire[21].

In the view promoted by Savulescu, parents should have freedom over their children's genes, which is similar to the freedom they have regarding their rearing and education. Procreative liberty is to be extended to enhancement for two reasons. First, since the raising of children is a private matter and parents must endure the hardship of having children, they have a justifiable interest in the nature of the child they are bringing up. Second, it is only through "experiments in living" that people find out what is best for them, while others have the opportunity to observe the variety of lives that can be good. Diversity in choice is thus essential to discovering which lives are optimal for human beings[22].

Savulescu rebuts the religious argument that we should not interfere in God's ordinance (or in human nature, as the more secular form of this argument) by asserting that people implicitly reject this view already when screening embryos and fetuses for diseases, while vaccination, pain relief for women in labor or the treatment of deadly diseases is not less of an interference in nature or God's will than genetic therapy. Hence, medical interventions based on new bio-technologies are our moral duty and do not hinder God's will more than, for example, the administration of antibiotics[23].

Savulescu also confutes the fear of the creation of a two-tier society of the enhanced and the unenhanced by asserting that the inferior unenhanced are already underprivileged all through life. Some are born terribly deprived, fated to die in physical and mental torment after short and miserable lives or to suffer great genetic disadvantage, while others are born talented in many aspects. Consequently, allowing choice to change our biology will permit the ungifted to approach the gifted. Enhancement may be fairer than the gamble of nature. Furthermore, how well the lives of the deprived go depends not on whether enhancement is allowed, but on the social institutions that have to protect the underprivileged and provide everyone with a fair chance in life[24]. Savulescu believes that those who oppose the use of bio-technological enhancement are guilty of a "crude form of social determinism", predicting undesirable social consequences if enhancement is permitted, even though it is within our power to avoid these consequences taking place and to reduce inequality[25].

Everything considered, what remains is the difference between a naturally given and a perfected human being. If we have to choose between these two, it is our duty to opt for the latter, even though the former might be God's creation. A cognitively enhanced human being is a better human being. We are obliged to try to become better, while society ought to provide us with the best opportunity for this endeavor.

View 1: Cognitive enhancement is morally permissible only if it is preceded by moral enhancement

Nevertheless, even if we conclude with Savulescu that enhancement "expresses the human spirit" and that "to be human is to be better"[26], the question remains whether we have the moral capacity to cognitively enhance ourselves. And if we do not have such a capacity, is moral enhancement a possible solution?

Douglas[27] focuses on motives, defining moral enhancement as follows: "A person morally enhances herself if she alters herself in a way that may reasonably be expected to result in her having morally better future motives, taken in sum, than she would otherwise have had"[28]. Examples of moral enhancement include a reduction of the dislike of certain racial groups, as well as a lessening of impulsive violent aggression. Moral enhancement would thus lead people who have been subjected to it to have better motives than they would otherwise have had[29]. Douglas refers to a number of relevant findings: oxytocin has been shown to promote trust, SSRIs to increase cooperation and reduce aggression, while methylphenidate reduces violent belligerence; furthermore, the biological basis for some personality types that prompt to immoral conduct appears to be elucidated - antisocial personality disorder may have biological underpinnings, whereas criminality has been related to MAO mutation on the X chromosome, especially when coupled with social deprivation[30].

Persson and Savulescu[31] also argue that moral enhancement ought to precede other forms of enhancement: "For if an increasing percentage of us acquires the power to destroy a large number of us, it is enough if very few of us are malevolent or vicious enough to use this power for all of us to run an unacceptable increase of the risk of death and disaster. To eliminate this risk, cognitive enhancement would have to be accompanied by a *moral* enhancement which extends to *all* of us, since such moral enhancement could reduce malevolence"[32]. Moral enhancement is here also defined as our *motivation* to act morally[33]. The steady decrease in racism through our evolution is forwarded as an example of such a motivationally determined understanding of moral enhancement: the role of racial distinction to signify a lack of kinship by marking off strangers from neighbors has been gradually loosing its biological significance, enabling us to comprehend the moral falsity of racism[34]. Since moral

features are not a social construct, but are based in our biological makeup[35], Persson and Savulescu conclude that the potential hazards of cognitive enhancement are to be kept in check by a "vigorous research program on understanding the biological underpinnings of moral behavior". If these hazards can be controlled successfully, effective forms of moral enhancement are our duty and ought to be mandatory[36].

In Persson and Savulescu[37] the problem of moral enhancement is further developed along the same lines. The authors diagnose a misfit between the limited human moral nature and the globalized, highly sophisticated technology. As the progress of scientific technology has been steadily increasing, the human capacity to cause harm has reached the stage at which life on Earth might be eliminated. This can occur as a consequence of various factors, ranging from the use of weapons of mass destruction to catastrophic climatic changes. The root of the problem is that human moral psychology has been adapted to life in small, cohesive societies with primeval technology, while it is unprepared for the moral challenges of a technologically advanced global society. Life in a traditional society has developed a bias towards the future among humans, disposing them to care primarily about immediately upcoming events that are relevant to them and their close neighbors. Furthermore, humans are still morally unprepared to respond appropriately to the hardships of larger groups. The development of advanced scientific technology appears to have resulted in the need for a radical change of human moral dispositions. It is thus essential that the possibilities of moral enhancement by means of genetic and other biomedical techniques be investigated. The misfit between a limited human moral nature and a technologically sophisticated global society ought to be ameliorated by moral enhancement in order to achieve restraint, promote cooperation, develop respect for equality, as well as other values that are now necessary for the survival of humanity. And it is precisely scientific progress, the cause of this misfit, which might be employed to address it - by offering means leading to the enhancement of our capacity for moral behavior. But that is precisely where the caveat ("the bootstrapping problem") is: human beings, i.e. those who need to be morally enhanced, are the ones who have to make a morally wise use of the techniques of moral enhancement[38].

Fenton[39] and Harris[40] criticize Persson and Savulescu[41]. Fenton asserts that if moral enhancement is to take place at the biological level, non-traditional cognitive enhancement is required. Hence, if we do not continue scientific research into enhancement, we have no hope of achieving the great moral progress that will ensure the survival of humans as a species. In other words, Persson and Savulescu's argument appears to lead us to an obstinate predicament: "scientific progress is both the means of our salvation, as well as the means of our downfall"[42].

Harris also asserts that moral enhancement must in large part consist of cognitive enhancement[43]. Cognitive enhancement ought not to be postponed in anticipation of moral enhancement. Not only that scientific development will be delayed in that way, but we will also impose restrictions on our freedom, including our "freedom to fall". Furthermore, much of the mass destruction we have been or will be exposed to is not attributable to malice and is thus not subject to moral intercession. It is rather the consequence of various types of cognitive failure ("idiocy", prejudices etc.). Harris believes that the most obvious countermeasure to prejudices is a combination of rationality and education, possibly assisted in the future by various new forms of cognitive enhancement[44].

View 2: Cognitive enhancement is morally permissible only if it is a means to moral enhancement

It is clear from the foregoing that both "classical standpoints" (the bio-conservative and liberal one), as well as View 1, have been subjected to forceful mutual critiques. I will argue that all these perspectives are less cogent than what I call "View 2". This view states that cognitive enhancement is morally permissible only as a means leading to moral enhancement. Moreover, both types of enhancement are highly related processes if CE impacts on our motives leading to morally enhanced behavior, or if CE is a direct cause of ME. In what follows, I will first emphasize the discrepancy between what we do and what we believe is right to do as arguably the essential problem of our moral existence. I will relate this issue to a weakness of Harris's critique of View 1. Subsequently, I will provide arguments in favor of View 2, identifying drawbacks of View 1.

The discrepancy between what we do and what we believe is right to do might be the greatest predicament of our existence as moral beings. The essential issue is not how to make us understand morality better, but how to morally enhance our *actions*. It is freedom rather than cognition that is at the heart of the matter. Hence, the key problem of morality comes down to how we use our freedom, to how we decide to act. On the other hand, Harris's thesis is that prejudices can best be countered by a combination of rationality and education. If these two countermeasures are applied successfully, our comprehension of morality will be enhanced. But the question is to what degree it will morally enhance our actions (in quantity and quality)? Is it going to have a critical impact on the great moral concern of our existence, on the problem of how to bring our actions in line with our understanding of morality? Since it is difficult to believe that the impact will be even close to decisive, means other than rationality and education will have to be sought in order to make us *act* more morally.

One possibility for moral enhancement is medication. It is indeed gradually becoming possible to develop medicines that can help us act more morally. We have already noted that trust can be promoted by drugs containing oxytocin, cooperation by SSRIs, while violent aggression can be reduced by methylphenidate. Such medicines can have a direct impact on our behavior, but they can also influence our motives, inducing us to act more in line with what we consider to be moral. In other words, it might as well be some types of drugs rather than rationality and education that, impacting on our motives, can have a favorable bearing on the enhancement of the morality of our actions. They improve the morality of our deeds, not solely our comprehension of morality. They primarily lead to morally enhanced *behavior*.

Harris's interpretation of the role of prejudices in immoral behavior is questionable. Prejudices, namely, do not have to be the cognitive basis for racism and other types of morally dubious inclinations, but their rationalization[45]. Harris is of course right in pointing to the existence of a cognitive element in (im)moral behavior, but fails to take into account the role rationalization might have in the development of this basis. Rationalization, namely, can be a possible cause of prejudices and other types of cognitive failure. Racism is rooted in a lack of good moral will. It does not have to be based on defective cognition, but might be rationalized as a cognition-based motive. In other words, Harris's understanding of the role of prejudices might be prejudiced itself, i.e. biased towards our proclivity to act always in line with what we consider as rational. Certain cognitions are thus not the primary cause of (im)moral behavior, but are frequently the consequence of the (im)morality of our inclinations, of good or devious motivations. Accordingly, CE is not to be applied exclusively in order to enhance our knowledge of morality, but in order to limit our scope for rationalizing immoral behavior by influencing our motives. On the other hand, Harris's critique of View 1 deals too much with the cognitive component of morality. It fails to address the central issue of our moral life: the issue of how we act. It does not narrow down the disparity between how we act and how we believe we ought to act.

Different from Harris, I criticize View 1 because it fails to give a solution to the problem of how competent decisions on moral enhancement can be taken by ordinary humans, i.e. by those who have to be morally enhanced. Moreover, View 1 regards moral enhancement too much in isolation from cognitive enhancement. Treating ME as something that ought to precede CE is not supportive of either one of them. View 2, on the other hand, considers CE and ME as highly related processes, whereby CE is acceptable only if it leads to ME.

Jones[46] offers empirical evidence that relates intelligence to cooperative behavior. If this evidence is well-founded, the implication is that intelligence is a driver of moral behavior: when we are more intelligent, we cooperate more and are less prone to violent conflict or to

secretive actions; hence, we are less inclined to certain types of immoral behavior; consequently, enhanced intelligence appears to help us act more morally. As it is well known, however, not all motives for cognitive enhancement are morally justified (e.g. the use of methylphenidate by students in order to provide them with a competitive advantage over their colleagues during exams might be morally dubious). Hence, we should not enhance our cognition indiscriminately. We have to use our moral judgment in order to decide which types of cognitive enhancement are ethical. But it is precisely this judgment that is alleged as what ought to be enhanced.

Conclusion

The only morally permissible solution to this problem appears to be to promote exclusively those types of cognitive enhancement that directly lead to moral enhancement. Hence, moral enhancement always ought to be the objective of cognitive enhancement. And that is also the solution to the "bootstrapping" problem in Persson and Savulescu (2011): human beings, i.e. those who need to be morally enhanced, will make a morally wise use of the techniques of cognitive enhancement by ensuring that cognitive enhancement serves the purpose of moral enhancement. Hence, we need to approach cognitive and moral enhancement as a single project. Our objective ought to be cognitive **plus** moral enhancement, (C+M) E.

View 1 asserts that cognitive enhancement ought to be preceded by moral enhancement. But View 2, the one that is promoted in this paper, advances a combined application of cognitive and moral enhancement. Two such applications have been identified:

1) One that is based on the use of appropriate medication leading to (C+M) E. The utilization of such medication can have an impact on our motives (CE), having an effect on our behavior (ME), or it can directly affect our behavior. This is essential because it has the potential of closing the gap between what we do and what we believe is right to do.
2) (C+M) E that is not caused by medication, but that can either directly or indirectly affect our behavior (e.g. cooperative behavior that can be brought about by the enhancement of our intelligence, as results from Jones's argument). This application is not less essential because it also deals with the type of CE that makes us *act* more morally, i.e. the type of CE that narrows the discrepancy between what we do and what we believe it ought to be done. Being cognitively enhanced (e.g. more intelligent), we appear to become more cooperative and less prone to violent, secretive and other types of morally dubious behavior.

Regarding the first application, it is important to note the following: medicines that serve (C+M) E cannot deprive us of our free will. It is our free will that gives meaning to our decisions and the (im)morality of our acts, including our morally enhanced acts. Our free judgment will always remain the adjudicator, even if it is cognitively and morally enhanced by medication. Ultimately, it is thus our will that decides whether we will act morally. In other words, our free will is going to continue to be free after (C+M) E, even though our motives might change. However, if our motives have been morally improved, even artificially, our will is also going to be influenced to make us act more in line with our comprehension of what is moral. In other words, (C+M) E that is brought about by drugs induces us to act more morally, while leaving our freedom untouched.

A central value in almost all religions is the development of morally enhanced human beings. Being superior to View 1, View 2 is also the most interesting potential link between religious outlooks and enhancement. Cognitive/moral enhancement is an intervention in what is natural, but if it is solely directed to the creation of a morally improved human, it can become a matter of preference for many religious outlooks as well. In fact, it will become a preferred religious perspective if the dislike toward interventions in what has been created by God or shaped by nature is trumped by the worth of a morally improved human - even if his improvement has been achieved by artificial means.

The remaining question is who should be allowed to undergo (C+M) E, and whether there are individuals or groups that ought to be prevented from it. Neither of these questions is difficult to answer. Since View 2 deals only with those forms of cognitive enhancement that lead to moral enhancement, there is no reason to prevent anyone from undergoing it. All should be allowed to be subjected to (C+M) E. An entirely different problem is the question whether many of us would be sufficiently motivated to embark on that path of improvement. Are we eager to use medication in order to enhance the morality of our actions? If we were, why would we prefer to take drugs rather than decide to act more morally without them? Furthermore, will more trust and less aggressiveness help us to be successful in the societies we live in? Might more empathy mean not being abused by others?

Since all of the above concerns are founded, it appears that we might be in need of external stimuli to undergo (C+M) E. The state ought not to be excluded here as an actor that can have a role in providing them. It should not prescribe (C+M) E, but it can use a variety of means in favor of C+M enhanced citizens: tax reductions, schooling allowances for their children, retirement benefits, affirmative action policies that favor them. Such benefits would give morally enhanced individuals various social advantages: advantage in opportunity, rather than equality of opportunity.

(C+M) E would not be obligatory. In combination with what has been proposed above, this would ensure the achievement of two essential objectives. First, (C+M) E would be encouraged, while making sure that C+M enhanced individuals are not in a disadvantaged position in relation to the C+M unenhanced ones. Second, by treating (C+M) E as a matter of choice, our freedom would not be encroached upon. In other words, View 2 preserves a liberal position while motivating citizens to undergo moral enhancement (we have seen that the role of moral enhancement is critical in View 1).

All things considered, in View 2 our dignity as free agents is preserved, while our moral improvement is also aided. This improvement occupies an essential place in most religions. As amusingly noted by John Harris, "God had important things to say on the subject of moral enhancement"[47]. In addition to that, religious outlooks generally do not deny or at least do not have to deny the dignity of humans as free moral agents. View 2 has therefore the potential of reconciling two cherished values in many religious outlooks, i.e. the moral progress of humanity in combination with the preservation of the freedom of humans as moral agents, with the endeavor to create cognitively AND morally enhanced human beings by biotechnological means. With this potential, View 2 might be a solid platform for defining the relationship between religion(s) and bioethics in the decades and centuries to come.

Notes:

[1] Enhancement will be defined in this paper as the use of medical intervention aimed at the improvement of normal individuals. Its meaning will thus be limited to those interferences that go beyond medical treatment. Although the treatment of diseases might be regarded as some form of enhancement as well, for the sake of the clarity of my argument, I will draw a sharp line between enhancement and therapy / medical treatment. In other words, I will avoid semantic overlaps by postulating that the meaning of enhancement and the meaning of therapy exclude each other.

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[3] Such an improper disposition can receive religious forms. For instance, technological advances can be understood as tools for the "salvation" of humankind. For an analysis of this approach, see Sigurd Bergmann, "Technology as Salvation: Critical Perspectives from an Aesth/ethics of the Spirit", *European Journal of Science and Theology*, 3/4 (2007): 5-19.

[4] Kass, *Beyond Therapy: Biotechnology and the Pursuit of Happiness*, 290-301

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[15] James Hughes, *Citizen Cyborg: Why Democratic Societies Must Respond to the Redesigned Human of the Future*, (Boulder: Westview Press, 2004).
[16] Vincent Cakic, "Smart Drugs for Cognitive Enhancement: Ethical and Pragmatic Considerations in the Era of Cosmetic Neurology", *Journal of Medical Ethics*, *35 (2009):611-615.*
[17] Sarah Chan and John Harris, "In Support of Human Enhancement", *Studies in Ethics, Law and Technology*, 1/1 (2007).
[18] Savulescu, "Genetic Interventions and the Ethics of Enhancement of Human", 525.
[19] Nicholas Agar, *Liberal Eugenics: In Defence of Human Enhancement,* (Oxford: Blackwell, 2003).
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[21] John Harris, Enhancing Evolution: The Ethical Case for Making Better People.
[22] Savulescu, "Genetic Interventions and the Ethics of Enhancement of Human", 526-527.
[23] Savulescu, "Genetic Interventions and the Ethics of Enhancement of Human", 528-529.
[24] Savulescu, "Genetic Interventions and the Ethics of Enhancement of Human", 530.
[25] Savulescu, "Justice, Fairness and Enhancement", 336.
[26] Savulescu, "Genetic Interventions and the Ethics of Enhancement of Human", 531.
[27] Thomas Douglas, "Moral Enhancement", *Journal of Applied Philosophy*, 25/3 (2008): 228-245.
[28] Douglas, 229.
[29] Douglas, 231.
[30] Douglas, 233. For an illustrative analysis of the role of the neurotransmitter serotonin, useful is: Molly J. Crockett, Luke Clark, Marc D. Hauser, Trevor W. Robbins, "Serotonin Selectively Influences Moral Judgment and Behavior Through

Effects on Harm Aversion", *Proceedings of the National Academy of Sciences of the United States of America*, 107/40 (2010): 17071-17072. Serotonin turns out to directly alter both moral judgment and behavior through increasing our aversion to personally harming others. Hence, it has the capacity of enhancing us morally.

[31] Ingmar Persson and Julian Savulescu, "The Perils of Cognitive Enhancement and the Urgent Imperative to Enhance the Moral Character of Humanity", *Journal of Applied Philosophy*, 25/3 (2008): 162-177.

[32] Persson and Savulescu, "The Perils of Cognitive Enhancement and the Urgent Imperative to Enhance the Moral Character of Humanity", 166. The shift in Savulescu's position between 2006 and 2008 is to be noted.

[33] Persson and Savulescu, "The Perils of Cognitive Enhancement and the Urgent Imperative to Enhance the Moral Character of Humanity", 167.

[34] Persson and Savulescu, "The Perils of Cognitive Enhancement and the Urgent Imperative to Enhance the Moral Character of Humanity", 168.

[35] Persson and Savulescu, "The Perils of Cognitive Enhancement and the Urgent Imperative to Enhance the Moral Character of Humanity", 168.

[36] Persson and Savulescu, "The Perils of Cognitive Enhancement and the Urgent Imperative to Enhance the Moral Character of Humanity", 174.

[37] Ingmar Persson and Julian Savulescu, "Unfit for the Future? Human Nature, Scientific Progress, and the Need for Moral Enhancement", in *Enhancing Human Capacities*, edited by Julian Savulescu, Ruud Ter Meulen and Guy Kahane, 486-500, (Oxford: Wiley-Blackwell, 2011).

[38] Persson and Savulescu, "Unfit for the Future? Human Nature, Scientific Progress, and the Need for Moral Enhancement", 498.

[39] Elizabeth Fenton, "The Perils of Failing to Enhance: A Response to Persson and Savulescu", *Journal of Medical Ethics*, 36 (2010): 148-151.

[40] John, Harris, "Moral Enhancement and Freedom", *Bioethics*, 25/2 (2011): 102–111.

[41] Persson and Savulescu, "The Perils of Cognitive Enhancement and the Urgent Imperative to Enhance the Moral Character of Humanity".

[42] Fenton, 148.

[43] Harris, "Moral Enhancement and Freedom", 106.

[44] Harris, "Moral Enhancement and Freedom", 105.

[45] The meaning of the term rationalization corresponds here to the one that is common in psychological jargon.

[46] Garett Jones, "Are Smarter Groups More Cooperative? Evidence from Prisoner's Dilemma Experiments, 1959–2003", *Journal of Economic Behavior and Organization*, 68/3–4 (2008): 489–497.

[47] Harris, "Moral Enhancement and Freedom", 102.

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