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COGNITIVE ENHANCEMENT: THE PRESENT AND FUTURE OF HUMAN ABILITIES

Abstract: The following work will present the ways in which technology has managed to intervene and enhance certain aspects of human cognition so far. It will analyze the positive and negative consequences of these interventions, and finally, an evaluation will be made based on the ethical theories of deontology and utilitarianism. The aim of the work is an in-depth exploration within the framework of bioethics, of the alternative solutions that technology presents to everyday problems, such as cognitive disorders (Schizophrenia, Alzheimer's) as well as simple human difficulties such as lack of attention or creativity. Through all these, we will see what the capabilities of humans are at this moment, what they could be in the future, and whether this future is truly desirable.
Keywords: Human Enhancement, Cognitive Enhancement, Human Capacities, Memory, Attention, Creativity, Julian Savulescu, Immanuel Kant, Jeremy Bentham, Utilitarianism

I. INTRODUCTION

For many years, one of the main themes addressed in science fiction films and books has been the issue of human technological enhancement.[2] Whether it relates to the cognitive or physical domain, we all have memories of images picturing fictional societies with people who, through technological intervention, have abilities that initially seem

1 Author's e-mail address: faidrao2@gmail.com
2 Andrew Maynard, *Films from the Future: The Technology and Morality of Sci-Fi Movies* (Miami, FL: Mango Media, 2018), 96-99.

ideal and enviable but are later revealed to have led humanity into a dystopian and oppressive reality.[3] It is evident that the issue of human enhancement concerns society to a great extent, but its deconstruction is also common as a reassuring message that humans do not need to change; they can remain exactly as they are.[4]

In this field, science combined with philosophy aims to answer a crucial question – if human enhancement through technology is possible, and if some aspects of these fictional constructs can be materialized, would it be desirable to pursue it? And on the other hand, is it ethical to wish for humans to remain exactly as they are? By examining the cognitive domain, a review will be presented of the ways technology can intervene and enhance human abilities, the potential consequences of such interventions – whether negative or positive – and finally, an attempt will be made to draw a conclusion based on all these elements regarding the utility and morality of these practices.

Before examining all these aspects, I must clarify what exactly I mean when I refer to the cognitive and mental domain of human abilities. Human mental abilities are defined as the capacity for memory, data organization and processing, attention, comprehension, perception, speech articulation, and problem-solving.[5] It is evident that a large part of our daily life, our performance, and our overall capabilities are determined by the capacities of our cognition.[6]

Cognition is perhaps the most useful and decisive tool that humans possess, yet there are often obstacles that prevent its full utilization.[7] Many times, our cognition isn't at its full effect due to emotional and environmental factors that interfere with its normal function.[8] Additionally, some of the most significant and difficult to manage diseases and disabilities are those that affect cognitive capabilities, such as demen-

3 Ibid.

4 Ibid., 99-101.

5 Charlotte R. Housden, Sharon Morein-Zamir, and Barbara J. Sahakian, "Cognitive Enhancing Drugs: Neuroscience and Society" in *Enhancing Human Capacities*, eds. Julian Savulescu, Ruud ter Meulen, and Guy Kahane, pp. 113-127 (UK: Blackwell Publishing Ltd., 2011), 113.

6 Ibid.

7 Julian Savulescu, Anders Sandberg, and Guy Kahane, "Well-Being and Enhancement" in *Enhancing Human Capacities*, pp. 3-19, 13-14.

8 Anders Sandberg, "Cognition Enhancement: Upgrading the Brain" in *Enhancing Human Capacities*, pp. 71-92, 71.

tia,[9] Alzheimer's disease,[10] or on a smaller scale, dyslexia and Attention Deficit Disorder (ADD).[11]

Even if someone does not suffer from the aforementioned conditions, the question remains whether they truly manage to utilize their full range of abilities and, if they do, whether this is sufficient for the next step in human evolution.[12] It is reasonable at this point to wonder, if the most important part of our daily lives could undergo some form of improvement, what exactly would that be like, and would it be desirable? Simultaneously, if there were a way to prevent the mentioned dysfunctions in the field of cognition, would this pave the way toward equal opportunities or lead us toward an authoritarian and oppressive direction?

II. POSSIBLE COGNITION ENHANCEMENT METHODS

For a long time, science has been attempting – often successfully – to find solutions to the fundamental problems that impede normal brain function. The purpose of this chapter is to present the solutions that have already been provided as well as to propose solutions that may still be in the experimental stage, with the aim of showcasing the ways in which technology could intervene and enhance human cognitive abilities and what executing such interventions would mean in practice.

To begin with, I must refer to one of the most important yet susceptible aspects of human cognition: *memory*. Before discussing the potential problems that may be identified with this brain function and the possible improvements that could be made, we need to understand what memory actually is. Memory consists of a set of complex proce-

9 Kaarin J Anstey, "Enhancing Cognitive Capacities Over the Life-Span" in *Population Ageing and Australia's Future,* eds. Hal Kendig, Peter McDonald and John Piggot, pp. 165-183 (Australia: ANU Press, 2016), 167.

10 Peter J. Whitehouse, Eric Juengst, Maxwell Mehlman, and Thomas H. Murray, "Enhancing Cognition in the Intellectually Intact" in *The Hastings Center Report* 27, no. 3, pp. 14-22 (New York: The Hastings Center, 1997), 16.

11 Hana Ames, "What to know about dyslexia and ADHD" on Medical News Today (May, 2023). https://www.medicalnewstoday.com/articles/dyslexia-and-adhd#similarities

12 Bengt Brulde, "Is Mood Enhancement a Legitimate Goal of Medicine?" in *Enhancing Human Capacities*, pp. 18-230, 218.

sses that manage the acquisition, creation, and recollection of data.[13] The two types of memory are implicit memory, which is associated with mobility and habit and operates subconsciously, and declarative memory, which is associated with events and ideas and operates consciously.[14] Additionally, there is the distinction between long-term and short-term memory, which pertains to the duration of remembrance.[15]

Every stage of memory formation can be hindered by diseases or aging. Forgetfulness is an active physiological process that can be influenced and regulated by pharmacological or non-pharmacological intervention.[16] Let's take Alzheimer's disease as an example, which occurs due to a dysfunction of the cholinergic system, a system that operates by transferring information between neurons.[17] Many elements indicate that by administering drugs containing the substance acetylcholine, the function of the cholinergic system is inhibited, allowing the brain to make the necessary connections to create long-term memories.[18]

In this context, studies have been conducted on the pharmaceutical substance donepezil, which – although it has often been used by older individuals suffering from dementia or Alzheimer's – lately seems to be used by healthy individuals as a memory enhancer.[19] The results at this point are not sufficient to definitively conclude whether this substance actually affects and significantly changes the quality of memory in a healthy individual – however, it is useful to note that there are discussions regarding substances used to treat diseases are starting to be consumed in experimental stages by healthy individuals, revealing a desire for the circulation of drugs with enhancing capabilities.[20]

Equally noteworthy are the experiments in recent years with the pharmaceutical substance modafinil. This substance has been used in

13 Cristina Lanni, Silvia C. Lenzken, Alessia Pascale, Igor Del Vecchio, Marco Racchi, Francesca Pistoia, and Stefano Govoni, "Cognition Enhancers Between Treating and Doping the Mind," *Pharmacological Research* 57 (2008), pp. 196-213, 197.

14 Ibid., 197.

15 Ibid., 197-198.

16 Ibid., 198.

17 Ibid., 201.

18 Ibid., 199.

19 Lucie Wade, Cynthia Forlini, and Eric Racine, "Generating Genius: How an Alzheimer's Drug Became Considered a 'Cognitive Enhancer' for Healthy Individuals," BMC Medical Ethics (2014), 2.

20 Ibid., 2-3.

the past as a psychostimulant drug to treat narcolepsy and hypersomnia syndrome.[21] The experiment in question refers to the use of this substance to improve memory in rats. The results of the experiment showed that indeed the memory of the rats improved, and after discontinuing the use of the substance, they did not exhibit serious signs of withdrawal – which indicates that this substance, assuming it has similar functionality in humans, does not induce addiction or any other undesirable symptom.[22]

Subsequently, technological interventions in the field of the *attention spectrum* will be presented. Attention is the brain process that manages the information we receive – some information takes priority, while other information is ignored for our individual convenience.[23] Human attention is divided into two categories: tonic attention (general vigilance) and selective attention (focus on a specific space, object, or property). A more specific categorization divides the attention spectrum into three networks: the alerting network (prepares for a quick response), the executive control network (detects errors and resolves conflicts), and the orienting network (directs attention to the input source).[24]

At this point, I need to refer to relevant disorders or learning difficulties that may occur in the area of attention – starting with ADHD (Attention Deficit Hyperactivity Disorder), which affects individuals of all ages in both educational and professional settings.[25] This disorder characterizes individuals who have difficulty maintaining their concentration and often exhibit symptoms of hyperactivity and impulsivity.[26] Based on studies conducted on humans and animals, it appears that dysfunction in specific brain circuits containing catecholamines (a group of neurotransmitters such as dopamine and norepinephrine) plays a

21 Helen M. Murphy, Dylan Ekstrand, Matthew Tarchick, and Cyrilla H. Wideman, "Modafinil as a Cognitive Enhancer of Spatial Working Memory in Rats" in *Physiology & Behavior* 142 (2015), 126.

22 Ibid., 129.

23 Lanni et al., 201.

24 Ibid., 201.

25 Beatrix Krause, Roi Cohen Kadosh, "Can Transcranial Electrical Stimulation Improve Learning Difficulties in Atypical Brain Development? A Future Possibility for Cognitive Training." in *Developmental Cognitive Neuroscience* 6 (2013), 177.

26 Ames. https://www.medicalnewstoday.com/articles/dyslexia-and-adhd#similarities

role in the development of ADHD. Similarly, in other attention disorders, such as neglect, the same dysfunction is observed.[27]

Regarding the treatment of ADHD, we will often see the use of mirtazapine. Mirtazapine (a substance commonly used to treat depression) appears to have many benefits for said treatment, as it enhances the transmission of nerve signals and blocks specific receptors that affect mood and attention.[28] In studies, patients who received mirtazapine or SSRIs (Selective Serotonin Reuptake Inhibitors) performed better on certain tests compared to those who received other antidepressants. Mirtazapine appears to effectively improve attention in depressed patients, while initially having a negative effect on attention in healthy individuals, which disappeared with continuous use.[29]

Finally, another method that has garnered a lot of interest lately and through which technology can contribute to improving the attention spectrum and addressing learning difficulties without medication should be presented. Recent research shows that Transcranial Electrical Stimulation (TES), a brain stimulation method involving the application of low-voltage electrical current to the scalp, has proven to be a safe tool that – when properly utilized in combination with cognitive training – can significantly improve the training's outcomes.[30] Specifically, improvements are observed in numerical processing, language skills, and reaction control – all of which address significant deficits in individuals with learning difficulties and ADHD.[31]

So far, the issues that have been presented relate to enhancing human cognition concerning memory and attention. However, human cognition is much more than the logical brain processes we engage in to complete daily tasks – it also involves *creativity*. Clearly, creativity is not a useless aspect in someone's daily life, as it can be what is needed to achieve the best possible results in their specific professional field. Moreover, we cannot overlook the fact that almost everything we use or consume in our daily lives is the creation of creative individuals who had the ability and skill to innovate.

27 Lanni et al., 202.
28 Ibid., 202-203.
29 Ibid., 202-203.
30 Krause et al., 176.
31 Ibid., 176.

So, just as we discussed memory and attention as necessary issues susceptible to technological improvement, the issue of creativity must also be examined. For this reason, I will refer to psychoactive substances or legal stimulants, which have been synthesized to mimic the action of classic narcotics such as heroin, ecstasy, or cocaine.[32] There are many new psychoactive substances categorized as stimulants, psychedelics, synthetic cannabinoids, dissociative drugs, sedatives/hypnotics, and opioids. Each category has different effects on the brain and body, and if used properly and under medical supervision, there is no risk of addiction.[33]

To complete the part on possible proposals, solutions, and therapies that technology could offer, I will address the aspect of technological enhancement aimed at assisting individuals with specific psychological disorders or disturbances resulting from cognitive dysfunction. One of these is *schizophrenia*, a complex mental disorder that affects thinking and perception of reality. Its symptoms range from hallucinations and delusional thoughts to problems with organization, planning, and decision-making.[34] Many research studies have identified abnormalities in the nicotinic and muscarinic receptors of the brain, especially in the prefrontal cortex, in individuals with schizophrenia.[35] Furthermore, abnormalities have been found in the interneurons of the subcortical structures, which are critical for brain function. This suggests that changes in these receptors may play a significant role in the pathophysiology of schizophrenia.[36]

Research has shown that the cholinergic system plays a central role in schizophrenia, especially in its interaction with the dopaminergic system and the appearance of the symptoms mentioned earlier.[37] Ziprasidone has been proposed as a newer antipsychotic medication with very low frequency of side effects. Recent studies reveal that patients with schizophrenia who switch to ziprasidone after using conventional

32 Lanni et al., 204.
33 Ibid.
34 Emmanuel Stipa, Sylvie Chouinarda, and Luc Jean Boulaya, "On the Trail of a Cognitive Enhancer for the Treatment of Schizophrenia" in *Progress in Neuro-Psychopharmacology & Biological Psychiatry* 29 (2005), 220.
35 Ibid., 226.
36 Ibid.
37 Ibid.

antipsychotic drugs experience significant improvement in overall learning as well as long-term memory and information recall compared to those who continue their treatment with conventional drugs.[38]

III. CONSEQUENCES

Having discussed the primary ways in which technology could contribute to the cognitive enhancement of individuals, I must examine the consequences of this on a practical and societal level. First and foremost, I need to address the relief that cognitive enhancement would offer to individuals with the aforementioned conditions, disorders, or learning difficulties. These occurrences are neither rare nor isolated; for example, attention deficit disorder is the most common neurobehavioral disorder in young people, and the need to alleviate its symptoms is becoming increasingly urgent.[39] Similarly, the daily lives of individuals suffering from Alzheimer's and schizophrenia remain challenging and fraught with serious challenges that must be addressed – therefore, it is certain that it would be a positive prospect for these individuals to know that their condition is not unavoidable.[40] All this to say, a person's day-to-day life can be full of difficulties, but cognitive enhancement methods may allow people to control the extent of their suffering.[41]

However, technological enhancement doesn't only have a pharmaceutical role, where it helps an individual improve areas of difficulty, but also a purely augmentative role, where it can upgrade an individual's existing abilities. If one examines this scenario comprehensively, including its social aspects, it becomes evident that such a development could be an innovation that forever changes the structure of human daily life. For instance, in the workplace, things could radically change through the new, enhanced efficiency of employees, which wo-

38 Ibid., 227.

39 Charlotte R. Housden, Sharon Morein-Zamir, and Barbara J. Sahakian, "Cognitive Enhancing Drugs: Neuroscience and Society" in *Enhancing Human Capacities*, pp. 113-127, 116-117.

40 Ibid., 115.

41 Julian Savulescu, Evangelos D. Protopapadakis, "'Ethical Minefields' and the Voice of Common Sense: A Discussion with Julian Savulescu," *Conatus – Journal of Philosophy* 4, no. 1 (2019), 127-128. Doi: 10.12681/cjp.19712

uld undoubtedly benefit employers, but also employees by reducing workload and the difficulties associated with managing it.[42]

Beyond the professional and social reasons that might lead someone to seek technological enhancement of their cognitive abilities, the purely personal reasons for making such a choice should not be overlooked. It is well known that there is a demand for self-improvement books and aids, new diet or exercise routines, and many other ways with which people seek expert guidance on naturally enhancing their abilities. In this context, technological enhancement would be another step towards achieving the ideal version of oneself and another option for self-improvement in areas where an individual feels they want to perform better.[43]

Additionally, beyond the scenario where an individual seeks personal cognitive enhancement, there is a significant reason to consider that they might similarly desire it for the people who influence their lives. For example, doctors and judges are in crucial positions where the lives and well-being of others are at stake. No one could deny that if there were something that could make them more capable of carrying out their difficult tasks or something that would ensure their efficiency and the correctness of their decisions, there would be substantial social reasons for them to have access to such enhancements.[44]

Significant benefits can also be identified in the issue of equality. I will return to this topic later, as it is quite complex to fully address at this point, but let's make an initial observation. Issues of inequality often arise concerning individuals' positions in economically robust or marginalized groups, but there are also issues of equality stemming from individuals' basic abilities. People are divided into classrooms and colleges based on their ability to succeed in specific exams, and this classification significantly determines their subsequent lives. Therefore, bridging these differences through cognitive enhancement might be an important achievement, allowing individuals greater freedom of choice without being segregated based on their abilities.[45]

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42 American Academy of Arts & Sciences, "The Academy convenes a discussion on the regulatory and ethical dimensions of artificially enhancing human cognition" in *Bulletin of the American Academy of Arts and Sciences* 69, no. 4 (2016), 6.

43 Sandberg, 71.

44 Whitehouse et al., 19.

45 Jan Trnka, "The Ethics of Cognitive Enhancement," from Academia.edu (March, 2009), 9. https://www.academia.edu/2914861/The_Ethics_of_Cognitive_Enhancement

Beyond this, regarding the issue of equality, the assistance that cognitive enhancement would provide to individuals with illnesses or disorders such as those mentioned above can't be overlooked. If indeed this enhancement were implemented in a transparent and universal manner, it would create a framework in which no one would significantly fall behind others in terms of their cognitive abilities. It would be a way to level the cognitive differences, which are often a matter of simple genetics but can also be a matter of socioeconomic class. Individuals from lower social classes frequently do not receive equal education (compared to higher social classes) and, throughout their lives, do not have the same amount of time to spend develop themselves intellectually, especially in cases where they are forced to enter the workforce at a very young age.[46]

To summarize this part of the discussion, many of the positive consequences of cognitive enhancement are self-evident, making it seem unnecessary to recap them. However, it is crucial to analyze them as thoroughly as possible so that we can understand precisely what the related technological intervention aims to achieve and then decide whether we truly want to live in such a future or not. Before drawing this conclusion, we must also consider the other aspect of cognitive enhancement – the potential negative consequences it may bring.

Firstly, I need to address a completely practical issue: the human brain is a complex organ with significant flexibility, especially in young individuals. Therefore, how can we be sure that a teenager has reached a point where they genuinely cannot achieve more with their own abilities? The answer is that we truly do not know, and we cannot predict the consequences that might arise from such an intervention if the child has not yet reached the full extent of their capabilities before the intervention takes place.[47]

Additionally, when it comes to minors, there is the possibility that their brain development may not proceed normally if their brain becomes accustomed early on to relying on pharmaceutical aids for attention and memory. The development of these skills should be a natural process that each child goes through at their own pace so that they can eventually meet societal standards. It would certainly require great de-

46 Ibid.

47 Krause et al., 190.

termination and effort for a child to decide to develop their abilities on their own or to try to overcome any learning difficulties if they know that an easier solution is available.[48]

At this point, I need to revisit something mentioned earlier: the issue of equality. It was previously emphasized that cognitive enhancement would be supportive in this regard, as it would give anyone who needed it the ability to overcome their genetic difficulties so that everyone would have a common starting point. However, this would only hold true under the condition that everyone had equal access to cognitive enhancement methods. If such access was not ensured (as is often the case with most drugs and aids), then not only would this innovation not be a step towards equality, but it would create a new class gap between those who can afford this technological enhancement and those who cannot. And this gap would, of course, be yet another advantage for the upper classes, facilitating to an alarming extent the exploitation of the lower classes and perpetuating differences.[49]

Furthermore, we cannot ignore the issue of authenticity. We have often seen athletes being excluded and severely punished in competitive arenas for using some form of pharmacological aid. This clearly happens due to the violation of rules that strictly prohibit such actions, but what concerns us is why that prohibition exists in the first place. Pharmacological enhancement in sports is banned because it is believed that an athlete who has received this enhancement does not compete with their true abilities, thus they have not won in an authentic manner.[50]

Certainly, sports are an arena whose whole purpose is to showcase human abilities, so this specific parameter is definitely logical and understandable. However, we must consider what this would entail for cognitive enhancement in academic or work environments. If an athlete does not truly utilize their abilities under the influence of enhancing drugs, does a student or a worker truly utilize them by doing the same thing? Are their achievements genuinely their own? If not, then what

48 Teresa Iuculano and Roi Cohen Kadosh, "The Mental Cost of Cognitive Enhancement" in *The Journal of Neuroscience* 33, no. 10 (2013), 4486.

49 Sandberg, 84.

50 Maxwell J. Mehlman, "Cognition-Enhancing Drugs" in *The Milbank Quarterly* 82, no. 3 (2004), 490.

consequences will individuals face knowing that they have not truly succeeded with their own abilities?

Finally, we must recognize that society is composed of individuals who differ from each other, each having their own abilities and weaknesses, when put together they complement each other, creating a harmonious whole. Technological enhancement in the realm of intelligence might threaten this social balance and compel everyone to confine themselves to a specific framework of abilities that they may not have developed on their own, thus distancing themselves from what they truly want to do.

The danger is that a society of identical individuals with common abilities and difficulties may emerge, suppressing all forms of creativity and depriving prospects for collaboration. Moreover, concerning healthy individuals aiming to use this technology purely for enhancement purposes, a significantly graded division could be created between those who opt for enhancement and those who, for whatever reason, do not desire it, posing the risk of normalization of enhancement as the only option.[51] This would clearly pose a threat to the freedom and autonomy of individuals regarding their own body.

IV. PHILOSOPHICAL DIALOGUE

Having briefly outlined what cognitive enhancement would entail in practical terms, along with the methods and consequences it might bring, we'll now turn our attention to the purely ethical dimension of the issue. Through the perspectives of the two major ethical theories, deontology and utilitarianism, we'll explore the positive and negative outcomes and assess the concept of cognitive enhancement itself. Our aim is to arrive at a conclusion regarding the morality of the matter and its future implications.

We'll begin with deontology, as it is a theory that can lead us to more absolute conclusions in opposition to utilitarianism. The philosopher who established it, Immanuel Kant, has expressed his ethical beliefs in his book *Groundwork of the Metaphysics of Morals*, which we'll rely on here. He states that, in his view, the only truly ethical thing in the world is "good will," meaning that to judge an action as ethical, what

51 Sandberg, 84.

matters above all is the motive of the individual performing it.[52] This means that if, for example, someone performs an act that has positive consequences but they didn't do it for the sake of the higher good, that act cannot be judged as ethical.

Significantly, one will observe that Kant places great emphasis on the concept of duty – he considers that ethics arises from the duty of individuals to behave in a specific way that is in accordance with the moral law.[53] The moral law is what he calls a "categorical imperative," which advocates that for an action to be ethical, it must be desirable for all people to perform it.[54] For example, lying could never be ethical because if it is ethical in one case, then it must be ethical in all cases. We can understand that this would be impossible because if lying were ethical in all cases, then everyone would be entitled to lie in any situation they desired, and thus the concept of truth would lose its meaning.[55]

Returning to the value of the word duty, the philosopher states that it is very different for someone to act ethically out of duty than to act ethically because they believe that the consequences of a specific action will benefit them.[56] In the first case, a person behaves ethically because they act based on goodwill and the categorical imperative, thus following their ethical duty. In the second case, a person behaves ethically because in that particular situation, it happens to be more beneficial for them to take the ethical path, whereas in another situation, when it does not benefit them, they may act unethically. For this reason, the most critical proposition of deontology is: "everyone must act in such a way that their subjective judgment becomes a universal law."[57]

At this point, the following conclusion can be drawn: the ethical judgment of cognitive enhancement based on deontology depends largely on the reasons for which someone desires to become subject to it. If someone wants to undergo a technological intervention because they do not wish to do the hard work required to achieve their goal on their own, then clearly this act would be judged as unethical. Conversely, if someone has truly maximized their abilities and wishes to enhance

52 Immanuel Kant, 393; 395.
53 Ibid., 401.
54 Ibid., 402.
55 Ibid., 402-403.
56 Ibid., 403.
57 Ibid., 403-404.

them in order to be more effective in their work with the intention of benefiting their colleagues and society as a whole, then this act might be considered ethical.[58]

However, how easy would it be to make such a distinction? And how could one ensure that they have indeed maximized their individual abilities so much so that they cannot achieve anything more on their own without external assistance? Furthermore, if the second case mentioned earlier is the only scenario in which cognitive enhancement could be considered ethical, then we should judge not only whether the individual cannot achieve anything more on their own, but also whether what they are attempting to achieve will indeed benefit society in some way. For example, we could support someone to undergo cognitive enhancement to perform a difficult job like that of a neurosurgeon, but not to enable them to have greater success in gambling or to win a competition.

At this point the following problem arises: is it possible that cognitive enhancement would be ethical in one case and not in another, when it was previously mentioned that everyone should desire that the maxim of their action become a universal law?[59] Therefore, perhaps if cognitive enhancement is wrong in one case it should be wrong in all, as I mentioned earlier about lying. If we imagine a society in which everyone could receive cognitive enhancement, the concept of authenticity could be threatened just as everyone being able to tell a lie could threaten the concept of truth.

This question is indeed quite complex, so at this point, I may not be able to give an absolute answer. However, regarding everything that has been said, I can conclude the following: "good will" and "duty" are the coordinates that, according to Kant, should guide each of our actions, and these advocate for the ultimate purpose of humanity to be the social good, benefiting and helping our fellow human beings.[60] It is difficult to imagine how deontology could close the door to something that achieves all these purposes. It should be noted that there are many things that are ethical based on deontology, which someone could do for the wrong reasons.

58 Ibid., 398.
59 Ibid., 403-404.
60 Ibid., 423.

For example, a famous person could donate a large sum of money to a charity, not because they care about helping people, but solely to improve their image. Certainly, a deontologist would not approve of this act, but that does not mean they should consider the act of donating money unethical. Let's close the deontological discussion with this, concluding that if someone truly has societal good in mind with their action, they could, based on this philosophical theory, undergo some form of cognitive enhancement within the framework of their mental abilities.

I will proceed to the next ethical theory that will guide us to some conclusions regarding the ethics and limits of cognitive enhancement – utilitarianism. Utilitarianism finds its origins in Jeremy Bentham, who in his book *An Introduction to the Principles of Morals and Legislation* argues that our lives are guided by the dichotomy of pain and pleasure.[61] This means that every choice we make, by our nature, is driven by our desire to experience pleasure and avoid pain. Bentham does not condemn this, as he is deeply influenced by Epicurean hedonism and empiricism, considering the essence of our experiences to be truly significant.[62]

He fully approves of people's desire to experience as much pleasure and as little pain as possible, but he believes that there should be certain rules or frameworks within which one chooses the appropriate action and which ensure that this action will bring the greatest possible benefit to the greatest number of individuals.[63] Utilitarianism, essentially, is a social theory; it does not support the idea that everyone can look out for their own benefit at the expense of others. On the contrary, utilitarianism often sacrifices individual interests in order to benefit the society as a whole.[64]

So, initially, we can see that there are some fundamental differences between deontology and utilitarianism – in utilitarianism, the consequences of an action are of paramount importance, while the "good will" or the intention behind why someone chooses an action has no serious ethical value. Additionally, in deontology, something that is et-

61 Jeremy Bentham, *An Introduction to the Principles of Morals and Legislation* (Oxford: Clarendon Press, 1907), 12.

62 Philip Schofield, "The Epicurean universe of Jeremy Bentham: Taste, beauty and reality" in *Bentham and the Arts*, eds. Anthony Julius, Malcolm Quinn, Philip Schofield, pp. 21-40 (UK: UCL Press, 2020), 24; 27.

63 Bentham, 25-27.

64 Bentham, 44.

hical for one person must be ethical for everyone, while utilitarianism judges each action separately in order to take into account all the different parameters surrounding each action.[65] Therefore, in this ethical theory, where the motive behind an action does not concern us, and we strictly focus only on the consequences of actions, we should summarize the potential consequences that were mentioned earlier and use them to judge whether cognitive enhancement will bring greater pain or pleasure to society.

Starting with a positive consequence, I mentioned that cognitive enhancement could help eliminate certain diseases and disorders resulting from cognitive impairments. Based on utilitarianism, this would be a significant and serious achievement as it would bring unlimited positive consequences to the patients of these diseases, greatly benefitting both society at large and the individuals suffering. On the other hand, there is also the negative consequence that there may be cases where an individual (usually at a young age) may not have developed enough to rely on such enhancements to overcome certain difficulties, such as dyslexia and attention deficit disorder.

If we compare these two consequences based on the parameters offered by utilitarianism, we will see that the positive consequence yields greater pleasure than the pain caused by the negative consequence. Firstly, this is because the positive consequence affects a larger number of people and not just individuals of a specific age group. Secondly, if we consider that serious diseases are indeed eliminated, which torment people and render them unable to adapt to daily life, this clearly carries more weight than cases where a young person would receive some form of cognitive enhancement while they could have achieved the same result by themselves with more effort. This is because, in the first case, we know with certainty how positive the result would be, while in the second case, we don't really know what problems would arise, if any at all.

Another positive consequence I mentioned is the improvement of abilities for individuals who do not have any relevant medical condition but simply wish to have better memory, increased attention, problem-solving skills, etc. I noted that this would have a positive impact in social contexts (e.g., the workplace) as well as individually, and that

65 Bentham, 12; 25.

it could be comparable to other methods of self-improvement, such as exercise and good nutrition. On the other hand, the problem of the lack of freedom and autonomy of individuals' bodies could arise because if the majority chose such enhancements, those who did not opt for them would be socially excluded.

In this case, we should also consider that, based on utilitarianism, the positive consequence carries greater weight because, as I mentioned earlier, individuality is often sacrificed for the greater good of the majority. Since a large portion of the population would choose and benefit from cognitive enhancement, while those who wouldn't choose it wouldn't experience any significant harm, apart from possibly feeling pressured to choose it themselves for better survival conditions, then we must say that cognitive enhancement remains the better solution in this area as well.

I also mentioned that a potential positive consequence would be the increased trustworthiness of individuals performing highly demanding tasks or making serious decisions (such as doctors, judges) since those who depend on them would know they have received some form of cognitive enhancement. This is an extremely important positive consequence since it is a part of human nature to be influenced by emotional factors or to struggle to discern the best possible option in every situation,[66] therefore it would be very beneficial to minimize that inherent difficulty. Additionally, I addressed the issue of authenticity regarding whether someone's achievements are genuinely their own and the possibility, through this entire process, of making it impossible for humans to honestly declare that they have achieved something entirely on their own.

Once again, it wouldn't surprise us to find that in this area, the positive consequence carries more weight than the negative. For a utilitarian, it doesn't matter whether someone achieved something on their own or needed something beyond themselves to achieve it; the only thing that matters is what precisely arises from that achievement. Therefore, if people receiving cognitive enhancement can indeed fulfill difficult

66 Michael Anderson, Susan Leigh Anderson, Alkis Gounaris, and George Kosteletos, "Towards Moral Machines: A Discussion with Michael Anderson and Susan Leigh Anderson," *Conatus – Journal of Philosophy* 6, no. 1 (2021), 187. Doi: http://dx.doi.org/10.12681/cjp.26832

tasks more effectively, with significant social implications, then for a utilitarian, it wouldn't matter whether they accomplished it alone or not.

Finally, I will address the issue of equality, which is possibly the most crucial part of the discussion regarding cognitive enhancement. On one hand, equality of abilities is largely ensured as individuals who genetically have weaknesses in certain skills or have one of the diseases or learning difficulties I mentioned could reach the same level as everyone else. On the other hand, if cognitive enhancement were not widely accessible and could only be obtained by people who belong in a high socioeconomic class, then social divides would be reinforced, making survival harder for lower socioeconomic strata. What I can say at this point is that for utilitarianism, it would clearly be better for no one to have access to cognitive enhancement than for it to be available only to specific groups if those groups exploit it in such a way. Therefore, we are faced with a very serious issue here: *who could have access to cognitive enhancement and under what conditions would they be allowed to utilize it?*

Therefore, in the realm of utilitarianism, the use of cognitive enhancement could be deemed acceptable only under two conditions: a) everyone, regardless of social class, should have access to all C. E. methods, which would likely mean that individuals who couldn't afford them should receive them for free, or b) access should be limited to certain individuals if it is determined that they need it (due to illness or the demands of their work), and once they have obtained cognitive enhancement, there should be some form of control over how they use it. If neither of these conditions were met, then the risk of cognitive enhancement turning into a tool of oppression and social discrimination would be much more serious than any potential benefits.

V. CONCLUSION

Having presented different aspects, benefits, and challenges that may arise from widespread access to cognitive enhancement methods, I am left to attempt an answer to the initial question: if we had immediate access to all the methods mentioned, would it be sensible for humans to undergo this technological intervention, or would it be better to remain as they are and try to reach their maximum potential with their own abilities?

Certainly, there cannot be only one correct answer to the question, and the purpose of this work is not to provide a definitive answer. The effort made aimed to present the alternatives that humans could have in order to improve their daily lives and accomplish things they might not be able to achieve solely by the use of their natural abilities. Additionally, the goal of this essay has been to combat the subconscious suspicion and resistance that people may inherently have towards anything new simply because it is unfamiliar, and they may not want to take such a big risk.

Of course, there are many serious counterarguments to the issue of cognitive enhancement that do not merely rely on the fear of something new, some of which have been attempted to be presented in the best possible way and addressed effectively and without prejudice. Therefore, let's conclude the discussion with this statement: humans still have a long way to go to evolve, achieve more and significant things, and surpass their current limits of abilities. None of the ways in which the above can be achieved will come without some problem or difficulty. We must not let all of this deter us from seeking something better – as, if we did, we would have been deprived of countless medical and scientific innovations, thanks to which many people are able to live andprosper at the moment.

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KOGNITIVNO UNAPREĐENJE: SADAŠNJOST I BUDUĆNOST LJUDSKIH SPOSOBNOSTI

Sažetak: Rad koji sledi predstaviće načine na koje je tehnologija do sada uspela da se umeša u izvesne aspekte ljudskog saznanja, i da ih unapredi. Analiziraće pozitivne i negativne posledice tih intervencija, a na koncu, njihovo vrednovanje biće sprovedeno na osnovama etičkih teorija deontologije i utilitarizma. Cilj rada jeste da u okvirima bioetike temeljno istraži alternativna rešenja koja tehnologija daje za svakodnevne probleme poput kognitivnih poremećaja (šizofrenija, Alchajmerova bolest), kao i za proste teškoće ljudi poput nedostatka pažnje ili kreativnosti. Kroz sve to, sagledaćemo šta ljudske sposobnosti jesu u ovom trenutku, šta bi one mogle biti u budućnosti, kao i da li je ta budućnost zaista vredna želje.
Ključne reči: unapređenje čoveka, kognitivno unapređenje, ljudske sposobnosti, pamćenje, pažnja, kreativnost, Julijan Savulesku, Imanuel Kant, Džeremi Bentam, Utilitarizam

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