Human enhancement making use of technological incorporations in their biology - Ethical perspective

Melhoria humana valendo-se de incorporações tecnológicas em sua biologia - Perspectiva ética

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Abstract

Is it ethical or not to enhance the characteristics and capacities of human beings, making use of technological incorporations in their biology? This article presents arguments from both position pros and cons, about technological incorporations in human bodies. The denaturalization of technologically enhanced humans is discussed; A discussion is raised about the impact of these technologies on the population inequality; We present a contrast between whether the research is for treatment or enhancement purposes. Some of the repercussions on a society of humans are analyzed, both hyper connected and technologically enhanced. Some of the future challenges that societies with technologically enhanced humans must face are presented. In conclusion, the development of technologies, within a regulatory and normative framework, to enhancing the characteristics and capacities of human beings is ethical. Because technologically enhanced humans are part of the NBIC convergence, and the NBIC convergence will generate new knowledge that will surely be used to develop clean and safe energy sources, preventive medical treatments that

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will eliminate diseases such as cancer and HIV, and design strategies to the conservation and decontamination of the planet.

Keywords: *Human enhancement technologies. Ethical. NBIC convergence. Enhanced human. Cyborgs.*

Resumo

É ético ou não melhorar as características e capacidades do ser humano, valendo-se de incorporações tecnológicas em sua biologia? Este artigo apresenta argumentos, tanto a favor quanto contra, sobre a incorporação da tecnologia no corpo humano. A desnaturação de seres humanos tecnologicamente melhorados é discutida; Há uma discussão sobre o impacto dessas tecnologias na desigualdade populacional; Apresentamos um contraste entre as pesquisas para fins de tratamento ou melhoria. São analisadas algumas das repercussões em uma sociedade humana, hiperconectada e aprimorada tecnologicamente. Alguns dos desafios futuros que as sociedades com humanos tecnologicamente melhorados enfrentam são apresentados. Em conclusão, o desenvolvimento de tecnologias, dentro de um quadro regulatório e normativo, para melhorar as características e capacidades do ser humano é ético. Porque humanos tecnologicamente melhoradas são parte da convergência NBIC, e a convergência NBIC irá gerar novos conhecimentos que certamente serão usados para desenvolver fontes limpas e seguras de energia, tratamentos médicos preventivos que eliminarão doenças como câncer e VIH e estratégias de design para o conservação e descontaminação do planeta.

Palavras-chave: Tecnologias de aprimoramento humano. Ética. convergência NBIC. Humano melhorado. Ciborgues.

Introduction

Is it ethical or not to enhancing the characteristics and capacities of human beings, making use of technological incorporations in their biology?

Human enhancement technologies are part of the results of the scientific-technological convergence Nano Bio Info and Cogno (NBIC) (Giesen, K. G., 2018)(Ochoa, Y. V, et al , 2017), since it is based on the understanding of the biological systems at the molecular level, for the interfaces development between technological devices, organs and tissues.

From the ethical point of view, the detractors of the incorporation of technologies within the human organism, for enhancement their capacities, argue that this denatures the human being; thus it transforms him into a new human-machine

hybrid being, who makes his decisions only from a logical point of view, without considering the moral implications. This could separate him from understanding the environment and other individuals.

On the other hand, supporters of technologically enhanced humans argue that there is already an interaction between human beings and technology; Examples of this in augmented reality and Smartglass devices can be found; which provide real-time data to the user, expanded information for decision-making. This increases user natural capacities, but this does not denature the way they make decisions; thus, the technology-human integration will not either. This will only reduce the analysis time of information. Therefore, everyone will continue to be aware about of responsibility that comes with each decision he makes, and its repercussions on the environment.

In addition to the question of the naturalness of the decision-making process of technologically enhanced humans, other ethical issues are debated. Among these, the accessibility of technology for most of the population, the harmful effects on the organism that the incorporation of technologies could bring, and the social repercussions that individuals would be hyperconnected.

Terminology
Definition of technologically enhanced humans:

Technologically enhanced humans are conceptualized as "cyborgs", who incorporate technological artifacts in their bodies to enhance their capabilities (Juengst, E., & Moseley, D., 2019. This text focuses on the incorporation of electronic devices with functionalities such as: exchange information with one or several organs of the body, store information in digital format, support data processing, and enable interconnection with other external technological devices, such as computers, internet or robotic prostheses (Clark, A., 2001).

Definition of backdoor elements within
hardware-software technologies:

Technological systems that incorporate some type of software or firmware can carry hidden factory applications called backdoor elements (Gandotra, E., et al., 2014). These are included in the category of malware applications, whose main objective is to allow an external system to perform actions on a hardware-software device, without authorization given by the device main administrator. The backdoor elements are used to execute other applications, send files, modify system configuration parameters or install other malware (Yaacoubi, O., 2019).

Denaturalization of technologically enhanced humans

With the certainty that most people frequently use technologies that facilitate information analysis and processing, and that there are extensive communication networks, the current decisions of the population are not moral by using technological aids can be affirmed, because people are enabled to morally evaluate their actions even if they use technologies (Noorman, M., 2012). In this case technological aids can be seen in analogy to books, letters and abacus, all these artificial elements, which do not alienate people from the moral responsibility of the decisions they make when they use those elements. Therefore, the technological artifacts incorporated in the human organism for the enhancement of their storage, analysis and information exchange capabilities would not affect the naturalness of the actions of human beings, more than the other available technologies.

Will enhancement technologies accentuate inequality in the population?

Taking the development of health and education systems as an analogy, to compare those with what could be the development of human enhancement

technologies; a possible scenario to analyze the impact of these technologies on the equality and opportunities indicators in societies can be established.

In the middle ages in Europe, health and education services were only reserved for governing elites. Each advance in health issues provided an increase in the quality of life of the elite, and restricted access to education services strengthened population control with governance systems. In this period of history, education and health services accentuated the inequalities between the individuals that made up society. However, with the development of the concept of "state", from the European renaissance to our era, the states implement policies that provide minimum comfort for its societies, within which basic coverage in health and education have been contemplated Nozick, R. (1974). These policies prevent these services from being main elements of social inequality between the states individuals (Rawls, J., 1971). Therefore, initially, human enhancement technologies will only be accessible to those who can afford them; but fortunately, there is a high probability that, in a medium term period, these technologies will be part of the basic coverage package that the states will provide.

The above conclusion only applies to countries where strong states have been built, called "first-world countries". Sin embargo, in the countries called underdeveloped, coverage in health and education is of smaller scope than in the first. Therefore, there is a marked difference in equal opportunities between the individuals of the two types of states. Consequently, human enhancement technologies can increase inequalities between individuals belonging to states with low levels of development.

Research in technologies for human enhancement, treatment or enhancement?

Treatment or enhancement? To clarify this questioning in the context of technologies for improvement enhancement; one of the functions of the ethics committees of institutions that manage projects with results applicable to technologies for human enhancement is taken as a starting point: the Ethical Endorsement. Most R & D & I projects require a prior endorsement from an ethics committee, and many of the research related to the development of technologies for human enhancement could

be masked in research for treatments or people rehabilitations (Vertovšek, N., & Greguric, I., 2018), which already has an ethical approval. However, there is a diffuse area at the time of assessing the case of people who are treated by some type of accident using technological incorporations in their body, not only recovering the initial capacities, but giving rise to capacities that may be above the natural capacities (Pruski, M., 2019).

For examples, suppose the case of a paralympic athlete who uses a prosthesis that allows him to develop speeds higher than the speeds that runners could achieve without any type of prosthesis. In a other case, a person who loses an eye and is replaced with an electronic-eye that allows him to see a greater distance and frequency spectrum, than a human eye. The development of technologies for both cases could be within the ethics parameters of a committee. However, when the results of these projects are already available: What would happen if a person in normal conditions decided to amputate a leg to incorporate a prosthesis that would make it faster or get injured to obtain a new electronic eye? At this time there is an important regulation gap, in matters in which people decide to do, beyond a health condition, to access an already developed technology of human enhancement. Neither is there a way to monitor and control the applications of the results of R & D projects that initially obtained an ethics guarantee for being framed in a context of rehabilitation.

Repercussions in a society of hyper connected individuals

At present, societies are facing the ethical dilemmas related to people information management. For this case, the analysis focuses on societies in which their individuals have broad access to information technologies.

In general, when people use electronic devices to interact with other individuals, using Internet networks as a channel, the information that flows is monitored and feeds data banks, which are then analyzed, both by government agents and privates corporations. This has developed new fields of research, the best known is the so-called "Big Data" (Bauer, W., et al., 2015). There are several methods to collect information from people, the most common are those based on social networks such as Facebook,

Twitter, Instagram and YouTube. However, it is known that email applications and web browsers also send user information to different types of repositories.

As for the privacy of user information and the use that may be given, there are several controversies. The main one focuses on the complexity of the Data Use Agreement, which is a legal instrument in which users express the scope that a third party will have to access and manage the information that the user provides through the use of some particular technology (Fakhar Manesh, et al., 2020). Usually these instruments are not fully understood by users, which allows the information collected to violate their privacy with different objectives, the most common is to identify consumption preferences and development of personalized advertising strategies.

Currently users voluntarily enter the information into the systems. This is done by clicking on a browser, sending an email, typing a search in a search engine, sending a text message, sharing photos on social networks, or sharing the location in an application. There are several systems developed to capture and transmit user information, and they generally work without the user noticing or being aware about of information destination and use. Taking this to the context of future electronic devices integrated into the cerebral cortex of users, as part of human enhancement technologies; These devices could: capture the information of the thoughts at any time, modify the information related to the user's memories, with or without users consent. Therefore, it gives rise to the question: What would happen if people thoughts were tracked by hidden backdoor elements in electronic human enhancement devices? The repercussions of this are large scale. This scenario raises a lot of arguments for detractors of the use of electronic devices for human enhancement, which give rise to the timely development of laws that protect society against the misuse of the information that flows. However, who will define what is good and bad use of information? It is a question still open.

The future and challenges of societies with technologically enhanced humans

The main prospective element of technologically enhanced humans is genetic engineering. Research for human enhancement based on microelectronics devices is

already underway; Those technologies are not from the future, they are already from the present (Mukherjee, S., 2017). However, the free use and experimentation of biotechnology for the development of genetic engineering in humans has not yet been allowed. There are many ethical debates about the extent of future research results that lead to genetically enhanced humans. The enhancements that genetic engineering could provide are not only in physical characteristics such as strength, speed, and eidetic memory; It can also be behavioral characteristics. But who will decide what is a genetic enhancement of behavior in humans? What will be the parameters to evaluate what is an enhancement in behavior? This is a field where the risks can be very high, mainly because an enhancement at the genetic level not only affects the individuals of a society, but also reaches the individuals of the following generations.

One of the main challenges that technologically enhanced human societies must face is based on the construction of a regulatory and normative framework worldwide, that in turn allows to consolidate minimum global ethics standards, agreed between all states and nations. This like what happens in environmental conservation treaties, technological advances are not a matter of a single country, they are issues that transcend borders impacting humanity and the planet. However, current regulatory frameworks can serve a dual purpose. The first is to provide the basis on which a society determines the scope and nature of its different initiatives. The second purpose may be a mechanism by which governments ensure that research initiatives report on their activities, to control the dynamics and direction of research. Finally, these frameworks can become means of manipulation, so it cannot be ensured that the ends are totally altruistic.

Final remarks

The incorporation of technologies within the human organism to enhance its capabilities is ethical. However, there are several challenges that must be overcome so that the development and use of human enhancement technologies do not represent dangers for societies.

Currently, it is inevitable that research is developed that is framed in human enhancement technologies; But parallel to these investigations, scientists and

legislators around the world work together to minimize the risks that come with the development of these technologies.

Like other fields of research, such as nanotechnology, biotechnology, and genetics, among many others; human enhancement technologies seem to advance faster than their regulatory frameworks; But fortunately, the training of the scientists who carry out these investigations not only incorporates the technical and basic science components, but also has a great component of ethics and responsibility, which allow them to carefully advance in each experimentation. However, the role of ethical detractors is very important, because are they who will identify all types of risks in the development of technologies, and their repercussions on societies, allowing the research community to take precautions and design carefully their models of experimentation.

The future of humanity is quite promising, and part of that future is the use of human enhancement technologies, which, like other technologies, will allow the development of new capabilities in humans; This will not only make possible the faster appropriation of knowledge, but they will be part of the vital tools for the generation of new knowledge; New knowledge that will surely be used to develop clean and safe energy sources, preventive medical treatments that will eliminate diseases such as cancer and HIV, and design strategies for the conservation and decontamination of the planet.

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