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UPDATE

Bioethics and biotechnical moral enhancement

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Abstract

The rapid development of neuroscience has given rise to expectations regarding the potential medical-therapeutic applications of neurological and behavioral diseases, which remain incipient and provisional. Proposals of cerebral interventions to enhance cognition, memory and learning, meanwhile, have advanced more quickly. Neuroethics analyzes the uses, abuses, benefits and risks of bioenhancement. Recent publications in bioethics journals have debated the urgent need for an instrumental and moral bioenhancement, due to the protracted and insufficient moral maturation achieved by the traditional processes of education and socialization, which have been too slow to meet the cognitive development of technoscience, due to the risk that such technology might fall into the hands of individuals and groups who wish to carry out actions with catastrophic results. Latin American bioethics must actively participate in the debate on the moral enhancement of biotechnology, in view of the local consequences of research and the potential implementation of cerebral interventions for moral ends.

Keywords: Bioethics. Medical, ethics. Neurosciences. Cognitive neuroscience. Moral development.

Resumo

Bioética e ampliação moral biotecnológica

O rápido desenvolvimento da neurociência estimula expectativas para aplicações médico-terapêuticas em doenças neurológicas e comportamentais, ainda muito incipientes e provisórias. Com maior rapidez avançam propostas de intervenções cerebrais para melhorar cognição, memória e aprendizagem. Usos e abusos, assim como benefícios e riscos de tais intervenções de ampliação são analisados pela neuroética. Na literatura bioética recente se debate sobre a necessidade urgente de uma bioampliação moral instrumental, dada a lentidão e insuficiência do amadurecimento moral tradicional mediante a educação e socialização, perigosamente atrasado em relação ao desenvolvimento cognitivo da tecnociência dado o risco de potentes armas destrutivas caírem nas mãos de pessoas e grupos dispostos a gerar catástrofes massivas. A bioética latino-americana deve participar ativamente do debate sobre a ampliação moral da biotecnologia, em vista das consequências locais da pesquisa e eventual implementação de intervenções cerebrais com fins morais.

Palavras-chave: Bioética. Ética médica. Neurociências. Neurociência cognitiva. Desenvolvimento moral.

Resumen

Bioética y realce moral biotécnico

El acelerado desarrollo de la neurociencia abre expectativas para aplicaciones médico-terapéuticas en afecciones neurológicas y conductuales, aún muy incipientes y provisorias. Con más celeridad avanzan propuestas de intervenciones cerebrales para realzar cognición, memoria y aprendizaje. Usos y abusos, así como beneficios y riesgos de tales intervenciones de biorealce son analizados por la neuroética. En la literatura bioética reciente se debate sobre la necesidad urgente de un biorealce moral instrumental, dada la lentitud e insuficiencia de la maduración moral tradicional mediante educación y socialización, peligrosamente rezagada con respecto al desarrollo cognitivo de la tecnociencia por el riesgo de que potentes armas destructivas caigan en manos de personas y grupos dispuestos a generar catástrofes masivas. La bioética latinoamericana debe participar activamente en el debate del realce moral biotécnico, en vista de las consecuencias locales que presenta la investigación y eventual implementación de intervenciones cerebrales con fines morales.

Palabras clave: Bioética. Ética médica. Neurociencias. Neurociencia cognitiva. Desarrollo moral.

Declaram não haver conflito de interesse.

The expansive and accelerated research in genetics and neurosciences has initiated a debate on the possibilities of improving, perfecting or even creating the physiological functions and abilities of human beings, under the generic term of *enhancement*. Of possible translations into Latin languages, the term "*realce*" appears to be more appropriate insofar as it refers to change or increase, without prejudging whether every robust function is beneficial or obeys a universally desired and frequently proclaimed perfective ideal. The present reflection focuses on the biotechnical moral enhancement proposed and debated from neuroscience and bioethics.

Like the Ethical, Legal and Social Implications (ELSI) Research Program initiative that accompanied the Human Genome Project, neuroscience has developed the discipline called neuroethics, characterized as *the examination of what is right and wrong, good and bad about the treatment of, perfection of, and welcome invasion or worrisome manipulation of the human brain* [1]. Neuroethical reflection develops along two aspects: a facet dedicated to the ethics of neuroscience, the other focused on the neuroscience of ethics [2]. The ethics of neuroscience studies the *ethical assessment of the application of new techniques, which raises questions very similar to traditional bioethical issues*, and the neuroscience of ethics *deals with the neural bases of moral agency* [3].

The relationship between neuroethics and bioethics has been variously described, varying from descriptions of bioethics either as insufficient for the challenges of neuroscience, as a new discipline within bioethics, or as a particular aspect of bioethics, such as applied ethics. Swedish thinker K. Evers points out that neuroethics *can be considered, by virtue of its interdisciplinary nature, as a subdiscipline of neurosciences, of philosophy or of bioethics in particular, depending on the perspective one wishes to emphasize* [4].

Recognizing the relevance of bioethical thought in terms of the *new technologies from life sciences in the last three or four decades*, neuroethics points out that *it is plausible to argue that the techniques and technologies that emerge from the science of the mind present even more profound questions about the significance of the human, and pose greater challenges to moral thought* [5].

Under the ill-defined mantle of interdisciplinarity, a confused relationship between neuroethics and bioethics has emerged, without it being possible to clarify whether neuro-ethics is an applied ethic of the second order in a disciplinary taxonomy that places bioethics in the form of applied ethics in the first order, or whether they are two independent but connected disciplines, in whose reading it is implied that neuroethics is, effectively, a bioethics applied to matters concerning the study and applications of brain research.

Adela Cortina, possibly the Spanish-speaking philosopher who has most extensively studied neuroethics, has said on several occasions that, if neuroscience allows the understanding of the neural mechanisms that command what "we must do morally", philosophical ethics and with it bioethics would become obsolete and useless. Although Cortina believes it unlikely, some attacks from neuroscience point to a mismatch between *neuroethics (which) is or should be an attempt to propose a philosophy of life with a cerebral foundation* [6], and the bioethics that reflects, based on the transcendental pragmatics of Apel, on committed values in human interventions on vital and natural processes [7]. In this respect, a very recent and complete panoramic vision of neuroethics, points out that:

While bioethics deals with the more general aspects of human behavior in the context of the life and health sciences, neuroethics emphasizes more specific questions regarding the link between the brain and behavior. Of course, neuroethics has several areas in common with bioethics [8].

It would not be more than an academic debate, however, if it were not for the fact bioethics is involved in an intense controversy initiated by a number of prominent bioethicists who are urgently promoting scientific research and technical application to improve provisions and moral decisions, proposals that have triggered the interest and opposition of other thinkers, as described below. The aim of the present reflection is to recognize that bioethics deals with the same issues as neuroethics, and that this concept is of particular significance for Latin American nations, which must actively participate in the debate due to the important sociocultural consequences of the issue, especially in regions where inequalities create discriminations and access to the techno-scientific proposals - both biomedical and genetic and neuroscientific - that attempt to modify the moral dispositions of human beings.

Biotechnical enhancement

An enhancement is an intervention - a human action of any kind - that increases or accentuates

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the capacity (or characteristic) that human beings ordinarily possess or, more radically, that produces a new [capacity]. The widely used term *biomedical* enhancement creates confusion between medical or therapeutic interventions that repair or normalize deficient or subnormal functions, and what must properly be called biotechnical enhancement, applied to healthy subjects. Those who prefer to disregard the distinction between therapy and enhancement, ignore the fact the medical interventions that repair dysfunctions obey a bioethics that differs, sometimes even contrasts, with the bioethical reflection on non-medical interventions that instrumentalize the body's capabilities and functions.

Once it is recognized that some biotechnical enhancements will bring broad social benefits, including greater productivity, we must abandon the comfortable assumption that the risk of state eugenics is a thing of the past. The government subsidy of biotechnical enhancements can alleviate some problems of distributive justice, but also bring out the spectrum of mandatory enhancements [9].

The enhancement of human faculties of cognition and morality is recognized as a non-medical application of pharmacology, genetics and, with growing relevance, of neuroscience, being intimately intertwined with the therapeutic intentions of neurological and behavioral medical profiles and alterations in cognition. The topic of debate, not addressed here, has been the search of limits between the normal, atypical, and pathological, questioned by the biomedical scientism that has been instrumental in disarticulating the traditional confines between health and disease, opening the channels for proposals of enhancement that have therapeutic angles and vice versa.

Biotechnical enhancement is still in the embryonic stage, while the debate continues to reveal positions and arguments both for and against. As a society we face the deployment through *the front door and through the back door* of biomedical enhancement. Biomedical enhancement enters through the front door from the moment it appears as an enhancement...For now, biomedical enhancements enter through the back door as derivatives of efforts to treat diseases or disorders [10].

Non-medical applications refer to enhancements in three areas: behavioral, cognitive and moral. Neuroscience is dressed in the white coat of the therapist, pointing out that their therapeutic efforts are legitimate non-medical extensions inasmuch as the enhancement of cognitive and moral faculties is always beneficial for the well-being of people and in favor of social stability. It is important to remember, nevertheless, that since its inception, neuroscience has been stimulated and financed by the Department of Defense of the United States of America (USA) and by various agencies of the Pentagon, for the purpose of military strategies with the goal of fortifying the alertness of war pilots, increasing resilience to post-traumatic shock and stimulating emotional indifference when executing acts of war such as attacking civilian populations [11]. The beginnings of neuroscience are aimed at intervening in brain functions and control emotions, an initiative that requires a serious ethical reflection and careful weighing of the benefits and risks compromised.

The detractors of human enhancement through the application of biotechnology, whether of a temporary nature through drugs, or long-term or permanent by genetic manipulation or neuroscientific interventions in the neural networks of the brain for symptomatic or even final programmatic purposes - hard-wiring - consider all such applications as deleterious for human nature and the autonomy of individuals, and for putting at risk the nature-culture balance: "playing God" in an unacceptable manner. From this perspective, interference in the development of nature and culture with the intention of stabilizing the adaptability of human beings to their environment and achieving a life of more value - worthwhile - and more prolonged, is unwarranted [12].

The philosopher Michael Sandel justifies his aversion to the concerns of the perfectionists: *The problem is not the drift to mechanism but the drive to mastery. And what the drive to mastery misses and may even destroy is an appreciation of the gifted character of human powers and achievements* [13]. When one third of humanity lives under conditions of malnutrition and inequalities of all kinds and is affected by the anthropocentric destruction of their environment, it is difficult to consider that life is simply a gift.

The debate on the "ethics of human enhancement" highlights at least five areas of active debate: 1) Freedom and autonomy; 2) Health and safety; 3) Equanimity or fairness; 4) Social disruption; 5) Human dignity. These and many other aspects of neuroethics are intertwined and appear with varying emphasis in the active controversy over these subjects [14].

The benefits of any enhancement depend on the values involved. There is a general tendency to

favor all cognitive enhancement and to suppose that greater rational development will allow us to elaborate more appropriate moral judgments, as well as to assist sociology in fostering and recognizing pro-social behaviors, eliminating asocial behaviors in a more effective and timely manner than through processes of cultural evolution. Protesting the slowness and ineffectiveness of traditional education and moral socialization, voices enter the arena of the bioethics of biotechnical moral enhancement on three fronts: genetics, nanotechnology and neuroscience, with the emphasis of the present discussion centered on the last of these.

Until very recently, bioethics has only been moderately interested in biotechnical enhancement – based on neuroscience as opposed to pharmacological or genetic enhancements – allowing itself to be seduced by the therapeutic objectives that neuroscience proposes as predominant. Through neuroscience, non-medical enhancement focuses on the cognitive development of individuals by extending their learning and memory skills, which would achieve a moral maturation of people and greater social integration in groups.

The potential of intervening in the neural processes of the human brain in order to *analyze our behaviors in the interest, as is logical, of governments and communities*, should be of concern to neuroethics and bioethics [15]. Interventions aimed at modifying behavior have a manipulative potential that can distort ethical directives in the name of vested interests of various kinds.

Medical benefits have been scarce, while the development of biotechnical applications to modify behaviors and enhance cognitive processes have dominated both the laboratory and the market. Uses and abuses of neuroscience trigger an active ethical reflection that summons philosophers and neuroscientists especially to develop the complex agenda of a "neuroethics", and ponder the proposals for therapeutic enhancements -biomedicine - and perfectives - biotechnical.

Until the end of the last decade, emerging biotechnologies motivated the ethical, philosophical and social consequences of their use to enhance *cognition, affection and prolongation of life* [16], while interventions with behavioral ends remained in a limbo of uncertainties and justifying debates. At the beginning of the debate on moral enhancement, the diversity of opinions about the form and objectives of programs and interventions in the ethical sphere of the people is clear. While maintaining the initial premise of stimulating "normative beliefs resulting from correct rational processes", others have argued that it is necessary to strengthen basic moral emotions such as sympathy and altruism. There is no univocal answer to the question about what are commendable ethical motives and whether they constitute independent values or are part of a virtuous constitution [17].

The reflection based on the multiple angles from which the debate on biotechnical moral enhancement can be contemplated acquired a character of urgency since cognitive enhancement and increasingly accelerated techno-scientific expansion have made a series of powerful tools with destructive powers available to humans, which could be used by individuals or groups engaged in mass destructions. Faced with this imminent danger, a controversy began about the needs, benefits and dangers of artificially induced moral enhancement [18].

Biotechnical moral enhancement

Most publications that discuss the needs and risks of biotechnical moral enhancement appear in important journals of philosophy and bioethics, putting the latter at the center of the debate. My thesis is that there is nothing *inherently* wrong with moral bioenhancement and that, contrary to our presumed idealizations, the relevant modalities of moral bioenhancement are desirable [19].

The need to encourage the investigation and application of moral enhancement was defended based on certain premises that, in turn, have been much discussed [20]:

- The cognitive advance of technoscience has developed instruments of major destructive power, both in aggressive strategies and in the spoliation of nature;
- Access to weapons of mass destruction to violent and morally immature individuals and groups has been permitted, exacerbating the risks of catastrophes provoked;
- Faced with this urgency, it is insufficient to rely on traditional moral maturity and interventions must be sought with immediate and effective effect to counteract the moral deficiencies of potential annihilators.

The gap between techno-scientific cognition and moral dispositions requires the enhancement of the entire human population. The proposal of the promoters of an acceleration of pro-social moral attitudes that are more permanent than the

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pharmacological products now in use, sustains the need to increase attitudes of altruism, empathy and sympathy, in time to mitigate the tendencies to violence and aggression. These tendencies have a biological origin: *Together with altruism, a sense of justice is a central moral disposition. Both have a biological basis* [21]. Intervention at the same structural level is therefore justified to reprogram human beings towards a moral enhancement appropriate for current times.

With these arguments, it is noted that biologically inherent moral dispositions exist but are insufficient to face contemporary techno-scientific acceleration and its risks and secondary effects. In this way, the proposal of biotechnical moral enhancement is both justified and urgently required when cultural moral maturation is not effective in the face of the challenges of the present and the future [22]. However, data that support the biological foundations of moral dispositions are weak, based on isolated publications of a supposed moral coherence between univitelline twins that do not occur in other twins; Despite these precarious foundations, the authors cited insist that these provisions are part of the genetic program of human beings and require biotechnical intervention at the biological level.

For its defenders, the moral maturation necessary to face the challenges and dangers of a cognitive expansion that allows the development of powerful techno-scientific instruments and their availability to socially destructive or ecologically irresponsible groups, is not achieved through the cultural means of moral progress - education, socialization, emphasis on human rights, ethical reflection and bioethics. In education, for example, as knowledge of the brain/moral relationship advances, it will be possible to develop educational programs that promote altruistic behavior and the collective good through behavioral and neurocognitive interventions [23].

Between criticisms and oppositions to the call for a biotechnical moral enhancement, we find one of the first and most persistent opponents, the English philosopher and bioethicist John Harris [24], who maintains that the traditional modes of education and moral socialization are adequate and sufficient to establish an ethical conscience and sensitivity according to the society in which one lives, and that it is risky and unjustified to resort to biotechnical interventions.

The most obvious countermeasure to false beliefs and prejudices is a combination of rationality and education, possibly supported by various forms of cognitive enhancement, in addition to courses or sources of education and logic [25]. Values and moral virtues, according to other opponents of biotechnical moral enhancement, are transmitted by educators to develop a "core of moral integration" in the child's mind, in a process that unfolds in historical development as the "personality of the person who is maturing", conditions that are not met in pharmacological, genetic or instrumental bioenhancement, whose utility must be limited to therapeutic indications [26].

Some authors point out that moral bioenhancement can refer to moral dispositions or moral status; while the advantages or disadvantages of enhancing moral dispositions through education or instrumental intervention are still under discussion [27], there is a concern that the enhancement of the moral status of persons will necessarily create a new moral level that will be post-people, creating a hegemony that would allow domination of "mere" people who would be vulnerable to suffering "significant damage" [28].

Considerations from Latin America

A meta-analysis of several well-respected databases seeking articles related to moral bioenhancement, the study of 85 publications, specifically excluding 14 that addressed the subject *but were not written in English*, highlighted that the debate *does not adequately distinguish proposals to morally enhance "humanity as a whole", from treatments focused on specific alterations of mental health (such as psychopathies)* [29]. The discomforts and moral problems of humanity are severe and complex, caused by structural forces of social, cultural, political and economic order, where individual moral deficiencies have little influence.

A universally compulsive bioenhancement is an idea that has been proposed but is unacceptable for various reasons, including the question of what values or virtues can justifiably be imposed, considering that scientific evidence regarding the correlation between the functional and topographic findings of neuroscience and relevant moral thoughts and emotions is an interpretive construct weakly supported by presuppositions that interpret evidence from a biased hypothesis [30]. *Political issues over-determine 'ethical questions', the so-called imperative of the moment in which it is not enhancement but social justice* [31].

The debate on biotechnical enhancement has often focused on the inequalities of access to desired and requested enhancement techniques, which would create and accentuate the inequalities of cognitive power and impose ethical decisions on those who acquire the technical reinforcements available over the excluded who will remain at an additional disadvantage. This intense debate presents angles that must be incorporated into the debate in Latin America. The interventionism of moral bioenhancement, although still in a speculative stage, contains within itself a limitation of human freedom to make decisions and even, citing Milton, "to be free to fall", without which there would be a "literal moral bankruptcy" which sacrifices "freedom for the sake of survival" [32].

The possible risks to the autonomy of humans suffering an intervention by biotechnical enhancements has been a matter of concern since Habermas analyzed the issue in relation to genetic manipulation; with equal fervor, adherents to moral bioenhancement argue that *influencing people's motivational states could be more liberating than restrictive* [33].

Autonomy is a fundamental theme of bioethics, especially highlighted in Anglo-Saxon principlism, rooted in the Kantian idea of autonomous goodwill that gives rise to the moral and rational person. The incontestable nature of autonomy as an essential anthropological feature is elaborated within socio-cultural contexts that require instead discussing an "autonomy embodied in the finitude and vulnerability" of the human being [34].

For Latin America, with its persistent socio-economic inequalities, it is more appropriate to speak of the exercise of autonomy, limited by economic and social obstacles. Given the potential risks of moral bioremediation to personal autonomy, our region must remain especially alert to the danger of any additional restrictions on the limits of the exercise of autonomy that configures our reality.

A very recently published study reviewed the effects of neurotechnics, aiming to achieve moral enhancement through sophisticated interventions such as transcranial magnetic stimulation (TMS) - and invasive deep brain stimulation (DBS) and concluded that these techniques lack effects on moral decisions, include risks and undesirable side effects, and confirm a preference for promoting "social interventions" to achieve more mature moral dispositions [35].

Despite the intense defense of the need, urgency and indispensability of developing scientific knowledge in pharmacology, genetics, neuroscience and nanotechnology, in order to make biotechnical enhancements a reality, there is agreement that the feasibility of these projects is not envisaged in the present or the future. This could be reason enough to de-emphasize the importance of the debate, but has had the opposite effect of calling for an intensification of issue:

While the science dedicated to influencing moral dispositions is still in its infancy, it seems likely that this science can provide powerful means to influence decisions, including moral decisions ... such a science must be undertaken in a prioritized and aggressive way [36].

Attempting to reduce the gap between cognitive expansion mediated by a powerful and potentially destructive technoscience, and an insufficient moral maturity in the face of this growing danger, would require appeasing the rhythm of instrumental growth and universally bio-enhancing ethical sensitivity. This proposal contains the undesired effect of slowing biomedical progress, and an internal contradiction: slowing scientific research in the cognitive-technical area while accelerating biotechnical knowledge in the moral sphere.

The same authors, Savulescu and Persson, [21] point out that the scientific possibilities of advancing the issue are not known at present nor can they be envisaged in the near future. If so, the cultivation of the heuristic of fear proposed by Hans Jonas, which here becomes what common sense calls "campaign of terror" and sociology understands as the spread of "moral panic", would have a negative ethical charge of excessive alarm without offering a glimpse of viable solutions.

Requesting greater efforts and research resources in highly improbable biotechniques of moral enhancement could unsettle our societies, which are subject to dependencies, neocolonialism and coloniality, as it could exacerbate what has been described as the 90:10 gap in research resources, which in the vast majority of cases will solve the problems and concerns of the 10% most affluent of the world's population. Recognizing that biotechnical enhancements will favor the privileged and increase inter- and intra-social inequality in countries with limited resources, it is possible to predict that any increase in bioenhancement research will mean less availability for studies with local social value.

Of relevance to regional bioethics is a recently published proposal to redesign human rights in relation

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to the "age of neuroscience and neurotechnology", given the intimate relationship between human rights and bioethics, as revealed in the Universal Declaration of Bioethics and Human Rights [37]. Taking the accelerated development of "neural engineering, cerebral imagery and invasive neurotechnology" seriously, four relevant laws to these matters emerge:

1) The right to cognitive freedom, which includes two principles: a) the right of individuals to make use of emerging neurotechnologies and b) the protection of individuals against coercion and non-consensual use of such technologies;
2) The right to mental privacy, absolute or relative?
3) The right to mental integrity;
4) The right to psychological continuity [38].

Final considerations

Biotechnical moral enhancement contains enough negative elements to detract from the credibility of its most enthusiastic supporters. If a technique of moral enhancement achieves precision and effectiveness, there are those who maintain the need to universalize its application, that is, make intervention mandatory, as is the case with certain vaccines. Universal impositions are ethically unacceptable as they are not based on valuation justifications or principles that are generally acceptable without exceptions or reservations. If we accept the position that enhancement is elective, there is inevitably a disparity between those who have access and those who are marginalized, intensifying the inequalities between having and lacking the means to acquire techniques, contributing to those who benefit from an enhancement to accumulate more power and competitive ability.

For Latin American nations, riddled with inequality - income, education, health, social status, empowerment and opportunities of all kinds - biotechnical enhancements by non-therapeutic indications are sources of discrimination and marginalization of the excluded and should be vigorously opposed. The argument that for now and in the foreseeable future the development of bioenhancement will not be possible strengthens the argument that asks us not to invest resources in matters that lack social value simply to satisfy the privileged.

The proposal of new human rights, whose relevance the authors predict over the next decades, intersects with many of the points of debate already mentioned, arguing that Latin American bioethics cannot be left out of the debate on the biotechniques of cognitive and moral enhancement.

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