Treat, yes; enhance, no? A critical analysis of the boundary therapy/enhancement

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Abstract

One of the controversial points of the debate regarding the uses of biotechnology is the normative function of the boundary between therapy and improvement. For those who defend such a boundary, bio-techno-scientific interventions in human beings must be restricted to therapy, such that improvement must be prohibited. In this paper, we defend the viewpoint that this boundary has important empirical imprecisions and conceptual problems, such that it is normatively inappropriate to justify the difference between what must be prescribed and proscribed. In the first place, we analyze the distinction between normal and abnormal, in view of the foundations for such a boundary. Next, we examine the boundary per se, in order to point out its problems. Identifying such problems and postulating that biological normality is bereft of intrinsic moral relevance, we infer that it is not clear why it would be morally forbidden for biotechnology to advance beyond therapy.
Keywords: Bioethics. /therapeutic use. Biomedical enhancement. Biotechnology.

Resumo

Tratar, sim; melhorar, não? Análise crítica da fronteira terapia/melhoramento

Um dos pontos controversos do debate sobre os usos da biotecnologia é a função normativa da fronteira entre terapia e melhoramento. Para quem defende tal fronteira, as intervenções biotecnocientíficas no ser humano têm de restringir-se à terapia, de modo que o melhoramento deve ser proibido. Neste artigo, defendemos que essa fronteira tem importantes imprecisões empíricas e problemas conceituais, sendo normativamente inadequada para justificar a diferença entre o que deve ser prescrito e proscrito. Primeiramente, analisamos a distinção entre normal e anormal, haja vista servir de alicerce a tal fronteira. Em seguida, examinamos a fronteira propriamente dita, a fim de apontar seus problemas. Identificando tais problemas e postulando que a normalidade biológica é desprovida de relevância moral intrínseca, inferimos que não resta claro por que seria moralmente proibido à biotecnologia avançar além da terapia.
Palavras-chave: Bioética. /uso terapêutico. Melhoramento biomédico. Biotecnologia.

Resumen

¿Tratar, sí; mejorar, no? Análisis crítico de la frontera terapia/mejora

Uno de los temas polémicos en el debate sobre los usos de la biotecnología es la función normativa de la frontera entre terapia y mejora. Para los que las defienden, las intervenciones biotecnocientíficas sobre el ser humano tienen que restringirse a la terapia, por lo que en la mejora debería estar prohibido. En este artículo, se argumenta que esta frontera tiene importantes imprecisiones empíricas y problemas conceptuales, siendo normativamente inadecuada para justificar la diferencia entre lo que debe ser prescrito y proscrito. En primer lugar, analizamos la distinción entre lo normal y lo anormal, teniendo en cuenta que la misma sirve como base de esa frontera. Después examinamos la frontera misma, con el fin de señalar sus problemas, postulando que la normalidad biológica no tiene una relevancia moral intrínseca y señalando los problemas de esa frontera, deducimos que no queda claro por qué debería estar moralmente prohibido que la biotecnología fuera más allá de la terapia.
Palabras-clave: Bioética. /uso terapéutico. Refuerzo biomédico. Biotecnología.

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Declaram não haver conflito de interesse.

Although the human struggle against diseases would be something millennial, severe criticism is aimed at medical-therapeutic interventions, such as towards the progressive medicalization, biomedicalization and pharmaceuticalization of human beings, which reveals that not all therapy is seen as normatively acceptable or correct. Still, now much more convincing is the censorship back to what is controlled, sometimes imprecisely, non-medical use or enhancement of biotechnologies. These days, the development and application of the biotechnology for purposes which have been conventionally called/named as *human enhancement* is, perhaps, the most pungent and complex version of the controversies in relation to intervention in human life.

Such questions can be summarized in the dilemma between what we should permit and what we should prohibit. The normalization of the biotechnology depends on the possibility of justifying normative judgments to what is and what is not correct to do. There is a recurrence of such judgments remitting empirical elements (facts) that are closely tied to human biology, but that are not limited to it, once they drive considerations with strong normative content. That is, the debate involves as many empirical elements (facts and descriptions) as normative (values and principles), combining factors of diverse fields – epistemological, social, political, cultural, religious, judicial and moral -, in conformity with the perspective that Vilaça and Dias [1] have maintained. Out of this "short-circuit" between facts and values, comes the distinction between the forms of biotechnological interventions for therapeutic purposes and the interventions destined for human enhancement – that is, the *boundary between therapy and enhancement.*

In this article, through a review of the literature, we argue that this boundary, however revindicated, incurs important empirical inaccuracies and conceptual problems, being normatively inadequate to justify the difference between what should be prescribed and proscribed. We analyze, on the one hand, the distinction between normal and pathological/abnormal, to which is supported the supposed difference between therapy and enhancement. We attempt to show the description of an organism is merely biological - from which we interpret as instigated or not a pattern previously defined as normal or pathological – not authorized to derive conclusions with respect to, of the moral point of view, we should promote or prohibit. Finally, surpassing the normative power supposedly inherent of the distinction between normal and abnormal, we attempt to remove the boundary between the forms of intervention given therapeutics and biotechnologies aimed at human enhancement.

Normal and abnormal: rewriting boundaries

The distinction between therapy and enhancement can also be named in terms of types of *eugenics.* Habermas [2], for example, defends that, in virtue of the biotechnological advances and the successes of genetic therapy, it is important to separate the *negative eugenics* from the *positive eugenics,* that is, between what is therapy – *the prevention of evils,* such as diseases and deficiencies, which are seen as *deviations or lack of normal organizational functioning, typical of the species,* – and what genetic enhancement, which refers to interventions as exploitative and tecnicized of human nature, in that they would be affected by a "mere" programming guided by the egotistical preference of a third.

As can be seen, the differentiation between abnormalities and normalities is the basis of the Habermasian perspective and entails a distinction of moral capital, to know, the distinction between what it is to treat something bad (or the bad) – what it would be to do good – and what is a simple and arbitrary option or preference of the actors involved, considering a type of intervention that is morally unjustified, or even harmful.

In the Eugenics movement approach, and, more specifically, the boundary between negative eugenics (therapy) and positive eugenics (enhancement), Buchanan and colleagues affirmed that *the distinction between them rested crucially on drawing a further line between what was considered sub- or abnormal or defective and what was considered normal or even superior* [3].

Before we enter in the merit of the distinction proposed, we will make a brief digression about the idea of boundary. The boundary between two cities, states or countries, for example, it is a marked jurisdiction of limits between the two artificial entities, created. Boundaries do not exist before, by human arbitration, they have to be created. They don't *in themselves* have an existence, but yes for us. That is, according to this point of view, boundary is an invention for defining where the other inventions begin and end. With the creation of boundaries, human beings seek to give some rigor to the separation between things which, in themselves, were originally continuous, indistinct, merged.

In theory, the boundary should prevent the confusion or mixture of parts that are to be discerned. The function of a boundary is to circumscribe the spaces, to establish clear limits, producing the logic of "here something begins and here something ends", such as the idea of belonging. In effect, certain characteristics are attributed to the things that are understood as our demarcated spaces. So, besides establishing limits, the boundaries determine properties, and sometimes labels, that, in turn, create duties, rights, associations, separations, relations, forms of treatment, welcome, exclusion, circulation and impediment.

Considering that the normal and abnormal predicates shall introduce a kind of vast and radical boundary in the ground of human life, it is reasonable to suppose that such a distinction raises important questions and would be, therefore broadly discussed in the most diverse areas of knowledge. For our purpose, we intend to point out only some elements of this debate.

As a point of departure, it is known that the notions of normal and abnormal, health and disease, are full of controversies. One reference of critical approach is the classic "The normal and the pathological", in which Georges Canguilhem [4] reveals the opacity of the boundary between normal and abnormal, as well as the tension between the universal and the private, between what characterizes biological human life in general and its varied dispositions or conformations. Here we are not intending to reproduce the arguments of the author, nor the nuances of his position, that are widely known. It is enough to underline that the boundary between normal and pathological is, according to Canguilhem, extensively problematic.

The normal and the abnormal are classifications that vary throughout history. Taking seriously biological evolution, it should be admitted that the environments own influence on human biology changes considerably the pattern of normality over time, having seen environmental changes and the demands of adaptation, survival and evolution. Thus, what today we identify as a pattern of normality is only a result of a continuous evolutionary process, which, evidently, becomes contingent and fleeting.

There are biological characteristics taken as normal in a given moment and taken as abnormal in another. Here we can cite, for example, the hypothesis raised by Diamond [5] and Moalem and colleagues [6] of which Type 1 Diabetes – today regarded as a chronic disease – was a factor of adaptation and, later, of survival for human beings when they were exposed to extremely cold climates, acting as a *cryoprotection*. That is, high levels or "abnormals" of blood glucose, for the pattern currently adopted, had in the past, what Vilaça and Palma [7] called *biological citizenship* – a kind of *legitimate or authorized biological existence* that, these days, was completely "revoked" in the face of the universal pretensions of a perspective of normality.

Still using the judicial-biological metaphor, a same biological trace does not mean *universal and inalienable rights of citizenship,* but its rights depend on its functional duties, these rights understood, according to biological evolution, as toward the survival and evolution of the species. That is, if a biological characteristic (anatomic, physiological, behavioral, etc.) has an adaptive role, propitiating the survival and evolution of the specie, its right to normality is preserved. Apart from diachronic variation, the evolutionary process created synchronous variations, that is, it did not homogenize the unit(s) of selection in an absolute way [8]. With this, the attempt of the imposition of a pattern of normality to another context can be something anti-evolutionary, constituting, perhaps, a factor of extinction.

Our criticism with regard to the empirical character of the distinction between normal and abnormal does not lead to the unfeasibility of a critical-judicial evaluation. However, relative/relational, the notions of normal and abnormal are not relative in absolute terms, if considered from the normative point of view. Contrary to what we call *absolute relativity,* our understanding is that the non-existence of a single, identical and fixed normality *does not lead, necessarily,* to the conclusion that all the traces of phenotypes or genotypes are by consequence "good", or in that, something that should be maintained or promoted.

In this sense, give the continuity of the relative problems in the normal-abnormal pair and its fixed and universal pretentions we would like to introduce a new boundary in the debate, which is, the boundary between *the desirable* and *undesirable.* The part of the premise of which, in biological and social terms, the human being depends on subsidized and/or conditioned functions, that permits it to understand, evaluate, judge, deliberate and modify its nature – including improving it, which makes it, throughout its history, differentiate itself from other living beings or functional systems.

Jean-Jacques Rousseau seems to point to this direction, when he affirms the presence of a specific quality, inherent in the existing distinction between

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man and other non-human animals, to know: the faculty of improving oneself [9]. The human being, perceiving and understanding, even if partially, its biological, social psychic, etc. constitution, understands that he himself is, having seen the capacity to evaluate that which pleases or suits him, that aspects of his own constitution seem desirable or undesirable to him.

Given his surprising creativity, with its positive and negative effects, the human being has invented a series of (technical) means to change, control and promote his own nature/constitution. With relevant and growing, still not absolute, dominance over oneself, over the other humans and over the environment, human beings promote transformations, on the basis of what they desire or reject. Such processes, according to Sloterdijk [10], consist of the base of beliefs and affective interventions in the humanist tradition. In other words, it was long believed that man becomes human insofar as in that as far as he discerns the traces and tendencies that are desirable for him, and which, therefore should be promoted, and that, those which are undesirable, should be fought.

It is the consequence of this premise and tradition of the boundary between the desirable and the undesirable proposed here that acquires meaning. Let us see some examples that can help to reinforce its pertinence before the distinction between normal and abnormal:

It is (statistically) abnormal for a human being to possess three nipples or an adolescent to have a head full of white hair. Such abnormalities can generate certain social discomfort for the individual, depending, above all, on the degree of prejudice present in his social environment. Although they do not cause physical injuries, not being framed, *a priori,* like diseases and deficiencies, nor foist a considerable deficit or a functional disadvantage, an individual can not desire them and, thereby, start to seek methods to circumvent them (cosmetic surgery to remove the spare nipple; hair dye). Another individual, however, can live very well with those abnormalities and, with that, not demand any type of intervention.

It is (statistically) normal that the natural process of aging generates the loss of muscle tone, which causes, among other things, flabbiness in some parts of the body. As with the previous case, there are people that resort to the available means to circumvent such a process, but there are also those that calmly deal with that normality. And it is interesting to note that the individuals that seek to circumvent the progressive loss of muscle tone are modifying the normality, even though currently that would not be seen as a major problem. I

It is (statistically) abnormal and, in theory, functionally disadvantageous, to be blind. There are available treatments (transplants and implants) for some types of blindness. Overall, the similarity of what Bradshaw e Meulen [11] relates about a deaf girl who rejected being treated by the *cochlear implant*, in order to be cured from her abnormality, blind individuals could, in the use of their liberty, prefer blindness to treatments. That is, while for some the cure of blindness can be considered a good, for others, it can be something undesirable, which would go against the idea of the therapeutic obligation. In cases like that, imposing the treatment of the abnormality would be morally problematic.

Selfishness, competitiveness and the lack of solidarity in levels that we could call detrimental to the community can be even (statistically) normal, but some of their effects can be seen as harmful to social order, in a way that the investments of varied shades against such characteristics become imperative. This means that, while some individuals can want to remain profoundly selfish, there are societal demands, concerning certain sacred values and, so to speak, benefits for the community, to which, for being taken as priorities, justify the imposition of certain ways of combating those "normal" traces.

Some psychopaths, apart from the (statistically) abnormal, are socially harmful. It is possible that, from the point of view of the individual, a psychopath lives well with his or her abnormality. Yet, the potential risks of the psychopathologies can turn their treatments and/or monitoring as urgent and obligatory, making the collective interests superimpose the desire of the individual. In other words, the undesirable, from the community point of view, can become morally justified forms of imposed intervention, including biotechnological interventions.

In sum, all the examples cited show that, in some cases, there is little concern if something is abnormal or normal. In reality, what matters are the damages that it can cause on two levels, individual and collective, thus, becoming desirable or undesirable. Finally, our proposal is that, instead of looking to base or normative judgments on a supposed objective-factual biological nature, fixed and impersonal to human beings, we assume the responsibility for our fallible choices, as much as we desire or reject, as much as it is considered "the best" for each of us by a certain group and/or by the society/culture in which we are placed in a given

historical moment – that judgment which, by rule, changes with the passing of time.

Lastly, we would like to point out something the vast literature about the pair normal-abnormal tends to neglect, to know, the existence of the *positive abnormalities, positive deviations, for the better,* such can be considered certain biological functions naturally above the "normal" level (statistic median). In spite of the vagueness of certain terms and patterns in the determination of what is the best or in the comparison between the worst and the best, there are individuals that are identified as *gifted,* and even as *supermen,* for presenting the highest ability to memorize information; to resist fatigue, cold or pain; to reproduce sounds; to create and transform their environment, etc.

Thus, that ability, apart from the media of which it is socially defined as "normal" is far from being commonly interpreted as something negative, harmful and, consequently, undesirable. There are, even so, traits (statistically) abnormal taken as positive. In that case, the fact that something is abnormal does not make it a target for therapy. Such observation constrains, even more, the normative pretentions of the boundary between normal and abnormal and reinforces the pertinence of its substitution for the boundary between the desirable and the undesirable.

We would like to conclude this topic emphasizing the separation between the attributes of normality and abnormality, of which the content can be interpreted only on the level of descriptive statistics, just as well as the harmful character and undesirable conferred to determined properties or characteristics of a system in which morally negative judgments fall. Such as suggested by Kahane and Savulescu [12], damage and disadvantage represent, simply and unmistakably, something that compromises *a prior level of wellbeing* or *someone's greater future flourishing,* the understanding of which imposes relationships of *comparison and temporality.* And, it is worth noting, the understanding of it varies considerably, as we have already tried to show before. In that sense, treating an abnormality is not radically imperious or beneficial from a moral point of view. Likewise, to change a condition said to be normal does not represent, necessarily, something bad or something morally condemnable. Thus, the attribution of biological normality or abnormality is seen as devoid of intrinsic moral relevance.

Between therapy and enhancement: which limits the biotechnology intervention?

As a point of departure, the defense of the boundary between treating and enhancing would contradict an ordinary intuition, which would be, that all forms of treatment, by principle, tends to make the life of the individual *better* than it was before, or better than what it could be without such an intervention. The discourse that we should promote therapies that, knowingly, will harm more than they will benefit the individual in question, would sound implausible. Thus, in theory, *to treat* aims *to enhance.*

Such consideration is in line with the definition of enhancement from Harris, *the way in which our increasing ability to alter, adapt, and increase human functioning*[13]. Michael Bess, in one of the most interesting perspectives available on the subject, considering making a taxonomy of types of enhancement, defends that, among others, there are two types of enhancement: 1) *modify an existing characteristic in the given individual*; 2) *add one that he did not possess, but that is common in other specimens* [14]. That is, a therapy that makes a deaf person hear would be an enhancement, since it modified "for better" a condition that existed, adding something common (hearing) to most human beings. Thereby, the dichotomy of the terms "to treat" and "to enhance" would be, whether ordinary, whether philosophical, *nonsense.*

But there are other definitions of enhancement that may give rise to the boundary with therapy. According to Allhoff and colleagues, citing Eric Juengst, *"human enhancement" can be understood to be different from "therapy", which is about treatments aimed at pathologies that compromise health or reduce one's level of functioning below this species-typical or statistically-normal level* [15].

Questioning the normative distinction between therapeutic intervention and enhancement, Buchanan reproduces the terminological distinction and explores its application. According to the author, *if we take the disease as a deviation from normal functioning and therapy oriented toward preventing or curing diseases, then the contrast with enhancement is clear: enhancement is intended to increase or improve normal functioning. In this sense, it is intended to go beyond therapy* [16]. Buchanan exemplifies: *To modify the genes of a human embryo to*

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prevent a genetic disease would be therapy, and not enhancement. To modify an embryo to improve the normal immune system, the ability of the system to fight diseases, would be an enhancement [16].

That is to say, therapies would be biomedical interventions that would elevate the characteristics or functions to the condition of normality (or they would restore such a condition), while enhanced interventions would be those that would try to overcome such a condition, providing a kind of *hyper* or *supra-normality*. Here, more than once, the notion of normality assumes the key role.

Yet, on the fundamental level of the moral debate is the demand to identify what *should be permitted or prohibited.* And, for this task, the supposed distinction between therapy and enhancement encounters strong limitations – those limitations are recognized even by their defenders. Leon Kass [17], for example, affirms that, though at first sight, this distinction seems useful, *a posteriori*, it is inadequate for the purposes of moral analysis. Habermas [2] also recognizes the difficulties that in general present the distinction of such fields of intervention.

Although they recognized their limits, defenders of the *anti-enhancement perspective* – according to the expression coined by Buchanan [18] – continue betting on the existence of a boundary capable of distinguishing therapeutic interventions and enhancements, being those normatively justifiable and those, reproachable. For them, crossing the boundary would, put at risk human nature, liberty, autonomy, dignity and morality. Among those who support this reasoning, we find Jürgen Habermas, Michael Sandel and Francis Fukuyama.

In defending his perspective, Habermas bases his distinction between negative eugenics and positive eugenics. For him, *However hard it may be to distinguish in the individual case between therapeutic interventions – the prevention of evils – and enhancing interventions, the regulative idea that governs the in-tended delimitation is simple. As long as medical intervention is guided by the clinical goal of the healing a disease or of making provisions for a healthy life, the person carrying out the treatment may assume that he has the consent of the patient preventively treated. The presumption of informed consent transforms egocentric action into communicative action* [19].

The author argues that crossing the limits of therapy would generate the *disturbing phenomenon* of the fading of the limits between what we are by nature and the organic destiny we create for ourselves, undermining the boundary between accident and free decision, between what grew naturally and what was produced. But, if we admit that falling ill is part of our nature, thereby constructing the "human accident", the secular fight against diseases would not be an evident way to alter it, in order to redirect our organic destiny by way of free decision? With the excepting of being wrong, it is a fact that, when a doctor cures a disease in an embryo or fetus, he is changing the accident that generated such illness, by way of his free decision and in accordance with his job and judgment of relatives.

Going beyond this aspect, Habermas seems to hobble dangerously – or inadvertently – between the particular and the general. Although he mentions the importance of the boundary in particular cases – understanding with which we can agree, because it is absolutely reasonable to assert that investing in the cure for blindness is different from investing in X-ray vision, his proposal clearly leads to a generalization. For him, curing (blindness, for example) is to fight against an evil and thus do a good – in all cases.

However, if we take into account the morphological and functional freedom defended by Bradshaw e Meulen [11], the preventively treated individual could, instead of what Habermas supports, reject in a future moment, the mentioned clinical objective taken as unquestionable. If it is not evident that the treated embryo will agree with the intervention performed, when it could do it, it is not clear, by its turn, why to presuppose the dissension of the embryo that would suffer an intervention of improvement – which Habermas [20] calls the individual of genetic programming – not even because the person that suffered a therapeutic intervention should not, equally, be considered genetically programmed to be healthy.

Lastly, we call attention to the Habermasian focus on a communicative action that involves a part that can not make use of the discourse. The presupposition of previous consensus of a future person does not appear to make sense even for the abstract notion of the situation of ideal speech defended by the author, which turns his argumentation, at least, surprising. After all, the embryo is completely co-

erced into accepting the "argument" of the doctor, even if it were not the best.

Sandel [21], in turn, points out the conflict between *contemplating* and *dominating* human nature and the idea of *the wisdom of nature*. In his book, "The case against perfection", Sandel defends the protection of human nature against genetic manipulation for the purposes of absolute determination of what we are or want to be – one of the ideas that characterize anti-enhancement thought. The main point of the Sandelian argument is that we should preserve the *risk factor*. For the author, *one of the blessings of seeing ourselves as creatures of nature, of God or by accident is not being completely responsible for that which we are. The more we become masters of our genetic loads, the greater the burden that we carry for the talents that we have and for our performance.* [22]. (AQUI O TRADUTOR NÃO ENCONTROU O ORIGINAL EM INGLÊS E TRADUZIU LIVREMENTE)

Sandel also shows concern with cognitive enhancement, emphasizing pointing out stressing that this could create two types of human beings, specifically, the "enhanced" and the "natural". Such inequality could be transmitted to the offspring, perpetuating a problem. Yet, it projects that *the fundamental question is not how to assure equal access to enhancement but whether we should aspire to it. Should we devote our biological ingenuity to curing disease and restoring the injured to health, or should we also seek to improve our lot by reengineering our bodies and minds?* [23]

Regardless of the pertinence of some of his critical notes, one must question why Sandel does not consider the millennial human investment in the cure for diseases and in the healthy recovery as evident forms of dominating human nature. After all, if there were some moral reason for restricting ourselves to the contemplation of the nature with which we were "blessed" (or, for some, cursed) by God, by nature or by accident, then the therapeutic interventions would be immoral, once, as we already said, falling ill is part of our nature (divine, biological or casually constructed). The Sandelian question – for which the author does not offer an answer – if we should dedicate our biotechnological ingenuity exclusively to the cure of diseases and restoration of health, or even to the re-engineering of our bodies and minds, we risk responding that all forms of therapy are, also, a way of reorganizing biology, restoring, as far as possible, the "normal" functions, in order to reach the well-being and longevity of the individual, as well as control over our precarious nature, full of vulnerabilities.

On the other hand, why would the "risks" of an unequal access be restricted to the improved techniques, but not also be applied to therapy? After all, the unequal and unjust access to the factors that determine the health-disease process express, create and perpetuate a social division of individuals, of which the consequences are tremendous.

Lastly, that which Sandel calls *reconstruction of our bodies and minds* has been done for centuries. Plastic or reconstructive surgeries, drugs, vaccines, prostheses of limbs, pacemakers, psychological therapies, educational processes and a countless number of other examples disregarded by United States' philosophy are clear examples of the techniques of reconstruction of what we are. Furthermore, those techniques – some of them considered typically therapeutic – are ways to fight against the unpredictability factor. Through them, we assume the power and the responsibility to try to produce a life that we want to have.

Fukuyama [24] acknowledges, right on the boundary between therapeutic intervention and enhancement, the "yellow line" around the possible uses of the given biotechnological procedure, distinguishing what it is or not legitimate to do. In his own words, *One obvious way to draw red lines is to distinguish between therapy and enhancement, directing research toward the former while putting restrictions on the latter*[25]. Positioning himself as a kind of spokesperson and defender of humanity, as the defenders of anti-enhancement usually do, Fukuyama follows his logic giving examples that, to him, represent a clear distinction between what we want and what we do not want that the biosciences produce.

The terms used, such as praxis, are selected to cause an impact and produce, overall, the effect of persuasion, as can be seen from the following excerpt: (...) *The original purpose of medicine is, after all, to heal the sick, not to turn healthy people into gods.*[25]... So, in line with his perspective, it is permitted to use *biotechnologies to, for example, cure genetic diseases* (...)*, but not to make our children more intelligent or talle*[26]. Sharing the fear of other anti-enhancement thinkers, Fukuyama considers that *the most significant threat posed by contemporary biotehnology is the possibility that it will alter human nature and thereby move us into a "posthuman" stage of history*[27].

Considering the concept of *posthumanity* to be central in the Fukuyamian critique, it be-

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comes necessary to mention it. In conformity with Cole-Turner [28], we think that posthuman is too broad of a concept, imprecise and virtual, that is, an idea too vague to guide a debate as relevant as that close to the moral limits of biotechnology. Only the title of provocation, we can ask ourselves, once admitting the stages trans and posthuman as phases of a human deification, yet we cannot be considered closer to gods than we are to humans, considering the many changes that we have made in ourselves throughout history.

In addition to the long evolutionary process, what greatly altered our physical and, especially, cognitive capacities, foisting intense changes over millions of years, human beings carry in themselves or with themselves, currently, a series of connected systems, pieces of diverse materials carved in their brain, heart, limbs, etc., which we ourselves, in the use of our demiurgic (creative) and cybernetic (controlling) capacities we impose. From glasses to dentures, the hearing aids to the filters and sunscreen, we incorporate, increasingly in everyday life, extrinsic elements to our nature. Extending the idea a little further, and encompassing our skills and capabilities, we can include in that role even cars, airplanes, computers and cell phones, which apart from our body, offer the super-human capacity to our potential dislocation and communication.

The secular process of biopolitical investment comes substantially altering our lives, revealing a constitutive idiosyncrasy of the human being: to be a creature that modifies itself, as we have seen in the previous topic. As a result of a series of historical investments in nutrition, sanitation and public health, for example, the life expectancy of human beings has grown in almost all countries. Centuries ago, human beings were living 30 or 40 years. That would be considered "normal'. Currently, in some countries, people are already living, on average, more than double that.

Thus, deaths at 30 or 40 years are taken as premature, "abnormal". In effect, for those impressed with great radical changes of the "normal" human condition, doubling the life expectancy, extending the vital human time in that order of greatness, could be seen as a threat to humanity. Yet, the prolonging of life is taken as a new human condition and a new standard of "normality". That is, the increase of longevity, one of the central objectives of the defenders of human enhancement, appears not to be seen as a problem for humanity.

It is worth noting that, commonly, the critics of enhancement do not see the impressive gamma of biotechnologies taken as therapeutics – and, consequently, authorized and considered correct (transplants, pacemakers, prostheses, implants, *in vitro* fertilization, etc.) – a factor harmful to human nature, in spite of the biotechnologies having changed profoundly not only human life, but also our way of living and dying, our perspectives, behaviors and biological conformation.

As it seems to have become clear, the critics of enhancement support themselves in the notion of normality. But a human being with bionic members and a pacemaker is not something normal, in the common sense of the term. In this way, similarly to the other authors, like Roberto Esposito [29], it seems to us blatantly controversial the evocation of *a natural human being* or *normal,* from a "per se," that serves as the normative parameter to oppose a supposed (and harmful) posthuman. Profound differences can be verified if we compare, for example, primitive human beings with those today; yet that has not brought us to identify ourselves as posthumans.

Beyond that empirical limit, it is worth analyzing yet one conceptual question. Retrieving the example given by Buchanan [16] – specifically the part in which he mentions the enhancement of the normal immunity -, we take the specific case from the bio-tech of *vaccination.* It is known that this technique is destined to stimulate the production of antibodies and create an immunological memory around a pathogenic agent, with the purpose of elevating the normal capacity of an organism to resist or fight the given infection. Thereby the vaccination of the populations would be, in the terms of Fukuyama [25], a kind of elixir of gods, since the vaccine, in intervening in human biology, elevates the "normal" immunity, making the vaccinated more immune than what they were originally, in such a way that it ends up contributing, in a decisive manner, for the increase beyond the normal (statistical mean) of the life expectancy of a population in a given historical moment.

Contradicting an intuition that is widely disseminated, according to which that would be a type of prophylactic therapy, to which it seems, would be taken seriously its own presuppositions, the critics of enhancement would have to include in the list of practices that promote enhancement and, consequently, prohibit it, of what, with the exception of being wrong, would generate much resistance in modern society. Furthermore, we ask, if the vaccinated individuals or those that are over 80 years old today are regarded as super-humans, semi-gods or something similar? Roughly, we would say no.

One last criticism we would like to address to those who assume the position as guards of the moral border between therapeutic intervention and enhancement in reference to their implicit adhesion to what we call the politics of the medicalization of life. Despite all the reservations already made to the de-contextualized attribution of the normal-abnormal binomial, for those authors in question, still prevailing is the logic according to which scientific intervention is taken as legitimate when its target aim purpose goal objective is an organism considered ill, deficient, upset disrupted deranged – in sum, abnormal. The alleged abnormality is, thus, the dividing line that guarantees legitimacy to medical-scientific intervention.

However, as Buchanan and colleagues highlight, *many of the most serious abuses were actually, committed in the name of negative rather than positive eugenics*[30]. So many and so evident are the examples of this, that it is not necessary to cite them. Aware, then, of the problems of reputing medicine the power to determine where and in whom to intervene and how it should be done, it behooves us still to ask whether, despite appearances, that type of intervention would not already be a clear intent, equally subject to failure, of improving the human species, its life or its existence.

Retrieving the prolongation of human life as an example, we clearly visualize how a same fact or transitory objective by the ambiguous boundary between treating and enhancing human life. The techniques of extending life, aiming beyond the limit, immortality, represent the apex of the eugenic human dream. The extension of longevity beyond normality (numerical average of the population) is taken as one of the prominent forms of human enhancement. Though, as Bailey [31] reminds us, the first *revolution of longevity* occurred in the beginning of the 20th century, as a consequence of the decline of infant mortality and control of infectious diseases. Thus, the extension of the average time of life of human beings was a result of the preventive practices and therapies. The next revolution of longevity, according to the author, will be characterized by the *delay of aging.* In both cases, on the agenda is the manipulation of human biology and its relationship to the environment with the purpose of expanding something beyond normal.

How should we, then, interpret the effect (longevity) of the biotechnical intervention? As therapy or enhancement? If the effect is the same, why would the first revolution be therapeutic and the second, exclusively enhancing? Supposing that living longer and with the least possible compromising of our functions (movements, vision or memory, for example) means a better life – understanding that can be controversial, but reasonably defendable -, the act of fighting the physiological changes concerning the aging process (of which, include, responding to some diseases, such as the disease Alzheimer's, and the shortening of the life span) is not a therapeutic way to produce enhancement? In our understanding, clearly, yes, because, in theory, a life without diseases – in other words, without the compromising of our basic functions – it is a better or preferable life; a better life in the sense of being potentially more complete in its fulfillment.

Final considerations

The developed arguments arouse some suspicions about the possibility of sustaining ourselves, in reference to the therapy *versus* enhancement, the normative character of our judgments in relation to the biotechnical interventions concerning the life of human beings. In spite of the varied motives that bring us to have legitimate reservations and, even, real fears about the possible risks of such interventions – which serves as an invitation for prudence and criticism -, it is argumentatively evident that the boundary between therapy and enhancement did not contribute to the normalization of the biotechnical question, just as the proponents of anti-enhancement think.

Such is the case, we understand that it is more opportune and productive to fall back upon other fundamentals, criteria, concepts and/or set of principles – among the various ones available, there the morphological liberty [11], hermeneutic choice [1], *proactionary principle*[32], *principle of procreative beneficence*[33] and *Transhumanist Declaration*[34] – of which, while full of controversies, seem to help us reflect and formulate criteria for normalization effectively able to interpret and understand facts and values, identify risks and opportunities, evaluate dilemmas and expectations, as well as regulate studies and applications concerning the investment in human enhancement through biotechnology.

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