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TRANSHUMANISM 'AGAINST' EDUCATION?

¿Transhumanismo 'contra' educación?

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ABSTRACT

This article argues that a 'human' version of transhumanism is possible, that the elimination of physical or physiological limitations does not undermine the possibility of education, and that true education is not diminished by transhumanism.

The first part presents the main currents of transhumanism, and the arguments for and against it. In the second part, from a logocentric position, it is shown that transhumanism is not incompatible with education and that there does not have to be a transgression of moral codes in it. In the end, some criteria to judge when biotechnological interventions in humans are acceptable and when they are not, are proposed.

Keywords: transhumanism; posthumanism; education; enhancement; biotechnology.

RESUMEN

En este artículo se argumenta que es posible una versión 'humana' del transhumanismo, que la eliminación de limitaciones físicas o fisiológicas no atenta contra la posibilidad de la educación, y que la verdadera educación no queda disminuida con el transhumanismo.

En la primera parte se muestran las principales corrientes del transhumanismo, y los argumentos a favor y en contra de este. En la segunda parte, desde una postura logocéntrica, se trata de mostrar que el transhumanismo no es incompatible con la educación y que no tiene por qué haber una transgresión de códigos morales en el mismo. Al final se proponen algunos criterios para juzgar cuándo las intervenciones biotecnológicas en los seres humanos son aceptables y cuándo no.

Palabras clave: transhumanismo; educación; posthumanismo; mejoramiento; biotecnología.

1. Introduction

We are currently witnessing a period in which previously established certainties are being subjected to scrutiny. Conceptions of gender identity, once considered straightforward, are now subject to considerable debate and re-evaluation. It stands to reason that within this climate of profound uncertainty, we should also critically examine the fundamental question of what it means to be human. Recent advancements in linguistic models have further intensified these uncertainties, prompting reflection on the nature of intelligence and our interactions with artificial intelligence, which holds the potential for self-awareness. Such concerns surrounding artificial intelligence have prompted calls for legal restrictions on its capabilities, reminiscent of the cautionary measures advocated in response to the cloning of Dolly the sheep and genetic manipulation of human embryos.

However, historical precedent suggests that if a technical possibility exists, it is likely to be pursued eventually. The cautionary tales and regulatory efforts directed towards these emerging technologies echo the admonitions found in the Genesis narrative regarding the forbidden fruit from the tree of knowledge of good and evil. It appears that within human nature lies a propensity to transgress boundaries in pursuit of possibilities, unencumbered by the fear of losing an idealized state of existence. Luc Ferry (2016) similarly reflects on the inevitability of change and the futility of attempts to impede it.

These discussions surrounding artificial intelligence, machine learning, genetic manipulation, hybridization, and biotechnology, each fraught with ethical and practical considerations, coalesce around the central theme of this monograph: transhumanism.

This article aims to posit the feasibility of a 'humanistic' interpretation of transhumanism, contending that the removal of physical or physiological limitations

need not undermine educational objectives. Furthermore, it argues that authentic education remains undiminished in the face of transhumanist advancements. Moreover, it contends that interventions enhancing individuals' autonomy are ethically justifiable, while those compromising autonomy warrant scrutiny.

The ensuing sections will provide a concise overview of transhumanist ideology and its associated arguments, followed by an examination of bioconservative perspectives. From a logocentric vantage point, the article will endeavour to demonstrate the compatibility of transhumanism with education and the potential for ethical adherence within its framework. Finally, the article will propose criteria for assessing the ethical acceptability of biotechnological interventions in human subjects.

2. What is Transhumanism

Transhumanism is an intellectual movement predicated on the belief that our civilization possesses the capability to leverage technological and scientific advancements to effect artificial enhancements, both physical and psychological, in humans. In the words of Bostrom, "Transhumanism is a philosophical and cultural movement concerned with promoting responsible ways of using technology to enhance human capacities and to increase the scope of human flourishing" (Bostrom, 2014, p. 45).

Thus, transhumanism constitutes "an act of optimistic, voluntarist, and rationalistic faith in the future, in human creativity and responsibility" (Hottois, 2014, p. 7).

These ideas coalesced around the 1960s in California, often considered part of the 'Californian ideology' (Barbrook and Cameron, 1996), a blend of hippie ideals, technological fervour, and innovative entrepreneurial ventures underpinned by neoliberal ideology (Jardin, 2018). Transhumanism probes the boundaries of the human experience by positing scenarios wherein individuals surpass commonly accepted human limitations.

Three pivotal reports have explored these ideas. The first, "Converging Technologies for Improving Human Performance" (Roco and Bainbridge, 2002a), is a comprehensive examination wherein eighty scientific leaders and industry experts outline the potential of technology to enhance the human condition on both individual and societal levels. While the full study spans nearly 500 pages, an executive summary is available in Roco and Bainbridge (2002b). It advocates for the convergence of diverse sciences and technologies—nanotechnology, biotechnology, information technology, and neuroscience—in a collective endeavour to enhance physical and intellectual capacities. The integration of these technologies at the nanoscale holds promise for a profound augmentation of human capabilities. The essence of the report is encapsulated in the following proposition:

"If the *Cognitive Scientists* can think it

The *Nano* people can build it
The *Bio* people can implement it,
And the *IT* people can monitor and control it"
(Roco and Bainbridge, 2002b, p. 289; italicized in the original).

Additionally, two reports commissioned by the European Union have tackled this topic: "Converging technologies-Shaping the future of European societies" (EU, 2004) and "Human Enhancement" (Savulescu and Bostrom, 2009).

Transhumanism aspires to render humans 'amortal' (Coeurnelle, 2013)—free from biologically preprogrammed death and the physical and psychological afflictions caused by disease or physiological limitations (Coeurnelle and Roux, 2016)—while imbuing them with enhanced physical, intellectual, and emotional faculties.

3. Forms of Transhumanism: Extropianism and Technoprogressivism

Within the transhumanist movement, two primary strands emerge: 'extropians' and 'technoprogressives'. Extropianism (Esfandiary, 1973; More, 1998) hinges on 'extropy', the antithesis of entropy, signifying the increasing organisation of systems through science and technology, predicated on a trajectory of unbounded progress. Extropians are fundamentally concerned with achieving immortality and contend that existence can be digitally replicated and perpetuated indefinitely. They posit that our identity resides solely in the information stored within our brains, and if this information can be transferred to a digital medium, we liberate ourselves from corporeal limitations. Consequently, this principle engenders the concept of absolute freedom and renders the body obsolete (More, 1998).

This extropian principle gives rise to the paradox of transhumanist dualism, wherein an underlying dualism pervades this form of transhumanism. Presently, bioconservatives assert that manipulating the body equates to manipulating the human being, thereby embracing operational monism. Curiously, nowadays the 'conservatives' espouse monism, while the 'liberals' adopt dualism.

Emmanuel Jardin (2018) characterises this extreme form of transhumanism as ostensibly philosophical but substantively a lobby—a movement that operates across scientific, technological, political, and economic spheres.

Technoprogressivism (Coeurnelle and Roux, 2016), conversely, advocates for integrating technology and bodily modifications while advocating for state intervention to ensure that scientific and technical innovations adhere to ethical and social standards.

Approaches such as those espoused by extropians prompt some authors to distinguish between transhumanism and posthumanism, delineating the former as the biotechnologically transformed individual and the latter as entities emancipated from biological constraints.

4. Classification of stances regarding 'enhancement'

The dilemmas posited by transhumanism are intricately linked to the essence of the human condition. Understandably, many of transhumanism's propositions elicit contrasting reactions of varying intensities. One method to categorise positions regarding 'enhancement' or 'augmentation', as proposed by transhumanism, is to classify authors based on their stance towards suggested transformations and the nature of their arguments. This dichotomy yields bioconservatives and transhumanists, each comprising proponents of empirical and essential arguments. Table 1 delineates this classification for some authors who have weighed in on the topic.

5. Bioconservatives vs Transhumanists

The dichotomy between bioconservatives and transhumanists hinges on differing perspectives concerning what is considered natural versus artificial, normal versus abnormal, therapeutic versus ameliorative, and internal versus external.

Arguments proffered in both camps are either empirical, that is, based on the possible social consequences of transhumanism, or essential, that is, based on the intrinsic goodness or evil of the transhumanist proposal.

Table 1
Classification of some authors based on their stance regarding transhumanist transformations

	Bioconservatives	**Transhumanists**
Empirical	Christine Overall (2020) Luc Ferry (2016) Apolline Tailandier (2019) Anna Falcone (s.f.)	Allen Buchanan (2000) James Hughes (2004) Gilbert Hottois (2013)
Essentialist	Michael Sandel (2004) Emmanuel Jardin (2018) Francis Fukuyama (2002) Jürgen Habermas (2015/2001)	Besnier (2009) Nick Bostrom (2014) John Harris (2007) Savulescu y Bostrom (2009)

Source: Own work

6. Arguments in favour of Transhumanism

For instance, within the camp of thinkers advocating for enhancement through technology, commonly known as transhumanists, a prevalent argument posits that transhumanist initiatives represent a natural progression in humanity's ongoing history

of modifying the environment. They assert that the pursuit of enhancement through technical means is simply a logical extension of endeavours aimed at improvement through symbolic methods.

John Harris (2007) posits that enhancement is not merely a possibility but a moral imperative. Throughout history, humanity has continually enhanced its environment, from primitive tools to the internet. Today, this trajectory has shifted focus towards the human individual. Harris argues that if these changes result in alterations to the human species, it does not signify an "essential anthropological, metaphysical, or theological catastrophe; rather, it heralds the onset of a new phase of evolution, increasingly entrusted to human responsibility" (Harris, 2007, p. 31). Transhumanism embodies "the belief that the time has arrived for humanity to assume control over its own evolution" (Golfi, 2012, p. 20).

Moreover, the matter of enhancement is deemed an individual prerogative. Individuals are best positioned to determine what is conducive for themselves and their progeny, provided it does not encroach upon others directly. Any societal benefits arising from such initiatives are considered ancillary and do not inherently define the moral nature of the issue. Consequently, transhumanism finds moral validation in "entrusting individuals with the responsibility to elevate collective conditions through personal choices" (Taillandier, 2019, p. 78). Indeed, "within transhumanist and liberal circles, libertarian and liberal justifications for negative morphological and procreative freedoms are espoused" (Taillandier, 2019, p. 77).

"Transhumanists perceive themselves as heirs to the Enlightenment, viewing the posthuman future not as a rupture from human nature but as a continuation of humanity's distancing from nature—a defining trait of human existence" (Taillandier, 2019, p. 78).

But the introduction of these artificial modifications leads us to question the extent to which they affect the essence of the human condition. Besnier (2009) estimates that transhumanism in fact makes us see the continuity of the human species with the rest of nature, first backwards, towards animals (the principle of continuity of species) then towards intelligent machines (principle of the continuity of calculative-computer reason) "to the point that the unity of the human species has become questionable." For Besnier, transhumanism poses problems that require more than ever to elucidate and practice human morality, all the more so as our context is more non-human.

Coeurnelle and Roux (2016) state that this use of technology does not change anything fundamental. In fact, "technique is part of the definition of what is human." That is why "every human is at the same time a transhuman."

Among the empirical arguments in favour of transhumanism, Allen Buchanan et alii (2000) consider that one of the fundamental functions of transhumanist transformations is to eliminate the inequalities of origin associated with the biological nature of human beings. But correcting the effects of the natural lottery, as Buchanan

proposes, eliminates one of the central mechanisms of evolution: trial and error. As a consequence, we would move from blind evolution to directed evolution, another of the important themes of transhumanism. It is human beings who take the reins of their evolutionary future. To do this, it is enough to trust in informed individual and parental freedom, or what is the same, trust in the market, although with great ethical-political vigilance. But, above all, we must fear the eugenic intervention of the State. It is true that the autonomous action of the market may initially produce inequalities between individuals who can afford biotechnological improvements and those who cannot, but the inequalities produced by artificial improvement will be temporary and it is not something new that innovations initially favour a privileged few. But in the end the market mechanisms themselves make these innovations accessible to all individuals. Thus, the egalitarian argument according to which improvement is not correct because not all subjects have the same resources to benefit from them, is, for transhumanists, a weak argument.

7. Arguments against

Essentialist arguments against transhumanism appeal to human nature.

> (…) From different philosophical positions, transhumanism is criticized by focusing on human nature. Both philosophers, unitarians, and those in favor of deliberative democracy appeal to human nature to counteract transhumanism. For example, Jürgen Habermas speaks of the defense of an 'ethics of the species' (...) while Francis Fukuyama calls for embracing 'the empirical fact of natural human equality' as the foundation of human dignity (Taillandier, 2019, p. 77).

The most representative bioconservative of essentialist positions is Michael Sandel. He believes that the fundamental question has to do with the moral status of nature. If we resolve the question of human nature, if that were possible, we would have the definitive criterion for judging the question of the appropriateness of NBIC transformations.

His strongest objection has not to do with the sociopolitical consequences of improvement, which would be an empirical argument, but with improvement itself. It has to do with the impact on human nature. His objection, without being strictly religious, has a religious touch. He understands that transhumanism is confusing our role with that of the gods (Sandel, 2004).

Frances Kamm's objections (2006) pertain primarily to sociopolitical ramifications rather than moral or metaphysical concerns, challenging some of Sandel's contentions and proposing acceptable biological modifications.

Christine Overall (2020) advances empirical arguments, contending that enhancement exacerbates social disparities, creating a class division between first-class transhumans and inferior ordinary humans, rendering it ethically unacceptable.

The problem with all empirical objections is that they are always possible contingencies, but not necessary outcomes. And a general ban on biological modifications cannot be based on such arguments.

Michael Sandel asks the right questions. Fundamentally, what is intrinsically wrong with the artificial transformation of human beings? If we cannot answer this question, there are no empirical arguments strong enough to make us reject transhumanism. For Michael Sandel, what is essential is the sense of 'donation' of life. It is morally necessary to accept what one receives instead of forcing what we want to receive. But it does not give an underlying reason to justify why this is so. He himself recognizes that his arguments have a religious resonance, although, he says, it is not necessary to have a transcendent stance to accept his argument. However, as Arthur Caplan (2009) states, from the point of view of secular evolutionism, the notion of gift and acceptance does not make sense. Chance is the force that governs evolution, and our presence on earth is the result of a mere succession of coincidences. It is the conjunction of chance and necessity (Monod, 1970) that drives evolution from causes to effects, and not any force that teleologically attracts it from an 'omega point'.

8. Anthropocentrism and Logocentrism

From my vantage point, bioconservatives are not as distant from transhumanists as presumed. I contend that the primary objection of bioconservatives can be characterised as 'anthropocentric,' rooted in the belief that human worth emanates from their rational, autonomous, and moral nature, thus rendering them deserving of dignity—a notion often framed as being created 'in the image and likeness of God.' Consequently, bioconservative concerns should focus on biological modifications that undermine these attributes, scrutinising interventions that diminish autonomy, moral capacity, or rational faculties. Why should transformations that do just the opposite, that is, increase the autonomy, rational capacity, and moral capacity of individuals, be unacceptable? Only by believing in an immutable human nature, originating in a creative act or in a predetermination of nature, can these interventions be objected to. And it is curious that this objection, which I would call 'para-religious', is the one put forward by authors as distant from each other as Habermas (2015/2001), Fukuyama (2002) or Sandel (2004).

Thus, the essence of anthropocentrism, encapsulating rationality, autonomy, and morality, logically leads to what I term 'logocentrism'—the notion that any entity endowed with rationality, autonomy, and morality merits respect, consideration, and rights, irrespective of its natural or artificial origin or its human or non-human status (Schuster, 2022). This idea is implicit in Kant's assertion, "A human being *and generally every rational being* exists as an end in itself" (4:428). (Italics are mine).

A similar sentiment is echoed by Savulescu and Bostrom (2009, p. 238), who argue that moral considerations should revolve around empirical verification of qualities such as sensibility, capacity to suffer, reason, and consciousness.

In a democratic transhumanist society, rights would be extended to all beings capable of consciousness, reason, and moral agency—a democracy of 'persons' rather than merely humans in a biological sense. "A central question of biopolitics will be what rights we should grant to the various kinds of beings we create with technology" (Hughes, 2004, p.221).

In this vein, transhumanism assumes the mantle of humanism, albeit in a broader sense, encompassing all rational, autonomous, and moral beings within its ambit. Hottois identifies transhumanism's faith in human perfectibility, affirmation of individual freedom, and acknowledgment of the dignity of all life forms as key attributes aligning it with humanist principles. Transhumanism, thus construed, serves as a bulwark against nihilism and its inherent distrust of humanity—a characteristic of postmodern deconstructionism, according to Trigano (2022). Furthermore, transhumanism advocates for biological equality alongside social equality, advocating mastery over evolution to mitigate the vagaries of chance (Hottois, 2013, p. 166).

9. The origin of moral life (on the morality of machines and hybrid and symbiotic transhumans)

But a few important questions arise. Can biotechnical transformations affect the moral capacity of transhumans or even posthumans? Are transformed human beings, especially posthumans, capable of leading a moral life? Can we design artificial beings capable of morality? Can machines make moral judgments? What is the origin of morality?

Answering these questions involves considering the nature of moral judgment. If we assume that moral judgment is a process of reasoning using the data of a situation to which valid moral principles are applied, we can say that any machine capable of reasoning is capable of applying moral principles. But does that make it a moral being? Clearly not. A common postulate among objectivists is that moral life can be objectively 'calculated'. In this sense, a machine could be of great assistance in making moral judgments. But that does not make it a moral being. When do values arise, and therefore moral life?

Values arise when a conscious living being confronts the world with its own desires. In humans, this desire is for 'perdurability'. Perdurability is more than just a desire for survival. It is the desire to project oneself into the future. Biologically, it is the translation of the phylogenetic impulse that leads us to transmit and project genetic material into the future. This desire for perdurability, with deep roots in

phylogenetics, is what gives rise to the two emotional forces intuited by Freud: Eros and Thanatos.

For physical reality to have any meaning, there must be a conscious being that interprets it.

> A precipice on the primitive surface of this planet was not 'dangerous' before the arrival of creatures that could fall into it. It is not simply that a brain must relate to a precipice to consider it worth avoiding. Rather, the relationship must involve a living being, perhaps with a brain, that wants to keep living (Champagne, 2023, p. 22).

Values begin at the moment when the notion of good or bad appears. "Our worldly landscape acquires moral relief only when it is valued by a living entity concerned with surviving." (Champagne, 2023, p.22). "Well-being, the desire to be happy, to flourish, are synonyms. And it is what makes things in the world good or bad." (Champagne, 2023, p. 25). An immediate consequence is that for there to be moral life, there must be a conscious being with a desire for perdurability. The entire conflict in Stanley Kubrick's magnificent film, '2001: A Space Odyssey', based on the eponymous novel by Arthur C. Clarke, occurs precisely when HAL 9000, the computer controlling the ship, learns that the crew wants to disconnect it. Its desire to survive tragically leads it to confront the crew. And at a moment when they are already disconnecting it, it confesses a very human feeling, 'I'm afraid...'.

Moral judgments can be the subject of scientific study, since it can be objectively judged whether, according to certain principles, one solution is better than another. These are falsifiable claims. That is why moral judgments can be supported by machines. But the very origin of moral life is beyond the reach of science. Indeed, regarding the possibility of 'computing' moral life, Champagne states: "Specific proposals on *how* to maximize the best state possible can definitely be falsified in light of new evidence. However, the desirability of that state itself is not falsifiable" (Champagne, 2023, p.26). And also, "In other words, my desire to be happy is not falsifiable". (Champagne, 2023, p.25). Therefore, what gives rise to moral life does not belong to the realm of science. And this is because, "(...) the claim 'My life is worth living' can't be shown wrong. The bedrock of morality, then, cannot possibly be science." (Champagne, 2023, p.26).

Moral life arises from the conjunction of an external world, whose existence is objective and governed by the blind laws of nature, with a living and conscious being, who desires perdurability, who desires to live. In this sense, it is our consciousness of mortality that gives rise to values. It is our judgment that assesses whether certain external reality is favorable or unfavorable to our well-being, whether something is good or bad.

The interesting consequences of this approach are that an artificial intelligence that is not endowed with the sense of self-preservation, with the desire for

perdurability, could not properly have a moral life, but, nevertheless, could make totally accurate moral judgments!

And this implies that a hybrid or symbiotic transhuman with artificial intelligence could not only have moral life but could be morally more effective, since while maintaining the conscious impulse of perdurability, it could make more accurate moral judgments, as the artificial component would enhance its judgment capabilities, and therefore its evaluation of the specific circumstances in which the moral dilemma arises.

Now, is it possible that the transhumanization of individuals, leading towards 'amortality', towards the elimination of finitude, eliminates the very foundation of moral life?

I think not. 'Amortality' eliminates the programmed end but does not avoid the accidental one. On the other hand, our limits are not only temporal, along the length, but also along the 'width'. Others will always be a limit to our expansion.

10. Transhumanism and Education

It is evident that anything affecting human nature has repercussions both on the conception and the development of education. An article addressing this issue in depth from a bioconservative standpoint is noteworthy. Gil Cantero's (2022) article offers an insightful perspective on the problem of transhumanism. Although from a standpoint of disagreement, it can be asserted that this work emphasizes an important aspect of transhumanist transformations. It is not only about the "what" of being 'transhuman,' but also about the "how" of becoming. It places us, from a new perspective, before one of the problems that education has always had to address, namely the nature of humanity, that is, what makes us human and what are the appropriate means to achieve individual flourishing. It concerns itself with what the advancements in technologies linked to the enhancement of our capabilities through artificial means imply for the preservation of what constitutes each human being's essence, their humanity, and how education may be affected by these changes.

Gil Cantero's article aptly underscores the issue of how education, which could be characterized as the process by which one attains the status of an autonomous person, is affected by the emergence of technologies that could potentially become alternatives to education itself in achieving those same ends. Simplifying to the extreme, if through periodic injections during the growth period, we were able to produce intellectually and morally autonomous individuals, we would not need education. Gil Cantero reacts against this idea, arguing that not only do the final states matter, but also the manner in which these final states are reached ultimately determines the nature of the final state itself. The path of education leads

to a different and more valuable state than the one supposedly achieved through technological contrivances.

While the above ideas might suggest that education would be completely sidelined in a society of transhumans, from my point of view, we can, however, consider two things that contradict this perspective:

A) There is a continuity of intentions between transhumanism and education.
B) Second, and more importantly, education is the process of transition from potential autonomy to actual autonomy.

The transhumanist ideal consists of improving human beings by providing individuals and society with capabilities that were previously beyond their natural reach. This is not very different from the optimizing nature of education. What is achieved through technological means in one case is accomplished through symbolic elements, cultural contents, and personal relationships in the other. In some respects, the possibilities for improvement offered by transhumanism surpass those of education. The technologically extended or obtained capabilities from enhancement can hardly be acquired through mere traditional symbolic procedures. However, education is more than just the promotion of innate or acquired abilities. Education involves an integration of cultural contents that must be appropriated by the learner to reach the autonomous adult state, which is the aim of education. Education is not only about the individual flourishing of various capacities but also about the integration of the individual into a social body, into some social group. In this sense, education goes beyond mere transhumanist improvement.

Secondly, the profound nature of the changes that occur during the educational process is that of transition from potentiality to actuality. And it is this transition that presents some aspects that are somewhat paradoxical, and which are indeed emphasized in the articles by Gil Cantero (2022) and Reyero and Gil Cantero (2019). Although the latter does not specifically address transhumanism, it does tackle the issue of limits, which ultimately relates to this topic. Indeed, the goal of education is to ensure that learners become autonomous adults capable of making their own reflective, yet independent choices. However, it is impossible to educate in a vacuum or in indeterminacy. One is born within a culture, educated in a certain language, adopts certain beliefs, and without all these, there can be no education because without them, there would be no integration into the culture. But all these elements correspond to choices made by educators before learners become autonomous, and that certainly opens up some future options but closes many others. Being educated in Spanish opens the doors to enjoying all literature in this language, but it limits us in terms of any other language that we could potentially have learned. That is why it is so important that all decisions made regarding the Cultural Corpus are deeply respectful of the decisions that those with parental authority can make.

But in any case, this is the essence of the educational process: the transition from starting potentialities (potentiality) to the final state of autonomy (act). And here is where my agreement with them ends.

And it is here where we can see the complementarity of transhumanist transformations and education. The former may increase, to limits only accessible to our imagination, potentiality, the starting point. But education will always be the process that, taking that initial potentiality, leads to the act, the final state of autonomy.

Interestingly, it is the education according to the progressive concept that would be threatened by transhumanism. Indeed, the most current trend in education is competency-based education. According to this, it is the development of competencies rather than the acquisition of knowledge that should be fostered by schools. So much emphasis is placed on basic competencies that, in many cases, the material content of education is overlooked. This would be nothing more than a means for competencies to appear. And it is to the extent that things like the ability of 'learning to learn' are defined as basic competencies. Although this is nothing more than an empty rhetorical figure devoid of explicit content, it reflects well how the importance in this conception lies in the functionality that the content empowers. Once functionality is achieved, the content becomes irrelevant.

Therefore, curiously, it is this type of education that transhumanism threatens. If improvement of competencies, of individuals' functional capabilities, can be achieved through technological procedures, the educational process conceived in this way loses its objective in a very important part, if not entirely.

However, if we consider education as the actualization of the individual's potential autonomy, as the integration of the individual into their cultural environment, we will see that specific cultural contents and values, belonging to a particular culture, are indispensable. Integration cannot occur without the incorporation of cultural contents and values corresponding to the environment to which one is to be integrated. Therefore, it is not sufficient to have the capabilities or competencies that improvement or purely competency-based education can provide. And this is why the roles of optimizing transformations and education are complementary. Improvement increases the starting potentialities, while education actualizes those potentialities into a specific act.

11. About Capacity Development and Content Transmission

Transhumanism, in its version of biotechnological enhancement of human capacities, is not incompatible with education, which is an enhancement through symbolic means of the human being. In this sense, transhumanism is related to the flourishing of capacities, while education would also have to do with content, attending to its nature as symbolic technology.

This is an important nuance that arises when considering the role of education in transhumanism. The technological development of capacities does not present the same dangers as the technological transmission of content. The former has little risk of undermining individuals' autonomy, while the latter presents a high risk in this regard. (Although not greater than what education has always presented before transhumanism, because, really, what is education besides the implantation of knowledge and attitudes and the development of aptitudes and skills?)

In any case, there is something in common between transhumanist techniques and education. In both cases, it is about doing something to a person, to transform the person himself/herself. In this sense, education is essentially a transhumanist activity.

12. Education and the Elimination of Human Limitations

Transhumanism seeks to eliminate many human limitations. However, Gil Cantero and Reyero argue that these limitations play a fundamental, mediating role in the educational process. This is where my disagreements with their formulation arise.

Gil Cantero's article (2022) is in a certain sense a continuation of Reyero and Gil Cantero's article (2019), in which it is argued that education that limits is the one that liberates. Naturally, if we artificially eliminate all limits, it seems that the consequence is the disappearance of the possibility of education.

Reyero and Gil Cantero make a good argument in their article about why education involves recognizing certain limits. They adopt a positive perspective on freedom. This can be seen in their initial argument where they say, "What if we don't really know what we want? What if our desires need discipline to be truly valuable?" In support of this idea, they then quote a text by MacIntyre (2017, p. 27) "Is what I want now what I want to want? And do I have enough reasons to want what I want now?" It is clear that, if one adopts this positive perspective on freedom, the individual becomes truly free when they are able to know themselves, recognize their passions, and their true human interest and autonomously choose the right option. One is free when they can autonomously choose the good. I believe educators could sympathize with this stance in principle, as we tend to see, not only the specific individual we are educating, but also the future individual that our student could become.

My stance, however, is closer to a negative conception of freedom. An individual is free when there are no external obstacles preventing them from realizing their preferences. But also from this perspective, it is easy to argue that education is the process by which individuals learn to identify and respect the limits to their will. A society of free individuals requires all participants to recognize others and their legitimate interests as limits to the development of their will. And in this sense, learning and the appropriation of social rules allow the individual to 'play' freely in social life.

Accepting, then, that education sets limits, it must be said, however, that not all limits are educational.

I believe this idea is fundamental. Education is the process by which we move from the potentiality of autonomy to its actuality. Potentiality is the almost infinite set of future possibilities. The realization of education requires the concretization of these countless possibilities into a few choices. Choosing these options implies implicitly rejecting others that will never be possible. The child's right to an open future (Feinberg, 1980, 1986) contradicts the 'right to *a* future' when attempts are made to maintain 'openness' indefinitely. Potentiality is in itself unlimited, while the act is by definition determined, closed. We cannot move from potentiality to act without losing countless future options along the way. We lose the possibility of many things when we achieve something specific. This is what economists call 'opportunity cost'.

In this sense, education has a dual relationship with limits: first, to educate is to open up new possibilities of being while renouncing others, and second, as Reyero and GC argue, one can only be educated in relation to limits.

An example related to the first point is provided by the well-known natural ability of Rafa Nadal for soccer and golf. He could probably have been a star in either of those two fields. But when his training focused on tennis and he became a star in this sport, it came at the cost of not being able to excel in either of the others.

This transition from potentiality to act involves assuming what we could call final limits. Limits as a result of education. The limits imposed when choosing one path over others, and the limits imposed by the rules of the chosen path.

But the second aspect of the relationship with limits is what R and GC address, that is, limits as a means for the development of education. Transhumanism seeks to minimize or eliminate the limits, biological limits mainly, of the human being. Yet they consider these limits to play a fundamental role in education. When discussing biological limitations, they cite the example of Nussbaum and Steiner.

> (...) the attempt to suppress, through a mad posthumanist race, any physical imperfection, since all in some sense limit us, can lead us to a world where the virtues acquired through education are unknown, forgetting that every virtue is educated in the exercise in the face of limitation (Reyero and Gil Cantero, 2019, p. 218).

Certainly, accepting inevitable limitation and valuing its pedagogical potential does not justify accepting every limitation as inevitable. Therefore, Martha Nussbaum's testimony, in which she states, "Not only would I not like, *ex post*, to have had a different daughter, but I wouldn't even like her to have been 'fixed'." (Nussbaum, 2002, p. 16 Cited in Reyero and Gil Cantero, 2019, p. 218). But this testimony does not serve to justify non-intervention in transhumanism. It makes no sense to say, 'I wouldn't change you for another person with fewer limitations,' because it is equivalent to saying 'I wouldn't change the past,' and this is purely rhetorical because the past cannot be changed. What is truly important and meaningful is to know if we

would change the future to prevent limitations. Wouldn't we give future mothers folic acid in their diet to prevent possible spina bifida in the baby? Wouldn't we give Lamivudine to people with Down syndrome if its effectiveness is confirmed (Martinez de Lagran et al., 2022), to not change their personal characteristics, no matter how endearing they may be? And above all, would Martha Nussbaum's daughter have the same opinion about the possibility of being 'fixed'?

It is true that 'education that limits is the one that liberates,' but it is not true that all limits are educational or liberating.

This topic is further explored in Gil Cantero's article on transhumanism (2022). The artificial overcoming of many physical limitations, the argument seems to say, ultimately prevents true education. If there are no limits to fight against, character cannot be formed. However, it overlooks the fact that it is the universe itself that limits us. No matter how many capabilities humans develop, the universe imposes limits of space-time reality on us. We live in a temporally unidirectional and entropic universe that limits us in countless ways. There will always be physical limits to contend with.

Moreover, probably the most important limitations that can be attributed educational virtues are social limitations. It is civic life, and the process of integration into it, that is truly educational. If only biological limitations were educational, it would result in the paradox that the most athletic students would miss out on opportunities to educate their character, while only the most frail ones would have a whole range of personal development opportunities.

13. About the value of effort

Reyero and Gil Cantero seem to suggest that the value of effort is more important than the end achieved. Or, in other words, that the goal of education is not in the destination but in the journey. "The aim of this article is to show that the central idea of education as human development lies in emphasizing more the demanding and continuous effort of the subject in their own formation than in an artificial improvement of oneself." (Gil Cantero, 2022, p.13) "In other words, do the means matter? How we go about showing not only matter, but education is or is not in the choice of its means." (Gil Cantero, 2022, p.14)

The problem is that I don't see arguments supporting this assertion. If we accept the classical definition of education by Saint Thomas Aquinas, 'Traductio et Promotio prolis, usque ad perfectum estatus homini in quantum homo est, qui es virtutis status.' (Puelles, 1958) the concern is the point of arrival, which is the state of virtue. It would be a bit strange to say that this state of virtue is not valid because it has been reached by unorthodox means.

It could be argued that this state of virtue can only be achieved through proper means. But that sounds too much like empirical argumentation, which would need a great deal of evidence to be validated.

Gil Cantero's (2022) and Reyero and Gil Cantero's (2019) argument seem to establish that in education what matters is the means of transition from potentiality to act, that, in fact, the act is determined by the way that transition occurs. What I don't quite understand is why if the final state reached can be achieved by alternative means, it becomes worthless. Why is it crucial to know if it has been achieved by unconventional or non-educationally valuable means?

It seems that their main objection to this type of reasoning would be to deny the premise, that is, to deny the possibility of reaching an end or state of virtue without first going through a path of overcoming and effort. But again, that is an empirical assertion that would need empirical evidence to verify its truth.

If we understand education as the directed process of transition from an initial state, a state of potentialities, to a final state of actualizations and, let's not forget, of new potentialities, then transhumanistic artificial enhancement is nothing more than defining a new starting point. A starting point that places the beginning of education at a higher stage.

14. Is random better than design?

And that's another reason why Gil Cantero rejects artificial intervention and what I understand as an overvaluation of ontogenetic chance. But one wonders, what makes the product of chance superior to voluntarily chosen characteristics? It seems to be assumed that the product of chance is the expression of a higher ethical reason. At one point, GC says:

> How to deal with, from pedagogy, the longing for precision and improvement offered by these technologies and which will clearly increase (...) between working with perfect students or with what we have, between choosing a perfect child or accepting what comes? (Gil Cantero, 2022, p. 15).

But this consideration leads us to question the relationship between freedom and human dignity with chance and imperfection. Is it really unpedagogical to have a 'perfect' student achieved through technology, but it is not if that same perfection has been obtained through chance? Although in Gil Cantero's article the idea is not explicitly expressed, it seems to be taken for granted that chance is the expression of a higher ethical reason, the ethics of the species, of Habermas (2015/2001), the natural human equality of Fukuyama (2002), or what in some context would be the expression of a suprahuman will, as in Sandel (2004). But why is a certain initial status acceptable if it is the result of fortunate chance and not if it results from planned intervention? Do we find here the natural-artificial duality? According to this, would the result of the natural always be ethically superior to the artificial? I sincerely believe that bioconservatives, and specifically Gil Cantero (2022), do not resolve this issue.

15. About the starting conditions

"In short, the chances of education, of being more and better human, do not increase by believing that we can omnipotently control the starting conditions of that humanity." (Gil Cantero, 2022, p.16)

Gil Cantero assumes this bioconservative position because he fears that

> the human condition will be blurred in its basic attributes of adopting responsibilities and taking a free stance towards life, that is, in the particular conditions of our educability. For example: 'is it the same for the human condition, to get a prisoner to change their moral criteria by freely assumed conviction, as by supplying them with citalopram, an antidepressant that, by increasing serotonin levels, improves the moral evaluation of harm to others? (Serra, 2016, p. 179 cited in Gil Cantero, 2022, p. 17).

Gil Cantero clearly considers this action as paradigmatic of the abuse of Transhumanism. Perhaps that is why it is worth analyzing this case.

The first thing to say is that this case does not fit entirely into the model of 'abuses' that he proposes. It is not about a change that transhumanists want to make to a mentally healthy individual. There is some dysfunction when it comes to a subject who is in jail. It does not mean that only the sick ones can choose to do evil. But it must be recognized that we are facing a dysfunction. And, if it is found that the problem is that the subject in question has a lack of empathy towards the victims of their actions caused by a serotonin deficiency in their brain, what difference would there be between administering a medication to remedy that deficiency and providing insulin to a diabetic? The contradiction to righteousness would occur if this treatment, like any other, were administered without the consent of the subject involved or if this treatment had disproportionate side effects of which the prisoner had not been properly aware. Something that happens, for example, in Stanley Kubrick's magnificent and terrible film based on Anthony Burgess's novel 'A Clockwork Orange' (1971). "Better be evil by one's own decision than good by brainwashing." (Anthony Burgess cited in Vasconcellos, ABC, 15/08/2012). That is why, precisely in that Burgess quote lies the fundamental difference. After the brainwashing, Alex Delarge is no longer capable of doing evil, even if he wants to. When he tries, a terrible series of adverse physiological reactions happen to him. I think that is the touchstone of any 'treatment'; that the subject does not lose the capacity to act freely. After taking Citalopram, the subject remains capable of harming others. But now the would-be offender will be susceptible to experiencing empathy, which did not happen before.

Later on, Gil Cantero mentions some authors who propose "Including improvements in the professional efficiency of certain sectors with which economic income would increase compared to the competition, 'since many people would prefer

to fly with airlines or go to hospitals, where staff take medication to improve alertness.'" (Savalescu, 2012; Savalescu et al. 2011; Person and Savalescu, 2014; Sloterdijk, 2006; Singer, 2002; cited in GC, 2022, p. 328). And all this is mentioned with a clear disqualifying intention. Certainly, when I read this paragraph, the case of German soldiers in World War II came to mind. They were given Pervitin, a methamphetamine. The side effects were enormous, leading to psychosis in many of those who received this stimulant. By association, one would flee from an airline whose pilots flew drugged. But, what if there were only positive effects? Some months ago, in the press, there was some repercussion of the reproaches made by some French cyclists to tennis player Rafael Nadal for the treatment received by the latter to alleviate chronic pain in his foot. In this case, sports authorities took as a criterion to approve the treatment that it did not provide an advantage to the tennis player over his rivals and that it also did not have negative side effects on the athlete's health. Well, if this is the case, what difference would there be between a pilot who drinks coffee before flying to stay alert and another who takes an infusion or a pill for the same purpose, but with better performance and even without the side effects of coffee? Why wouldn't this be acceptable? Again, I think Gil Cantero assumes the moral superiority of abstention, but does not answer this question.

16. Criteria for judging transhumanism

I believe that bioconservatives cannot provide a reason why artificial biological transformations are inherently bad. However, it is evident that, like any human innovation, the use made of it will determine its goodness or badness. Therefore, I think it is perfectly valid to establish some criteria to determine which biotechnical interventions are acceptable and which are not.

For me, the main criterion has to do with the autonomy of the subjects. It is about distinguishing between what increases our autonomy and what diminishes it. Increasing our capacities enhances our autonomy. Implanting uncriticizable contents or uncontrollable automatic behaviours diminishes our autonomy. And in general, any transformation is acceptable if it meets the following conditions:

1. The modification is a genuine improvement, not just an aesthetic adaptation of the subject for the satisfaction of their parents or a third party. (Authenticity requirement)
2. The improvement benefits the subject themselves, it is not a modification for the benefit of third parties, nor for doing a better specific job (Generality requirement) (Such as mining work, diving, or anything else for the greater benefit of third parties), nor for organ donation, when this entails a decrease in the physical condition of the subject, etc.

3. It does not harm the mental or physical health of the subject in the short, medium, or long term.
4. It does not cause physical or psychological dependence.
5. It does not eliminate the free will of the subjects. That is, they are capable of acting morally both good and bad after the treatment.
6. They are accepted with fully informed consent by the patient subject or by their legal representatives as long as they are not benefiting third parties.
7. The improvements focus on capacities rather than the content of the mind, such as ideas, feelings, attitudes. And, in any case, if any content is implanted, it must not be irreversible, that is, impossible to eliminate by the rational analysis of the subjects themselves, as that would go against the principle of self-determination.

These principles can be summarized in two: modifications that increase the autonomy of the subject are acceptable, and always respecting the Kantian principle of considering the person as an end in themselves, not as a means to other ends. ("Act in such a way that you treat humanity, whether in your own person or in the person of any other, always as an end and never merely as a means" (Kant 1785/1980, 4:429).

17. Conclusions

After analysing the most serious objections presented by bioconservatives, it seems to me that there is less distance between them and transhumanists than it appears. The former are anthropocentric and concern themselves with the dignity of the current human being. The logocentric stance of transhumanism is concerned with the dignity of all beings endowed with rationality and moral life.

I believe I have shown that there is no decisive reason to consider transhumanist interventions as inherently bad. At least none has been proposed clearly and convincingly by bioconservatives, no reason that does not depend on the prior acceptance of a certain worldview or ideological or religious position.

Like all human actions, only the specific conditions surrounding biological interventions in humans will determine whether a specific action is acceptable or not. Along these lines, I have proposed some criteria, not exhaustively, that allow us to judge whether the modifications referred to are ethically valid or not. In essence, I believe that transhumanist modifications, as long as they serve to increase the autonomy of the transformed subjects, are perfectly compatible with human values.

Transhumanist modifications are also perfectly compatible with education, as they fundamentally affect the physical or intellectual capacities at the outset, but if

the criteria we have established are respected, they do not diminish the autonomy of the subject or prefigure the content of their mind after the educational process.

Transhumanism and education are not antagonistic realities, but complementary ones. The optimizing intention is common to both, and they only differ in the methods employed: biotechnical in one case, symbolic in the other.

In any case, I believe that all the phenomena highlighted by transhumanism are a golden opportunity to reflect on the most basic, and therefore most important, issues that education must face. In this sense, the articles by Reyero and Gil Cantero (2019) and especially Gil Cantero's (2022) highlight that it is precisely the relationship of education with limits where the key to judging transhumanism lies. My response differs from theirs, but their question is still the right one.

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