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Reflection paper

The Extended Mind Thesis and the Transhumanist Ideal of Cognitive Enhancement*

La tesis de la mente extendida y el ideal transhumanista de mejoramiento cognitivo

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Abstract: This paper explores the connection between the extended mind thesis and transhumanism, with a particular focus on how technology may influence, alter, or enhance human cognitive capabilities and skills. The extended mind thesis posits that external elements can become an integral part of cognitive processes. Drawing on this notion, the paper contends that transhumanism adopts such perspective in defending the possibility of cognitive enhancement. In this sense, it assesses whether technology can truly enhance cognitive function or induce a specific type of ignorance, instead, by diminishing cognitive phenomenology—the lived, experiential dimension of mental processes or the phenomenal aspect of cognitive consciousness. The assumption that cognitive technologies inherently enhance independent mental performance is challenged with the argument that overreliance on technology may reduce the ability to execute cognitive tasks autonomously. The analysis concludes that coupling to technological artifacts can indeed lead to a specific type of ignorance by compromising cognitive phenomenology. It also suggests that such ignorance is a symptom of technology overuse, which can undermine the ability to perform cognitive tasks independently. These two conclusions invite reconsideration of the transhumanist claim that technology can enhance human cognition.

Keywords: technological advances, cognitive phenomenology, ignorance, extended mind, transhumanism.

Resumen: el artículo explora la intersección entre la tesis de la mente extendida y el transhumanismo, enfocándose, específicamente, en cómo las tecnologías pueden influir, alterar o expandir nuestras capacidades y habilidades cognitivas. A través de un análisis de la tesis de la mente extendida, que propone que algunos elementos externos pueden formar parte constitutiva de nuestros procesos cognitivos, se argumenta que el transhumanismo adopta dicha tesis al tratar el asunto del mejoramiento cognitivo, y se examina si la tecnología puede realmente mejorar nuestras capacidades mentales, o si, por el contrario, podría inducir a un tipo específico de ignorancia al hacernos perder la *fenomenología cognitiva*, es decir, la vivencia de nuestros procesos mentales o el aspecto fenoménico de nuestra conciencia cognitiva. Se cuestiona, además, si el acoplamiento con tecnologías cognitivas disminuiría nuestra capacidad de realizar tareas mentales de forma autónoma, sugiriendo que una dependencia excesiva de la tecnología podría reducir nuestra habilidad para realizar procesos cognitivos sin ayuda de artefactos tecnológicos. Luego del análisis, el artículo concluye que, efectivamente, nuestro acoplamiento con artefactos tecnológicos puede conducirnos a un tipo específico de ignorancia al eliminar nuestra fenomenología cognitiva. También determina que dicha ignorancia es síntoma de que el uso excesivo de tecnologías puede despojarnos de nuestra habilidad de realizar tareas cognitivas sin asistencia tecnológica. Estas dos conclusiones deberían minar, o al menos replantear, las aspiraciones transhumanistas acerca del mejoramiento tecnológico de nuestra mente.

Palabras clave: avances tecnológicos, fenomenología cognitiva, ignorancia, mente extendida, transhumanismo.

INTRODUCTION

In his novel *Fahrenheit 451*, Bradbury (2012) tells the story of Montag, a firefighter in a dystopian society, whose job is not to control fires but to burn books, as they are considered a threat to the well-being of society. Montag secretly steals some of the books he is tasked with burning, seeking to preserve them. When he is discovered, he escapes due to the possibility of being executed by the state. On the run, Montag meets a group of intellectuals and scholars who, like him, are committed to preserving books. These individuals live as hermits, memorizing books to safeguard their content. Granger, one of these intellectuals, explains to Montag:

> We're book burners, too. We read the books and burnt them, afraid they'd be found. Microfilming didn't pay off; we were always traveling, we didn't want to bury the film and come back later. Always the chance of discovery. Better to keep it in the old heads, where no one can see it or suspect it. We are all bits and pieces of history and literature and international law, Byron, Tom Paine, Machiavelli or Christ, it's here. (Bradbury, 2012, p. 167)

This passage alludes to a key feature of our cognitive processes that may be lost due to the increasing reliance on technology. Although difficult to recognize sometimes, this feature is exactly what this paper seeks to highlight. In the literature, such feature has been referred to as *cognitive phenomenology* (Bayne & Montague, 2011; Chudnoff, 2015; Montague, 2017), which is the sensation experienced when performing cognitive tasks such as recalling, calculating, or inferring. Many modern technological devices now perform these functions, much like how Granger points out that information could be stored on microfilm, eliminating the need to memorize it. This paper defends the thesis that the pervasive and habitual use of technological tools does not necessarily enhance human cognitive processes, as transhumanists believe (Bostrom, 2014; Bostrom & Sandberg, 2009; Kurzweil, 2012). On the contrary, it may foster a particular form of ignorance, as the human mind could lose its cognitive phenomenology. The loss of this phenomenology would signify a diminished capacity for individuals to autonomously perform certain cognitive tasks.

In order to achieve this goal, the following section analyzes how transhumanism embraces the ideal of cognitive enhancement. Next, the extended mind thesis is discussed as a strong argumentative foundation for the transhumanist ideal of cognitive enhancement. Finally, it is demonstrated that this thesis can, in certain cases, lead to diminished cognitive phenomenology, resulting in a specific form of ignorance.

THE TRANSHUMANIST IDEAL AND COGNITION

The enhancement of cognition is one of the most cherished goals of the transhumanist movement. Huxley (1968) introduced this term to describe the human aspiration to transcend oneself, to rise above their current existence, and to take control of their evolution through the development of science and technology. Transhumanism, therefore, can be understood as an

ideal: the humanist ideal of enhancing and even surpassing the human species itself.[1] In recent years, the transhumanist ideal has been fueled by remarkable technological advancements. Through new technologies, human limitations could be remedied to the point that even death is perceived merely as a technical enigma. Transhumanism can be defined by two key theses:

> T1. Every human weakness can be enhanced and even overcome using modern technology.
> T2. The human species as a whole can be enhanced and even surpassed using modern technology.

In addition, transhumanism seems to support a third thesis of an ethical nature:

> T3. The human species has a *moral duty* to enhance and even surpass itself using technology.

This article addresses the first two theses, which are more metaphysical than ethical. However, some points raised here may have an impact on transhumanism's ethical stance.[2] T1 and T2 call for an explanation of their assumptions. The first assumption suggests that our bodies limit what we *truly* are or what we *can become* (Diéguez, 2021). Indeed, T1 points out that human weaknesses are susceptible to enhancement, but transhumanism often views the human physical condition as the primary limitation, identifying death, illness, and aging as key paradigms of bodily constraints. Human physicality—it argues—can be enhanced through various technological strategies. In this sense, transhumanism can be understood as the continuation of a long-standing tradition that perceives humans as more than mere physical bodies. Furthermore, as evidenced in T2, the enhancement transhumanists anticipate is not limited to addressing or overcoming individual or particular weaknesses. Instead, the anticipated enhancement targets humanity as a whole, aiming for transcendence. More (1998), one of the leading advocates of transhumanism, explains it in the following terms:

> Transhumanists take humanism further by challenging human limits by means of science and technology combined with critical and creative thinking. We challenge the inevitability of aging and death, and we seek continuing enhancements to our intellectual abilities, our physical capacities, and our emotional development. We see humanity as a transitory stage in the evolutionary development of intelligence. We advocate using science to accelerate our move from human to a transhuman or posthuman condition.

The pursuit of overcoming human limits through technology covers various aspects of humanity, utilizing different means to achieve this purpose. These include the use of nanotechnology and biotechnology, the development of genetic alteration techniques, and the creation of technological devices that function as prosthetics for the human body. These means seek to enhance longevity, enhance health, eliminate motor and cognitive diseases, explore new ways of engaging cognitively with reality, or optimize physical and biological resources for performing different tasks (Diéguez, 2017; Ferry, 2017).

[1] For a discussion on the interplay between humanist and transhumanist ideals, see Duarte Arias (2023) and Muñoz González (2020a, 2020b).
[2] For a defense of the ethical thesis of transhumanism, see Bostrom (2006), Harris (2010), and Savulescu (2009).

The cognitive aspect of transhumanism seems to have two distinct versions (Ferry, 2017). The first version emphasizes the development of strong or general artificial intelligence, with the ultimate goal of creating superintelligence. Transhumanists argue that the human ability to create machines capable of processing information and "thinking" in ways that surpass human cognition would ensure an "enhancement" in human cognitive faculties. Moreover, many transhumanists believe and claim that this possibility is an inevitable outcome of technological progress, so that the emergence of artificial superintelligence is a matter of time. Chalmers (2016) and Kurzweil (2012) refer to this pivotal moment as "singularity".

For this scenario to truly represent an enhancement, it is essential not only to develop artificial intelligence but also to integrate it with human intelligence. This integration is envisioned as the possibility of uploading the human mind—thoughts, emotions, memories, and other mental states—to a medium outside the human body. Consequently, humans could "exist" within a machine, which would allow human cognition to transcend the physical limitations of the body and elevate mental states beyond the current, fragile cognitive capacity (Bostrom, 2014; Kurzweil, 2012).

The second, less radical version of cognitive transhumanism does not focus on the total transfer of human minds to machines. Instead, it is based on the ideal of hybridization between the organic and the technological. The concept of the *cyborg* is key to this version, where the organic does not disappear but is transformed through a complex interaction with technological tools. Devices such as implants, prosthetics, and other artifacts installed in the human body would enhance both living conditions and cognitive abilities.

Clynes and Kline (1960) introduced the term *cyborg* to refer to the integration of cybernetic and organic elements as a means of survival in hostile environments such as outer space. Rather than modifying these environments, organisms should be enhanced through the implantation and interaction with technological devices that allow them to function in different settings while enhancing functions like blood pressure regulation, breathing, or perception. The authors emphasize that cyborgization will occur when there is a harmonious integration between humans and machines, not a scenario where humans become "slaves" to machines.Prosthetics serve as a paradigmatic example of cyborgization, as technological prostheses are designed to enable the seamless functioning of motor, cognitive, or perceptual systems. This integration is meaningful only if these prostheses are conceived as originating from human activity, rather than mere complements to it (Sharon, 2014). Prostheses that achieve a hybridization between the organic and the technological and enhance cognitive processes would represent a path to achieving the transhumanist goal of cognitive enhancement.[3]

[3] Transhumanists also point to genetic engineering and drug use as tools for enhancing human cognition (Bostrom & Sandberg, 2009; Sandberg, 2011). However, this paper is limited to analyzing technological hybridization.

THE EXTENDED MIND THESIS AND TRANSHUMANISM

The idea of creating superintelligence and transferring the human mind into a machine seems difficult to materialize. First, there are widespread criticisms regarding the feasibility of developing strong artificial intelligence. Although such criticisms are not directed at transhumanism, they do challenge one of its key assumptions: the potential for general artificial intelligence. Notable examples include Searle's famous Chinese room argument (1980) or the well-known arguments referencing Gödel's first incompleteness theorem to assert the impossibility of strong artificial intelligence (Penrose, 1996, 1999). The same can be said of Dreyfus's (1992) famous criticisms against one of the assumptions of strong artificial intelligence, which posits that human experience is fundamentally based on the explicit manipulation of symbols. A second set of criticisms highlights the implausibility of uploading the human mind into a machine, pointing to both conceptual and technical limitations. These critical arguments assert that there is no evidence to suggest that inorganic systems can replicate the neural functions essential for cognition. Additionally, they challenge the functionalist perspective that underlies the idea of singularity, which overlooks the biological substrates vital to cognition (Diéguez, 2017, 2021; Marcus & Davis, 2019). Given these concerns, this paper will focus on the hybridization between the organic and the technological as a means of achieving the transhumanist ideal of cognitive enhancement, setting aside the more radical version that seeks the creation of artificial superintelligence.

The extended mind thesis, proposed by Clark and Chalmers (1998), has been applied to at least three levels: cognitive processes, propositional attitudes (e.g., beliefs, intentions, or desires), and conscious experience (Clark, 2008; Clark & Chalmers, 1998; Kirchhoff & Kiverstein, 2019; Pritchard, 2010; Rowlands, 2009). This analysis will focus exclusively on cognitive processes to explore the potential relationship between the extended mind thesis and the cognitive approach of transhumanism.[4] The literature on the extended mind often discusses the "three waves" that this explanatory paradigm has undergone. The first wave posits that the mind can be *coupled* to objects in the world, the second wave addresses *integration* with external artifacts, and the third wave explores the *distribution* of the mind across different agents (Kirchhoff & Kiverstein, 2019; Sutton, 2010). This analysis will be limited to the first wave—the idea that the mind can be *coupled* to external objects—because it aligns most closely with transhumanism, as will be explained in this section.

The extended mind thesis suggests that cognitive processes do not necessarily occur within human heads. Instead, these processes can extend into the world through interaction with external objects that, together with the human brain and nervous system, form cognitive systems. Clark and Chalmers (1998) define cognitive processes as all information processing that leads to knowledge acquisition or understanding, often embodied in "epistemic actions." Examples include perception in its various forms, reasoning, calculation, attention, and orientation. According to the traditional (Cartesian or classical materialist) view, these

[4]As Andrada (2021) notes, although cognitive processes and propositional attitudes are distinct levels, they are often addressed together. However, for the purposes of this paper, it is appropriate to focus exclusively on the first level and isolate it from the second. Therefore, this study concentrates on cognitive processes, setting aside mental states, propositional attitudes, and dispositional states.

processes do not take place in what we usually call "the world." Instead, they are instantiated within a particular spectrum of our cognitive life: "the mind," or they are reduced to a neuronal process. The extended mind thesis challenges this traditional perspective.[5]

The central idea is that cognitive processes do not always occur within the human mind; they can involve *coupled* systems that incorporate both intracranial and extracranial elements working together to perform cognitive tasks. For example, logical deductions can be intracranial processes, but using pencil and paper can facilitate calculations, as taught in basic logic courses. Pencil and paper do not serve as a mere physical representation of what the mind has already deduced; they become part of a system *coupled* with internal elements that, together, perform the logical deductions. This dynamic is also applicable to cognitive processes such as searching, analyzing, and predicting. While these processes can be internally performed, they often benefit from the integration of external elements. To illustrate extended cognitive processes, Clark and Chalmers (1998) introduce the parity principle:

> If, as we confront some task, a part of the world functions as a process which, *were it done in the head*, we would have no hesitation in recognizing as part of the cognitive process, then that part of the world is (so we claim) part of the cognitive process. (p. 8)

Thus, if tasks like deducing, calculating, searching, predicting, recognizing, and understanding are readily labeled as *cognitive processes when performed mentally*, we can continue to categorize them as such when they result from a coupling between elements of the external world and elements inside our heads. Therefore, it can be concluded that, *sometimes*, cognitive processes can be extended to objects in the world.

While the most prominent transhumanists may not explicitly reference the extended mind thesis to support their views on cognitive enhancement, their statements often implicitly suggest an underlying acceptance of it. For example, Bostrom and Sandberg (2009) highlight the following methods for enhancing the mind: transcranial magnetic simulation, interaction with external hardware and software, brain–computer interfaces, and collective intelligence. These four methods of cognitive enhancement resonate, to varying degrees, with the extended mind thesis. The first three methods involve a direct relationship with technological artefacts, which, according to the authors, would promote the transhumanist ideal of enhancing cognition. The fourth method, on the other hand, refers to the concept of the extended social mind, originally proposed by Clark and Chalmers (1998) and further developed in recent years. In this context, and addressing the human relationship with external hardware and software, Bostrom and Sandberg (2009) note:

[5] The extended mind thesis has been criticized for failing to fully transcend the distinction between the mind and the world. Specifically, it has been argued that the formulation of the thesis itself inherently perpetuates the distinction between the internal and the external, thereby implying that the former is extended into the latter. This distinction may hinder a comprehensive explanation of coupling or integration (Aydin, 2015). Likewise, the most traditional criticism of the extended mind thesis is that it conflates the role of external elements in *causing* cognitive processes with the notion that these elements *constitute* those processes (Adams & Aizawa, 2001). This criticism implies that the extended mind thesis does not completely dissolve the difference between the mind and the world. However, as will be shown in this section, transhumanists seem to implicitly accept this thesis, which is why it will be the focus of analysis in this paper. It would be worthwhile to conduct research exploring the relationship between the transhumanist ideal of cognitive enhancement and alternative conceptions of the mind.

> What is new is the growing interest in creating intimate links between the external systems and the human user through better interaction. The software becomes less an external tool and more of a mediating "exoself." This can be achieved through mediation, embedding the human within an augmenting "shell" such as wearable computers or virtual reality, or through smart environments in which objects are given extended capabilities. (p. 320)

This passage illustrates how using technological hybridization in the transhumanist pursuit of cognitive enhancement seems to tacitly assume the extended mind thesis applied to cognitive processes. The idea that cognitive processes are enhanced through technology holds true only to the extent that the boundaries between the human and the technological blur. Other prominent transhumanists make similar observations without directly referencing the extended mind thesis (Kurzweil, 2012; Sandberg, 2011; Warwick, 2004). In fact, the relationship between this thesis and transhumanism has become more explicit, not in the writings of transhumanists, but in the work of thinkers who analyze the connection between transhumanism and cognition (Marshall, 2022; Monserrat, 2022; Park, 2015; Sharon, 2014; Theiner, 2021; Zawidzki, 2012).[6] Indeed, the extended mind thesis seems to align well with the transhumanist idea that technological hybridization can enhance cognition, as humans would be not only biologically limited but also technologically empowered. This technological enhancement of cognition could be realized to the extent that humans function as a circuit coupled with technological artifacts. Monserrat (2022) illustrates how transhumanists might support the extended mind thesis as follows:

> What is the new extension of mind proposed by transhumanism? It is the consideration that the extension of mind through external networks, of one type or another, can always be done directly, without the intervention of an interface. Thus, the computer and man, the human mind, would form a single system, without the mediation of interfaces. It would be the appearance of the «man machine». (p. 451)

In this sense, since there would be no causal mediation between the mind and the artifact, transhumanists would be aiming to create cognitive units that integrate the biological subject with the technological artifact in such a way that cognitive processes could be extended. Hence, cognitive extension is "direct," and for that reason, transhumanists prefer the concept of *coupling* rather than *integration.* Once this concept is accepted, it should also be noted that any technological enhancement of the artifacts extending our cognitive processes would consequently enhance those processes. The argument would have the following structure:

1) If the mind can be extended into external objects, then cognitive behavior will rely on coupling with those objects that form the cognitive system.
2) If cognitive behavior relies on coupling with the objects that constitute the cognitive system, then enhancing the objects in the cognitive circuit will lead to a cognitive enhancement of the system.

[6] It is also important to note that the analysis of the relationship between the extended mind thesis and cognitive enhancement has gained prominence in the literature, often without direct reference to the transhumanist movement (Carter & Pritchard, 2019; Clowes, 2015; Nyholm, 2024; Pritchard et al., 2021; Smart, 2021; Walsh, 2017).

3) If the mind can be extended into external objects, then enhancing the objects of the cognitive circuit will imply a cognitive enhancement of the system (follows from 1 and 2).
4) The mind can be extended into external objects (extended mind thesis).
5) Therefore, enhancing the objects within the cognitive circuit will result in a cognitive enhancement of the system (follows from 3 and 4).

Thus, the extended mind thesis would support the transhumanist ideal that the mind and cognition can be enhanced through technology. Specifically, the thesis supports the weaker version of cybernetic transhumanism, which advocates for technological hybridization to transcend our biological cognitive limits.

IGNORANCE AND COGNITIVE PHENOMENOLOGY

Does every form of coupling lead to cognitive enhancement? First, embracing the extended mind thesis—applied to cognitive processes and understood as the potential for a *coupled* circuit—it could be argued that it is independent of current advancements in technology. If the thesis is true, the extension of cognitive processes into objects would reflect a capacity that humankind has possessed for thousands of years. The use of pencil and paper to perform abstract mathematical operations, a compass to determine location, specific tools to measure distances, and even language are examples of what the extension of the mind entails at the cognitive process level. The mind is not exclusively extended through robotic prostheses, computers, and futuristic artifacts. The human mind is extended every second. The use of cave signs, papyrus, or a laptop only differs in sophistication, not in qualitative changes that enhance or transcend the limitations of a previously existing form of cognition. In this regard, the extended mind thesis may not necessarily provide a conceptual foundation that reinforces transhumanist ideals (Clark, 2003; Monserrat, 2022; Rivera Novoa, 2020).

The remainder of this paper will not focus on this type of criticism. Instead, it will be assumed that the extended mind thesis can support cognitive enhancement in certain cases. However, attention should be paid to specific instances where human interaction with technological artifacts may result in forms of ignorance. It is not a black-and-white scenario. Technology does not *always* guarantee cognitive enhancement that can even surpass human biological limits—as transhumanists claim—nor can it be stated that technology *always* leads to a loss or detriment in human cognition—as some techno-pessimists might point out. It is important to consider the analyses by Aagaard (2021) and Bruineberg and Fabry (2022), who agree that many studies on extended cognition exhibit what they refer to as "harmony bias." Such bias is a tendency to focus solely on instances where there is harmonious coupling between the biological mind and external artifacts, while neglecting cases where the relationship with technology is not harmonious or does not result in cognitive enhancement.

There is increasing concern regarding the rise of generative artificial intelligences such as ChatGPT (Cassinadri, 2024). According to this perspective, excessive reliance on such tools

may lead to a decline in our natural cognitive abilities. In discussing how cognitive extension can occur with artificial intelligences, Nyholm (2024) states:

> If we hand over too many tasks to AI systems, and we therefore have fewer occasions or incentives to develop our capacity for intelligence, then there is a risk that we might end up being less intelligent than we could otherwise be. If we assign to AI technologies many of our intelligence-requiring tasks, rather than engaging in these tasks ourselves, and instead rely heavily on AI technologies, the increased dependence could prevent some people from fully realizing their intellectual potential. (p. 80)

The issue appears to be that successful cognitive extension could result in a decline of human biological or natural intellectual capacity. Examples of this phenomenon include the fact that to remember certain information, people no longer appeal to their biological memory, but to their smartphone. Similarly, when trying to locate a specific place, people rely on GPS technology rather than their own navigation skills. Likewise, ChatGPT might discourage writing production, as some individuals may have fewer opportunities to practice their writing skills. In short, a high reliance on technological artifacts might indicate successful cognitive extension, but also a decline in natural abilities.[7] To criticize this argument, Pritchard (2022) frames it in terms of ignorance:

> P1) The more we are reliant on extended cognitive processes, the less we employ our purely on-board cognitive processes.
> P2) The less we employ our purely on-board cognitive processes, the less epistemically effective they are.
> P3) The less epistemically effective our purely on-board cognitive processes are, the less we acquire epistemic standings like knowledge and true belief from these sources.
> C1) The more we are reliant on extended cognitive processes, the less we acquire epistemic standings like knowledge and true belief from our purely on-board cognitive processes (from P1, P2, and P3).
> P4) Ignorance is to be understood as the absence of an epistemic standing, such as the lack of knowledge or the lack of true belief.
> C2) The less we acquire epistemic standings like knowledge and true belief from our purely on-board cognitive processes, the more susceptible we are to being ignorant (From C1 and P4). (p. 62)

Returning to the case of *Fahrenheit 451*, excessive reliance on technological artifacts could undermine human ability to remember independently. As Granger points out to Montag, the

[7] Empirical studies have demonstrated that human reliance on technological tools can result in a decrease in "natural" cognitive abilities. For example, there is abundant evidence that our dependence on the internet, GPS tools, and digital reading negatively impacts memory, spatial awareness, and reading comprehension (Baron, 2021). Other studies suggest that prolonged exposure to digital screens can lead to attention deficits, a decline in social intelligence, and inadequate brain development (Small et al., 2020). These impacts have consequences in educational contexts, where some "deep thinking" learning problems may arise (Cavanaugh et al., 2016). A review of the empirical literature on this decline in cognitive abilities in relation to the extended mind thesis is a necessary undertaking. Similarly, it will be essential to explore the empirical support for the potential loss of cognitive phenomenology related to these tasks. As will be shown later, such loss reflects an inadequate cognitive extension that leads to a particular form of ignorance. However, this paper only focuses on the conceptual aspect of these phenomena.

best course of action in their situation would be to memorize all the books they are trying to protect. However, this capacity would be diminished if they relied on microfilms or other artifacts for storing that information. While microfilm could facilitate successful cognitive extension, excessive reliance on it could impair the human ability to remember. Increased dependence on external aids risks ignorance by reducing stimulation for natural faculties.

In response to this argument, Pritchard (2022) critiques the premise P1, noting it as a non-evident assumption needing empirical support. The author agrees that if humans use smartphones to remember phone numbers, they may not use their biological memory for this purpose. However, this does not imply humans should abandon biological memory entirely, as they can still engage it in other contexts. What Pritchard finds more problematic is the leap from C1 and P4 to C2, the argument's general conclusion. According to him, even if extended cognitive processes lead to fewer instances of knowledge and true beliefs derived from biological cognition, this does not necessarily mean that increased reliance on technology makes humans more prone to ignorance. Indeed, Pritchard does not identify a specific type of ignorance resulting from cognitive extension. If cognitive extension is effective, then the concern about ignorance should disappear.

Cognitive enhancement is assured even if humans no longer rely on natural or purely biological cognitive processes, as coupling with external artifacts enhances epistemic trust, leading to knowledge and true beliefs within the coupled circuit. Only by rejecting the extended mind thesis can it be claimed that technological dependence fosters ignorance. Nevertheless, once we acknowledge the extension of epistemic credit, it becomes illogical to suggest that humans are more prone to ignorance when the technological extension of their cognitive processes has occurred. Humans are not more ignorant for using pencil and paper to perform calculations, nor does Watson cease to have true beliefs simply because Holmes informs him of how he uncovered a crime scene. Therefore, it makes no sense to claim that humans lack knowledge or true beliefs because they rely on technology to perform cognitive tasks. Thus, this type of argument would not undermine the transhumanist ideal of cognitive enhancement.

According to the extended mind thesis, it should not be assumed that the objects and tools that assist in cognitive tasks are doing the work for humans. What occurs is the establishment of tightly coupled cognitive systems in which the absence of any one component can compromise the entire cognitive process. This is what the authors call an extension of epistemic credit: the acquisition of knowledge is not solely attributable to the subject's internal biological capacity, but the tool used in the cognitive process also deserves credit. However, it can be argued that, at times, rather than an extension of epistemic credit, there is a "shift" of epistemic credit, with all the merit falling on the technological tool and not on any biological aspect of the knowing subject. These are the cases in which Pritchard claims that ignorance is absent because true belief and knowledge remain intact. What he requires is a specific form of ignorance that results from cognitive extension. To achieve this, it may be necessary to revise P4, especially the definition of ignorance, since it is restricted to the absence of knowledge and true belief.

The process of extending cognitive capacity is likely to result in the subsequent inability of the agent to perform the task "on their own." The loss of natural cognitive capacities is tantamount

to saying that the task of thinking is outsourced to technological devices. To that extent, individuals might stop thinking for themselves. Once responsibility for human cognitive activities is delegated to technological tools, individuals may lose the first-person authority that defines their mental states and activities. Cognitive tasks can still be completed, but they are no longer under the individual's control. Ultimately, with total delegation of cognitive tasks, individuals lose the experiential dimension that accompanies intellectual activities, which may result in phenomenologically inferior cognition. But what exactly does this mean? In the literature, an aspect that accompanies thinking activities has been referred to as *cognitive phenomenology*, which can be defined as "the experience associated with cognitive activities such as thinking, reasoning, and understanding" (Smithies, 2013, p. 744).

Just as there is an experience of "what is like to be a bat", there is also an experience of being an individual who deduces, calculates, searches, understands, and so on. Cognitive activity is thus accompanied by this cognitive phenomenology, which some thinkers argue is irreducible to other sensations or experiences derived from our senses (Chudnoff, 2015). Once an individual has fully delegated a cognitive task, such as remembering telephone numbers, to a technological tool, the experience of being someone who remembers those numbers is lost, although some might call this a cognitive extension. The same would apply to other tasks that would no longer be associated with cognitive phenomenology. This loss of cognitive phenomenology may vary in degree. However, when the delegation of certain tasks is complete, the loss of that cognitive phenomenology will be equally significant.

One of the arguments supporting the existence of cognitive phenomenology is particularly relevant to the discussion of the transhumanist ideal of cognitive enhancement. It is known as the contrast argument. Strawson's (2009) version is worthy of presentation here, as it is related to the understanding a foreign language. Consider two subjects, A and B: A is a native English speaker, while B is a native Spanish speaker. They both hear an utterance of a sentence in Spanish: "Ladran, Sancho, señal que cabalgamos." Both A and B share the experience of hearing the utterance, yet there is an experiential difference. While B comprehends the meaning, A finds it unintelligible. Hence, there is an experience of being like someone who understands Spanish—a cognitive phenomenology of linguistic comprehension. In this case, A lacks that phenomenology, while B does not. This kind of experiential ignorance of cognition can be defined as a lack of awareness of the cognitive phenomenology involved in an activity, such as understanding a sentence in Spanish.

Strawson's argument can also be applied to consider a case where A uses an IA translator to ascertain the meaning of the sentence "Ladran, Sancho, señal que cabalgamos." Even if A gains the knowledge or true belief regarding the meaning, they still lack the experiential understanding of the sentence in Spanish. Although A benefits from cognitive extension by using the translator, which prevents them from lacking knowledge or true belief about the utterance's meaning, they remain unaware of the experience of being like someone who understands that sentence in Spanish. Thus, the same can be said of any excessive or complete transfer of cognitive tasks to technological tools.

The cognitive phenomenology linked to performing cognitive tasks—which may be diminished in certain instances of successful extension—also signifies that the task was accomplished

through the individual's own effort. In the context of a task that has been entirely delegated, it makes no sense to suggest that the individual acting in isolation can claim credit for the task. In the aforementioned case, the fact that A lacks the experience of understanding an utterance in Spanish implies that they cannot take credit for knowing the meaning of the sentence, even when using a translator to ascertain it. Several distinct cases merit consideration: a native Spanish speaker, a native English speaker who is also a Spanish translator, an English speaker learning Spanish, and an English speaker with no familiarity with the language. Both the translator and the individual learning Spanish may consult a dictionary or a AI translator to assist them with certain expressions. In such cases, it can be pointed out that they experience what it is like to be someone who understands the sentence. Cognitive phenomenology is evident in both instances, where cognitive extension *expands* epistemic credit. However, in the case of the fourth subject, although there is cognitive extension, epistemic credit has not been *expanded* but rather completely *delegated*. When cognitive extension occurs but epistemic credit is entirely *delegated*, ignorance of certain cognitive phenomenology can arise: the experience of performing a cognitive task independently is unknown.[8]

That sense of *ownership* over human cognitive activities is a key aspect of cognition, which can be undermined by the pervasive presence of technological tools. This concept is illustrated in the Bradbury quote that opened this paper. As Granger observed, the preservation of books relies on biological memory rather than on attempts to "extend" cognition through microfilm or any other artifact. The character points out that this is the only way to keep the books safe. The cognitive phenomenology of intellectual activity emerges as a crucial aspect to be safeguarded against the potential risks of extending human cognition into the external world. Otherwise, transhumanist motivations could diminish the individual's experience rather than enhance their cognitive abilities.

CONCLUSIONS

This paper argues that the extended mind thesis—when applied to cognitive processes and understood in terms of *coupling*—serves as a conceptual basis that transhumanists must implicitly or explicitly adopt. Cognition is a crucial aspect that transhumanists aim to enhance through technology, favoring the hybridization between organic and artificial elements as a primary means to achieve this goal. The extended mind thesis aligns seamlessly with this enhancement approach, as it advocates for the formation of coupled cognitive circuits that grant epistemic credit to the entire system by integrating both biological and artificial elements. However, it has been argued that when epistemic credit is entirely delegated rather than merely extended, a specific form of ignorance can arise: the loss of cognitive phenomenology that accompanies human cognitive activities. This loss indicates that, once a cognitive task has been delegated, the individual will no longer be able to perform that task independently. In contrast to Pritchard, who contends that coupling with external objects eliminates the possibility of ignorance—defined as a lack of knowledge and true belief—this paper posits

[8] Nyholm (2024) speaks of the "praiseworthiness" in having accomplished a task, while Walsh (2017) discusses the sense of agency that accompanies the experience of thinking.

that an additional form of ignorance can emerge even when cognitive extension is successful. This ignorance pertains to the experience of being someone who performs cognitive task X, thereby affecting the understanding of what it truly means to engage in X.

This perspective should not be seen as techno-pessimistic; rather, it conveys a healthy skepticism toward techno-optimism. The fact that technological extension can lead to a form of ignorance does not imply an inherently undesirable situation. For instance, the invention of writing, much to Socrates' dismay, eliminated certain cognitive phenomenologies he deemed essential for nurturing thought. Nevertheless, writing has introduced new ways of thinking that might have never been encountered without its development. An additional task will be to determine criteria that help us identify which areas may be worthwhile to remain ignorant of, thereby guiding ideals might be transhumanist.

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CONFLICTS OF INTEREST

The author declares that neither this paper nor the research that led to it incurs any financial, professional, or personal conflict of interest.

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