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Understanding human enhancement technologies through critical phenomenology

Pierre Pariseau-Legault¹  | Dave Holmes² | Stuart J. Murray³ 

¹Department of Nursing Science, Université du Québec en Outaouais, Saint-Jerome, Quebec, Canada

²Sue and Bill Gross School of Nursing, University of California, Irvine, California

³Department of English Language and Literature, Department of Health Sciences, Carleton University, Ottawa, Ontario, Canada

Correspondence

Pierre Pariseau-Legault, Université du Québec en Outaouais, St-Jerome, QC, Canada.

Email: pierre.pariseau-legault@uqo.ca

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Abstract

Human enhancement technologies raise serious ethical questions about health practices no longer content simply to treat disease, but which now also propose to “optimize” human beings’ physical, cognitive and psychological abilities. These technologies call for a reassessment of our relationship to health, the human body and the body’s organic, identity and social functions. In nursing, such considerations are in their infancy. In this paper, we argue for the relevance of critical phenomenology as a way to better understand the ethical issues related to human enhancement technologies (HET). In so doing, we seek to problematize HET and assess their influence on the future development of nursing science and practice. It is difficult to anticipate the concrete effects of HET, we suggest, because these practices reconfigure the meaning of normativity and disorient our conventional ethical landscape. In this context, we argue that the later work of Martin Heidegger and Michel Foucault invites a critical perspective into how techno-scientific discourses modify our relationship to care, to health and to our own social and corporeal identities. Despite the traditional philosophical opposition between phenomenology and critical theory, we maintain that a hybrid critical phenomenological approach opens new ways to assess the integration of technology and practice. Our analysis understands HET as a process of “hybridization” between technological objects and human subjects. Critical phenomenology thus effectively questions anthropocentric definitions of technology, challenges the dichotomy between curative treatment and enhancement and, finally, prompts valuable reflection on the implications of HET for nursing theory and practice.

KEYWORDS

Foucault, Heidegger, phenomenology, technology, the self

1 | INTRODUCTION

New medical technologies call for sustained and serious reflection on our relationship to health and the human body, including the body’s social and organic identity and functions. Human enhancement technologies (HET) in particular raise pressing ethical questions about a medical practice no longer content simply to treat disease, but which increasingly proposes to “optimize” human beings’ physical, cognitive and psychological abilities (Goffi & Missa, 2011). For some authors a risk–benefit analysis is sufficient to justify

the development and use of HET (e.g., Harris, 2010), whereas others insist that we consider the thorny issues surrounding the methods used, objectives pursued, and values that inform these practices and the futures they portend (e.g., de Melo-Martin, 2010; Sandel, 2009). Among the latter, the arguments commonly revolve around two interrelated themes: Human enhancement technologies (a) pose a threat to human identity and/or (b) may result in significant social injustices (Talbot, 2012).

Although human enhancement has been treated extensively in ethical and theoretical research (Coenen et al., 2009), such

considerations are in their earliest stages in clinical settings. Hotze, Shah, Anderson, and Wynia (2011) have conducted a survey on physicians' opinions and practices regarding human enhancement. A majority of the respondents expressed ethical ambivalence but reported that in practice they had received, and had sometimes granted, requests for enhancement prescriptions from clients. And public attitudes surrounding enhancement practices have been studied by Fitz, Nadler, Manogaran, Chong, and Reiner (2014), who document a similar ambivalence, as well as a moral sensitivity, on this topic. In nursing, some authors have argued for a more sustained reflection on the ontological, epistemological and ethical implications of technology on everyday practice (Teixeira de Almeida Vieira Monteiro & Curado, 2016; Zitzelsberger, 2004).

In this paper, we focus on "human enhancement" technologies in order to foster a conception of nursing practice founded in a techno-vigilant ethics of care. In so doing, we offer a comparative analysis of the late work of Martin Heidegger and Michel Foucault, each of whom has made significant ethical contributions on the uses (and abuses) of technology. Our reading of Heidegger and Foucault hopes to problematize human enhancement technologies and their influence on the development of care ethics from a socio-political perspective. We bring Heideggerian phenomenology and Foucauldian critique into *ethical* dialogue mindful that numerous academic debates have in recent decades exploited the historical opposition between the works of these two thinkers. Refuting the erroneous assumption that Foucault was a disciple of Heidegger (Milchman & Rosenberg, 2003; Rayner, 2001), but bearing in mind that Heidegger's influence on Foucault's work is still debated (Rayner, 2007), we suggest that their respective work can help us to analyse our human relationship to technology, and conversely, technology's relationship to us—that is, how technology modifies our own understanding of human health and illness, and informs the terms in and by which we relate to the body and perform its social identity and functions. In other words, according to both Heidegger and Foucault, technology represents a human power that also acts on human beings—a mutual influence that subverts traditional liberal conceptions of the human as a free, autonomous and rational agent (sometimes also referred to as possessive individualism or enlightenment subjectivity). Because traditional conceptions of (medical) ethics tend to presume, if not reify, such subjectivity and autonomy (e.g., principlism), new technologies and the new subjectivities that they constitute require us to reassess what we mean, practically, when we speak of human ethical agency.

Indeed, human enhancement technologies have begun to redefine what we understand as ethically normative: Our conventional ethical points of reference (e.g., reason, autonomy) no longer map our ethical terrain as these technologies and practices have begun to modify our relationship to care, to health and to our own social and corporeal identities. In brief, they have begun to reconfigure our understanding of human subjectivity, phenomenological experience and what a critical approach to care might entail in praxis. It is difficult to anticipate the myriad concrete effects of HET on human existence and inappropriate to respond in traditional terms. Here, Heidegger's work on technology helps us to think about HET in a

nonanthropocentric manner, while Foucault's work sheds insight into the ways that subjects and technologies converge to form distinctly hybrid "posthuman" (or sometimes "transhuman") subjectivities. Reading Heidegger together with Foucault, we argue for the pertinence of critical phenomenology as one way to challenge the presumed dichotomy between curative treatment and enhancement, and to prompt valuable reflection on the implications of HET for nursing theory and practice. By critical phenomenology, we understand analysis that reflects, with ethical vigilance, both on what has become normative across medical discourse on HET and on the increasing normalization of technologically enhanced bodies and their lived experience. This critical approach must *both* expose processes of subjectivation (the inculcation of norms) *and* attend to the emergence of greater social injustice that may occur under the guise of greater individual freedom and self-improvement (i.e., the illusion that these technologies will ensure—rather than subvert—our possessive individualism, autonomy, rationality, free will and subjective agency).

2 | WHAT IS HUMAN ENHANCEMENT?

The burgeoning of HET is the result of recent scientific developments in nanotechnology, biotechnology, information technology and cognitive science (Frankel & Kapustij, 2008). These developments have also advanced a discourse—certainly not always critically or ethically informed—that argues in favour of enhancing human beings' physical, psychological and intellectual characteristics, which implicitly conceives human beings as biological entities (Rose, 2007). In this context, the purpose of medicine is no longer simply to care for, treat or cure disease: Medicine is also increasingly the domain in which we might modify or enhance the human body's biological processes "beyond [their] normal healthy state" (Bostrom & Roache, 2007, p. 120; Rose, 2007). When they are effective, these technologies are capable of prolonging life (de Melo-Martin, 2010; Juengst, Binstock, Mehlman, Post, & Whitehouse, 2003), for example, or augmenting an individual's psychological, physical or cognitive abilities through drugs, implantable electronic devices or genetic therapies (Agar, 2007; de Melo-Martin, 2010). Human enhancement may also lead to interventions based on an individual's genetic "susceptibility" (Rose, 2007), promoting what some authors have called liberal eugenics (Agar, 2004). This approach to "care" means that it is possible to prevent certain genetic anomalies through such techniques as preimplantation genetic diagnosis or to provide clients the freedom to influence or select for a future child's characteristics.

2.1 | The definitional problem of HET

Before going further, we must acknowledge that the presumed dichotomy between curative treatment and enhancement is problematic. Although techno-science affords ever-new enhancement opportunities, enhancement practices themselves are not new and, looking back, there were few concerns for the ethical challenges

they raised. We can classify at least four nonexhaustive types of enhancement found in the literature: (a) personal enhancement practices, (b) instrumental enhancements, (c) first-stage human medical enhancement and (d) second-stage human (bio)medical enhancement. As de Melo-Martin (2010) and Lin and Allhoff (2008) emphasize, enhancement is not just about modifying one's genetic code: Personal enhancement practices might also involve practicing physical exercise, eating well and educating oneself—ancient practices that Foucault has described as “technologies of the self.” Lin and Allhoff (2008) also point out that the development of myriad tools, such as wheelchairs, prostheses and eyeglasses might also be considered instrumental enhancements employed to optimize human welfare. In addition to personal and instrumental enhancements, there are first-stage medical enhancements, such as cosmetic surgeries and performance drugs, which are not in themselves therapeutic. However, as Coenen et al. (2009), Dijkstra and Schuijff (2016) and Lin and Allhoff (2008) suggest, we can pinpoint a moment of transition in which new medical technologies—second-stage human (bio)medical enhancements—begin to have permanent effects on corporeal integrity. In other words, these technologies become permanently integrated into our bodies in order to enhance their biological characteristics by changing their structure and functions (Lin & Allhoff, 2008). Many authors characterize these as radical transformations “that result in human characteristics and abilities that often lie beyond the existing range of human characteristics and capacities” (de Melo-Martin, 2010, p. 484).

These categories are not all-inclusive. For example, should we consider coffee consumption as human enhancement? If so, how can or should we distinguish drinking coffee from the use of other cognitive enhancers or performance drugs? Are these merely differences of degree or of kind? And what about immunization? Should such a basic preventative health intervention, which is driven by techno-science, be classified as treatment or enhancement? Scully and Rehmann-Sutter (2001) argue that prevention is itself a third category of medical intervention, but to include it in the presumed dichotomy between prevention/treatment and enhancement would reveal the normative presumptions that we bring to this question but that remain uninterrogated.

In the widest sense, “HET” could refer to any medical intervention that is situated beyond the therapeutic spectrum and that integrates (or employs) techno-scientific technologies into (or on) the human body. This broad definition would capture every means by which one could “optimize” the body's intrinsic biological characteristics beyond their “normal” state. However, even this simple definition is problematic when we consider debates over how to define what is “optimal” and “normal,” or what we consider to be an “illness” or “disability”; and it is more problematic still given the fluidity of these definitions and how they might be understood tomorrow. Scully and Rehmann-Sutter (2001) caution against a definition of enhancement that would integrate a normative standard, since it would maintain a binary opposition between therapy and enhancement, between the normal and the abnormal, and between what is morally good and bad. As they suggest, defining human enhancement

in contradistinction to curative treatment effectively reduces the corporeal human being to its genetic and biological characteristics.

Drawing on Heidegger's (1977) work on technology, it is implicitly dangerous to define human technological enhancement in normative terms because humans tend to value a technologically driven conception of human existence. Notwithstanding, we contend that it is crucial to distinguish both (a) personal enhancement practices and (b) instrumental enhancements (“technologies of the self”) from (c) first- and (d) second-stage human (bio)medical enhancements. The latter exceed the instrumental, anthropocentric use of technology insofar they are integrated into—and indeed, as—the human body, transforming it in the process. As Herbrechter (2013) suggests, this represents a process of convergence or coalescence between the human “subject” and the technological “object.” Attending to this process will be critical to understanding the social function of nursing practice: The process reconceptualizes selfhood and human subjectivity, which has immediate implications for nursing care and the “objectivity” of techno-science. Insofar as human enhancement technologies are incorporated into living beings, modifying their characteristics and altering their given limits, they create ruptures both ontologically (“*What is health?*”) and epistemologically (“*What kind of knowledge should [health professionals] have?*”) (Rose, 2007; Svaneus, 2013, p. 13).

These ontological and epistemological questions carry their own ethical valences when framed in normative terms: What should health be? What should we do with our knowledge? How should we define what is “enhanced,” “optimal,” and “normal”? And finally, who or what should the human *become*, thanks to emergent technologies, knowledge, and practices? If the presumed dichotomy between curative treatment and enhancement is problematic, it echoes the *ethical* dichotomy that underpins traditional principles or frameworks for (medical) ethics, such as reason and autonomy. These must also be problematized. “In the medical context, rational autonomy is a strange convention in part because its philosophical underpinnings continue to be dualistic, founded in a binary logic that sees agency as a mental activity of free will, and bodies no more than resistant, brute matter or a heap of ‘spare parts’” (Murray & Holmes, 2009, pp. 3–4). Because this model no longer holds (and this is not simply a “theoretical” insight), we are caught between what is *normative* (socio-ethically) and what is *normalized* phenomenologically (techno-corporeally). And this calls for a critical phenomenological approach to technology as one means by which to reflect on the normative valences of technological practices.

3 | A CRITICAL PHENOMENOLOGY OF TECHNOLOGY: FROM ESSENTIALISM TO CONTINGENCY

The reconfiguration of normativity engendered by HET transforms the ethical landscape. Our conventional ethical points of reference no longer map our ethical terrain, and it is difficult to anticipate the effects of HET or how we ought to respond to them as these

technologies and practices have begun to modify our normative relationships to care, to health and to our own social identities (Svaneus, 2013). Arguments that invoke a normative, unreconstructed conception of “human nature” ultimately do little more than reinforce binary oppositions that only encourage a reductive understanding of HET as either morally “good” or “bad.” In response to new ethical challenges, conventional anthropocentric theories yield incommensurate answers because they fail to take account of the ways that our normative landscape affects and alters what we mean by “human” and “technology” in the first place (Rae, 2014; Svaneus, 2013). Moreover, these “new” technologies are soon normalized, in theory and in practice, and constitute a kind of phenomenological status quo that is difficult to transcend. Therefore, rather than defining technologies as neutral tools in the hands of a rational, autonomous and free human subject, we assume a critical phenomenological standpoint in which human “subject” and technological “object” are mutually informative and hybridized.

Here, the later work of Martin Heidegger and Michel Foucault invites us to develop a perspective that investigates the ways technoscientific discourses modify our relationship to care, to health and to our own identity. To be clear, we are not arguing for a straightforward reconciliation of interpretive phenomenology and critical theory. Rather, we propose a phenomenology of technology grounded in a critical theoretical perspective. As Marsh (1987) has suggested, a dialectical and critical phenomenology could succeed descriptive and interpretive traditions, thereby allowing for an understanding of our conscious (and unconscious) encounter with things. Critical phenomenology would therefore constitute a means by which to reflect “on the transcendental and material structures that make experience possible and meaningful,” as well as a way to rethink “structures that privilege, naturalize, and normalize certain experiences of the world while marginalizing, pathologizing, and discrediting others” (Guenther, 2017, p. 49).

In addressing the work of Heidegger and Foucault, we first briefly summarize each thinker’s approach to questions concerning technology. We then demonstrate why issues related to HET are better understood by complementing phenomenology with a critical Foucauldian conceptualization of power, subjectivation and resistance. In discussing the relevance of Foucault’s work for a critical phenomenology of technology, we illustrate how his thought can help us to develop an approach that is both nonessentializing and attentive to the socio-historical contingency of human existence.

4 | HEIDEGGER AND TECHNOLOGY

Heidegger’s thought is distinguished from the descriptive phenomenological approach originally developed by his mentor, Edmund Husserl (1859–1938); however, the methods of both have been described as belonging to the constructivist paradigm (Lincoln, Linham, & Guba, 2011) and are the philosophical foundations traditionally used in phenomenological research in health science (Beck, 2013; Munhall, 2013). Although he remained focused on the question

of the “sense of being” (*Dasein*, or “being-there”), a radical change, generally named “the turn” (*Kehre*), occurred in Heidegger’s thinking after the publication of *Being and Time* in 1927 (Wheeler, 2014). This is the context within which Heidegger (1977) wrote the essay, “The Question Concerning Technology.” In this work, Heidegger problematizes the ontological dimensions of technology and interrogates its very essence: He describes technology as a means to reveal truth (Heidegger, 1977). In other words, from this standpoint technology is a set of practices and “a background of habits ... against which objects appear [as] usable” (Sawicki, 2003, p. 57). And as Dreyfus (2003) argues, by integrating these practices through events of appropriation (*Ereignisse*), the human subject or *Dasein* is able to understand the world in which it evolves by means of an interpretive process. The effect of this understanding is to create a clearing (*Lichtung*) that allows individuals to get closer to the essential structures of their existence. Despite this, zones of exteriority, shadow and existential mystery nonetheless persist (Rayner, 2001; Wheeler, 2014).

4.1 | Science and technology

For Heidegger (1977), the essence of technology is not limited to its instrumental/anthropological definition. He argues that although this is a fair enough description, it is ontologically reductive to understand technologies as simple tools or neutral instruments. For Heidegger (1977), technology (*techne*) refers to the arts and the production techniques used by the craftsman. It is above all a way of revealing and knowing things. In contrast, modern *techne* is a way of revealing that challenge nature (*Herausfordern*) and consequently besieges and transforms things into energy and disposable resources. The ontologically reductive perspective of modern *techne*, which is our commonsense understanding, amounts to an illusion whose dominant, instrumental conception of technology redirects the “sense of being” away from its existence (Heidegger, 1977). Ontologically, Heidegger argues that modern *techne* is not controlled by human beings instrumentally—or as a means, but rather the reverse: Modern *techne* has an ontological dimension and has become an end in itself. In other words, technology is not simply a material apparatus in the instrumental sense, but is instead a way to reveal human ability (Heidegger, 1977). Following this logic, technology must be considered an independent entity and, consequently, human beings are unable fully to control its development or the direction it takes (Sawicki, 2003). Heidegger’s approach to technology distances him decidedly from the Cartesian dualism of his contemporaries and allows him to differentiate between modern technologies based on modern science and other, older technological modes (Sawicki, 2003). For him, our modern conception of technology “sets-upon” (*stellen*) nature as a resource (“standing-reserve”/*Bestand*) and engages in besieging, accessing and extracting its energy, as well as accumulating, organizing, transforming and distributing it (Heidegger, 1977). Heidegger employs the metaphor of a hydroelectric power station that controls the course of a river: Whereas bridges and grain mills represent an older, respectful relation with the river, power stations transform the river into sources

of water and power, harnessing nature's bounty and storing it for use on-demand (Heidegger, 1977). Brassington (2007) argues that modern *techne* must nonetheless meet predefined criteria and correspond to modern science's worldview. As a result, the ability to reveal and objectify things depends on the means available to science to confirm their scientific validity and permit their use (Heidegger, 1977). This is sufficient to define a new relationship to objectivity and subjectivity, these two poles now being mutually influential (Rayner, 2001). Heidegger also maintains that modern technology redefines this relationship by delineating the limits of nature and of what merits objectification or consideration as "real" (Brassington, 2007; Rayner, 2001). In other words, technology unilaterally determines our conception of existence.

4.2 | Will to power and total mobilization

The will to power described by Nietzsche plays a prominent role in Heidegger's later thinking. For Heidegger (1977), however, the will to power is no longer a "will" per se; it has become the human being's way of being, with technology its most indomitable form. According to Braver (2014), our current conception of the "sense of being" might best be described as one that encounters problems and mobilizes the resources required to respond to them. In this context, nature and its constituent parts become resources to be exploited (standing-reserve/*Bestand*) to support human development (Rae, 2012; Wheeler, 2014). For Heidegger (1977), the essence of modern technology has therefore become an enframing apparatus (*Gestell*). In the form of *Gestell*, modern technology permits us to transform things into resources to be controlled, transformed, stored and distributed: "that challenging claim which gathers man thither to order the self-revealing as standing-reserve: 'Ge-stell'" (Heidegger, 1977, p. 19). The "challenging claim" means that we are claimed by, and claimed for, a certain order(ing) or logistics—but the summons is not itself technological: We are not challenged-forth, set-upon or gathered *in the name of* technology or by any particular technology as such (p. 27). Enframing is, as Heidegger writes, the *essence* of technology, and "*Gestell*" can also be translated as "apparatus" (Foucault's "*dispositif*"). It is, then, the order(ing) itself, an order(ing) to set into use, which frames particular technologies—and indeed, human capital, the human body itself, which becomes yet one more resource among others. "Enframing means the gathering together of that setting-upon which sets upon man, i.e., challenges him forth, to reveal the real, in the mode of ordering, as standing-reserve" (Heidegger, 1977, p. 20).

Heidegger (1977) then uses the phrase "total mobilization" (*Totale Mobilmachung*), a term initially used by Ernst Jünger (1895–1998) to describe the human desire to dominate nature using industrial and technological apparatuses as intermediaries of human will. Although Jünger's writings are subject to academic debate, for Armitage (2003), this expression also represents the "totally mobilized body" as a symbol of modernity. From this perspective, human subjects are also considered resources. Total mobilization is consequently the realization of Nietzsche's nihilist prediction: It establishes itself

as a complete modern metaphysics (Rayner, 2001; Wheeler, 2014) in and by which human beings are annihilated and become objects of measurement, control and power (Hicks, 2003). By bringing humanity closer to nihilism, this kind of *enframing* constitutes a threat by producing a loss of meaning and a significant sense of emptiness (Brassington, 2007; Hicks, 2003).

4.3 | Saving power

Heidegger (1977) seems to entertain the possibility of returning to a "sense of being" by emphasizing the value of the creative act (*poiesis*) and of a "meditative thinking" (Hicks, 2003, p. 99). Following this process makes it possible to resist technological foreclosure, to continually question the "sense of being," as well as to promote alternative practices resistant to totalitarian scientific knowledge (Dreyfus, 2003) and to make way for new modes of self-revelation (Sawicki, 2003). Citing the poet Hölderlin (*But where danger is, grows/ The saving power also*), Heidegger (1977, p. 34) suggests that our "saving power" shares technology's dangerous ontological essence and therefore flows directly from it. He also underscores the importance of recognizing and confronting this technological danger. Reminding the reader that *techne* (in reference to a carpenter's skills and abilities) and *poiesis* (in reference to spiritual and fine arts) have the same etymological origin, Heidegger (1977) points to the necessity of returning to creative, reflexive acts as a mode of revelation. Nonetheless, for Rae (2012), Heidegger's thinking appears limited to anticipating an alternative to anthropocentric metaphysics without actually engaging in concrete actions leading to it.

5 | FOUCAULT AND BIO-POWER

We now turn to Foucault's work and its relevance for a critical phenomenology of technology. Foucault's writings are situated within the critical theory paradigm (Lincoln et al., 2011) and tend to avoid phenomenological arguments to focus instead on the discontinuities, ruptures and struggles that situate and inform individual identities (Dreyfus, 2003; Foucault, 1978a, 1978b; McWorther, 2003). For Foucault, a personal experience cannot be reduced to pure subjectivity because it forms an integral part of a larger network (Foucault, 2001a). An experience is therefore contingent on a larger apparatus (*dispositif*) of discursive power and therefore also on socio-historical processes of subjectivation (*assujettissement*) and resistance (Revel, 2002). Following Foucault's work on these concepts, we argue that human enhancement technologies must be understood as part of a larger discursive apparatus that technologically circumscribes in advance the terms by which human beings relate to themselves, socially and biologically (or biopolitically).

5.1 | From technology to biopower

For Foucault (1978a, 1978b) there are two forms of biopower: anatomopolitics and biopolitics. In his description of anatomopolitics, Foucault

(1977, 1978a, 1978b) argues that power regulates human bodies through an individualizing, disciplinary training process that seeks to exploit an individual's full potential, skills and docility (Foucault, 1978a, 1978b). Human beings become malleable forces to be trained, observed, corrected and normalized (Perron, Fluet, & Holmes, 2005). Anato-politics holds power over life and controls its activities through the spatio-temporal organization, mobilization and the distribution of individual bodies (Perron et al., 2005). The metaphor of the panopticon (Foucault, 1977), which Foucault borrowed from Jeremy Bentham's work, illustrates the function of the disciplinary apparatus. Briefly, it refers to carceral architecture developed for the purposes of surveillance and control. Consisting of a central guard tower surrounded by a ring of cells in which prisoners are isolated, its structure makes it possible "to induce in the inmate a state of conscious and permanent visibility that assures the automatic functioning of power" (Foucault, 1977, p. 201). This process instils a sense of constant visibility which elicits self-control within the subjects themselves, who become autoregulating (Foucault, 1977). It constitutes a "laboratory of power" in which power and knowledge go hand-in-hand (Foucault, 1977, p. 204).

Unlike anato-politics, biopolitics is interested not in individual bodies, but in managing the social body or "populations" (i.e., birth rates, death rates and quality of life) (Foucault, 1978a, 1978b). Biopolitical power *massifies* in order to control "a multiplicity of individuals too large to be thoroughly controlled" (Foucault, 2003; Macmillan, 2010, pp. 52–53, original translation). The population therefore becomes a distinct entity, a "natural phenomenon" (McWorther, 2009, p. 423) whose biological processes may be regulated. The social body acquires a statistical utility the state can then exploit to control the body politic's movements, growth and freedom. Foucault (2003) writes: "regulatory mechanisms must be established to establish an equilibrium, maintain an average, establish a sort of homeostasis, and compensate for variations within this general population and its aleatory field" (p. 246). Using the statistical tools it has developed, the state justifies the implementation of public policies designed to measure and regulate the well-being of such a body, as well as to mobilize the resources necessary to achieve this goal (Perron et al., 2005). Hence, these techniques are not only part of a strategy that legitimizes the state's intervention, but they also respond to a logic of control aimed at strengthening the normalizing processes of biopower and ensuring both the docility of individuals and productivity of populations.

Today, these two previously distinct axes (anato-politics and biopolitics) form a network of constant, multiple interactions; this complex interface typifies the "society of control" that has come to displace the disciplinary society described by Foucault (Deleuze, 1990; McWorther, 2009). To briefly summarize their interactions, one could argue that anato-politics and biopolitics are both grounded in a normativity considered intrinsic to the biological body, one that facilitates both an individualizing *and* massifying form of biopower: "The element that circulates between the two is the norm" (Foucault, 2003, pp. 252–253). These mechanisms can be explained by the simultaneous (a) individualization/objectification of

the subject, (b) amassing of information transformed into normative, statistical data used to determine an individual's normality or abnormality vis-à-vis a population or group, and (c) correction of individual deviance and normalization of the social body. In sum, biopower makes it possible to justify the implementation of public policies, scientific practices and regimes of truth that contribute to the construction of subjects and the modification of their relationship to their own social and somatic identities.

5.2 | Subjectivation and resistance

Despite the importance assigned to biopower in his writings, Foucault's work does not target power per se, but rather the way power transforms individuals into subjects (Foucault, 1978a, 1978b, 2001b). According to Foucault (2001b), modern science has created a process of objectification that achieves this transformation in three ways: (a) the scientific classification of the individual, (b) the institution of practices that transform individuals into objects of knowledge and (c) the subjectivation process itself (Foucault, 2001b). Although Foucault's earlier writings address the first two mechanisms, near the end of his life he turned back to antiquity and what he terms the "care of the self" (*epimeleia heautou*) (Foucault, 1984a, 1984b). Here, he studied personal mastery and "enhancement" through the use of *technologies of the self* through which the subject attempted to access truth (Dahaner, Schirato, & Webb, 2000).

For Foucault, it is the normative valences inculcated by state science that produce individuals as obedient, docile subjects. Henceforth situated in an open, deinstitutionalized space, these societies of control (Deleuze, 1990) no longer seek to oppress: On the contrary, they regulate freedom through stimulation (Foucault, 1980), incentivization and the creation of regimes of truth that *act upon* and are *built on* the relationships individuals maintain with themselves and others (Foucault, 2001b, 2001c). In other words, the force of this power is recognizable by its ability to both *produce* and *mobilize* human desires and knowledge (Foucault, 1980). This normative conception of subjectivity is based on the development of an ethics of the subject much more than on the verticality of its relationship to the law (Foucault, 1984b; McHoul & Grace, 1999).

Foucault's analysis of subjectivity appears to distance him from nihilism, for at this point in the development of his thought he began to discuss the concepts of strategic reversibility (Foucault, 2001b, 2001d) and resistance (Foucault, 1978a, 1978b). Although power regulates individuals both from within and without, it also fulfils a fundamental condition: *freedom*. Freedom does not exist in binary opposition to power, but as an essential component of it (Foucault, 2001b). From there, Foucault developed a fluid, asymmetrical, interdependent conception of power and the resistance that may engender specific transformations of it (Foucault, 1978a, 1978b, 1980, 2001b).

Beyond the issue of resistance lies the question of how individuals avoid subjectivation and succeed in rejecting these "abstractions of identity" (Malette, 2006, p. 97, original translation). In his discussion of the origin of resistance, Foucault (1978a, 1978b) explains that

“power relations are both intentional and nonsubjective” (p. 124) and that they result from objectives and calculations without relying on Cartesian rationality. He then developed the idea of an agent capable of producing its own freedom, creativity and autonomy by emphasizing the “art of existence” (Foucault, 1984a, p. 18, original translation). This perspective emphasizes the creation of personal ethics as well as a “creative freedom and ... the ongoing process of self-definition” (Hicks, 2003, p. 104).

6 | TOWARDS A CRITICAL PHENOMENOLOGY OF HET

Heidegger's propositions to address the challenges of technology are described by Tabachnick (2007, pp. 492–500) as being essentialist without being deterministic, ranging from aggressive essentialism (the rejection of technology) to moderate and passive essentialism (the regulation or acceptance of technology). However, we believe that such a standpoint maintains a duality between the human subject and the technological object. It also fails to consider the contingency of HET and the conditions of possibility for the “enhanced” subject. For these reasons, we believe Foucault's work on biopower and subjectivation permits a more robust understanding of the discursive productions related to HET, particularly when they are understood phenomenologically. It also offers an analytical framework more sensible to the question of selfhood in a context where the clear and distinct boundaries between the human subject and the technological object are fading.

According to Nadesan (2008) and Rose (2007), biopower has recently encountered a major turning point in its development: It is experiencing a complex transition from normalization to enhancement. This leads to the idea of a symbiotic relationship: the hybridization of human and nonhuman, two entities the anthropocentric point of view previously considered distinct. Subjectivation becomes a process that explains the emergence of an enhanced subject and through which the boundary between human and nonhuman fades under new regimes of truth articulated through HET. We must also add that the development noted above, from normalization to enhancement, is also fluid and mutually informative: The more that enhancement is embraced and its technologies incorporated into the human body, the more this will become normalized—and indeed, normative, which is to say, ethically acceptable, if not desirable.

The discursive rupture between therapy and enhancement facilitates the establishment of new knowledge/power relations and offers a better understanding of biopower's evolution. This is not a matter of refuting biopower's disciplinary, normalizing vectors, but of interpreting the enhancement of human abilities as signs of the resulting amplification of its efficiency and power relations. Although biopower remains the mechanism through which individuals are normalized (i.e., the treatment of illness), technological integration now makes it possible for some individuals to be “enframed” as enhanceable (i.e., as intervention beyond treatment) (Fitz et al., 2014). While the convergence of nanotechnology, biotechnology, information

technology and cognitive science figures human beings as essentially biological entities, Rose (2007) argues that the human subject is actually becoming either “asymptomatically or pre-symptomatically ill. [Hence,] [t]echnologies of life not only seek to reveal these invisible pathologies but intervene upon them in order to optimize the life chances of the individual” (p. 19). What then follows, if this logic is pursued, is both an intensification of anatomo-political power and an extension of biopolitical power: Anatomo-politically, the techno-subject integrates enhancement technologies (Dorrestijn, 2012) made possible through biotechnologies that can in fact only be developed at the population level (e.g., genomics), thereby normalizing enhancement processes for the purposes of both individual and population health and well-being.

Because these processes depend on discursive constructions of what (or who) can be enhanced, implementing these technologies may exacerbate oppressive relationships between “normal” and “enhanced” human beings (Frankel & Kapustij, 2008; McWorther, 2009). Conditions previously considered normal also risk being pathologized, thus allowing medical practice invested in human enhancement to redefine, at will and according to its own parameters, those considered “defective, abnormal, or inferior” (Juengst et al., 2003, p. 26). This may also lead to the emergence of new forms of subjectivity through which subjects' normative relationships to themselves and to others are transformed according to the changing norms of modern techno-science.

There can be no doubt that the emergence of HET accelerates the erosion of social boundaries between the normal and the pathological (Juengst et al., 2003). Confronted with a complex interface composed of human beings and technology, (bio)medical practice no longer limits itself to treating illness, but aims increasingly to enhance and control individual abilities. The use of psychoactive substances for cognitive performance (De Pauw, 2011; Talbot, 2012) and the implantation of microchips for remote drug administration (Farra et al., 2012) are but two examples of recent techno-scientific developments that could profoundly change our relationship to health practices. These technologies may certainly contribute to greater individual well-being and quality of life. However, although their liberalization might be justified by “freedom of choice,” they may also foster conditions of exclusion and oppression, or to create new ones hitherto unimaginable. In other words, improving individual abilities could easily lead to the establishment of new power relations that contribute to the subjugation of some human beings (Herbrechter, 2013). For Hardt and Negri (2000), a society of control “develops at the far edge of modernity and opens toward the postmodern.... [It is characterized by] mechanisms of command ... ever more ‘democratic,’ ever more immanent to the social field, distributed throughout the brains and bodies of the citizen” (p. 23). In our opinion, HET pose precisely this danger if they are uncritically integrated into (bio) medical care; the acceptance of their unproblematized instrumental value can amplify mechanisms of control.

The development of a techno-vigilant ethics of care would better prepare those of us in the field of health care to respond to, or at least reflect upon, issues emerging around HET. First, it would

make it possible to question new regimes of truth related to HET by allowing us to dispose of both the instrumental vision of technology and the human/nonhuman binary interpretation derived from anthropocentrism (Rae, 2014). This would encourage the deconstruction of techno-scientific arguments claiming that human enhancement is simply a beneficial *tool* for humanity, despite the fact that it is currently very difficult to anticipate the consequences of these technologies on human existence. Such an approach would also facilitate the implementation of a hypervigilant attitude focused on criticizing and perhaps meliorating oppressive relations without denying the emancipatory potential of these technologies. This would inspire the analysis of mechanisms of governmentality that “enframe” human beings as *enhanceable* resources subjugated by various power relations. Finally, by refuting arguments related to human nature this perspective would also encourage criticism of biotechnological determinism that leads to the denial of the existing social causes of illness, as well as new pathological processes targeting conditions previously considered “normal,” such as ageing (Juengst et al., 2003).

In order to develop a techno-vigilant ethics of care, we suggest that a critical phenomenology of technology should be inspired by Heidegger's understanding of technology and grounded in Foucault's analysis of power and subjectivation in order to better understand the socio-historical conditions facilitating the emergence of the discourse of “enhanced” human beings (McWorther, 2009). In this context, the “enhanced” subject is approached as a new form of subjectivity (re)constructed through new power relations whose neoliberal orientation cannot be denied (Herbrechter, 2013). This perspective should therefore examine the concept of human “enhancement” as a new discursive formation intimately tied to the contemporary constructions of selfhood.

7 | CONCLUSION

We have demonstrated in this paper that although the broad concept of enhancement has been thoroughly integrated into health practices, it has yet to be problematized by the progressive integration of HET specifically. We have suggested that HET constitute a new mode of subjectivity. Thus, by rejecting the hypothesis that human beings possess personal essential, yet inaccessible, truths, techno-scientific discourse seems to have acquired an ontological dimension by constructing or “enframing” the individual subject as a resource or standing-reserve available for techno-scientific enhancement. This major development can be observed in the way HET have progressively blurred conventional distinctions between technological “object” and human “subject” in order to create a new discursive object, the “posthuman” (Herbrechter, 2013, p. 37). And yet, the creation of a new form of subjectivity invites (bio)medical disciplines to question their ontological and epistemological foundations. If clinical practice incorporates HET into its conceptual and theoretical models, introducing a critical phenomenology of technology would permit future health professionals to question HET in

order to deconstruct regimes of truth targeting the posthuman (or “transhuman”) subject.

Even though the very idea of ethical reflection is problematic at a time when our conception of “truth” is unstable, the works of Martin Heidegger and Michel Foucault invite us to develop a perspective that investigates the ways techno-scientific discourses modify our relationship to care, to health and to our own social and somatic identities. They also invite us to go beyond the “preventive/curative treatment versus enhancement” dichotomy and to problematize two hypotheses proposed by Talbot (2012): the necessity of questioning technology's influence on human existence and the need for vigilance in the face of social injustices that may decrease our tolerance of illness and disability.

Therefore, it would be hazardous to approach enhancement as the “new normativity,” as it can foster our instrumental relationship with technology, maintain arguments relating to an essentialist conception of “human nature” and polarize the ethical debates surrounding HET. On this point, Heidegger and Foucault can be useful if (bio) medical practice is willing to reflect, either collectively or through a case-by-case approach, upon HET. Finally, it is important to ask ourselves how the discursive association between technology and enhancement may exclude all forms of reflection on potential dangers related to these technologies. In the words of Žižek (2006), the danger with HET is “precisely, that *nothing will go wrong*, that genetic manipulations will function smoothly,” and, “at this point, the circle will in a way be closed and the specific openness that characterizes being-human will be abolished” (p. 195). Against an essentialist conception of human nature, we must be vigilant to the closures and foreclosures of techno-science. Such debate should not be limited to the intrinsically “good” or “bad” character of HET and, as Dorrestijn (2012) has argued, should rather be oriented towards the way we can pursue (human) enhancement without being totally (our addition) subjugated by the intensified power relations it is certain to produce.

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CONFLICT OF INTEREST

All authors declare that they have no conflict of interest

AUTHOR CONTRIBUTION

Pariseau-Legault conducted the analysis and interpretation of data. Holmes and Murray contributed to analysing, drafting and revising the manuscript. All authors have given final approval of the version to be published. All authors agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

ORCID

Pierre Pariseau-Legault  <http://orcid.org/0000-0001-9833-0187>

Stuart J. Murray  <http://orcid.org/0000-0001-8850-5406>

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