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The Promethean biohacker: on consumer biohacking as a labour of love.

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Just as the mythical Greek Titan Prometheus created humans and brought them the technology of fire, the biohackers studied here seek to recreate humanity and bring us technologies that make us god-like. In this paper, we explore how and why biohackers have been integrating technologies into their bodies. Drawing on Transhumanism, biohacking, and consumer sentiments literature, we depict three avatars of Promethean biohackers. While distinct from one another, their biohackings are tied by a single sentiment: that of love. Here, love is what energizes biohackers' actions on their Promethean journey to become transhumans. This study challenges prior discussions on human-technology relationships framed in largely instrumental terms. Our research also highlights the importance for scholars and practitioners to address ethical issues around eugenics and human commodification.

Keywords: biohacking; Transhumanism; Prometheus; technology; consumer sentiments; love

Introduction

“Just as he bled for us, I will bleed for you.” (Dynamo, interview, 2018).

This quote is from a man who had just endured the bloody procedure of having a microchip surgically embedded in his hand. Its romantic and heroic framing invokes the myth of Prometheus, who created humans and then invoked the wrath of the gods by stealing fire and bringing it to humankind. As punishment, he was chained to a boulder and had his liver eaten from his body by an eagle. Each night his liver grew back so he could suffer the same anguish the next day *ad infinitum*. The myth was also chosen as the subtitle of Mary Shelley's (1818/2012) novel, *Frankenstein; or, the Modern Prometheus*, suggesting that to some people, the result of usurping god-like powers to create life is less heroic than monstrous. The monstrous life forms that they create may be no more so than their creators. But Prometheus,

one of the gods' offspring Titans, is also a rebel, a trickster figure with superior intellect. His complex character provides an apt prologue for our study of Transhumanism and biohacking. After all, one of Titan's most meaningful legacies for humankind is technology (Hauskeller, 2016).

For some scholars and technology enthusiasts, there is no reason to accept the predetermined biological limitations of humans in order to achieve what is desired for our existence (e.g., Cordeiro, 2019; Farman, 2020; Fuller, 2020; Hables-Gray et al., 2020; Istvan, 2020; Kurzweil, 2005; Lee, 2019; More & Vita-More, 2013; Ross, 2020). Such a belief is at the heart of Prometheanism, a techno-progressive discourse rooted in the Enlightenment which asserts that we, human beings, should (re)design ourselves and the world without imposing limits (Müller, 2016). In this regard, it is through constantly “stealing fire from the gods” (Stock, 2003, p. 2), or technology, and integrating it with the human body that humanity will overcome its finite condition. According to Brassier (2014), a contemporary manifestation of Prometheanism is the social and philosophical movement called Transhumanism. The transhumanist thinking asserts that human beings must “transcend themselves by means of the usage of science and technology” (Deretić & Sorgner, 2016, p. 14). To greatly enhance the human biological condition, transhumanists say, humans should pursue the freedom of “intelligent evolution” instead of the randomness and chance as discovered and theorized by Darwin (Sharma, 2019). As a result, a human being should be a symbiotic creature in whom biology and technology are naturally integrated (Longo, 2003). In other words, the prototype of a transhumanist being is not based on the notion of human-technology interaction but human-technology integration.

Within this context, biohackers play a fundamental role in propagating and actualizing Transhumanism's ideals (Lee, 2019). These transhumanist enthusiasts are also known as do-it-yourself biologists (DIYbio) who combine body modifications with emerging technologies in an attempt to foster human improvement and well-being (Yetisen, 2018; Zettler et al., 2019). Even though a small number of biohackers engage with institutional artistic activities and educational projects, known as “fringe biotechnology” (Meyer, 2021; Vaage, 2017), most of them work outside conventional facilities, such as medical labs. In these non-traditional places, they conduct experiments that are often cutting-edge, bold, controversial, and polemic (Wexler, 2017). From their garages and sheds, biohacking practitioners have been developing night vision (Franco, 2015), trying to build an accessible real-time COVID-19 testing

machine (Limas, 2020), and even searching for a “cure for death” (Banas, 2018). Currently, in one of the major online communities of biohacking, there are more than five thousand registered members from around the world (see DIYbio, 2020).

Although previous research has explored distinct aspects of technology consumption (e.g., Dholakia et al., 2020; Dholakia & Firat, 2019; Hoffman & Novak, 2018; Kozinets, 2019a; Letheren et al., 2020; Novak, 2020; Puntoni et al., 2021; Takhar & Houston, 2019; Thompson, 2019; Yadav & Pavlou, 2020), the transhumanist phenomenon of human-technology fusion by biohacking has been largely overlooked (Belk, 2020; Belk et al., 2020; Schmitt, 2019). Understanding the defiant and seemingly strange phenomenon of biohacking is vital for both theoretical and practical reasons. Firstly, from a theoretical viewpoint, this understanding should advance our knowledge of emerging technology consumption framed by the singular and novel philosophical perspective of Transhumanism. Secondly, our research may contribute to the creation of public policies and transhumanist business, whilst grappling with related social and ethical issues arising from biohacking. To address this oversight, we ask the following research question: *How and why have biohackers been integrating technology into their bodies?*

To answer this question, we develop our insights from a three-year netnographic research on Facebook, Instagram, Twitter, and YouTube, as well as phenomenological interviews, and an autoethnography in which the first author acquired and used a microchip that was implanted in the left hand. Due to the novelty of the transhumanist phenomenon of biohacking in marketing and consumer research, a back-and-forth abductive process informed our analysis (Belk & Sobh, 2019; Peirce, 1935). To code our dataset, we employed a combination of French semiotics’ methodological tools (Floch, 2001; Greimas & Courtes, 1982) as heuristics for the construction of theoretical insights.

Our analysis was inspired by mythological themes of the myth of Prometheus and its relations to Transhumanism (Hauskeller, 2016). Rather than Thompson’s (2004) articulations of Gnosticism and Romanticism, we detect a different mythological theme: that of love (Isomaki, 1989). Sometimes agapic, sometimes philial, and even erotic (Soble, 1989), love was found to be the key mythical motif through which biohackers portray themselves. Promethean biohackers believe that in a small way they forward the transhumanist goal of human transcendence by engaging in DIY biological self-experiments. In studying this

human-technology integration, we find three avatars of Promethean biohackers, namely: the agapic act of heroes; the erotic play of tricksters; and the philiat coalition of comrades.

Our study not only expands the discussion of consumer reception of emerging technologies (e.g., Castelo et al., 2019; Harrigan et al., 2020; Pedersen & Iliadis, 2020; Schmitt, 2020) but helps to understand consumer sentiments (Gopaladas, 2014; Joy et al., 2020), particularly the ways in which love helps to engage and valorise consumer biohacking (Savulescu & Sandberg, 2008; Warwick, 2020). The next section presents key Transhumanism and biohacking premises and the consumer sentiments literature, focusing on love. This is followed by a presentation of our methods, findings, discussion, and conclusion.

Theoretical background

Children of Prometheus: transhumanists and biohackers

Sitting at the base of a hill, Prometheus took a handful of clayey soil, mixed it with some water from a stream, and began to mold the clay. Opening his hands, he looked at his work and saw a figure made in the image of a god, though modest and fragile. And so, it was here that we became: humans (Dougherty, 2006). As a species, humans inherited this Titan's creativity, intelligence, morality, strong will, and, to some extent, benevolence (Mayor, 2018). Prometheus in Greek means forethought or foresight, while the name of his somewhat dim brother, Epimetheus means afterthought or hindsight. Throughout human history, the quest to transcend the confines of our human condition and become more god-like humans threatens to breach the boundaries between sacred and profane, magic and technology, religion and science (Belk et al., 2020; Hughes, 2012). More than ever, due to the emergence of disruptive technologies, such as CRISPR (a genetic engineering technique), nanotechnology, and cryonics (Manzocco, 2019; Pedersen & Iliadis, 2020), the human-technology relationship has made these boundaries porous, uncertain, and complex (Kozinets, 2019a; Schmitt, 2019).

This complex realm has been discussed within the stream of marketing literature known as posthuman consumer culture (Giesler, 2004). Conceptualized as both an epistemology and aesthetic mode, posthuman consumer culture offers a “genealogy of sociohistorical and ontological disquiet in how humans face their technologies” (Buchanan-

Oliver & Cruz, 2016, 303). As seen in previous studies (e.g., Botez et al., 2020; Campbell et al., 2005; Giesler & Venkatesh, 2004; Kozinets, 2015a; Venkatesh et al., 2002), the metaphorical cyborg figure proposed by Haraway (1985) generates discussions of the promises and perils of the human-technology interaction. Despite pursuing this metaphorical cyborg, these researchers have not gone far enough in pursuing biological cyborgs who are an integration of a human with technologies, and the resulting sociological, cultural, and psychological consequences.

The radical and controversial ideals of Transhumanism help spotlight the promises and perils of the consumption of emerging technologies. While there is no consensus about an integrative view of Transhumanism (e.g., Ferrando, 2019; Fuller, 2020), the starting assumption is that we, as *Homo Sapiens*, are not at our final potential in terms of biological evolution (Vita-More, 2020). Based on this belief, it is held that humanity should embrace technology not as a tool to an end, as in the Heideggerian approach explored by Letheren et al. (2020) and Robinson and Arnould (2019), but as a natural constituent of humans ontology (Hayles, 2012). After all, there is no humanity without machines, as there are no machines without humanity (Wiener, 1964/2019). This mutual dependency is evident in Kirk and Rifkin's (2020) discussion of techno-driven coping strategies during the COVID-19 pandemic. However, consumer researchers have neglected the literal human-technology merger and the possible biological "progression" from *Homo Sapiens* to *Homo Technologicus* (Longo, 2003; Warwick, 2016). This new "more-than-human" being is a symbiotic creature in which biology and technology intimately interact. This "is not simply *Homo Sapiens* plus technology, but rather *Homo Sapiens* transformed by technology" (Longo, 2003, p. 23). Investigations of transhumanist consumer phenomena and their consequences have been called for in the last several years (e.g., Arias-Oliva et al., 2020; Belk, 2018, 2020, 2014; Buchanan-Oliver et al., 2010; Lai, 2012; Schmitt, 2019).

In addressing this gap, our study highlights aspects of the further fusion of humans and technologies in the not-too-distant future. For example, the Neuralink company's first promised product will allow for human enhancement by means of a brain-computer interface (BCI)—an implant in the human brain that is promised to eventually allow recipients to merge with artificial intelligence (AI) (Musk, 2019). Despite some quantitative evidence of consumer acceptance of BCI provided by Pelegrín-Borondo et al. (2020) and Arias-Oliva et al. (2020), this research did not consider the likelihood of increasing social asymmetries, such

as the facility that the rich may have in accessing self-enhancing technologies compared with the limited access available to the poor. Given BCI's forecast cost, a wide gap between the enhanced and the non-enhanced seems certain to emerge (Hughes, 2004).

In one hypothetical scenario, neurologically enhanced consumers could rely on real-time strategic information as well as exceptional information-processing power to gain an advantage in the stock market. The scenario of biotechnological inequality could even lead to the repetition of historical atrocities, such as the Nazi eugenics experiments during WWII (Ranisch, 2019). Probable dehumanization due to the consumption of human enhancements is discussed by Castelo et al. (2019). Their experimental research provides preliminary evidence that consumers may resist such technologies and stigmatize those using cognitive enhancers. Furthermore, current rather than hypothetical manifestations of Transhumanism have not yet been explored in consumer research.

Transhumanist goals aim at god-like immortality, discursively reframed as radical life extension (Thompson, 2017). Regardless of whether this will ever be possible or not, one vital element for the realization of these goals is biohacking (Ramoğlu, 2019). Although the phenomenon remains undertheorized in marketing and consumer research, it can be initially considered from a two-fold perspective. At the individual level, biohackers aim at the enhancement of their biological condition using techno-driven self-experimental biohacks (Gallegos et al., 2018; Gaspar et al., 2019). At the collective level, biohackers share experiences within their social network to receive feedback on different procedures and outcomes (Belk, 2010; Yetisen, 2018). This happens both in online communities and in-person events (e.g., the Biohack.me website and the in-person 2019 Def Con).

Nowadays, the most common biohacking involves implants of near-field communication (NFC) microchips, which allow consumers to replace door and car keys, electronic tokens, passwords, credit cards, and printed business cards by simply bringing their hands near electronic devices (Pedersen & Iliadis, 2020). Like Quantified Self enthusiasts, who monitor and analyse personal data captured by wearable devices, biohackers also do self-tracking by monitoring their biological condition electronically (Bode & Kristensen, 2016; DuFault & Schouten, 2020). Biohacking projects also include more extreme experiments based on open-source medicine for developing new human senses to feel magnetic fields (Doerksen, 2017), and gene-editing with CRISPR to hack human cells to boost muscle growth (Quirks & Quarks, 2019). The central tenet linking these movements is consuming emerging

technologies that create or amplify a given capacity to do something over and above the general norm, and thereby hopefully become “more-than-human” (Zehr, 2016). Biohacking is often regarded as illegal (Bennett et al., 2009), unethical (Zettler et al., 2019), and profane (Livingstone, 2015), but also bold (Wexler, 2017), altruistic (Sarpong et al., 2020), and sacred (Hughes, 2012). This mixed reception portrays Prometheus’ children as behaving just as insolently and benevolently as their father. Despite this ambivalent and complex reception, there is another common element that may provide coherence: hubristic or not, everything is done in the name of love. Sometimes for others, sometimes for self.

The Promethean sentiment: love

According to Greek mythology, in an apparent act of benevolence, Prometheus stole the fire belonging to Zeus and gave it to humans so we could transcend our condition of vulnerability (Hamilton, 2017). But setting aside this well-praised heroic act, we should wonder: Did Prometheus give the fire to humans because of his altruism or his vanity? Remember, the fire belonged to Zeus, from whom it was stolen through trickery in a battle of wits (Dougherty, 2006). Hence, we might ask, what sentiment motivated Prometheus’ bold act? It is impossible to determine a single motif in the myth; it could be: rebellion, hubris, and rage, but also hope, faith, and love (Isomaki, 1989).

Despite many portrayals of the defiant Titan’s myth (e.g., Aeschylus, 430 BC/2014; Goethe, 1789/2016), our view builds upon the mythological theme of love. In the end, even when Mercury, or Hermes in the original Greek version, summoned the Furies to tempt Prometheus into despair, he put his faith in the power of love: “I said all hope was vain but love” (Shelley, 1820, p. 1.824). More concretely than Shelley’s romantic depiction, the phenomenon of love is “characterized by autonomic symptoms such as the flow of adrenaline and increased heart rate” (Stets, 2003, p. 309). It is a manifestation of the romantic imaginations of potential partners (Campbell, 2018). It is also a composition of “intimacy, passion, and commitment” (Sternberg, 1986, p. 119), it is felt by the lover whose “discourse is spoken, perhaps, by thousands of subjects (who knows?), but warranted by no one” (Barthes, 1990, p. 2). From psychology to philosophy to anthropology, love has been found to have many manifestations (Denzin, 1985; Weis & Sternberg, 2006). From the perspective of marketing and consumer research, this sentiment has been explored in passionate consumer

desire (Belk et al., 2003), in love directed towards objects (Ahuvia, 2005), in passionate “foodporn” consumption (Kozinets et al., 2017), as part of gift-giving (Branco-Illodo & Heath, 2019), and as an influence on parental decisions (Thompson, 2005). Nevertheless, detailed discussions of love as a consumer sentiment are still lacking (Illouz, 2009; Joy et al., 2020), specifically regarding particular forms of love (Lastovicka & Sirianni, 2011; Minowa & Belk, 2019). Here, in developing our contribution to address this oversight, we follow Gopaldas’ (2014, p. 1011) assertion that sentiments (i.e., love) energize consumer-level thoughts, feelings, and actions (e.g., biohacking).

In an effort similar to ours, but in a different context, Kuruoğlu & Ger (2015) argue that love is embedded in objects and, consequently, this conjunction shapes collective imaginaries and actions. Love is also highlighted in Molander and Hartmann’s (2018) work on mothering as an embodied and tacit aspect of our everyday living. Their study addresses the role of love as an essential element for social practices to be formed, performed, and changed. Focusing on individual-level experiences, Molander and Hartmann (2018) theorize practice-emotion linkages, but without assessing nuances of the sentiment in distinct episodes or distinguishing between different types of love. Despite these studies, there is little consideration of different types of love enabling different types of actions. For this reason, we ask: What kinds of love exist?

Love is not monolithic, as some scholars may suggest (e.g., Carroll & Ahuvia, 2006). Therefore, for our study, the taxonomy assumes four variants: Eros, agape, philia, and storge (Minowa & Belk, 2019; Soble, 1989). Traced back to Plato’s writings, Eros is acquisitive, and has an ardent desire to be united with a specific other, human or non-human (Heilbrunn, 2015, p. 18). It also has an egocentric nature, a form of self-assertion and it aims at gaining a life divine. “Eros is the will to get and possess, which depends on want and need” (Nygren, 1989, p. 94). Moreover, eros has an upward movement; it is the humans’ way to God (Nygren, 1989).

Conversely, as explored by Belk and Coon (1993) in their work on dating and gift-giving, agape is the love devoted to others. This type of love is grounded in sacrificial giving, altruism, and spontaneity. As depicted in the *New Testament*, it is often exemplified through Christ’s embodiment (Melé & Fontrodona, 2017). Agape imposes no demands on the beloved; it expects nothing in return. In contrast to eros, agape has an outward direction, like gods loving their creatures (Lee, 1988). Grounded in mutual esteem, philia, the third type of

love, is often translated as friendship. As described by Aristotle in his *Nicomachean Ethics*, the sentiment is based on affection for someone else and the constant effort to maintain the relationship (Nygren, 1989). In part, philia is explored in Fournier’s (1998) seminal research on consumer-brand relationships. In her study, the Saturn brand, for instance, is taken as a friend due to constant marketing efforts forging emotional bonds with consumers. Storge or storgic love is “evolutionary” rather than “revolutionary” (Hendrick & Hendrick, 1986, p. 400). The ancient Greeks used this word to mean the affection that develops between siblings and childhood friends (Gibson, 1997). It may also be the sort of love that develops between mature couples (Minowa & Belk, 2019). Storge is associated with kindness and sociability without emotional or sexual arousal (Kanemasa et al., 2004). It involves loyalty, commitment, and affection.

As Hauskeller (2014) once mentioned, transhumanists hold that comprehending the nuances of love is essential for us, human beings, to achieve biological liberation and so to become “more-than-humans.” Thus, observing the mythological theme of love from these four distinct perspectives is helpful for the better elucidation of the self-portrayals and perceptions of Promethean biohackers. In conjunction with the transhumanist context and its philosophical underpinnings, the fourfold view enabled us to construct an understanding of the underlying script for the human-technology integration among biohackers.

Methods

To understand the Promethean biohacker’s action within the transhumanist context, we adopted a three-fold data collection approach, as shown in Table 1.

Table 1. Dataset.

Period	Method of collection	Source	Final dataset
From April 2017 to July 2020	Netnography	Facebook	2,500 posts and comments
		Instagram	5,000 posts and comments
		Twitter	3,500 tweets
		YouTube	100 hours of video and 8,000 comments

From January 2018 to February 2020	Phenomenological interviews	Three biohackers with distinct sociodemographic profiles were purposively selected to represent the phenomenon	102 single-spaced pages
From September 2019 to July 2020	Autoethnography	The first author implanted a VivoKey Spark microchip in his left hand	50 single-spaced pages of personal notes, 100 photos, two hours of videos, and two hours of audio

In order to gain first-hand experience with the biohacking *ethos*, Kozinets' (2019b) netnographic guidelines shaped our initial data gathering. From April 2017 to July 2020, we followed hashtags and keywords, such as #biohacking, to curate archival data (i.e., past discussions) on Facebook, Twitter, Instagram, and YouTube. These platforms were selected based on Kozinets' (2019b, p. 226) five site selection criteria: (1) relevance – naturally unfolding itself over time, (2) recency, (3) regularity of interactions, (4) sustained activity, and (5) richness of data. The data was visual as well as verbal, from simple photos of biohacking products to videos of biohacking procedures. Regarding the netnographic ethical procedures, we followed Kozinets' (2019b, p. 178) framework and began by selecting public messages from each social media to compose the final dataset. Even though the first author was accepted or invited to closed groups or to follow closed profiles, private messages helped conceive the conceptualization of the phenomenon but are not presented in this paper. Eventually, the approval to join such closed groups involved a questionnaire about biohacking and the motivations for joining the community. It should be beared in mind that the first author's identity was always disclosed as a researcher—either by informing the moderator and community or as communicated on his personal profile. Although biohacking may be considered a sensitive topic, there was no interaction with vulnerable populations or any engagement with live self-experiments conducted by biohackers. Here, our netnographic procedure was based on archival search and personal notes. As the final steps of the netnographic method, all names are appropriately anonymized (Kozinets, 2019b, p. 178) and quotes are carefully paraphrased because biohacking is a sensitive topic (Kozinets, 2015b).

Because biohacking is done *to* and *with* the body (Doerksen, 2017), we decided to collect data at the granular level with phenomenological interviews. This focus was fundamental for refining our initial perceptions since we were able to compare and contrast distinct perspectives on the topic. Three biohackers with different sociodemographic profiles, backgrounds, and stories, were purposively selected to represent the phenomenon under investigation. Table 2 presents their profiles.

Table 2. Interviewees' profiles.

Pseudonymous	Occupation	Biohack	Length and recording method
Dynamo	Engineer, entrepreneur, and Ph.D. in medicine researching and developing microchips, robots, and security software	Microchip implant in the hand; developing robots and AI applications to embed in humans	70 minutes of audio recorded on Skype
Link	IT professional specialized in cybersecurity and hacking	Microchip implant in the hand	60 minutes of audio and video recorded at a university's coffee shop
Tune	Journalist, designer, entrepreneur, and artist	Microchip implant in the hand; culturing fake human meat; creating vegan leather with graphene	180 minutes of audio recorded in a coffee shop at an art exhibition

Using an adaptation of Smith et al.'s (2009) guidelines for interviews, we paid attention to the biohackers' intentional acts and their descriptions of their lived experiences. The flow of the conversation was determined by the interviewees' responses since there was no structured protocol. We started with a grand tour question and then questions and probes. All discussions were about past experiences and did not involve the stimulus or live performance of self-experiments that could cause harm to the self or others. Interviews took place at coffee shops and via Skype. Conversations lasted between 40 minutes and three hours. Each audio-recorded interview was then transcribed verbatim.

Regarding our ethical procedure for interviews, we had informed consent, adherence to beneficence principles in the case of any discomfort from the interviewee (e.g., they could

stop at any time), and the assurance of confidentiality and privacy for the usage of pseudonyms (Smith et al., 2009).

Since the beginning of our study, the first author has been highly engaged with the transhumanist and biohacking communities. In September 2019, his engagement became more profound due to the implantation of an NFC microchip in his left hand—a personal decision made years before the present study but only materialized in 2019. Since the implantation, he has been storing passwords to unlock computers and door padlocks, as well as business contacts to be transferred by approximation with NFC-enabled smartphones. This marked the start of his autoethnography, which followed Denzin’s (2016) proposal for biographical projects to begin with a key event in the individual’s life. This methodological step involving a singular immersion in the phenomenon was vital for our conceptualization of the Promethean biohacker.

Our data analysis was informed by an abductive approach (Belk & Sobh, 2019; Peirce, 1935). As argued by Timmermans and Tavory (2012, p. 171), abduction comprises the process of formulating alternative explanations and categories “into which observations would fall.” In this vein, following Wolde’s (1989) recommendations for abductive reasoning and data interpretation, a combination of French semiotics’ tools were considered as heuristics for theoretical insights. As previously implemented in consumer research (e.g., Bradford & Sherry, 2015; Kozinets, 2008; Roux & Belk, 2019), the first approach to code data was to use an adaptation of the generative trajectory of signification (Greimas & Courtes, 1982, p. 134). Iteratively, our coding process for written texts moved from the concrete level to the more abstract level with special attention to figures (e.g., a computer board) and themes (e.g., the future). Secondly, for the visual analysis of images and videos, we conceived our insights based on Floch’s (2001) four analytical categories: chromatic, eidetic, topological, and material characteristics. To manage and code the large amount of data, we used the NVivo software. To ensure trustworthiness (Denzin & Lincoln, 2018), we had numerous discussions to reflect on our analysis and conceive an interpretation jointly. All methodological steps for data collection and analysis followed the ethical protocols suggested by the internal committee from where the first author was based at the time of the fieldwork.

Findings

As depicted in Figure 1, we identify the sentiment of love as the primary motif for accounts of the Promethean biohacker engaging in DIY biological self-experiments.

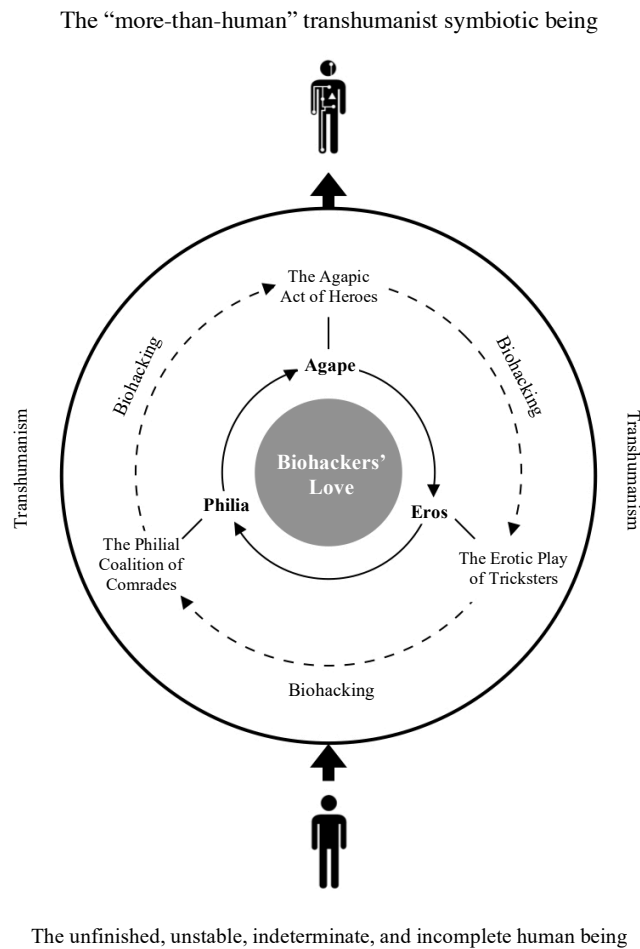


Figure 1. A visual outline of the study’s findings.

Drawing on Gopaldas’ (2014) claim that sentiments energize actions and conjugating it with Soble’s (1989) portrayals of love, we derived three avatars of Promethean biohackers. The first involves *The agapic act of heroes*, which portrays traits of agapic love expressed through the acts of sacrifice and creation. The second avatar involves self-characterizations of *The erotic play of tricksters*. By this, we mean that biohackers are portrayed as acting in a cunning, egocentric, and self-beneficial manner, all of which are traits of the erotic love. The third avatar is *The philial coalition of comrades*. This self-representation refers to collective rebellious actions towards a common benefit and a shared morality among peers. These

aspects suggest nuances of the filial love as attributions or motives behind the biohacking activities of some of those studied. We discuss each of these avatars in turn.

The agapic act of heroes

The heroic biohacker's avatar is grounded in mythological themes of sacrifice and creation (Dougherty, 2006). As suggested by Nygren (1989, 93), agape encompasses self-sacrifice and unselfishness, as manifested in the following biohacker's narrative. Their DIY biological self-experiment involved the development of a proposed alternative cure for HIV and the injection of the drug.

[Visual/Audio: Biohackers Tim, Mark, and Alice seated on a couch live streaming on Facebook. While self-injecting the solution, Tim says: "I dedicate this to all the people who have died while not being able to access treatment."]

Zion: Biohacker Self-Administers New Gene-Therapy Drug to Hopefully Cure HIV:

The first patient trying on a gene therapy cure for HIV. He has chosen to self-administer this experimental injection of antitoxin to remove HIV from his body.

Paulo: The world will be saved by biohackers.

Kneet: Rich people murder medical doctors or put them in jail. You guys deserve God's protection from these people.

Hick: this is so incredible.... Thank you for live streaming this!

(Zion, Paulo, Kneet, and Hick, public profiles on Facebook, 2017).

Biohackers also endure emotional and physical pain for others, as follows.

I have one [NFC microchip]. I applied it to myself even before launching it to the market. Since I coded and developed ours, the company staff looked at me and asked: "And now, what are you going to do with the implant? Who will be the first to apply?" I said that I was going to apply it to myself... As I am also in the medical field, my doctorate is in surgical sciences in organ transplantation. I thought: "ah... I will do it myself." (Dynamo, interview, 2018).

Propp (1968) argues that, in fairy tales, the climax of a story is reached when the hero, in possession of a magical object, such as a sword, defeats the monster and saves people. During his autoethnography, the first author attended a workshop given by a pioneer biohacker on how to do biohacks. During several hours of talking, watching, scalping, piercing, and bleeding, linguistics markers of the heroic archetype were identified, as follows.

Biohackers are always talking about special and even secret places to perform procedures. It is as if the location, equipment, and techniques for upgrading the body need to be combined in some way, as in magic potions. Once combined, the heroic biohacker can "kill the monster," which is a symbolic reference to the biological limitation of the human being (a transhumanist belief). He has already mentioned that biohackers are (1) *creators*; (2) *help* people to improve their lives; (3) in some cases *save* lives; (4) are *smart* and *bold*; (5) they *protect* people against oppressive structures (academia, governments, and media...), or Propp's monster. (First author, personal notes, 2019).

As another example of this archetypal enacted self-portrayal, hero biohackers see themselves as sharing and sacrificing their lives to help humanity in finding a vaccine for COVID-19. As reported in several news websites (e.g., Idrus, 2020), they have been working on the project "Do-It-Yourself: From Scientific Paper to Covid-19 DNA Vaccine." For some, this type of initiative is considered as rushed, extremely risky, and the practice of medicine without a license (Addison, 2020). However, despite its potential for harm (Sarpong et al., 2020), the goal of such an approach is to develop a reliable "home-made" alternative solution accessible to all humanity (Capps, 2020).

Based on Yu et al.'s (2020) findings, leading biohackers of this project developed a DIY DNA vaccine and have been streaming the process of how to create it on YouTube. The justification offered by biohackers for using a study based on monkeys as their foundation is because simians, they argue, have a similar biological system to human beings. Slim as it might be, this similarity offers some hope that this could produce a breakthrough. The project includes free webinars on procedures, classes about biology and technology, and a final experiment by self-injecting the vaccine. Currently, they are running a series of n of 1

experiments to validate the DIY antibody test and are collecting results from their social media followers. The following thread shows the admiration for their sacrificial acts.

[Visual: A cartoon depicting a science lab.]

Spark: How to Make a DIY covid-19 Vaccine from scratch. Tomorrow , 09AM PT (I'll record it and upload it to YouTube). Join us for the second class where I explain how to find, code and synthesize your DNA for the DIY vaccine. It will be huge. The link is in my profile if you are lazy.

Beam: I'm a undergrad student at the Medicine School of Rio de Janeiro (Brazil) and I'd like to say that you are an inspiration for me. I've been following your work on biohacking for 3 years now and it makes me want even more to follow your steps in the health field. I'm sure my first payments will go for biohacking equipment. Don't forget: You are a true Hero.

Awe: You're genius!

(Spark, Beam, and Awe, public profiles on Instagram, 2020).

It is worth remembering that Prometheus moulded humans in the “singular and perfect image of the gods.” This may be the first of Promethean acts of agapic love towards humanity since he did not want us to resemble some irrational animal of the wild (McNamee, 2007). Like Prometheus, hero biohackers aim at creating singular and special solutions. The next excerpt is from an interview with a biohacker, who also implants devices in others.

We also have the R1T1. Even though it is not a microchip, it has some similar technologies, such as the NFC. It is considered the world's best health robot. Since the beginning, before launching, it was already the best. It was born with that title [...] Only five or six people in the whole world can produce this kind of technology, and I am one of the two in the American Continent. All our projects, including my company, are unique. If you ever dreamed of doing something special or working at the best place to work, it is here with us [...] Our microchip development started in 2013 as an inside project. Since then, none of our implants ever went wrong; it is flawless. It is very unlikely to have any side effects—for example, an infection.

Sometimes a piercing can become infected if it does not have the perfect asepsis [...] We are always promoting implant parties, in which everyone attending it can become a cyborg. I am always helping people to do it. Sometimes I don't even charge them. (Dynamo, interview, 2018).

The mythological theme of creation can also be linked to the transhumanist principle of morphological freedom, which presupposes that humans should be free to enhance their biological condition as desired (Sandberg, 2017). Hero biohackers describe themselves as overcoming biological limitations by creative and brave hacks, possibly taking them closer to the *Homo Technologicus* ideal of Transhumanism (Longo, 2003). As highlighted by Warwick (2016), this is an example of the original *Homo Sapiens* morphed into a human-technology amalgam. For example, in the following post, we found the appreciation for the biohacker's sacrifice in his battle against achromatopsia, a syndrome that causes the absence of colour vision (Nikolov, 2018).

[Visual: Neil Harbisson showing his antenna implanted in the skull and how it works during a public conference.]

DBT: Biohacker, Artist, and Co-Founder of the Cyborg Foundation, describes the merging of non-human organs and senses with his body to create a “trans-species cyborg.”

Gaspar: This is remarkable. You must be very glad to finally see the beauty of colours. This technology will help others for sure.

MOD: OMG, he is a genius! God bless him! I hope this technology goes to the world! And I am happy this video is from this event. Dubai is always on the verge of technology and the future.

Ginger: He is more-than-human; he is everything a human being is, and he has an addition. That's how I think of it, at least.

(DBT, Gaspar, MOD, and Ginger, public video on YouTube, 2018).

Defeating diseases are not restricted to those already born. A controversial biohacking is the use of genetic engineering to create “superhumans” with superintelligence, super longevity,

and super well-being (Pearce, 2012). In many discussions, comments about the possibility of using, for instance, CRISPR to (re)design humans and overcome biological limitations are infused with enthusiasm and hope.

[Visual: A scientist using a microscope.]

Spartan: I have a certain degree of autism. If CRISPR-Cas technology can cure it, just do it. Those anti-genetic enhancement are afraid of their own shadows.

Chucky: I BOW to science and everything it brings to us for a better future. I Love it!!!

Direction: Do you know if it cures autoimmune illnesses???

PT: Don't worry, my friend. Eventually it will.

(Spartan, Chucky, Direction, PT, public video on YouTube, 2018).

Some hero biohackers have the knowledge and resources needed to promote morphological modifications such as gene-editing in their quests to boost COVID-19 immunity. They donate and share not only lines of code but also material ingredients for biohacking procedures. Since “sharing is caring” (Belk, 2010, p. 728) and caring is an element of agapic love (Nygren, 1989), hero biohackers experience the enlargement of their aggregate extended self (Belk, 1988, 2010) by caring for others: “When you really care about people, f#ck everyone else, you help them.” (Dare, public profile on Twitter, 2019). In doing so, the act of sharing may contribute to shaping their self-identity as being helpful, compassionate, and thoughtful (Llamas & Thomsen, 2016). The next thread exemplifies this argument.

[Visual: The U.S. President Abraham Lincoln is riding a brown bear covered with the American flag. The man is holding an old document and a machine gun.]

Jay: To celebrate Freedom and Independence Day I will send out DNA samples we made for our DIY COVID vaccine to 500 people—100% free. This is the sign-up form to receive plasmid. Have in mind that this is not a drug or a definitive cure or treatment for COVID (it hasn't been tested on us yet). I will send out approximately 5,000x smaller than what is used in a conventional DNA vaccine dose. I don't suggest you injecting yourself with anything because someone like me on the internet did it.

The price to have DNA synthesized was about \$1000, and I wanna this cost obstacle for those who are following these classes and wanna pursue similar research projects.

Justin: is your sequence available to the public?

Jay: yes, everything is can be found at http://***

Vix: Gosh, we need more biohackers like you in every area.

Cava: This is it. It is activism and resistance to biopolitics and the creation of fear during the pandemic. Go for it: offer others access to science and technology, just like the classic anarchists recommended. Meanwhile, traditional researchers only debate...

(Jay, Justin, Vix, and Cava, public profiles on Instagram, 2020).

In Hesiod's *Works and Days*, the Promethean tale has an emphasis not on the origins of the sacrifice but on its consequences. Prometheus' acts of love triggered a chain of events that led humanity to live in suffering, given Zeus' retaliation (Radin, 1956). But despite the potential harmfulness of some heroic hacks, there is little consideration of collateral effects in our data.

The erotic play of tricksters

This manifestation relates to mythological themes portraying the trickster's cunning, egocentrism, and creativity (Hyde, 2011). Despite several representations of the trickster as a culture hero acting for the common good (Klapp, 1954), he/she is also "a prankster who is grossly erotic, insatiably hungry, inordinately vain, deceitful" (Ricketts, 1966, p. 327). In the hero motif, we noted agapic-like narratives about sacrifice and bleeding for the other. But biohackers also show an erotic *ethos* in which the purpose is to acquire and not to give (Nygren, 1989). They do this by manipulating and deceiving others, as Prometheus did with Zeus. The associations of intelligence, trickery, and deception are shared with the trickster figure portrayed in many versions of the Promethean myth (Dougherty, 2006). For some trickster biohackers, every hack is a form of manipulation of people and objects for personal benefit. The following quote illustrates this outlook.

It's very nerdy, right. And then you obviously have people from the nerd culture who think it's great, there are people who think it's absurd. I am in the middle of it. As I

came from technology, I work with technology information and cybersecurity, I had been studying this for some time, I put it in as I don't care. It was natural for me [...] Several devices can read the chip with the command you configure [...] nothing philosophical, I was reading about chips and wanted to try some things. It must have a function and utility. For function and utility reasons to get an NFC implant, I told you the most useful: lockers and starting the car, OK. But there is also this article I read about hacking another person's phone because you have that possibility. You saw here that I wrote a code here to be transferred by approximation. So, there are a lot of people who leave the smartphone's NFC on, Wi-Fi on, Bluetooth on. It's another vulnerability to be exploited. People are not aware of it. So that is the reason I implanted the microchip [...] I wanted to hack other people. I've developed the code to send the virus via NFC but haven't tried yet (Link, interview, 2018).

The egocentric trickster has a will-to-possess similar to that of the erotic love; it aims at gaining “possession of an object which is regarded as valuable” (Nygren, 1989, p. 91). The ambiguous and erotic-inspired portrayal of the trickster biohacker can also be exemplified by the life and death of Aaron Traywick, the young Ascendance Biomedical CEO. As shown in Netflix's series “Unnatural Selection,” the cunning Traywick was always talking about creating new drugs to help humanity. However, since his death in 2018, the biohacking community has been revealing details about his deceitful, false, and dangerous practices. For instance, the non-government-approved “miraculous” gene-altering herpes treatment that he injected in himself during a conference was a placebo (Chironex, 2018). Some biohackers went further and presented evidence of Traywick's false scientific claims, scams, and financial frauds he used to benefit himself (Brown, 2018). His controversial legacy still resonates ambivalently, as seen in a comment for a post honouring a group of biohackers who work for the common good: “Aaron Traywick doesn't belong in that [our] group” (Gene, public profile on Twitter, 2020). Somehow, in a tricky way, some biohackers want to steal the bait and without getting caught on the hook (Hyde, 2011).

Shelley's (1818/2012) novel portrays Dr. Victor Frankenstein's Promethean quest for omnipotence that resulted in the creation of a monstrous being. Despite his initial noble purposes, the scientist behaved narcissistically to give birth to the nameless creature (Vine,

1996). In some ways, this narcissistic behaviour is also found in some biohackers' tales of self-adulation, as seen in the following transcript:

I met [Dynamo] at a tech event, and 15 minutes later, I was already implanting the chip. In 2017, I created a musical instrument that only I can play, and this experiment was widely publicized. It was hard to find the right sensors to activate the instrument and to create the performance. But that wasn't so nice. [Dynamo] and I ended up on TV, and then several people started talking to me. The media does a disservice. I do much cooler things than using the NFC chip, like working with 3D bioprinters, genetic manipulation, creating life from a bacterium, and this media coverage ended up leaving that part aside. I am not a person who handles the audience well. I have a lot of prejudice. I think people are stupid, they don't offer me any interesting insights, and I must deal with them just because they saw me on TV. My social circle is only for the elite. I'm almost a Nazi to give you an idea. I don't give a damn to what people think. (Tune, interview, 2018).

In the ambiguous trickster narrative, cunning and stupidity go hand in hand, each one enlightening the other (Radin, 1956, p. 181). The trickster is a “clever predator and stupid prey” (Hyde, 2011, p. 46), who desires satisfaction by the acquisition of an object of longing but never becomes satisfied, even when the belly is stuffed with food. This dynamic reflects the cycle of desire, characteristic of the erotic love, in which “whether the realization of desires leads to a cycling or recycling of desire, the reinitiation of desire appears to involve a basic desire to desire” (Belk et al., 2003, p. 342). Thus, in this thematic portrayal, “everything centers on the individual self and its destiny” *ad infinitum* (Nygren, 1989, p. 91). Bold acts of cleverness and self-assertion draw approval in the form of likes, shares, and euphoric comments from the biohacker's followers (Gannon & Prothero, 2016). The biohacker's never-ending desire is to be the follower's object of love and so to be praised. As Prometheans, they are vain. The next thread shows a risky procedure that portrays the biohacker as someone who is dauntless, extraordinary, and, for some followers, deserving of veneration.

[Visual: A biohacker receiving an intravenous (IV) injection.]

Tom: I told a friend at dinner: “my eye is weird, and I think I need to take some magnesium.” My friend: “How about a magnesium sulphate IV push with some procaine? There is a bonus: You’ll relax too.” I also feel instantaneously relaxed, my muscles relaxed and I felt this warm feeling spreading throughout my whole body. Please, pay attention: every time you’re having IV push you must to do it very very slowly, like more than 3+ minutes or you may have a heart failure/problem. There are many benefits of magnesium discussed over the internet. We, biohackers, kinda know how important magnesium is to our bodies, but have you heard of Procaine and how it works in the case of Neural Therapy? Neural Therapy is grounded in the assumption that traumas can produce enduring disorders in the electrochemical function of tissues. Are your muscles a bit tight? Do you need massages to help you to relax? Have you ever had Magnesium IV?

Silver: My daily supplementation has magnesium! I just don’t trust myself to give me pushes.

Fav: Wow. You’re my favorite biohacker

Doc: You’re a legend. Love it!

(Tom, Silver, Fav, Doc, public profiles on Instagram, 2020).

Do it, but do not do it, insinuates the biohacker sending out mixed messages. On the one hand, trickster biohackers often attempt to establish their position of superiority by doing or suggesting dangerous alternatives, such as self-injection of non-FDA-approved solutions. On the other hand, they also recommend “don’t try this at home kids,” as if they were the only ones capable of handling these hacks, either by knowing something special or just for supposedly being special. In the end, devious biohackers may hack and share to help others to help themselves, just like digital influencers advertising “beloved” solutions in their storytelling activities (Childers et al., 2019), as follows.

[Visual: A biohacker smiling during an intravenous.]

Limits: Summer into ozone therapy with 50% off all lectures! You’ve read it right!

Use the code SUMMER at checkout page and have this major discount! This is only for a limited time! This includes the (1) An introduction to Ozone Therapy Course and

(2) The Advanced Ozone Therapy Course. The best thing is this sale price is for both courses together! Below, you find the course description: Learn everything about the Amazing healthcare benefit of OT! Ozone therapy is natural and, for a long time, is used to fight infections, diseases, and all kinds of viruses! No need of pharmaceuticals! In both courses, I will cover the history, major benefits, and how OT works. You have video instructions for every step of the way, the required equipment and how to use them safely, dosage, and procedures. All videos and materials are available to watch and read as often as you need! Click on the Ozone Course link in my bio for more information. Live and enjoy every breath you take! #Gettinglimitless

(Limits, public profile on Instagram, 2020).

The question that arises here is: Will they be chained to a rock or chased by a monster for their hubris? The mythological themes of cunning, egocentrism, and creativity in these biohacking narratives suggest that some biohackers love to be loved by others.

The philial coalition of comrades

This thematic account of biohacking encompasses insolence, collectivism, and shared morality. Rebel biohackers are bonded by their love of camaraderie and love for the act of biohacking itself. The mythological theme is that of the rebellion, but not as an individual act, such as Prometheus'. Instead, it is the community of fellow biohackers that is called upon to manifest the Titan's rebellion. In some circumstances, when a community perceives betrayals and transgressions of social institutions, its members gather resources to rebel against the new order and cope with possible threats (Weijo et al., 2019). As an example, a vocal and dissatisfied rebel biohacker calls on his/her fellows for an uprising.

[Visual: A biohacker in a lab.]

Jets: There is only one thing worse than rebellion itself: the situation that causes rebellion. Every day, I see people frequently imprisoned to sh*tty medical systems. They tell us what we must and must not do to our own bodies and what medications are "suitable" for us to use at home. Here is the thing, the problem is that researchers,

medical doctors, and governments don't have you and your best interests in their minds. Believe me. They are not trying to help you, your family, or beloved ones. They are just trying to progress their careers or make a bunch of money or get a re-election to keep the status quo. Here is a question: What if you could change all of this just by learning science? Science and medicine are not complex at all. But the system has some unfair and outdated gatekeepers to only accept those deemed “worthy.” If I could pursue a PhD, you can do it too. Never forget: knowledge is your path to be free from these systems. Learn more. Do more. Rebel always.

News : What a message! Love it! How should I join? Do you have free resources or online courses?

(Jets and News, public profiles on Instagram, 2020).

Philial love is “an attachment toward a person who shares with us an important feature or activity of our life” (Protasi, 2008, 2). Currently, a topic that is spread across several biohacking communities is how to tackle the COVID-19 pandemic jointly. Driven by their DIY *ethos* (Yetisen, 2018), rebel biohackers are not waiting for governments or private companies to act. Characteristic of the transhumanist movement (Lee, 2019), several co-created and open-source solutions have been shared among biohackers, such as those listed in the crowdsourced *Coronavirus Tech Handbook* (<https://coronavirustechhandbook.com>).

Ed: Please access, read, send your contribution, and share!

Raj: Can we have this handbook translated to different languages? It would be amazing. My company and I can do it as volunteers in the case of English to Arabic so we can reach more people.

Geko: I’ve just contributed with some good stuff to governments—wonderful job, everyone!

(Ed, Raj, Geko, public group on Facebook, 2020).

These rebels with a cause are continuously defying social norms and regulations, such as those established by the U.S. Federal Drug Administration (FDA) (Zettler et al., 2019). We

can see the collective of biohackers impersonating Prometheus, while the opposing social institutions take the place of almighty Zeus. The following tweets briefly illustrate their battle.

CD: The group CoroHope has been trying to crowdfund research to develop an alternative coronavirus vaccine—bypassing traditional academics, the big pharma, and the FDA. They’re using bitcoin’s decentralized idea as a source of inspiration.

Melendez: When will they promote human trials? Can’t wait for them.

Brain: Sure, this certainly looks worth trusting and waiting.

(CD, Melendez, and Brain, public profiles on Twitter, 2020).

The element of trust is fundamental not only for the preservation of love but also for the political coalition within communities (Muñiz & O’Guinn, 2001). The challenges posed by almighty deities, such as Zeus and the FDA, are cooperatively overcome chiefly due to biohackers’ moral obligations towards their group of trusted peers. This is illustrated by the following case, in which two biohackers, on a digital platform, discuss suggestions on how to hack and solve failures of NFC microchips.

[Visual: A biohacker implanting a microchip.]

Chin: so, once you have the microchip, can you put data for multiple things on the same chip?

Pills: In my case, I have one 125 kHz reader and all it does is reading the chip’s serial number. There is nothing being stored in it. Also, I work for a security company and must go to different buildings using key badges... So they added me to their system just by scanning my hand with the implanted chip and adding its serial number to the system. But if you were to have a card cloned that's already made, then you're just cloning the number out of that card and storing it in the chip. This will lock it down to one thing (the entrance into a building) but if you have your chip like me, it's unlimited. If you want to know more about this stuff, go to DT’s website I will leave a link here. You can a lot more about the technology and even find the reader I mentioned. The same that I add to my projects.

(Chin and Pills, public video on Youtube, 2019).

Despite the possibility of being hacked by a computer virus, and so be tricked like Zeus, biohackers trust their fellows to conceive a solution for the problem. To keep the strength and cohesion of the group, Promethean biohackers share their biohacks and goals in online communities not only to be scrutinized but also to be socially endorsed (Giger & Gaspar, 2019). As another example of this social dynamic, Figure 2 shows a picture of a Facebook post of the first author wearing a t-shirt with a unique design which stands for the community. This photo was taken after the NFC microchip implantation in his left hand.



Figure 2. The first author is wearing a t-shirt of the biohacking community.

Among the many messages exchanged after the implantation, one private message to the first author shows the immediate welcome and social bonding *ethos* within the group. In the middle of the message there was the phrase “Welcome! One of us, one of us!” (First author, personal notes, 2019). This line comes from a scene of Todd Browning’s 1932 *Freaks* (<https://www.youtube.com/watch?v=bBXyB7niEc0>), in which the “freaks,” in a prejudiced portrayal of people with disabilities, gang up to celebrate the wedding of Hans (a “little person”) to a beautiful trapeze artist. During the event, the group repeatedly sing, “We accept her, we accept her. One of us, one of us. Gooble-gobble, gooble-gobble.” Occasionally, when

a non-biohacked individual becomes biohacked, or a “freak,” the community celebrates it this way as well. This initiatory ritual reflects the communal identity, sense of belonging, and moral obligation shared by peers that sustain the community (Muñiz & O’Guinn, 2001). After this episode, the first author was invited to private and online secret groups and forums for developers. Here, the philial love is that of friends sharing with one another without any underlying utilitarian goal, such as for the sake of self-pleasure (Aristotle, 350 BCE-2014).

Remarkably shaping the biohacker community *ethos* is the practice of defying (or mocking) God or His followers. The implantation of an NFC microchip, for example, is seen as an outrage to an obverse *Imago Dei*. The next set of posts illustrates this.

[Visual: Employees from a company being microchipped.]

GT: OH Yeah! Totally! The number of the beast on their forehead is a literal thing right? The monster that has profanity on their forehead is literal, correct? Not everything is literal. The mark is a spiritual mark that will become a law once the Antichrist comes. When is it?

Elza: God conceptualized, made, and approved this technology.

ED: Hell no! I prefer my privacy and will keep it!

Inc: What privacy means these days? What kind of privacy do you have?

Jad: That’s sick. Have no idea why this is getting so much hate like this.

Dinn: I’ll never let anyone chipping me with this profane mark.

(GT, Elza, ED, Inc, Jad, and Dinn, public video on Youtube, 2017).

Sharing resources with other biohackers is one way to insult or challenge the will of gods, whether they are materialized by social institutions (Smalley, 2018), religious entities (Gallaher, 2019), or marketplaces (Graafstra et al., 2010). By gathering collective means and acting together, Prometheus’ children personify their father and behave as rebelliously as the Titan himself.

Discussion and conclusion

In this ongoing research, we explore how and why biohackers have been integrating technology into their bodies. In Figure 1, we portrayed the Promethean biohacker's transhumanist pursuit of transcendence by engaging with DIY biological self-experimentations. As our findings show, sometimes agapic, sometimes erotic, and even philial love are the primary motifs attached to self-hacking and hacking others. In other words, following in part Gopaldas' (2014) conceptual propositions about sentiments, love is what energizes biohackers' actions towards the idealised "more-than-human" existential condition. Putting forward Promethean ideals in a future transhumanist era, the Promethean biohacker is seen, partially, as a heroic figure who sacrifices him/herself for humanity, in part as a selfish trickster who seeks to become a deity, and in part as an insolent rebel who defies the norms for the sake of his/her fellows. Within this scenario, our research contributes, firstly, to discussions of technology consumption, and, secondly, to the study of consumer sentiments by addressing distinct manifestations of love.

Over the years, most consumer technology research has relied on Heidegger's instrumental view of technology (Belk et al., 2020; Belk, 2017). It is fair to say that technological devices enable humans to live better and smarter in many ways (Kozinets, 2019a). This utilitarian view of technology consumption is spotlighted by Kaliyamurthy and Schau's (2019) discussion of technology augmentation and ethical consumption. They emphasize that "consumers use technology to augment their lives in multifaceted ways to enhance the convenience and improve outcomes" (Kaliyamurthy & Schau, 2019, p. 249). We drive Tesla's AI-enabled cars (Davenport et al., 2020), measure our heartbeat rate using the Apple Watch (Isakadze & Martin, 2019), verify symptoms for COVID-19 with the Oura ring (Kapoor et al., 2020), and perhaps find a cure for HIV by using CRISPR (Herrera-Carrillo et al., 2020).

However, when technology changes our ontological framing of ourselves as human beings, we must change our view of technology as well. Our findings challenge prior consumer research in which technology is seen as a purely instrumental means to an end. Despite the posthuman perspective adopted in some studies (e.g., Botez et al., 2020; Giesler, 2004), these research papers are simply about human-technology interactions. Even in studies exploring the agentic nature of objects, these discussions still frame technology as an entity *to be used* by consumers *to do* an activity (e.g., Hoffman & Novak, 2018; Novak & Hoffman, 2019; Verhoef et al., 2017). Such an approach falls short of capturing the complexity of

technological consumption where the transhumanist movement is concerned: the human-technology integration.

In contrast, as our findings show, biohackers and technologies are mutually constitutive and there is ontological symmetry between them (Hayles, 2012). Humans are not the masters nor is technology their servant (Schweitzer et al., 2019). They are rather partners who reciprocally affect and are affected by human-technology fusion (Schweitzer et al., 2019). By engaging with DIY biological self-experiments, biohackers thus move forward to the *Homo Technologicus* transhumanist symbiosis, in which biology and technology are fused and integrated (Longo, 2003; Warwick, 2016). In other words, the biohacker's Promethean labour of love in "fixing" the unfinished, unstable, indeterminate, and incomplete human being (Müller, 2016) may result in a machine-like human, like Neil Harbisson for example. During an interview, Harbisson (2016), who faces the absence of colour vision and has an antenna implanted in his skull to listen to colours, said: "I don't feel I'm using or wearing technology. I feel that I am technology." More research probing such Promethean and transhumanist contexts of becoming more machine-object-like and less human-subject-like is needed to elicit the potential commodification of human life.

Concerning implications for studies of consumer sentiments, our findings reinforce Gopaldas' (2014, p. 1008) claims that sentiments energize consumer actions, which in turn actualize otherwise virtual goals and sentiments. Our analyses also expand the predominant discursive approach to investigate the interrelatedness of sentiments and consumer-level actions (e.g., Valor et al., 2020). In this vein, we show that love, and not only discourses, is what promotes biohackers' engagement with the task of "stealing fire from the gods" (Stock, 2003, p. 2) to redesign fixed biological boundaries (Savulescu & Sandberg, 2008). Because discourses, practices, thoughts, and actions are bounded by sentiments (Gopaldas, 2014), biohackers are in a dialectical process of thinking, feeling, doing, and becoming. Such a dynamic accentuates the difficulty in tying permanent, universal, or even uni-directional linkages between a singular sentiment and consumer actions, as seen in prior consumer research (e.g., Carroll & Ahuvia, 2006).

Our findings also show that some biohackers are interested in genetic engineering of life to create superintelligence, super longevity, and super well-being for humans (Pearce, 2012). Love for a future child thus plays a fundamental role in parental decisions to free their offspring from the biological and genetic constraints that evolution has placed on human

beings (Hauskeller, 2014; Savulescu & Sandberg, 2008). With a few exceptions (e.g., Fischer et al., 2007; Takhar, 2020; Takhar & Houston, 2019), studies in marketing and consumer research only address human life after birth. Here, despite the absence of direct references to storgic love in our data (Minowa & Belk, 2019), this form of familial love may be useful to expand ongoing discussions.

Considering bioethics and potential parental decisions to interfere at the germline (heritable) level (Ranisch, 2020), hypothetically, a husband owns his spermatozoids and knows the possibilities of diseases in his family. His wife also owns her eggs and uterus and has a complex medical history. What if they decide to undergo a genetic engineering procedure using CRISPR so that a yet-to-be-conceived child would not suffer migraines? Would this be a case of ethical transgression (Linlin Sun et al., 2016)? If one agrees with Habermas (2003) and his critiques regarding genetic manipulation and its possible psychosocial consequences, then yes, there is an ethical transgression. However, as Hughes (2004, 131) argues about a parent's moral duty, "once safe, [and] beneficial gene therapies are available parents will feel the same sense of obligation to provide them for their kids as they do a good education and good health care." It is already possible to purchase higher probability sets of traits for the not yet existing zygote, such as black or green eyes, brown or white skin, height, chances of becoming bald, or having a stronger immune system, to mention a few (Marcus, 2018). Despite the excitement in the transhumanist community, there is an undeniable concern about the rise of consumer choices to promote biological changes (Battle-Fisher, 2020). For some, such a choice may promote dehumanization and usher a new form of eugenics (Agar, 2019; Fuller & Lipińska, 2014). That said, we ask: In the name of love for future offspring, how far is too far?

Within the biohacker sphere, scholars and practitioners may address these consumers using a two-fold approach. Firstly, it is highly important that there be discussions and decisions about human gene-editing considering both public and private governance mechanisms. These initiatives must include a broader education for biohackers towards understanding risks of gene-editing and other biohacking choices, including surgical interventions by non-medical personnel, such as piercers. There is also a governmental role to protect and educate consumers without unduly constraining inventiveness (Andorno et al., 2020). Secondly, public regulators would benefit from engaging with biohackers in order to better comprehend their experimentation and so that clear regulation can be established (e.g.,

Gaskell et al., 2017). As an illustration of the complex and morally ambiguous biohacking marketplace, consider that despite governmental regulations at the marketplace level (e.g., NIH, 2020), consumers can acquire inexpensive DIY CRISPR kits and start the god-like activity of manipulating life by culturing, growing, and genetically modifying human cells. We call for deeper ethical scrutiny of emerging as well as underregulated consumer practices of biohacking and related activities in the transhumanist pursuit of “intelligent evolution” (Sharma, 2019; Vita-More, 2020).

From another storgic perspective, a three-parent IVF technique, which fertilizes both mother (compromised) and donor’s (healthy) eggs with the father’s sperm, has recently emerged as a possibility in the health marketplace (Liao, 2019; Takhar & Houston, 2019). Here, it is interesting to consider the principle of genetic affinity, which is the desire for biological connections between parent and child, as a point for discussion (Pompei & Pompei, 2019). When the procedure goes as planned, the desired parenthood may be attained (Fischer et al., 2007; Rulli, 2016). However, when genetic manipulation fails, the repercussions can be disastrous. For example, a Singaporean couple, a few months after their child’s birth, realized that their ethnicity did not match with the baby’s appearance. Shortly after, on discovering that a mixture of genetic material with the wrong donor’s sperm was used, the parents sued the clinic in Singapore’s highest court (Schaefer & Labude, 2017).

An IVF child, and for that matter, any child, must not be seen as a being comprised by extrinsic or instrumental value. That is, conceiving a new life should not be regarded as a means to an end, as apparently in the Singaporean case (Schaefer & Labude, 2017). Instead, every human being has intrinsic or inherent value as well as dignity (Frankena, 1988). Due to rhetorical strategies and the institutional logic of the ART marketplace, donors, eggs, spermatozoa, embryos, and other human biological material are all potentially commodities (Hartman & Coslor, 2019). They are all subject to marketing strategies to safeguard financial returns for companies (Sobande et al., 2019). It is noteworthy that, supposedly, an IVF procedure can only be done at a traditional medical facility. Nevertheless, there are discussions on forums and websites about how to conjugate the fertilization procedure through biohacking (e.g., Morris, 2017). In this vein, public organizations have a duty to create policies specifically to protect intended parents from offers of dangerous solutions at illegal clinics for fertilization and genetic manipulation, for example. As for academics, we suggest future research to investigate psychosocial consequences of the interplay between the

transhumanist ideal of human engineering (Agar, 2014) and the commoditization of the human biological material (Hauskeller & Beltrame, 2016).

Given the rate of current technological development, it is not a hallucination to imagine changes in human-technology consumption relationships like those found and pursued among biohackers. From less contentious experiments, such as new diets (Lanyon, 2020), to the extremes of creating new body parts in order to have more powerful orgasms (Lee, 2019), biohackers seek to push biological and sociocultural boundaries (Smalley, 2018). Within the transhumanist context, we should wonder: Does biohacking extirpate the special spark that supposedly makes human life unique (Levy, 1992)? How far can humans go in blending with technology without losing their humanness? Research to answer such questions should be launched immediately. We hope this paper will contribute to these studies and stimulate a sense of urgency to investigate the promises and perils of the particular type of Transhumanism studied here. There are many opportunities for researchers to explore our techno-driven future and the possible rise of the *Homo Technologicus* (Warwick, 2016), as well as new forms of life, such as robots, cyborgs, and AI (Belk et al., 2020). However, to avoid unintended consequences, such as the death of a human being due to biohacking, critical ethical, and public policy discussions on the limits of self-experimentation are a priority and an immediate need.

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