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Counselling as a Procedural Safeguard for Brain-Machine Interfaces

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Abstract

The rapid development of Brain-Machine Interfaces (BMIs) presents unprecedented opportunities to enhance cognitive and physical capabilities. However, their transformative potential raises significant ethical challenges regarding autonomy, identity, and agency. In this article, I argue for the implementation of a model of enhanced informed consent, requiring individuals to participate in counselling before gaining access to BMIs. Such a requirement respects individual freedom while addressing the risks BMIs pose to fundamental human values. Drawing on Robert Nozick's libertarian framework, I highlight how counselling aligns with the moral basis of rights by ensuring individuals have the capacity to structure their lives in meaningful ways while respecting individual rights and autonomy. In fact, I argue that introducing counselling as a conditional procedural safeguard to have access to BMI technology is the better strategy vis-à-vis resorting to substantive prohibitions or paternalistic policies. Enhanced informed consent enables individuals to make deeply informed decisions while preserving their ability to lead meaningful lives.

1. Introduction

The most plausible libertarian account of a right to privacy views it as a specific instance of individual property rights.

If somebody violates your privacy, the violation will certainly come down to some infringement of your property rights over something to

which you retain, by virtue of a previous legitimate contract, at least, a partial set of rights from the total bundle of rights that exist over that something. If you claim that by act *X* some individual violated your right to privacy, it all depends on *how* your privacy was violated[1]. The how reports specifically to the way in which the alleged perpetrator accessed whatever information you wanted to keep private.

Here, what is at stake is that someone used something to which access was restricted because she did not have the property rights over it that would allow her legitimate access.

Hence, there is a relationship between the right to privacy and the control that property rights give us over certain things. Since we all have an interest in having some degree of control over what we disclose about ourselves to others, it is reasonable to assume that we need a bundle of property rights that gives us the possibility of exerting such control. Of course, some instances of personal privacy, like the way we look, the way we move, or the way we sound will be difficult to control at all times, and this can make us vulnerable to public exposure. But we seldom associate this lack of control with a violation of our privacy.[2]

However, if we retain control over most of the instances of our privacy, we can alienate or transfer these rights to third parties with whom we enter voluntary contracts. We do this all the time: for instance, when using social media platforms, we often voluntarily share personal information, such as our location, activities, and preferences. Sometimes, we enter these voluntary contracts by signing the terms and conditions and transfer some of our rights over information we would otherwise like to retain private just to be able to gain rights of access to other goods that we also value. By agreeing to the terms and conditions of these platforms, we allow the collection and use of our data, which is often used for targeted advertising, third-party sharing, or even surveillance purposes, making clear how we often give away our privacy rights in exchange for goods such as convenience or social connectivity[3].

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[1] A. Marmor, *What is the Right to Privacy?*, « Philosophy & Public Affairs», 43 (2015), p. 4.

[2] Except perhaps in cases where we are unaware of being under surveillance, it is an inescapable fact of our social and public lives that, at some point, somewhere, there is a strong possibility of someone watching us.

[3] A. Hanlon, K. Jones, *Ethical Concerns about Social Media Privacy Policies: Do Users Have the Ability to Comprehend their Consent Actions?* «Journal of Strategic Marketing», 31 (2023), pp. 1-18.

From a libertarian standpoint, these trade-offs present no significant challenges. Despite our possible disadvantaged bargaining position, we enter these contacts voluntarily, knowing the consequences resulting from them.

Here, however, I'm particularly concerned with the use of Brain-Machine Interfaces (BMIs). These technologies differ greatly from social media and other familiar technologies. BMIs enable direct communication between the brain and external devices by capturing and interpreting brain signals to control computers, prosthetics, or other equipment[4]. Currently, they are primarily used for medical and assistive purposes and facilitate direct brain interaction rather than relying on traditional input methods. Because of this, we should pay attention to the types of data collected from the brain and how this data is processed and fed back to the brain. It is not only a matter of security and privacy that is at stake here (*i.e.*, the security and privacy in the process of collecting, storing, analysing, translating, and feeding back data to the brain), but also and more importantly, how that data impacts individuals' autonomy, agency, and identity[5]. This relates to how people perceive and respond to the interactions facilitated by BMIs. For example, BMIs have the potential to influence a person's perception of control over her own actions and decisions, and the direct manipulation of neural signals to control external devices might blur the line between voluntary and involuntary actions. If a BMI is used to control a prosthetic limb, the person may question whether the movement originated from her own intention or from the BMI's interpretation of her neural signals. And we can also question whether the BMI was operating correctly, and if that interpretation was accurate. The integrity of personal agency and the potential for external influence on one's actions is thus of particular importance.

So, while external influences on one's neural signals might affect individual autonomy and threat our capacity to make independent decisions and have control over our actions, it also impacts our agency and identity. Whether one's actions originated in one's brain or are the result of external agents raises questions about the ownership over our actions, which is critical not only for preserving one's sense of agency, but to

[4] A. Demetriades, C. Demetriades, C. Watts, K. Ashkan, *Brain-Machine Interface. The Challenge of Neuroethics*, «The Surgeon: Journal of the Royal Colleges of Surgeons of Edinburgh and Ireland», 8 (2010), p. 267.

[5] S. Burwell, M. Sample, E. Racine, *Ethical Aspects of Brain Computer Interfaces. A Scoping Review*, «BMC Medical Ethics», 18 (2017), pp. 1-11.

enquire about individual responsibility or accountability for one's actions. Atop of the already significant challenge regarding the alteration of one's capacities and modes of interaction, these challenges may contribute to a further muddling of one's self-perception, probably bearing substantial impact on one's intersubjective relationships.

This descriptive presentation demands an ethical and normative examination of the challenges just mentioned. Hence, the purpose of this paper is clearly delineated in the following way: how, within a Nozickian libertarian framework, BMIs undermine individual agency, autonomy, and identity even when individuals voluntarily decide to use them and agree to the terms and conditions of their use?

My proposal to address this challenge is tentative: the voluntary use of BMIs presents challenges that the libertarian framework, based on individual autonomy and contractual freedom, struggles to accommodate. Individuals and BMI providers can enter voluntary contracts and make clear every aspect of what information is being collected, but even so, due to the very nature of these technologies, it will be very hard for individuals not to have their privacy breached in ways that were not clearly disclosed. More substantially, I claim that the use of BMIs has such a profound impact on human agency, identity, and autonomy that a libertarian framework should advocate for a model of enhanced informed consent, without which access to BMIs should be restricted. This entails that the neural enhancement market ought to be (heavily?) regulated for the sake of the protection of human agency, identity, and autonomy – and thus, freedom.

2. A libertarian framework

When we think of Robert Nozick's libertarian theory, we think of full self-ownership, the minimal state, robust individual rights, the entitlement theory of justice, and the importance of voluntary exchanges and property rights. And we inevitably recall Nozick's famous proclamation opening his *Anarchy, State, and Utopia*: «[I]ndividuals have rights, and there are things no person or group may do to them (without violating their rights)»[6].

However, what happens if an individual, whose rights are inviolable due to the robustness of moral side constraints, willingly and consciously

[6] R. Nozick, *Anarchy, State, and Utopia*, Basic Books, New York 1974, p. ix.

decides to transfer his rights of self-ownership to another individual? Nozick is crystal clear on this point: voluntary enslavement is legitimate[7].

There are compelling reasons why voluntary enslavement seems challenging. Take the case of a major good in our lives: autonomy. As Peter Vallentyne explained, Nozick's concern lies not in guaranteeing «the *having* of effective autonomy, or to *promote* the having, or exercising, of effective autonomy», but on the protection of its *exercise*[8]. An individual's rights are respected if his decision to sell himself into slavery is respected. It is the *protection of the exercise of autonomy* that matters, not the conditions under which it happens and much less the *promotion of effective autonomy*. For instance, a person suffers a life-threatening injury in a remote area with no access to medical assistance. A passerby offers to provide emergency medical treatment, but only if the injured person agrees to enter into a contractual agreement of voluntary slavery, in which she must work for the passerby during a year to repay the cost of the medical treatment and ongoing care. In this case, the contract requires the full selling of one's rights, but we can imagine everyday cases in which we enter contracts that require partial voluntary enslavement (although we may rarely perceive them as instances of slavery). Legal agreements such as leases, loans, rental contracts, employment contracts, marital commitments, and military service exemplify contracts in which individuals voluntarily engage in binding commitments and agreements that entail some degree of limitation on the exercise of their autonomy.

This only stresses the importance of full self-ownership as the cornerstone of Nozick's libertarianism. It implies that our natural individual and negative rights are in no way contingent upon societal convenience; rather, they serve as moral safeguards against actions that may encroach upon autonomy, emphasising the negative constraints on conduct rather than positive obligations. The foundation of such rights lies in morally significant aspects of individuals themselves, in their nature *qua* individuals, and especially in their intrinsic autonomy and rational devotion to the pursuit of personal projects and goals[9]. It is in this separateness of

[7] Ivi, p. 331.

[8] P. Vallentyne, *Nozick's Libertarian Theory of Justice*, in R. Bader and J. Meadowcroft (eds.), *The Cambridge Companion to Nozick's Anarchy, State, and Utopia*, Cambridge University Press, Cambridge 2011, p. 163.

[9] E. Mack, *Robert Nozick's Political Philosophy*, in E.N. Zalta (ed.), *The Stanford Encyclopedia of Philosophy* (summer 2022 edition), retrieved from https://plato.stanford.edu/archives/sum2022/entries/nozick-political/ [accessed 3-5-2024].

persons that we find the rationale for respecting moral side-constraints in interactions with others. Each individual is a unique and different person, with only one life to live, and to utilise one's life to benefit others imposes a morally problematic sacrifice on that individual's autonomy and uniqueness[10]. Nozick makes this clear when he states that these constraints reflect the «underlying Kantian principle that individuals are ends and not merely means; they may not be sacrificed or used for the achieving of other ends without their consent. Individuals are inviolable»[11]. Therefore, since individuals are ends in themselves, they naturally warrant our utmost respect, and since side constraints are absolute, and its existence is synonymous with full ownership of oneself, this entails forbidding their sacrifice for the advantage of others without their consent, as doing so would debase them to mere instruments and violate the exercise of their autonomy.

But there is a rather more interesting justification for constraints to be found in *ASU*. At some point, Nozick makes a reference to the «elusive and difficult notion» of the meaning of life. He says that living a meaningful life requires individuals to have the capacity to structure their lives in accordance with a coherent overarching plan: «only a being with the capacity to so shape his life can have or strive for meaningful life»[12]. In other words, Nozick believes that the moral basis of rights lies in the capacity to live a meaningful life. But there's at least one stance in which this line of argument warrants further examination. It might be argued that living meaningful lives requires possessing the capacities to give form to those kinds of lives, ensuring the availability of the substantive means to enable the use, development, and enjoyment of those capacities. If meaning in life is regarded as a non-instrumentally valuable good, and constraints are seemingly established for its protection, we may also consider that there exists a *prima facie* moral requirement to assist individuals in using, developing, and enjoying those capacities as means to shape their lives around their particular conceptions of what is meaningful, which in itself holds value. This opens the door to positive duties that imply the promotion and securing the effective conditions to exercise autonomy while Nozick's theory suggests otherwise: the acquisition of capacities and means should occur through voluntary exchanges rather

[10] R. Nozick, *Anarchy, State, and Utopia* cit., pp. 32-33.
[11] Ivi, pp. 30-31.
[12] Ivi, p. 50.

than coercive (re)distribution, even in cases where assistance might seem the morally right thing to do.

A critic like Samuel Scheffler has observed not only that this perspective might lead to prioritising certain individuals over others based on their ability to lead meaningful lives, but also that framing rights in such a way can potentially exclude some individuals and raise concerns about fairness and inclusivity in the application of rights[13]. Individuals who lack the relevant capacities to shape their lives in meaningful ways are left behind.

In his review of Scheffler's argument, Michael Otsuka has noted that certain positive rights to assistance, which allow for helping others, might be more effective in safeguarding the valuable capacity to live a meaningful life than the deontological constraints Nozick advocates. The Nozickian framework for deontological constraints, which prioritises non-interference, can lead to implications that justify anti-libertarian positive rights, such as those provided by welfare states[14]. In fact, Nozick's rationale for deontological constraints can lead to situations where violating these constraints might result in more people being able to lead meaningful lives. This implies that in certain cases, it might be morally justifiable to violate the rights of a few individuals if doing so can prevent harm to a larger number of people, thereby enabling more individuals to lead meaningful lives. Otsuka's reading of Scheffler's argument is that deontological constraints may not always be the best means of protecting individuals' capacities to live meaningful lives, particularly when compared to certain positive rights to assistance[15]. This line of reasoning is compelling: side constraints alone might be insufficient to protect individuals' meaningful lives in the face of complex threats like those posed by the use of emerging technologies of the kind of BMIs.

But individuals are rational and moral beings whose inviolability they carry with them, as something to be respected (thus the goal of deontological constraints), instead of something to be promoted[16]. To clarify, our moral standing is maintained and reinforced when we adhere to principles that prioritise non-interference and respect for others' rights, rather

[13] S. Scheffler, *Natural Rights, Equality, and the Minimal State*, «Canadian Journal of Philosophy», 6 (1976), pp. 69-70.

[14] M. Otsuka, *Are Deontological Constraints Irrational?*, in R. Bader and J. Meadowcroft (Eds.), *The Cambridge Companion* cit., pp. 49-50.

[15] M. Otsuka, *Are Deontological Constraints Irrational* cit., p. 50.

[16] Ivi, p. 51.

than seeking to improve it by means that actively impose certain conceptions of the good life or by coercively promoting specific outcomes, even if well-intentioned. This distinction underlines the idea that respecting individuals as autonomous agents requires refraining from actions that compromise their freedom to make voluntary choices, rather than attempting to enhance their moral standing through external intervention.

If it is from the robustness of individual inviolability, guaranteed by deontological constraints, that the Nozickian framework derives its normative strength and theoretical appeal, paradoxically, this very inviolability also weakens its value. Shelly Kagan raised this issue in a reply to Frances Kamm, stating that this robust individual inviolability leads to a reduced "saveability", by which she refers to the capacity to intervene and prevent harm from befalling an individual[17]. What Kagan is saying is that the more inviolable an individual is, the less can be done to him without his consent, but also the less can be done to save him from harm.

Hence, if we adhere to a perspective that holds that to shape a life that has meaning is non-instrumentally valuable for us as rational moral beings, we can reasonably assert that both saveability and inviolability alike are essential aspects of our status as rational moral agents. While inviolability grants individuals moral protection, it simultaneously restricts the ability of others to intervene and prevent harm. And yet, there might be cases in which to treat individuals as ends in themselves, focusing on saveability rather than robust inviolability, may prove more advantageous. Still, here, treating individuals as ends in themselves is synonymous with securing their right to exercise their autonomy and recognising the inviolability and separateness of their lives.

But now, consider the following case: a group of friends gathers for a weekend getaway at a remote cabin in the woods. During the trip, one member of the group, John, learns about a new experimental drug that promises intense euphoria and altered perceptions. Despite knowing that the drug is experimental and carries potential risks, intrigued by the idea of experiencing new sensations, John decides to try it.

Consciously and voluntarily, John ingests the drug, fully aware of the potential consequences but willing to take the risk in pursuit of the desired effects. However, as the drug takes effect, he begins to experience severe side effects, including hallucinations, paranoia, and erratic be-

[17] S. Kagan, *Replies to My Critics*, «Philosophy and Phenomenological Research», 51 (1991), pp. 919-920.

haviour. He becomes increasingly agitated and disoriented, posing a danger to himself and others. Despite his altered state, John does not seek help or express a desire to stop the effects of the drug. His friends, witnessing his distress and recognising the danger he's in, want to intervene and help him. They understand that their friend's life is now in danger due to the drug's effects and feel morally compelled to take action to ensure his safety.

Inviolability protects John's autonomy and right to make decisions about his own well-being, even if those decisions lead to danger. As a rational and conscious individual, John voluntarily chose to ingest the drug, and his friends should respect his autonomy and not intervene without his consent. From this perspective, John's inviolability entails respecting his right to manage his own risks and make decisions about his own safety, even if those decisions ultimately result in grave danger.

But saveability emphasises John's moral status just as effectively. It stresses the need to rescue John from the dangerous situation he finds himself in due to the drug's effects. Despite his initial decision to take the drug and his subsequent lack of request for help, his friends recognise the urgency of the situation and feel morally compelled to intervene to prevent harm. This also serves as a means to prevent any further, if not permanent, degradation of John's rational moral agency.

If we adhere strictly to the Nozickian framework, prioritising individual autonomy and full self-ownership as the basis for inviolability, John's increased inviolability, protected by deontological constraints, will result in a decrease in his saveability. While the exercise of his autonomy will be entirely respected, there remains a risk of losing his life. If we value the good of saveability, we risk violating John's inviolable rights to freedom and the exercise of his autonomy for the sake of keeping him alive and preserve his faculties precisely as an autonomous, rational moral agent, even against his previously expressed will.

Given that we cannot depend on any positive rights and obligations, there appears to be no alternative but to respect John's decision and the ensuing consequences, even if they culminate in John's death, regardless of the possibility of his friends saving him. If the drug causes persistent anxiety, depression, or other psychiatric symptoms, its use may impede John's ability to make autonomous choices or engage fully in social and personal life. This entails that if John is not rescued, he may permanently lose his capacity to act autonomously.

One of the reasons why this scenario seems so counterintuitive may be due to the very concept of self-ownership, as Dan Lowe argued[18]. If it is because of self-ownership and the robust inviolability of the person that it recommends that we are not justified to do what it seems to be the morally right thing to do, maybe the idea of self-ownership itself lacks appeal. It generates seemingly perverse recommendations that do not align with our moral intuitions and what we take to be the things that give our lives meaning. For instance, faced with such a moral dilemma, John's friends could prioritise the duty to prevent harm and the principle of beneficence, leading them to intervene to safeguard John's well-being, even if it means overriding his autonomy. The friends could reasonably argue that despite John's initial autonomous choice to take the drug and their willingness to respect his exercise of his autonomy, the subsequent loss of his rational faculties changes the ethical context of the whole situation. John may no longer be capable of making informed decisions or exercising rational judgment to consent or to refuse assistance. So, his friends may consider that it is morally justifiable to intervene and save him from harm, even without his explicit consent. They could also contend that safeguarding John's autonomy requires his rescue to ensure that this isn't the last chance for him to exercise his autonomy.[19]

The goal of this paper is not to look further into the idea of self-ownership and the ways it can be rethought so it can be more appealing. I'm not even sure if this is desirable. Instead, it aims to examine the specific case of BMIs through the lens of the Nozickian framework, with a focus on individual moral responsibility for one's actions and corresponding outcomes. Key to this analysis are the notions of human agency, identity, and autonomy, particularly the control and intentionality individuals exert over their actions. The use of BMIs, as obvious, shares several similarities with John's use of the drug.

[18] D. Lowe, *The Deep Error of Political Libertarianism: Self-Ownership, Choice, and what's Really Valuable in Life*, «Critical Review of International Social and Political Philosophy», 23 (2018), pp. 685-686.

[19] As noted above, Nozick's philosophy doesn't advocate for the kind of maximising view of autonomy that this argument seems to suggest. However, the safeguarding of John's autonomy through his rescue highlights the tension inherent in the libertarian framework, a tension that may appear unappealing when applied to everyday or real-life cases.

3. Brain-Machine Interfaces

In 2010, a group of scientists claimed that the risks involved in the use of Brain-Machine Interfaces make it «the greatest ethical challenge that neuroscience faces today»[20]. Fifteen years later, with a significant resurgence of the debate surrounding BMIs because of recent experiments[21], they are once more in the centre of the ethical debate.

I've already laid the groundwork that surrounds the problem I'm addressing in this paper; it stems directly from one specific feature of these technologies, namely their bidirectionality. This means that a BMI can both read and write information to and from the brain. Bidirectional communication allows for complex interactions between the brain and external devices or software. A bidirectional BMI can read neural signals to control a prosthetic limb and also send feedback signals from the limb back to the brain to convey sensations like touch or pressure. Among other concerns regarding this feature, a major one is the possibility of modulating neural activity through the information that is sent to the brain, by various methods of brain stimulation.

For example, in therapeutic contexts, the use of responsive neurostimulation for treating epilepsy showed that a system within the body (self-contained neuromodulation system) can both analyse, recognise, and modify brain activity using a processor attached to the skull[22]. BMIs have also been shown to modify behaviour in cases of depression and Tourette's syndrome[23]. Moreover, in Parkinson's disease, stimulation at certain targets has been associated with an increased risk of suicide[24].

In non-therapeutic contexts, like the augmentation of capacities in soldiers, BMIs will serve several different functions: from monitoring the soldier's performance and mental workload, to control prosthetics and weapons directly with the mind, or facilitate human-to-human and human-to-machine communication. A promising feature in this realm is to

[20] A. Demetriades, C. Demetriades, C. Watts, K. Ashkan, *Brain-Machine Interface* cit., p. 269.

[21] L. Drew, *Neuralink Brain Chip: Advance Sparks Safety and Secrecy Concerns*, «Nature», 627 (2024), p. 19.

[22] P. Gigante, R. Goodman, *Responsive Neurostimulation for the Treatment of Epilepsy*, «Neurosurgery Clinics of North America», 22 (2011), pp. 478-479.

[23] M. Shanechi, *Brain-Machine Interfaces from Motor to Mood*, «Nature Neuroscience», 22 (2019), pp. 1554-1564; W. Xu, C. Zhang, W. Deeb, B. Patel, Y. Wu, V. Voon, M. S. Okun, B. Sun, *Deep Brain Stimulation for Tourette's Syndrome*, «Translational Neurodegeneration», 9 (2020), pp. 1-19.

[24] A. Demetriades, C. Demetriades, C. Watts, K. Ashkan, *Brain-Machine Interface* cit., p. 268.

enhance cognitive performance, focusing especially on the regulation of emotional states (*e.g.*, stress) and the increase of focus and alertness to augment lethality and combat readiness[25]. In the long-term, this means to modulate the person's emotional states[26].

I find at least three promising future non-therapeutic, non-military perspectives for civilian use of BMIs. First, entertainment and gaming, in which individuals might enjoy immersive experiences in virtual reality environments, like controlling actions with their brain activity.[27] Second, as assistive technologies that enhance accessibility by means of social robots to services and goods through direct brain signals. Third, as consumer devices, either integrated with wearables and other smart appliances to adjust individual preferences based on neural feedback, or as tools to monitor and regulate physiological responses through brain signals. None of these use cases should surprise us given the current trends in mainstream technological developments. The only difference is that BMIs imply a higher level of integration by directly connecting the brain to our devices without the need for mechanical mediation. In fact, given their current stage of development, BMIs promise to make us more cyborgs than fyborgs, where cyborgisation involves physically integrating machines into our bodies, while fyborgisation refers to the functional integration of external machines into our lives[28]. It is true that the invasiveness and complexity of BMIs make their short-term adoption difficult, but these current technical challenges are likely to be resolved as the technology advances, just as many previously cumbersome technologies have become more efficient and accessible over time. Remember how early pacemakers, once large and invasive devices, have now been miniaturised and can be implanted with minimal discomfort?

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[25] C. Munyon, *Neuroethics of Non-Primary Brain Computer Interface: Focus on Potential Military Applications*, «Frontiers in Neuroscience», 12 (2018), p. 2.

[26] A. Binnendijk, T. Marler, E.M. Bartels, *Brain-Computer Interfaces: U.S. Military Applications and Implications, An Initial Assessment*, «RAND Corporation» (2020), retrieved from https://www.rand.org/pubs/research_reports/RR2996.html [27-2-2024], p. 17.

[27] In a livestream on *X*, Neuralink's first implanted patient demonstrated playing chess online using the device implanted in his brain, despite being paralysed from the shoulders down after a car accident. The 29-year-old man described the experience as «intuitive» and «wild», explaining that he controlled the cursor by imagining its movement (*Neuralink Video Shows Patient Playing Chess Using Brain Implant*, BBC, 2024, March 21). Retrieved from https://www.bbc.com/news/av/technology-68623380 [25-3-2024]. Breakthroughs like this one highlight the potential of BMIs in gaming and other applications, suggesting a promising future for the technology beyond therapeutic, enhancing, and military contexts.

[28] G. Stock, *Redesigning Humans: Choosing Our Genes, Changing Our Futures*, Profile Books, London 2003, p. 25.

There are other future perspectives that seem to serve less recreational functions, such as addressing cravings and addictions, modify internal drives and reward systems, and enable deliberate stimulation or inhibition of emotional reactions on a wide scale by rewiring pleasure and pain responses[29]. Some have called our attention to the possible misuse of non-invasive transcranial stimulation «to induce pain without physical trauma, or suppressive stimulation of dorsal neocortical structures to induce psychological distress» to interrogate or punish criminal suspects[30]. Others have highlighted the potential for BMIs to emerge as new existential threats, paving the way for extensive state surveillance, policing, and data collection, threatening democracy, and potentially fostering the rise of authoritarian and totalitarian regimes[31].

The primary concern and what is at risk here is the capacity to deliberately influence the brain and, subsequently, how we think and how we act. One aspect of this is the ability to block or to make us feel certain emotions and connect specific feelings with specific thoughts. For example, associating happiness with a particular idea or make it impossible for us to feel sad about something[32]. If this level of control is possible, then it is conceivable to use BMIs to make people like certain things or prevent them from disliking others.

Preventing negative thoughts could be highly advantageous. Consider the case of wartime memories linked to PTSD as an example. The literature on the ethics of human enhancement extensively discusses the use of drugs to mitigate or eliminate traumatic memories in these patients. BMIs could improve the effectiveness of this approach and contribute to the well-being of these individuals. A 2012 study conducted an experiment in mice where specific memories were recalled by reactivating the neurons associated with them, demonstrating the potential for manipulating memory recall in a controlled laboratory environment. Using optogenetics, researchers activated specific patterns of neurons to induce sensory experiences or fear reactions in mice, even in the absence of actual external stimuli. This internal generation of experiences led the mice

[29] J. Rafferty, *Brain Computer Interfaces: A New Existential Risk Factor*, «Journal of Futures Studies», 26 (2021), pp. 53-54.
[30] C. Munyon, *Neuroethics of Non-Primary Brain Computer Interface* cit., p. 3.
[31] J. Rafferty, *Brain Computer Interfaces* cit.
[32] Ivi, p. 57.

to form memories associated with the artificially induced sensations[33]. Therefore, it's not just about altering how we think and behave, but also about modifying our memories and how we recall our past, which has significant implications for the shaping of our identity and how we perceive ourselves as free, autonomous agents.

The internally generated sensory experiences that researchers reproduced led the mice to form memories associated with the artificially induced sensations. This shows the potential for manipulating memory recall to such a point that entirely new memories are forged. In fact, one of the features discussed regarding the future abilities of BMIs is whether it will be possible not only to simply dull or erase bad memories, but also to «custom-design memory content»[34]. In the future, specialised companies could potentially create or design memories, enabling individuals to access them even if they haven't personally lived or experienced the underlying realities. If feasible, this will not only disrupt our current understanding of memories as an individual and private experience but will make it a shared one.

Predictably, we will transform ourselves in desirous consumers of artificial memories and a market for them is likely to thrive. In this scenario, individuals would find themselves in a world where wirelessly connected BMIs enable them to extensively open the doors of their memory and mental space to external entities[35]. In the context of an industry of memory extraction, increased connectivity also means greater vulnerability, with individuals increasingly exposed to manipulation or exploitation, as external actors gain access to their deepest personal thoughts and experiences. Herein, it's not only the idea of consent that is put at risk, but also the lines between authenticity and artificiality, between reality and fiction, that are blurred. Furthermore, the psychological effects of relying on fabricated memories to shape one's personal identity or perception of reality will increase this vulnerability.

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[33] X. Liu, S. Ramirez, P. Pang, C.B. Puryear, A. Govindarajan, K. Deisseroth, S. Tonegawa, *Optogenetic Stimulation of a Hippocampal Engram Activates Fear Memory Recall*, «Nature», 484 (2012), pp. 381-385; M. Blitz, W. Barfield, *Memory Enhancement and Brain-Computer Interface Devices: Technological Possibilities and Constitutional Challenges*, in V. Dubljević, A. Coin (eds.), *Policy, Identity, and Neurotechnology*, Springer, Cham 2023, p. 224.

[34] M. Blitz, W. Barfield, *Memory Enhancement and Brain-Computer Interface Devices* cit., p. 215.

[35] *Ibid*.

Given this picture, BMIs promise to control our mobility, desires, thoughts, memory, and perception of the world we inhabit. If this is so, and algorithms generated from deep learning algorithms gather data about us and our needs and preferences, predicting our most intimate desires, there will be little space left for human purposefulness. If our actions are primarily dictated by external factors rather than our own choices, «then causality leaves little room for free will»[36].

4. Reconciling autonomy and freedom with conditioned access

This may seem like quite a departure from our original problem, but it isn't. The use of BMIs challenges individual autonomy, agency, and identity, even within a libertarian framework that emphasises voluntary agreements. We have strong reasons to consider BMIs as serious threats to our autonomy, agency, and identity. However, to argue for their banishment on the grounds of their dangerousness seems implausible in the context of a Nozickian framework, which is one that emphasises individual freedom and responsibility.

On the one hand, once the technology is available on the marketplace, the decision to use it remains an individual one, regardless of the possible consequences it may bring to the user. On the other hand, due to the potentially disruptive impact this technology can have on one's autonomy, agency, and identity, it is reasonable to implement procedural safeguards to ensure individuals can make truly informed decisions when choosing to use a BMI. In fact, I want to make a bolder statement: access to BMI technology should be conditioned on the individual attending counselling sessions aimed at achieving an enhanced form of informed consent, one that fully ensures the individual understands the deep implications the technology could have on his life. This approach goes beyond simpler methods, such as ticking a box on a consent form or having a doctor explain the posology of a medicine.

Let us then go back to the "elusive and difficult notion" of the meaning of life and consider the following hypothetical scenario. Suppose that John (who was, after all, saved by his friends) voluntarily decides to use a BMI to enhance his cognitive abilities and boost his productivity. He

[36] A. Demetriades, C. Demetriades, C. Watts, K. Ashkan, *Brain-Machine Interface* cit., p. 269.

goes directly to a BMI provider, selects the device on his own, and only gives a cursory glance at the instruction manual before starting to use it. The entire procedure is simple, and John is thrilled about the potential benefits.

However, after a few months of using the BMI, John's friends and family start to notice subtle but troubling changes in his behaviour. He becomes increasingly absorbed in his work, less engaged with his loved ones, and often seems detached or distant. During weekly casual social gatherings, John is visibly agitated and obsessively checks the statistics on his BMI device, constantly analysing his performance on every level. His friends begin to worry that the BMI may be subtly influencing his decisions, prioritising work over personal well-being, and that his actions are no longer fully aligned with his original intentions.

Over the course of several months, John's life deteriorates significantly. His BMI was hacked, and his personal data was exposed. He becomes depressed, increasingly isolated, and often mentions thoughts of suicide. There's no longer meaning to John's life, and this is precisely how he feels.

However, the protection of John's exercise of autonomy was respected. He autonomously and voluntarily made his decision, and he had access to information about the possible consequences in the pamphlet included with the BMI's terms and conditions, but he chose not to read it carefully.

By this point, the reader might begin to question the plausibility of this scenario and accuse me of oversimplifying[37] the issue to pave the way for claiming that access to BMIs ought to be limited to the conditional access clause of counselling. It is, indeed, my goal to argue for this conditional access clause on the grounds that it is comparatively better to go through the counselling requirement than to have either a substantive prohibition or a situation like John's, which can have irreversible outcomes.

It is important to acknowledge that even if John had read the pamphlet with the terms and conditions of the BMI, or if the BMI provider had given him detailed over-the-counter instructions on its use, the out-

[37] The misuse of medication, non-compliance with medical advice, and failure to fully understand the consequences of one's actions are not uncommon occurrences in medical practise, and they illustrate that the concerns raised in the example are far from oversimplified. Cfr. P. Theofilou, *Noncompliance with Medication Treatment. A Case Report of a Patient with Coronary Heart Disease*, «Japan Journal of Clinical & Medical Research», 3 (2023), pp. 1-2; R. Gittins, R. Vaziri, I. Maidment, *'It's a Horrible Situation for Everyone': The Impact of Over-the-Counter and Prescription Medication Misuse on Friends and Family*, «Drug Science, Policy and Law», 9 (2023), pp. 1-12.

come could have been the same simply because John could have chosen to ignore those instructions. Naturally, the same applies to counselling.

Suppose John wants to use a specific BMI, and different types of BMIs require different levels of counselling (*e.g.*, some are more complex and require more sessions with various professionals). For his preferred BMI, he needs to attend three counselling sessions with different specialists (doctors, ethicists, psychologists). After these sessions, he could still ignore the insights he gained, and the same consequences could follow. It would be his choice.

However, the situation now seems different. First, John voluntarily attended the sessions. He may not have been highly motivated, but he understood and agreed that in order to access the technology, he needed to engage in this process. We encounter similar trade-offs in other areas of life. For example, to drive a car, we must obtain a driver's license. While we might not enjoy the lessons, we still go through the process voluntarily. Second, just like Nozick clearly states, we recognise how crucial it is for individuals to live meaningful lives. Counselling serves this purpose by ensuring that each person has the capacity to structure her life in accordance with a coherent overarching plan, which is essential for living a meaningful life, this being a key foundation for the moral basis of rights[38].

We can hardly think of counselling sessions for BMI use as an infringement on individual rights. They are a procedural safeguard that ensures individuals are fully informed and prepared to incorporate such transformative technology into their lives. Counselling supplies individuals with the understanding necessary to better understand and face the complex implications BMIs can bring to our lives. Since BMIs are indeed tools, but ones with transformative and potentially disruptive power that is yet not fully understood, individuals who lack adequate preparation may underestimate the profound and long-term consequences of their use, much like John in the previous example.

Two purposes are met: we strive to help individuals never losing sight from living meaningful lives; and we emphasise individual autonomy and responsibility. Both instances are fundamental tenets of Nozick's libertarianism. By ensuring individuals have the tools to make informed decisions, we are not coercing them but rather supporting their ability to live meaningful lives. Nozick's framework does not merely defend freedom of choice, but it equally presupposes that individuals are capable of

[38] R. Nozick, *Anarchy, State, and Utopia* cit., p. 50.

exercising that freedom responsibly, which requires sufficient knowledge and understanding. Counselling sessions for BMI users develop this capacity, ensuring that individuals can shape their lives in accordance with their overarching plans without unknowingly compromising their autonomy or agency. We should not look at counselling as a measure to restrict access but about incrementing one's powers to make choices that align with one's values and goals. Individual rights are respected by ensuring that decisions are made with full awareness of their potential consequences, rather than in ignorance or under undue influence from external parties, such as BMI providers with commercial interests, insurance companies, or other stakeholders.

This clause, then, serves as a safeguard not just against external threats, like data breaches or neurohacking, but also against the internal risks of misusing or misunderstanding the technology. The lack of preparation John demonstrated in using his BMI is more the result not of malice or coercion but from personal negligence and lack of understanding. This could have been avoided if he had access to counselling before being given access to the technology. By making counselling a necessary clause for access to BMI use, we simply reinforce the very foundation of autonomy that Nozick values: the capacity to make informed, deliberate choices about one's life that enables one to give meaning to his life.

Because it does not impose substantive restrictions on the choices individuals can make but rather ensures that their choices are informed and reflective of their long-term values and goals, this is not a paternalistic approach. If this view has an advantage, that is the respect for individual autonomy by offering individuals the tools and knowledge necessary to make informed, deliberate decisions about BMI use. In fact, the counselling process reinforces the compromise with personal responsibility and freedom, as each person engages in the process to access transformative and disruptive technologies and accept the consequences of their decisions.

In this way, autonomy and agency are respected without us interfering with the agent's freedom, while simultaneously putting in place safeguards that aim to protect the agent's autonomy, agency, and identity. These safeguards ensure that the agent has been adequately informed and has provided truly informed consent. In fact, the agent has provided enhanced informed consent, as the counselling sessions offer a much more

thorough and personalised approach than simpler and impersonal methods.

There is a further advantage to this approach. Instead of reducing "saveability" or undermining inviolability, my argument positions the enhanced informed consent as a way to give power to individuals to make choices that align with their own values and goals, while still respecting their right to make those decisions freely. This approach avoids the problematic trade-off Kagan describes by neither violating individual autonomy nor leaving him entirely vulnerable to harm due to a lack of preparedness or understanding[39]. As an alternative, it ensures individuals are as equipped as possible to tackle the risks and consequences of BMI use.

A final word must be said about counselling. It is not my aim to develop a counselling model in this article, but it is worth to lay out its general structure to give us some directions on how to implement the model. As a starter, in the context of this argument, counselling is not a mechanism for coercion or paternalistic guidance. Rather, it serves as a means of equipping individuals with the knowledge and tools necessary to make informed decisions about BMI use. To be consistent with the libertarian framework, counselling should most likely be non-directive. That is, it should not impose specific choices or outcomes on the individual. Instead, it should focus on presenting information, outlining potential risks, and clarifying long-term implications, leaving the individual free to decide in accordance with his values and priorities.

This approach aligns with libertarianism's emphasis on respecting autonomy and individual responsibility. Non-directive counselling ensures that individuals retain full control over their choices, receiving «information about risk and options available to reduce that risk»[40] while also promoting the conditions for meaningful and informed decision-making. In this way, counselling operates not as a restriction on freedom, but as a procedural safeguard that enhances an individual's capacity to exercise that freedom.

As I mentioned earlier, the number and nature of sessions is most likely to be determined by the complexity and transformative potential of the BMI in question. A more complex BMI, with greater potential to impact on autonomy, agency, and identity, would dictate a more exten-

[39] Kagan, *Replies to My Critics* cit., pp. 919-920.

[40] J. Savulescu, *Procreative Beneficence: Why we Should Select the Best Children*, «Bioethics», 15 (2001), pp. 413, 419.

sive counselling process, whereas simpler or less intrusive BMIs might require fewer sessions.

Furthermore, as I also suggested, the sessions should involve various professionals to provide a well-rounded and comprehensive accompaniment. These professionals ought to include medical doctors, to address physical and neurological implications; psychologists, to explore emotional and cognitive impacts; ethicists, to examine moral and philosophical dimensions; and religious representatives, for those who wish to integrate spiritual considerations into their decision-making. Additionally, current and former BMI users could also be present, sharing firsthand experiences to give prospective users a grounded understanding of the technology's potential benefits and risks. This interdisciplinary approach ensures that counselling is not a one-size-fits-all process but rather a tailored framework.

Finally, when it comes to counselling strategies and procedures, we should strive to adopt effective methods that ensure individuals are fully prepared to make informed decisions. One foundational strategy is questioning, which is used to clarify meaning, elicit emotions and consequences, and gradually create insight or explore alternative actions[41].

The form of the questions plays an essential role in the counselling process. Open-ended questions, as opposed to closed ones, allow for a more comprehensive exploration of the person's thoughts, feelings, and experiences. These questions invite individuals to engage in a self-reflective process, providing counsellors with an opportunity to uncover underlying concerns and gain a deeper understanding of the person's perceptions and expectations. For example, questions like "What would happen if…?" or "What's the worst that could happen if…?"[42] help individuals think thoroughly on their values, motivations, and counterfactual thinking. The ultimate goal is, of course, to understand what drives an individual to seek BMI use, what outcomes do they expect, and how do these align with their personal goals and values. This invites individuals to think about life after BMI use: how does one envisions his life after adopting BMI technology? In what ways does he anticipate the BMI will enhance his overall well-being, productivity, or quality of life? Naturally, risks and limitations play a big role in this conversation: what potential

[41] I. James, R. Morse, A. Howarth, *The Science and Art of Asking Questions in Cognitive Therapy*, «Behavioural and Cognitive Psychotherapy», 38 (2010), p. 85.

[42] E. Gordon, *Human Enhancement and Well-Being*, Routledge, New York 2023, p. 71; I. James, R. Morse, A. Howarth, *The Science and Art of Asking Questions* cit., p. 86.

risks or limitations associated with BMI use does one foresee? How does one weigh these risks against the potential benefits? How does he anticipate BMI use will affect his relationships with friends, family, and colleagues? Will it improve or strain these connections?

A second strategy is interpreting, a process that allows the counselling team to help the individual gain deeper insights into the potential consequences of his decision. Interpreting involves six key steps: (i) the generation of clinical material by the individual (*i.e.*, the individual's thoughts, concerns, and desires about BMI use); (ii) the systematic organisation of this material by the counselling team into one or more problems or areas of concern; (iii) the planning of potential interpretations by the counselling team, which aim to shed light on the individual's situation or offer new perspectives; (iv) the presentation of preliminary interpretations to the individual for feedback; (v) the counselling team listens carefully to the individual's responses, evaluating the interpretations with the individual's support or rejection; and (vi) based on the individual's feedback, the counselling team can either revisit the process, refining interpretations, or offer further hypotheses to help the individual gain clarity or explore alternative perspectives.

The process of interpretation helps individuals develop a clearer and more comprehensive understanding of the potential implications of using a BMI. Interpretations could take the form of hypothetical scenarios that present different possible outcomes or trade-offs associated with the technology. These interpretations encourage the individual to think critically about the possible intended and unintended consequences of his decision.

As part of the interpretation process, the counselling team might ask: "How do you think your overall well-being and flourishing would be influenced if an intervention unintentionally resulted in you losing the ability to experience particular emotions, like empathy or anger?"; "what if the BMI radically enhances your cognitive abilities, making you extremely intelligent, but at the cost of impairing your ability to establish meaningful social and emotional relationships with others?"; "How would you feel if the BMI does not produce the desired outcome or fails to meet your expectations? Would this disappointment affect your view of the technology and its impact on your life?"; or "Could it be the case that, in order to enhance certain moral traits (such as empathy or compassion), you might need to sacrifice some aspects of your autonomy or freedom, perhaps even

the ability to act in morally questionable ways, even if to attain a greater good?".

These questions help the individual critically assess the potential impacts of BMI use from different angles, opening up a dialogue that encourages deeper reflection. It also allows counselling teams to present multiple perspectives on the consequences of BMI use, helping the individual to weigh the risks and benefits more comprehensively.

A possible third strategy involves explaining frameworks. This requires counselling teams to provide patients with conceptual frameworks or theoretical models that offer tools to organise and understand complex issues. These frameworks, whether ethical, cultural, or developmental, serve to clarify ambiguous aspects, offer constructive insights, and help prospective users consider dilemmas or make informed decisions aligned with their values[43]. For instance, an ethical framework might help individuals address moral concerns related to autonomy, identity, or potential risks associated with BMI use. Similarly, a developmental framework could encourage patients to consider how the use of a BMI might influence their personal growth, relationships, or long-term aspirations. In both these cases, counsellors introduce hypothetical scenarios. For example, "Imagine the BMI optimises your productivity to such an extent that you neglect time with loved ones. Would this align with the life you envision for yourself?", or "Consider another BMI user who became so focused on optimising efficiency that he lost the ability to empathise with his team members. How would you feel if something similar happened to you?".

The goal is to enable individuals to conceptualise the relationships between capacities and responsibilities[44], fostering reflection and deeper understanding of their motivations for seeking BMIs. These frameworks, when presented clearly and tailored to the individual, enable them to engage thoughtfully with the transformative powers of BMI technology.

Other strategies could certainly be proposed to address the challenges that BMI use might present. My aim here, however, was simply to provide an indicative example of a possible approach. Counselling works here as a procedural safeguard that is compatible with Nozickian libertarianism in two respects: first, it recognises the importance of structure-

[43] E. Gordon, *Human Enhancement and Well-Being* cit., p. 72; J. McLeod, *An Introduction to Counselling*, Open University Press, London 2013, p. 69.
[44] E. Gordon, *Human Enhancement and Well-Being* cit., p. 74.

ing our lives around meaningful ways of living, and second, it respects autonomy and freedom by not interfering with individual rights but protecting them. Non-directive counselling achieves this.

We cannot deny that individuals enter agreements to use BMIs voluntarily, just as they should not be prevented from making other significant personal choices, some of them so extreme as selling themselves into slavery. However, the critical issue lies in the fact that it is virtually impossible for individuals considering BMI use to fully understand the potential implications for their privacy and, more importantly, their agency, identity, and autonomy.

The model of enhanced informed consent I sketched here may be beneficial for both individuals and BMI providers. It allows for a comprehensive discussion of possible scenarios and consequences, providing individuals with comprehensive information about the short- and long-term effects that BMI technology could have on their daily lives. The counselling requirement that serves as a procedural safeguard is a superior strategy vis-à-vis substantive prohibition or other paternalistic policies.

In this way, informed and cautious access to BMIs is at least more plausible than the absence of any safeguards. This is particularly important because BMIs, ironically, have the potential to undermine the very autonomy they aim to enhance, whether through exploitation, dependency, or loss of privacy.

5. Conclusion

Once BMI technology becomes widely available, it is expected that individuals will want to use it for various reasons. They should be allowed to do so as autonomous, rational agents who are willing to take the associated risks. However, because BMIs are highly disruptive and their effects are still largely unknown, it is reasonable to argue that access to them should be conditional upon the prospective user demonstrating a solid understanding of what is at stake. While it is true that fully understanding the consequences of using a BMI (particularly how it might affect one's privacy, agency, identity, and autonomy) is nearly impossible, procedural safeguards could be adopted to mitigate potential unintended consequences. In this context, I have discussed one such safeguard: a model of enhanced informed consent.

This model involves counselling sessions, allowing individuals to discuss potential scenarios, risks, and long-term effects of using BMIs. Through these sessions, users are expected to gain a deeper understanding of how the technology might impact their daily activities and future aspirations. The counselling requirement serves as a procedural safeguard that supports informed decision-making without imposing unnecessary restrictions on individual freedom. From a Nozickian standpoint, this appears to be a reasonable approach that avoids hindering personal freedom while promoting individual autonomy and responsibility. It fosters autonomy by ensuring individuals have the knowledge needed to make responsible choices and it also helps avoiding the dangers of exploitation, dependency, or loss of privacy that could undermine the very autonomy that BMIs aim to enhance. Enhanced informed consent offers a balanced ethical framework for engaging with transformative technologies such as BMIs.