



Neurorights - Minding the Integrity of Mind

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ARTICLE INFO		ABSTRACT
Article History:		<i>Rapid development in neuroscience in the recent years has ushered in a new era in accessing, maneuvering and sharing information from human brain. Manipulation of the human neural processes through neurological technologies has posed a profound threat to human dignity and privacy with a grave risk to violate the ultimate sanctuary of human freedom – his mind. The application of such neurotechnologies pose prominent challenges to human rights values and several ethical and legal concerns must be focused in order to counter any inadvertent effects. The allusions posed by the emergence of contemporary neurotechnology with reference to the current human rights mechanism are evaluated in this paper and it is concluded that existing human rights regime is insufficient to address these emergent concerns. An inclusive analysis of the liaison between human rights and neurotechnologies represents the dire need of four new human rights that may adopt prime importance in the near future. These rights are as to mental privacy, mental integrity, cognitive liberty, and the psychological continuity.</i>
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Introduction

In 1878, electrical signals were transmitted through an animal's brain by Richard Canton, exactly after 46 years of this breakthrough achievement, the first human EEG was recorded. A transformation in neurological engineering is taking place since then (Illes, 2003). The conjunction of neuroengineering with the extra-clinical fields such as military and judiciary has triggered the public curiosity regarding socio-ethical and legal implications of the technologies capable to communicate directly with the human brain. In a broader sense, neurotechnology refers to a variety of methods used to monitor, record and/or influence neural activity of human brain. Due to the increased academic and general interest regarding this emerging technology, new disciplines and subdisciplines such as neuroethics and neurolaw have emerged. While describing neuroethics, it is simply an analysis of what is manipulation or good or bad invasion of human brain (Safire, 2002).

The term, neurolaw, was coined in 1990s by J.S. Taylor to denote the growing collaboration area between the lawyers and neuropsychologists (Taylor, 1991). Subsequently, the ambit of neurolaw was expanded to cover all the connecting areas between the law and neuroscience (Shen, 2013).

Since the beginning of this century, lawyers and the neuropsychologists have started to examine the ethical and legal implications of neuroscience and neurotechnology while considering the globally recognized normative philosophies such as duties and associated rights. This kind of analysis is now recognized as neurorights. Boire (Boire, 2001) and Sententia (Sententia, 2004) made a vital development towards neurorights by developing and elaborating the concept of cognitive liberty, which is the freedom to regulate one's own neural thought process. The concept of neurorights was reaffirmed by Bublitiz in 2013 who identified the right to cognitive liberty as a fundamental human right certifying one's dominion over his neural thought process (Bublitiz, 2013). Lenca and Andorno introduced the term "neurorights" in 2017 while working on their doctrinal analysis. They concluded their research by stating that existing human rights regime is insufficient to redress the issues raised by modern neurotechnological developments and identified four new neurorights to address the same, the rights included the right to mental privacy, mental integrity, cognitive liberty, and the psychological continuity (Lenca & Andorno, 2017). Another attempt to investigate the interlink between human rights and neurotechnology was made by Sommaggio and Mazzaocca in 2020 where they concluded that the idea of cognitive liberty is foundational in order to develop a functioning neurorights regime (Sommaggio & Mazzocca, 2020).

Currently, a wide range of neuroimaging technologies are commercially and clinically available making it possible to display and understand the patterns of activity of human brain. The neurotechnological innovations are unlocking human brain, making it readable through scientific lenses. It is expected that in near future neurotechnology will be embedded in many aspects of our lives and it will effectively mold our psychology and behaviour. While encouraging the continuous development in field of neurotechnology, this paper argues that we have to consider its legal and ethical implications proactively. International legal mechanism needs to be ready in order to respond the future threats caused by the emergence of neurotechnology, specifically with reference to the human rights. With the neurotechnological advancements, it has become crucial to determine whether contemporary human rights regime has the capacity to tackle the novel threats caused by the brain computer society entanglement, concurrently to provide help to technology developers and researchers in order to develop human rights respecting technologies.

Neurotechnology and Human Rights

Though neurotechnology is potentially undermining core human values and rights such as freedom against self-incrimination, right to privacy, mental integrity, and fair trial etc. yet contemporary International human rights regime is silent on all these issues. As compared to other biomedical advancements which are regulated under certain standard domestic as well as international regulations, neurotechnology remains an uncharted territory for human rights law which urges an immediate and efficient response from current human rights law regime. Neurotechnology requires that same pre-emptive response from the international human rights organizations that they showed to address the issues caused by the modern genetic technology by proactively devising Universal Declaration on Human Genome and Human Rights (UDHGHR), 1997 International Declaration on Human Genetic Data (IDHGD), 2003 and Universal Declaration on Bioethics and Human Rights (UDBHR), 2005 (Andorno, 2013).

It is evident from the historical trails of the genetic-revolution that the current neurotechnological-revolution will undeniably restructure at least a few of our ethical and legal philosophies. Easy accessibility of neurodevices in the near future will make the emergence of new rights inevitable making it mandatory either to make new laws or to develop the existing ones to protect the human race against novel threats caused by the neurotechnology. This notion is also supplemented by the perception as to the historical development of human rights into contemporary societies, human rights have always surfaced as a reaction to some recurrent threat to our fundamental interests (Nickel, 1987).

A usual opposition that we have to face while claiming to introduce any new right as fundamental right is that it could lead to right inflation, which is harmful as it weakens the philosophical foundation of core human rights and diverts us from the fundamental object behind human rights legislation, which is to safeguard strictly fundamental human rights, not all the things which would be ethically desired or beneficial in utopian society. Implementation of some vindicatory checks with reference to specific human rights could be a practical solution to prevent such human rights inflation. Philip Alston has suggested such certain points that a claim must comply with to be categorized as human right under international law (Alston, 1984). According to him, any proposed human right must relate to some important, consistent social problem, capable to achieve global agreement and should be specific enough to create perceptible rights and duties.

The rapid growth of brain technology has transformed the digital foundation of our society and our infosphere is in continuous transition. We need is to proactively access the ability of contemporary human rights regime in order to respond this evolving scenario.

Right To Mental Integrity

Physical or bodily integrity related right safeguards us against the bodily harm whereas mental integrity specific right guards us against the intrusion of mind. Though the critics argue that the mind is already protected as the brain is contained within the body so any efforts to further protect it will be superfluous. Such argument completely ignores the neurotechnological advents which has made it possible to interfere with the mind without interfering with the body. For instance, non-implantable Brain Computer Interfaces (BCIs) have the capability to affect human brain activity by seriously encroaching one's neural thought process, without intercepting his right to bodily integrity (Lighthart, 2023). Though a few neurotechnologies could be avoided on the pretext of bodily integrity but this right fails while dealing with the non-implantable neurotechnologies which are essentially non-invasive (Fox & Stein, 2015).

Since our central nervous system empowers our mind, the very idea of self or personhood is basically a state of mind. We can logically recognize the right to mental integrity as it shares the same philosophical foundation as the right to physical integrity, both of these rights rely upon the idea of self-ownership and individual's sovereignty (Bublitz & Merkel, Criminal Law and Philosophy 8 (1), 2014). The hypothesis of right to mental integrity fosters multiple questions for example, what is the criteria to classify any act as metal interference and exactly what type of mental interference? is it essential for a mental interference to be of harmful nature or at least of significant effects in order to be considered as an infringement of right to mental integrity? Considering the societal dynamins that every actor continuously affects other actors, vulnerability of the right to mental integrity poses serious threats at a larger scale. Consequently, it needs to be explained in a way that differentiates the breaches of mental integrity from undamaging and

unavoidable categories of mental influence, for example legally accepted argument-based inducement (Jotterand, 2022).

Right To Mental Privacy

Simply stated, mental privacy means a right to private emotions, feelings, thoughts and brain data. Whenever it comes to modern technologies and their anticipated threats to human race science fiction could be of great help, not only to anticipate the intensity of the threats but also to form a plausible response accordingly. A science fiction novel 'Star Trek', written in 1990s not only discussed the concept of mental privacy but also referred a fully function legal mechanism to deal with the violators. In the novel (p. 150) the captain of the ship 'Enterprise' who wanted to have access to brain data of all the visitors on the ship in order to catch a spy was reminded by one of his assistants that such action could only be warranted after adoption of due process of law otherwise it will be a sheer violation of right mental privacy (Mitchell, 1990).

Mind is the ultimate fortress of our protected information. However, neurotechnological developments have challenged it. Now we can access, analyze, and examine one's internal feelings and thoughts (Ligthart, 2023). Neurotechnology such as neuroimaging has bestowed upon us the ability to infer certain results with high accuracy by observing and examining the neural activity during cognitive activities. So, though in an indirect way, the modern neurological inventions have provided us with the means to have such brain data which is related to a person's private life and which should be shielded against public inspection or scrutiny.

Considering all types of personal data, brain data is the most delicate and valued (UNESCO, 2023) and its analysis enables us to anticipate the response of an individual regarding anything ranging from favorite color, political leaning and sexual orientation. For example, it is claimed that computer vision algorithm is capable to predict a person's sexuality from a single facial image (Wang & Kosinski, 2018). Privacy risks are of prime importance while dealing with the brain data due to its oblique use (Ligthart, 2023). What make these risks even worse, is the use of the brain data by the governmental agencies – particularly those which are previously involved with human rights violations.

Presently, many non-implantable devices, such as smart watches are monitoring bodily functions and are allowed by their users to record corresponding medical and geological information. If the brain data is added with this information, the extraction of sensitive personal information regarding an individual would be possible at an unprecedented scale (UNESCO, 2023). Though, Article 12 of UDHR and 17 of ICCPR ensure one's privacy in general but right to mental privacy remains unattended in these international instruments of prime importance despite the fact, brain data makes us what we are. It is pertinent to mention here that intrusion of mental integrity specific rights is not dependent upon the direct invasion into one's neural system. For example, external EEG repositories and databases are used to store the brain data for research or other medical purposes. Likewise, brain information collected by consumer grade BCI is shared with a connected application which stores it on cloud or at some other externally located databases. In any case, this private brain data could be accessed or hijacked without the presence or knowledge of the owner of that brain data and it all will be done without invading his brain signaling.

All these challenges have made it impossible for the existing data privacy and protection laws to protect us against neurotechnological scenarios. Inclusion of mental privacy right into the fundamental right regime is essential to guard one's personhood and inner life. This right will

provide protection to one's conscious and unconscious brainwaves as data as well as data generators. Hence, the basic aim behind the formal introduction of mental privacy focused right

is the fortification of the individuals regarding unethical and unlawful access or use of their private brain data and the stoppage of the flow of same data throughout the infosphere.

Right To Cognitive Liberty

Where the mind could be protected against illegitimate access and inspection by introducing mental privacy focused rights, mental states could be safeguarded from external illegitimate influence and intrusion by introducing right to cognitive liberty (Lighthart, 2023). Bublitz has defined the notion of cognitive liberty as mental self-determination, consisting of two basic and interconnected principles: (i) free will of the individual while using modern neuro technologies (ii) the individual is protected against coercive or unconsented use of neurotechnology (Bublitz, 2013). Cognitive liberty is a difficult and multi-dimensional notion. Bublitz identified its three interconnected but unidentical dimensions: (i) freedom to choose the change of one's mind and to select the means to do so (ii) protection against unethical or illegal intrusion into others mind, and (iii) duty to promote cognitive liberty (socially, ethically and legally). Putting it simply, right to cognitive liberty includes positive as well as negative cognitive freedoms. Positive right contains to control freely one's own mind and the negative right contains a right to be sheltered against external illegitimate control or/and interference (Berlin, 1959).

Since all human beings inherently enjoy their cognitive life, in different forms and degrees, the notion of cognitive liberty is in consonance with the idea of fundamental rights, inalienable in their very nature and the only criteria for their entitlement is to be a human being without any reference to their colour, ethnicity, sex, religion or nationality (Sepuldeva, Banning, & Genugten, 2004). Therefore, its incorporation into the contemporary human rights regime will safeguard such core values of human beings that are not previously protected under the current human rights mechanism. Concisely, if law considers the persons responsible for their actions and declares them liable for the consequences of their mental states (*mens-rea*), assuming that they had free will to decide, then, as consequent the law must provide them with the freedom of self-determination. The legal theory of liability cannot survive without the underlying concept of self-determination. Cognitive liberty cannot be defined as only a discretionary political right, rather it is an implied postulation of every legal order which depends on personal self-determination and accountability (Bublitz, 2013).

Mental integrity is not at risk only due to the mischievous brain-hacking or other illegal activities. Use of brain computer interface (BCI) technology in military in order to enhance the capacity of warfighter, illicitly alters their neural computation as well (Lebedev & et., 2011).

Brain stimulation is another area where mental integrity right is compromised. As the portable brain stimulators are readily available in the market, there exists a great risk that these devices will be misused by the people. Medical field is also not exempted from the probable use of right to mental integrity. Medical innovations for example deep brain stimulation (DBS) where electrical impulses are used to change one's neural processing. Though this procedure is medically beneficial, it has its own adverse effects at times, such as hallucination, empathy and compulsive behaviour (Mackenzie, 2011). Conclusively, memory engineering poses a vibrant trial to mental integrity. So far, many techniques have been devised in order to boost or erase some specific memory (memory engineering) from one's mind, though not yet been tested on human subjects (Nabavi & et., 2014). The initial findings of such techniques are indicative of big success while

being used to treat diseases such as Alzheimer's and PTSD. Concurrently, though, the abusive use of these techniques may cause unparalleled prospects for brain washing and mind manipulation. For instance, criminals could erase selective memories from their victim's brain either to ensure their anonymity or to simply cause them further harm. Furthermore, in the longer run, such technologies could be used by security or surveillance agencies to remove harmful or even just inconvenient recollections from people's brain. The same concept was pictured in the movie *Men in Black* in which a handheld device *neuralyzer* was used to wipe alien encounters memories from people's mind. There are many vital motivations behind illegitimate memory engineering, ranging from expansion of national security to have control over groups or individuals.

Inclusion of mental integrity right into the fundamental human rights regime would deliver a precise normative defense from probable neurotechnological intrusions involving illegitimate change of one's neural computation consequently causing him potential harm. Certain requirements that must be met in order to classify any harm as threat to mental integrity include: (a) unsanctioned direct access to an individual's neural signaling to manipulate them, and (b) causing of psychological or/and physical harm. The rapid inclusion of neurotechnology into our digital ecosystem and the swift entry of neural computation into the infosphere has endangered the mental integrity of the individuals if explicit defensive protocols are not implemented.

Right To Psychological Continuity or Personal Identity

Illegal use of developing neurotechnology is capable to put people's perception regarding their individuality at risk. As we have discussed earlier that neurotechnology is not only being used to observe brain signals but is also used to stimulate or temper brain functions as in the case of deep brain stimulation (DBS), transcranial direct current stimulation (tDCS), and transcranial magnetic stimulation (TMS). However, changes in the brain patterns through brain stimulation can cause inadvertent alterations in one's mental conditions critical to personality, thereby affecting a person's personal identity (Decker & Fleischer, 2008). Multiple scientific studies have shown that brain simulation have affected the psychological continuity of a person (Klaming & Haselager, 2013). Scientific research involving DBS treated patients articulated that most of the patients complained a sensation of unfamiliarity or strangeness with themselves after the procedure (Schüpbach & et., 2006). The same goes to memory engineering, where selected memories of a person, related to his self-recognition, are either altered or removed. The fundamental aim of right to psychological continuity or personal identity is to protect one's individuality and the uniformity of one's behaviour against unconsented modifications by an outside forces or third parties. It protects the continuity of habitual thoughts, choices and preferences of a person by safeguarding his neural functioning.

Undoubtedly, we need experimentation in order to determine the scope and occurrences of these behavior related variations caused by the psychological elements, and criminal law as well as the law of torts have to determine the impact of these deviations on accountability and liability. This paper is not concerned with these liability and accountability dilemmas rather its primary focus is the violations of fundamental human rights caused by the contemporary neurotechnology, whether by means of neuro-stimulation or memory engineering. Warranting psychological continuity is neuro-focused extension of identity specific rights depending upon the fundamental concept of right to private life provided under Article 8 of the European Convention on Human Rights.

Both rights, as to psychological continuity and mental integrity are intertwined and overlapping. Both are meant to protect the mind against illegal and unconsented alterations. The only difference

is that the psychological continuity related right is applicable in those circumstances as well where mental or neural harm is not directly inflicted, on the other hand mental harm is a pre-requisite in order to qualify an offence against one's mental integrity. Right to psychological continuity could provide a safeguard against revolutionized form of brain washing, such as TMS that could be used in order to alter neural calculations of one's brain for the attainment of specific political, religious, or social ends (Holbrook & et., 2016). Currently, it is a difficult question to respond whether the implementation of psychological specific rights should be absolute or relative. It would be logical to use neurotechnology to cause personality variations while dealing with the persistent offenders involved in the commission of violent crimes. Public interest will provide a rationale foundation to adopt such measures to protect the society against extremely dangerous persons who are inclined to repeat the crime if released. It will not be a bad deal for those persons themselves, who will be imprisoned for life otherwise. Though, we have to be extremely careful and extensive public opinion is crucial before permitting such deliberate interruption into one's personality.

Conclusion

Unprecedented development in neurotechnology and AI is challenging our ways how we look and think about fundamental human rights. The history of science is full of precedents where disruptive technological developments have caused normative evolution. For instance, the invention of the medical ventilator introduced the concept of brain death and consequently the law had to declare, in clear terms, the integral bodily functions that are required in order to declare a man alive. Likewise, advancements in the genome editing and genetic sequence provided the philosophical foundation to the contemporary international human rights instruments such as Universal Declaration on Human Genome and Human Rights (UDHGHR, 1997) and International Declaration on Human Genetic Data (IDHGD, 2003). These instruments presented novel human rights such as "right to be informed about one's genetic information."

Threats to human values posed by the illegitimate or unconsented use of neurotechnology are far more serious in comparison to those which are visible through orthodox legal lens. It is expected that neurorights shall tail a comparable historical trajectory in a way that increases the capability of our human rights regime to tackle the grave challenges posed by modern scientific innovations. Mental integrity and privacy focused rights along with the right to personal identity and cognitive liberty are distinct notions that necessitate a reconceptualization of traditional human rights regime to encourage sustainable development in the age of neuroscience and neurotechnology.

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