

Codifying Neurorights: A Legal Imperative for the Neural Age

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ABSTRACT

The rapid developments in the field of neurotechnology and neuroscience have caused profound challenges to individual rights, particularly regarding mental integrity and privacy. This paper discusses neurorights as the required legal and ethical framework to protect cognitive autonomy in the digital era. The study is based on preliminary research on neuroethics and human rights law and highlights the inadequacy of the current legal frameworks to respond to the intrusive potential of neurotechnologies that can bypass consent requirements and can access and modify neural data. The study argues that mental integrity and privacy, which are the fundamental aspects of human dignity, are more threatened than ever, requiring an immediate regulatory and normative response. The research recommends that in order to ensure the benefits of neurotechnology, without undermining human dignity, the states and institutions need to codify neurorights as part of emerging human rights regime in the neural age.

Key Words: *Neurorights, Neuroethics, Neurotechnologies, Mental Integrity, Mental Privacy*

INTRODUCTION

The domain of neuro-rights emerged in response to the rapid advancements in the field of neuroscience and neurotechnologies, which, while enhancing our comprehension as to the functioning of the human brain, has also caused considerable ethical and social dilemmas concerning the protection of individual rights, privacy, and mental autonomy.ⁱ The first discussions of neuro-rights originated in the 1990s, notably with writers such as Judy Illes, who started an examination of the ethical ramifications of emerging brain technology.ⁱⁱ In 2002, the United Nations Educational, Scientific and Cultural Organisation (UNESCO) held a conference on neuroethics, addressing the difficulties and possibilities presented by neurotechnologies and advocating for the establishment of an ethical framework for their research and implementation.

The term neurorights refers to a novel category of rights designed to safeguard mental integrity against the exploitation of neurotechnologies. It is particularly concerning as there is no specific international legislation which effectively protects fundamental human liberties, such as integrity and privacy, against the overreach of multinational firms engaged in neurotechnology trade.ⁱⁱⁱ Lopez-Silva and Madrid^{iv} illustrate a robust correlation between the words "mental" and "psychic," linking them to the term "psychological." Furthermore, they propose substituting "neural" with "cerebral," due to the significant correlation between the two concepts. In this context, "mental" is intricately associated with "mental privacy," a term often used to denote the secrecy of neurological data. It is essential to recognise that, contingent upon the application area and the historical-cultural context of each situation, the complexity of this issue may elicit diverse answers. Parlatino asserts that neuro-rights, or brain rights, constitute a

novel international legal framework that prioritises the safeguarding of the brain and its functioning alongside existing human rights. These rights include the entitlement to personal identification, mental privacy, and uniqueness.

Neurotechnologies pertain to technologies aimed at enhancing the neurological system.^v Experts maintain that neurotechnologies include a diverse array of techniques and devices that interact with the brain and nervous system broadly, either passively monitoring or actively modifying their functions.^{vi} Numerous recent studies indicate that the advantages of neurotechnology are being explored in the workplace, however, there are concerns regarding the potential threats as to the infringement of privacy, free choice, and human dignity.

Neurotechnological research on the brain presents significant issues, necessitating legislative efforts for the protection of neurorights, against the use of techniques and tools that interface with the nervous system. The use of neurotechnologies includes both their potential for human empowerment and their therapeutic capacity.^{vii} A primary issue about neurotechnology is its integration with AI, since it has the potential to undermine the fundamental nature of humanity. Similarly, neurotechnology displays the complexities of thoughts, emotions, subconscious processes, and neurological activity; nonetheless, issues concerning the respect for human dignity, rights, and fundamental freedoms remain largely unattended, notably in terms of personal data protection regulations.

Deep learning techniques are used for multi-dimensional data processing, considering the prevailing technical advancements, it is rather simple to get a remarkable volume of personal information from the data trails we consistently generate, including geographical locations and consumption patterns of items and services.^{viii} The earlier studies have revealed that movement patterns gathered from cellphones throughout people's everyday activities were effective for early detection of cognitive deterioration.^{ix} Neurotechnologies extend beyond the medical domain, revealing both opportunities and challenges in cognitive processes. They facilitate the development of preventive and therapeutic diagnoses; in this context, neurotechnologies have gained traction in Latin America and the Caribbean, where UNESCO has conducted a series of studies integrating the human genome with artificial intelligence. The rapid progression of neurotechnologies fueled by big data and artificial intelligence, necessitates the emergence of novel legal categories related to cognitive abilities, such as neurolaw, to protect the mental dimensions of human functioning and ensure comprehensive protection of human rights.

Mental Integrity and Neurotechnologies

Throughout the 20th century, with an expanding understanding of disorders and illnesses capable of influencing human consciousness, there has been a profusion of legal standards aimed at safeguarding and fighting for the rights of those coping with mental illness. Mental disturbance is marked by the clinically substantial impairment in cognitive function, emotional control, or behaviour, typically accompanied by distress or severe functional restrictions. The phrase “mental health disorder” comprises a range of problems, including mental disorders, different types of psychosocial impairments, and other pathological mental states which imply severe discomfort, functional impairment, or risk of self-harm.^x

However, with the exception of persons affected with certain diseases, everyone is subject to mental or cognitive affects coming from psychological abuse, threats, manipulation, and similar variables. These sorts of exposure may severely influence both an individual's psychological well-being and their ability for decision-making. In this context it is reasonable to assert that the right to mental integrity comprises a basic human right assuring protection from any interference capable of compromising one's mental health. This right comprises freedom from torture, cruel, inhuman, or degrading treatment or punishment; the

right to privacy and family life; the right to freedom of thought, conscience, and religion; and access to health-care services.^{xi}

The human mind, being a complicated machine, not only effects the mental and physical well-being of the person but also has repercussions for people in their surrounding environment. Considering the contradicting character of various verdicts, it becomes evident that any dispute regarding the preservation of the right to mental integrity should be assessed not merely based on existing documents but also on precedent established by past instances. The right to mental integrity represents a basic human right defending the inner world of a person, including their ideas, emotions, and feelings, from external influences. This right is vital for the protection the dignity and freedom inherent to every human. The idea of personal integrity comprises both physical and mental components, as described in Article 3 of the Charter of Fundamental Rights of the European Union and Article 5 of the European Convention on Human Rights. The confidentiality of neural data related to neurotechnology applications can compromise mental integrity, as unauthorised access to modify electrical stimulation parameters may lead to manipulation of brain-computer interface devices, potentially harming the individual's psychological well-being.^{xii} Moreover, mental freedom is linked to mental integrity, as it underscores individuals' rights to govern their own cognitive processes and to make independent decisions about cognitive enhancements or interventions.

A person demonstrates mental integrity if he is able to express and defend his views and values in the face of pressure from other people to change or forsake them. We may interpret mental integrity in terms of freedom from harmful interference^{xiii} and the right to govern our own mental states.^{xiv} Moreover, in our vanity, we want to believe that we have a great degree of control over our thoughts and emotions, and that they are somehow regulated and governed by rationality. This is a fallacy that we prefer to believe. As a result, the concept that our ideas and emotions are being influenced is often seen in a negative way. We are, of course, continuously exposed to a variety of mental interferences, such as sentimental films, political advertisements, and social media; but, we are normally unconcerned if we assume, maybe incorrectly, that we are aware of the interference and that we are able to maintain our freedom of thought. It is a worrisome fact that neurotechnology undermines or circumvents mental autonomy via "surreptitious" or forceful techniques. It is precisely this impression that is at the centre of the arguments that are taking place over cognitive improvement. Attempting to alter one's ideas and values through reason, debate, or even an appeal to emotion is one thing; attempting to do so with the use of neuropharmacology is an entirely other thing. It is important to note that the violation of mental autonomy is the aspect that is of special significance. For the reason that it is quite probable that we would be less worried about such direct interventions into the brain if they were only carried out with our agreement under voluntary circumstances.

Both the first-person character of our mental processes and the concept of mental privacy are intimately connected to the concept of mental integrity. Although we are likely to accept the view that many of our mental states have behavioural aspects. For example, to be happy is to feel and to behave in a particular way, we are also likely to believe that thoughts and feelings are directly accessible only to the subject who is thinking and experiencing them, and that the content of these thoughts and feelings is specific to the subject in terms of both what they are about and how they are experienced. To put it simply, I am the only one who can experience my happiness, and it is not the same as yours.

The concept that neurotechnology has the potential to compromise mental integrity has resulted in the formulation of a right to mental integrity, which safeguards individuals against mental interference not stemming from their own free will.^{xv} Such a right would not have been necessary until recently, since the right to bodily integrity would have likely protected the objectives that such a right aims to safeguard, this

is because the right to bodily integrity would have likely sufficient to preserve the goals it seeks to uphold. The emergence of neuro-technologies that may endanger mental integrity without breaching bodily autonomy has led to the emergence of such a right.^{xvi}

Mental Privacy and Neurotechnologies

The right to privacy is a basic human right which protects people from undue interference into their personal lives, allowing them to govern their personal information. Our neural data is constituted of information linked to the anatomy and functioning of our brain, commonly obtained using technologies such as neuroimaging or brain-computer interfaces.^{xvii} Hertz asserts that mental autonomy pertains to mental self-determination, namely the ability to choose and exert control over one's mental states, which may be influenced or conditioned by external parties without permission. The concept of freedom was articulated by Wrye Sententia in 2004, who posits that rights and freedoms are dictated by individual conscience and cognition.^{xviii} Conversely, Bublitz suggests that individuals possess the right to modify and improve their mental states, as well as to reject the use of devices that may manipulate those states. Mental freedom pertains to the freedom of mind acknowledged in human rights, and it is essential to elucidate that this freedom encompasses the internal aspect of mental activity.

The right to mental privacy pertains to the access of neural data that underpins neurotechnologies, aiming to safeguard against non-consensual access to one's neural data by third parties, including advertising firms, insurers, employers, and governmental entities. This respect is articulated in international human rights standards that encompass the confidentiality of personal data, asserting that there shall be no arbitrary interference in an individual's private life, family, home, honour, or reputation. Concerns exist regarding the safeguarding of neural data due to a legal interpretation not explicitly outlined in existing laws; therefore, these regulations require clarification to ensure the privacy of such data and to prevent discrepancies in juristic opinions.^{xix} This neural information is concerning as it may serve as biometric data for personal identification and might be used in the future for discriminatory practices related to mental health and cognitive capacities.^{xx} Any neurotechnology which links the brains of humans to the Internet, introduces the prospect of monitoring or altering the mental experience of a certain individual. For example, the algorithms used to target advertising, or match making would be substantially more precise if they were based on our neurological information.

Bublitz and Merkel contend that privacy and mental integrity are essential parts of ethical issues connected to breakthroughs in neuroscience and neurotechnology. Mental integrity is concerned with protecting the autonomy and integrity of an individual's cognitive processes and mental functions which are essential for the fundamental right to privacy. The use of neuro-technologies, particularly those which directly interact with the brain, raises worries regarding the possible influence on mental autonomy and mental integrity. The ethical use of neurotechnologies should prevent coercion or manipulation which might impair an individual's mental integrity by infringing upon his mental privacy. It is important to consider that mental integrity is vital to foresee and avoid unintended outcomes of neurotechnological treatments, especially those which may damage an individual's mental well-being. Achieving equilibrium between scientific advancement and the protection of individual rights is essential in this developing ethical framework.^{xxi} The laws must safeguard individual privacy by restricting and regulating third-party access to neural data and preventing the illegal collection, utilization, and dissemination of such information.

The interplay between the right to privacy and neural data is a multifaceted and dynamic concern. Unlike sensitive patient data received from medical devices in clinical settings, which are fundamentally protected by health legislation, the data surrounding consumer neurotechnologies is widely unregulated.

As technology progresses, so does the capacity to collect, interpret, and modify neurological data grows, consequently posing unique socio-ethical and legal challenges, including: Concerns regarding informed consent related to the acquisition and use of brain data. Secondly, the question of establishing who is the proprietor of brain data is of crucial importance. Thirdly, due to the very sensitive nature of brain data, there exists a danger of disclosing personal information, including an individual's emotions and cognitive capabilities. Fourthly, neuroethics explores the ethical implications of neuroscience and the use of neurological data. Fifthly, current legal frameworks may need modification to tackle the issues presented by neural data. In sixth and last position, it is vital to guarantee that the use of neurological data is aligned with social values and norms, owing to the harm that may be produced. In response to these issues, many legislative and regulatory strategies have been suggested to regulate access to and disclosure of neural data.

Potential Answers to the Emerging Threats

(i) Informed consent

Informed consent has a globally acknowledged legal foundation. It is regarded as a foundational premise in both legal and ethical systems. The principle of informed consent is founded on the respect for human autonomy and the freedom to make informed choices about one's own body, including involvement in research or medical interventions. Given that people possess the right to understand the rationale and purpose behind the acquisition of their data, why should this concept not extend to the collection and use of their neurological data?

Although a universal rule on informed consent does not exist, several international declarations and recommendations underscore its significance. The Nuremberg Code (German: Nürnberger Kodex), one of the first international instruments established post-World War II, established the foundational ethical standards for human experimentation. It underscores voluntarily informed consent as a fundamental prerequisite.

The Declaration of Helsinki, established by the World Medical Association (WMA), is a recognised framework of ethical principles for medical research involving human subjects. It underscores the need of voluntary permission and delineates explicit criteria for the ethical execution of research. Numerous nations have integrated the tenets of the Declaration of Helsinki into their national policies.

The Council for International Organisations of Medical Sciences (CIOMS), in conjunction with the World Health Organisation (WHO), established the International Ethical Guidelines for Biomedical Research Involving Human Subjects. These guidelines provide advice for the ethical conduct of biomedical research and emphasise the significance of informed consent, outlining the essential components of the informed consent procedure.

The United Nations Educational, Scientific and Cultural Organisation (UNESCO) has promulgated many statements pertinent to bioethics. The need of informed consent is highlighted in each of these articles. The Universal Declaration on Bioethics and Human Rights emphasises the need of voluntary and informed consent in medical research and treatment. The acquisition of brain data, mostly through medical procedures, requires the patient's informed consent. This criteria is essential to ensure that individual fully comprehends the intent, scope, and potential consequences of having his brain activity data collected.

The aforementioned international standards provide a foundation for informed consent, however their enforcement may differ at the local level. Several nations integrated these international standards into their own legal systems concerning health care. Researchers and healthcare practitioners are obligated to uphold ethical standards and conform to legal requirements at a private level. A preliminary approach may entail including informed permission as a prerequisite in activities that involve neural data, in accordance with international conventions and declarations, referred to as soft law. Consequently, we may go from non-binding standards to binding international law treaties and subsequently to the domestic law of States.

(ii) Proprietorship of neural data

The question of identifying the owner of neural data is paramount. It is both an ethical and a legal inquiry. From both perspectives, we may assert that neural data is intrinsic to the brain of each person. Individuals who produce neurological data has a rightful claim to ownership and authority over its use. This viewpoint emphasises the independence and the entitlement to privacy of persons regarding information obtained from their neural activity. The ownership of brain data is contingent upon many aspects, including the context of its collection, such as during medical treatment or research investigations. The outcome may also be contingent upon the characteristics of the data and the existing legal frameworks. In such instances, contracts or legal stipulations may determine ownership. In neuroscience research, the ownership of brain data may be regulated through informed consent contracts. In alternative legal contexts, such as employment relationships, ownership may be governed by employment or institutional laws. In collaborative academic research with various stakeholders, agreements on data ownership and distribution must be explicitly discussed and established. Certain scholars see academic knowledge, intellectual property rights, and ownership as crucial concerns, especially given the variability of data sharing and data protection legislation across different nations.^{xxii} With technological advancement, there is a need for transparent and ethical methods that protect human rights and interests while promoting scientific growth and innovation.

(iii) Safeguarding against illegal access

Neurological gadgets may access an individual's brain information without the owner's awareness. Neural violations may be more risky than conventional violations, since they may circumvent conscious thinking, leaving individuals defenceless against mind reading. Implementing stringent security protocols to safeguard neural data from unauthorised access, exploitation, or data breaches is essential. Consequently, brain waves must be safeguarded not just as personal information but also as sources of data. Researchers, such as Wolpe^{xxiii} and Stanley^{xxiv} posit that, in response to the fear of state tyranny, a boundary should be established to restrict state interference in the use of mind-reading technology. The skull should be classified as a realm of complete seclusion. Individuals should not be subjected to mental probing without their absolute knowledge.

Ideally, domestic legislations of all the countries worldwide should address legal and ethical concerns as to neuronal activity, since it underpins human cognition and consciousness. Neuronal activity should not be obtained from the brain without the individual's agreement, nor it should be used for commercial purposes. The mind comprises the individual and the functioning of his neurones. Both are solely ours, until we choose to share them.

(vi) Neuroethics

Neuroethics is a multidisciplinary domain that examines the ethical, legal, and social ramifications of advancements in neuroscience and neurotechnology. It examines enquiries about the ethical use of neuroscientific knowledge and the moral ramifications of treatments on the brain and nervous system. This emerging discipline examines the ramifications of neuroscience on human self-perception, ethics, and policy.^{xxv} Artificial intelligence technologies, especially those associated with neural networks, are being progressively used in neuroscience. Such technologies may assist in the interpretation of intricate cerebral data, facilitate the advancement of brain-computer interfaces (BCIs), and influence several facets of neuroscientific research and medicinal applications.

Concerns regarding proprietorship, personal privacy, informed consent, and the proper use of AI algorithms in brain data processing are essential aspects of the ethical utilisation of AI in neuroscience research. Three possible hazardous situations could be identified in this context. The advancement of BCIs, allowing direct connection between the brain and external equipment, prompts ethical enquiries over autonomy, identity, and possible upgrades. Secondly, ethical considerations arise while using AI-driven technology for cognitive development and performance optimisation. Thirdly, the use of AI in the analysis and interpretation of brain data raises significant problems regarding privacy and security of sensitive information.

(v) Judicial safeguarding

Although existing legal frameworks are trying to confront the distinct issues presented by neural data, the rapidity of technological advancement may render the notion of adaptation outdated, necessitating more dramatic legal changes. Legal safeguards for privacy may need extension, modification, or the creation of new frameworks to address the complexities of brain-related information. Contemporarily, we are experiencing a digital upheaval that may lead to legal disturbance. Neuroscientists have endeavoured to articulate the implications of neuroscience within the framework of legal norms to reassess legal standards, norms, and regulations for more accurate formulation. It seems more appropriate to assert that the neurobiological approach to legal norms creates novel legal effects by changing and improving the existing rules that regulate the interplay of traditional norms with neurobiology.

Jwa and Poldrack advocate for the establishment of stringent legal restrictions on the misuse of information obtained from neural data.^{xxvi} As a fundamental concept of the safeguarding of neural data, each owner must explicitly indicate their consent to share the data, irrespective of the originating equipment. The opt-in method must provide safety and security, detailing the data users, intended objectives, and duration of usage. This is analogous to the current requirements concerning personal information. According to that premise, further matters also need legislative clarifications. For instance, limiting the option to relinquish one's neural data or consenting to the integration of certain data into the brain in return for monetary compensation.

(vi) Neuro-values and neuro-principles

The terms neuro-values and neuro-principles lack a broadly accepted meaning. A 2021 extensive study on the ethical application of neurotechnologies emphasises the necessity for ethical awareness and direction: “regulators, researchers, and companies should prioritise collaboration with society, assuming the responsibility to ensure transparency and accountable leadership.”^{xxvii} The ethical and legal concepts grounded in shared values applicable to the use of neuro-technologies include respect for autonomy, beneficence, fairness, privacy, transparency, and non-maleficence, among these numerous principles are

customary laws acknowledged by national legislations. Although these principles are not officially designated as neuro-values, they may serve as a basis for ethical decision-making in neuroscience applications, given the distinctive characteristics of neural data and the possible ramifications of neurotechnologies. Effective communication and openness in the research and development of neurotechnologies foster confidence among stakeholders, including study participants, patients, and the general public. Lastly, non-maleficence underscores the duty to avoid damage, which includes reducing risks linked to neuroscientific research and applications, and ensuring that possible harms are offset by potential benefits.

CONCLUSION

The ethical and legal issues arising as the neurotechnologies develop at an unprecedented speed are complex, and seemingly hostile to any human rights protections currently in use. With an ever-growing availability and exploitability of neural data, the preservation of mental integrity and privacy must be urgently prioritized. The paper has illustrated that neurorights, which include cognitive liberty, and mental privacy are important in protecting human dignity in the wake of the novel threats. Existing legal frameworks are ill-equipped to address modern socio-legal challenges and the unique nature of neural data requires new legal definitions and regulatory mechanisms. In order to preserve mental autonomy and avoid the abuse of neurotechnological technologies, it is necessary to develop legal standards that would be binding, enforce informed consent, define data ownership, and implement neuroethics into the policy making. It is also important that a global, rights-based approach is introduced and implemented in order to ensure that technological advancement does not come at the cost of fundamental human liberties.

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