Centre for Health Law and Policy (CHLP)

TRANSCENDING THE NOTIONS OF HUMAN RIGHTS IN THE AGE OF NEUROSCIENCE

- *Kosha Doshi*[*]

ABSTRACT

"Genetics is crude, but neuroscience goes directly to work on the brain, and the mind follows" -

- Leon Kass

With boom in the genome project and its legal instrumentalities, the need for recognizing neuro-rights as basic human rights is the need of the hour. While setting a backdrop to human rights, the paper analyses existing literature review on neuro-rights through the lens of human rights. Building on this, the research gap is identified and objectives of this research is set forth. With an interdisciplinary approach, neurotechnology and the law is explored in light of 5 key rights of cognitive liberty, mental privacy, psychological continuity, and mental illness. Following which, the White and Gonsalves model is discussed whereby human rights grounded in human brain are sought in context of international human instrumentalities of UDHR, ECHR and ICCPR. The paper dwells into the dependence of neurolaw in courtrooms is dwelled in light of the recent Chile Act recognising neuro-rights as a wholistic concept. With empirical research, the nexus between neurotechnological advancements and human rights is analyzed. On a concluding note, the write-up presents several suggestions to bridge the gap in the existing legal framework.

Keywords: neurotechnology, human rights, ICCPR, ECHR, UDHR, neuro-rights

[*] The author is a law student at the Symbiosis Law School, Pune.

INTRODUCTION

Human Rights are typically universal rights endowed by virtue of being merely a human. Although no one grants people these rights, the State is bestowed with the responsibility of guaranteeing these universal, inalienable and indivisible rights. In the international domain, the sources of human law are international treaties, international customs, international instruments, precedents and official documentation. With origins traced back to the Code of Hammurabi, Cyrus Cylinder, Magna Carta and US Declaration of Independence; the landmark treaties securing and protecting human rights are '*UDHR, ICCPR, ICECSR, 2030 SDGs of UN'*[1]. All rights laid forth in these treaties are basically extension of the inherent dignity of humans. Conventional scope of human rights encompasses right to life, right of liberty, freedom of thoughts, religion, equality before law, non-discrimination and so on. During the 1970-1980s, the world began to plant the seed of bioethics. With technological advancements, the field of bioethics saw a surge and increased use in one's daily life. This brought forth the standard need to balance and regulate bioethic practices and its invasion in human rights boundaries[2]. As this was recognised, legal instruments such as '*Universal Declaration on Human Genome and Human Rights*' and '*International Declaration on Human Genetic Data'* were enacted for curbing human rights violations in the bioethical domain. In parallel, scientific experts have advocated for the incorporation of neuro-rights into the UN Charter, drawing from the advancements in neuroscientific and neurotechnological research over recent decades. This proposition is grounded in the evolving landscape of unconventional human rights.

LITERATURE REVIEW AND RESEARCH GAP

Sr. No.	Research Paper	Literature Review	Research Gap
1.	Towards New	With the neurotechnology revolution, the	While the author describes 4

[1] Laurie Pycroft, Sandra G. Boccard., Sarah L. F. Owen., John F. Stein, James J. Fitzgerald, Alexander L. Green & Tipu Z. Aziz, *Brainjacking: Implant Security Issues in Invasive Neuromodulation*, 92 WORLD NEUROSURG. 454, 462 (2016).

[2] Morris B. Hoffman, *Neuroscience cannot answer these questions: A response to G. and R. Murrow's essay hypothesizing a link between dehumanization, human rights abuses and public policy,* 3(1) J. LAW BIOSCI. 167,173 (2016).

	Human Rights in Age of Neuroscience and Neurotechnology[3] – Marcello Ienca and Roberto Andorno	paper analysis the intersection of law and neuroscience as it challenges the very foundation of human rights. On the basis of international instrumentalities, neuro rights are seen through 4 aspects: cognitive liberty, mental privacy, mental integration and psychological continuity.	rights to view human right violations with escalation of neurotechnological advancements, it fails to establish neurolaws and its need as an absolute domain in itself.
2.	Dignity Neuroscience: Universal Rights are Rooted in Human Brain Science[4] – Tara White and Gonsalves	The paper sets base of human rights international instruments and looks at 5 elements in this regime: agency, autonomy, self-determination; uniqueness; freedom from want and fear and unconditionality. Emerging from this, the author builds on the concept of dignity neuroscience.	While widening the horizon of neuro rights through the lens of human rights, the literature fades away and does not address the view of how neurolaw can be built and extended based on recent bioethical laws and rights as in the international legal framework.
3.	Freedom of Thought in the Age of Neuroscience – A Plea and Proposal for the Renaissance of a Forgotten Fundamental Right[5] – Jan Christoph Bublitz	Research is specifically aimed towards the freedom of thought and the new notion in neurotechnology. With the historical concept of liberty, the paper builds on the 2 types of freedom of thought: forum interim and forum externum. Interventions in through freedom of thought like neuroimaging, deep brain stimulation, neuromarketing, neuroenhancement and sanctions for mere criminal thoughts is explored.	Despite the discussion of various intervention technologies, there is a gap in research as the human right violation is seen only in the light of freedom of thoughts. Additionally, it lays down basic principles in context of state violations but neglects that in the modern welfare state, non-actors play a key role and due to this include scope for violations from

[3] Marcello Ienca & Roberto Andorno, *Towards New Human Rights in Age of Neuroscience and Neurotechnology*, 13 LIFE SCI SOC POLICY 5, 1 (2017).
[4] Tara White & Gonsalves, *Dignity Neuroscience: Universal Rights are Rooted in Human Brain Science*, 1505 ANN. N. Y. ACAD. SCI. 1, 40- 54 (2021).
[5] Jan Christoph Bublitz, *Freedom of Thought in the Age of Neuroscience – A Plea and Proposal for the Renaissance of a Forgotten Fundamental Right*, 100 ARSP 1, 1- 25 (2014).

			their side.
4.	Considering Advances in Neuroscience through the lenses of Law and Human Rights[6] – Mark Frankel	Through public dialogue, the author establishes human rights law and neuroscience. It discusses Commissions, AAAS researches and CASE Projects which recognize the interrelation between neurological advancements and human rights.	Although it establishes a union between neuroscience and human rights, it fails to answer specific questions: where, how and when neurotech violates human rights. It falls flat to set tone and backdrop as to which techniques transcend the boundaries of human right violations.

OBJECTIVE OF THE RESEARCH

Based on the existing research and literature, this paper aims:

1. To assess neurotechnological revolution as an extension of human genomic framework
2. To analyze the White and Gonsalves neural structural model and its nexus to the 5 universal rights of declaration
3. To discuss human rights in juxtaposition with forms of intervention (SPECT, EEG, MEG, fMRI, PET) through the neurolaw lens.
4. To dwell into legal bodies and conferences addressing the threat to human rights by neuroscience
5. To shed light on neural data as a medium of independent property through the evolution of Chile's recent neuro-rights law

NEUROTECH AND THE LAW

Neurotechnology offers a great future when it comes to personal responses, free will, criminal justice system, disability and policy learning. Given that human rights are inherent to all individuals by virtue of their humanity, regardless of cultural differences and societal changes. On these lines, since all human beings have the same structural nervous system, the concept of

[6] Mark S. Frankel, *Considering advances in neuroscience through the lenses of law and human rights*, 1 J. LAW BIOSCI. 215-217 (2014).

neuro-rights should extend to all and be considered part of basic human rights. Neurotechnology enables help patients detect abnormalities, monitor pre-post-surgery, offer new possibility of personalized services and supplement new avenues of criminal jurisprudence[7]. The mind was initially limited to processes like trepanation whereby one can only observe and manipulate brain tissue but these could not be linked to other neural and mental processes. But now, the neurotechnology has unlocked a dimension which can be explored to a great extent. In 1878, Ricard Canton first observed electrical signals in animals, eventually in 1924 the first EEG was conducted.

The potential to access, store, share, collect, and manipulate neuro data through techniques such as electroencephalography, magnetoencephalography, functional magnetic resonance imaging, positron emission tomography, neural engineering, brain imaging, and persuasive technology poses challenges within the context of human right.[8] Although the brain cannot scan concreate intentions or memories of an individual, they can decode general preferences. These preferences have been used by politicians to identify views of individuals, and companies to understand consumer patterns. Example: Google, Frito-Lays, Disney, CBS have taken up neuromarketing services through neuroimaging to predict consumer preference[9]. This pattern has taken the shape of persuasive technology through virtual reality systems, wearable well-being, neurosensory vehicles, real time neuromonitoring, cognitive training tools and so on. Example: Apple and Samsung use Ware Headset gadgets which enable reading brainwaves. NASA and Jaguar have developed a Mind Sense software which analyses the concentration of its driver and alters when low concentration is observed.

Mind is considered to be the last refugee of personal freedom and self-determination. While neuro-rights haven't been explicitly recognized, they can be associated with the right to privacy, freedom of thought, mental integrity, freedom from discrimination, fair trial, and protection against self-incrimination. Philip Alston lays down 4 conditions for qualifying any right as a human right[10]. These are: reflection of a social value fundamental to humans, consistency but not repetitive, capability of international consensus and precision of laying rights and duties. On these lines 4 rights can be mainly elaborated:

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[7] White & Gonsalves, *supra* note 4.

[8] Ienca & Andorno, *supra* note 3.

[9] Yesim Isil Ulman, Tuna Cakar & Gokcen Yildiz, *I Consume, Therefore I am!*, 21 SCI ENG ETHICS 5, 1271- 1284 (2015).

[10] Martha J. Farah, *Neuroethics: the practical and the philosophical*, 9 TRENDS COGN SCI. 1, 34- 40 (2005).

Cognitive Liberty

Apart from self-determination, the right of cognitive liberty has two-fold approach: right of individuals to use neurotechnology and the right to be protected from unauthorized, coercive and unconsented neurotech use. The right enables individuals to alter their mental state while having the right to refuse to such acts. Nexus can be drawn to the freedom of thought elaborated by freedom of choice, speech, religion and press. In this context, the Sententia in its 1st Amendment highlights that the State is barred from taking one's brain state as part of the protection against self-incrimination[11]. With a multi-dimensional approach, the right of cognitive liberty in neuro-rights provides: liberty to change one's mind, whether and means to change one's mind; receive protection from intervention in one's mind protecting mental integrity and creation of ethical, legal and moral obligations to supplement cognitive liberty.

Mental Privacy

Data mining activities, website regulation, video surveillance, facial recognition and spyware threaten one's life with the same degree of vulnerability and intrusion. Data privacy has been recognized in Article 12 of UDHR, Article 8 of ECHR and the EU Data Protection Directive. But the issue persists whether data privacy implies and includes mind data privacy.[12] Since neural data is personally identifiable, it should receive the same protection and restrictions a blood sample or DNA profiling encompasses. While most human rights are relative and not absolute, the neural-right in context of privacy shall be considered as relative too with restrictions provided in ECHR: necessity, proportionality, legislative purpose[13]. Brain scanning has shifted from being merely some data to testimony against oneself on the basis of the phrase 'the brain does not lie', violating the principle of self-incrimination as laid in the landmark case of ***Saunders***. Article 14(3)(g) of ICCPR, Rome Statue of ICC and ECHR all provide for the human right of protection against self-incrimination and the right of fair trial.

Mental Integrity

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11 Abel Wajnerman Paz, *Is Your Neural Data Part of Your Mind? Exploring the Conceptual Basis of Mental Privacy*, 3 MINDS MACH, 395- 415 (2022).

12 Silvia Inglese & Andrea Lavazza, *What Should We Do With People Who Cannot or Do Not Want to Be Protected From Neurotechnological Threats?* 15 FRONT HUM NEUROSCI. (2021).

13 *Id.*

Linked with privacy, the right of mental integrity encompasses the direct repercussions of neural computation in instances of malicious brain hacking. A criminal actor overriding and hijacking one's neural system can not only lead to mental but also physical harm. The ECHR and Article 3 of the EU Charter provide for physical and mental integrity. Example: brainwashing of prisoners of war[14]. There are 4 dimensions to this right: free informed consent; ban over commercialization of body elements; prohibition of eugenic practices and the human reproductive cloning. But to qualify as a threat to mental integrity, the following conditions need to be fulfilled: Manipulation or access of neural data in its direct form; absence of consent leading to unauthorized use; and an output of harm in nexus either physical or mental.

Psychological Continuity

A stimulation or modulation of one's neural system as part of their brain function leads to a memory engineered impact. Right to identity can be altered when one manipulates an individual's integral brain tissues. Article 8 of ECHR, Article 22 and 29 of UDHR provide for a right to private life and full free development of one's personality.

WHITE AND GONSALVES MODEL

The White and Gonsalves sought to establish the link between human rights and brain science. Their theory grounds 5 intrinsic human right principles to neurobiological features of the brain structure. The 5 categories of universal human rights are[15]:

1. Agency, autonomy, self-determination
2. Freedom from want
3. Freedom from fear
4. Uniqueness
5. Unconditionality

[14] Declan Butler, *Advances in neuroscience 'may threaten human rights'*, 391 NATURE, 316 (1998).
[15] White & Gonsalves, *supra* note 4.

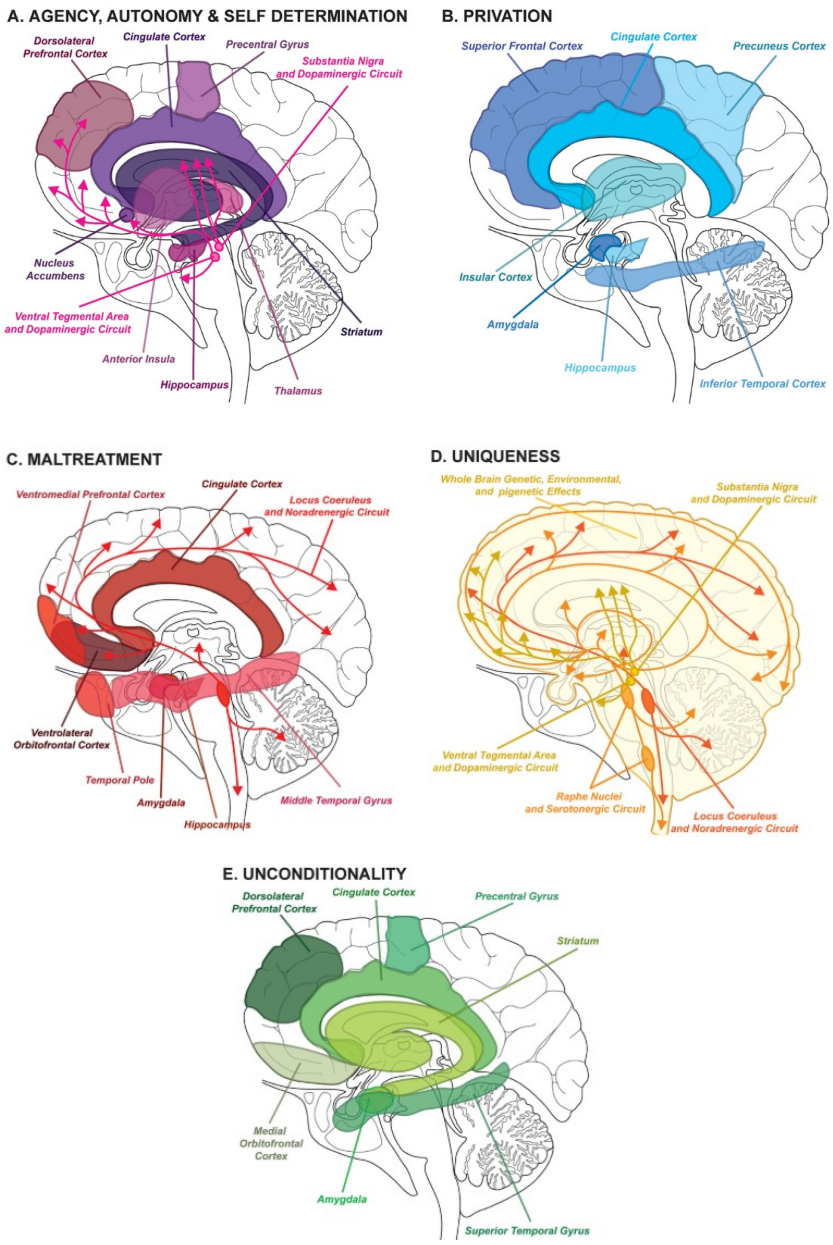


Figure 1: Human Rights grounded in the Brain Structure

Agency typically implies a person's ability and capability to make one's own choice and take one's own actions. It is intrinsic to the brain and rests on emotional balance associated to the gray matter in the brain. Autonomy means the independence and freedom associated with agency. This is linked to one's emotions, choices and empowerment. Self-determination is the ability of agency to determine for oneself unaccompanied by outside influence. It forms a distinct brain circuits response to yoked and non-yoked stimuli[16]. Neuroscience of maltreatment

[16] Martha J. Farah & Paul Root Wolpe, *Monitoring and Manipulating Brain Function: New Neuroscience Technologies and Their Ethical Implications*, 34 HASTINGS CENT REP 3, 35- 45 (2004).

(freedom from want and fear) basically highlights how violent childhood, intimate partners and exposure of war; effect the brain. These directly affect human rights like right to life, liberty, dignity, cruel and inhuman treatment. Unconditionality refers to the foundation of bonding and attachment, fraternity and brotherhood among humans. These 5 categories when emancipated brings up the concept of 'dignity neuroscience' implying the human rights expressions in human brains[17].

LEGAL FRAMEWORK

Sr. No.	Neuroscience concept	UDHR	ICCPR	ICESCR	2030 SDGs
1.	Agency, self-determination, autonomy	Article 3 – Right to life, liberty and security Article 13 – Freedom of movement Article 16 – Right to marry and form family Article 18 – Freedom of thought, conscience, religion Article 27 – Right to freely participate in cultural and scientific advancement	Article 1 – Right to self determination Article 8 – Protection against slavery and servitude Article 9 – Right to liberty Article 19 – Right to hold opinion without interference	Preamble – ideal of free human Article 6 – Right to work Article 8 – Right to strike Article 15 – Freedom from scientific research and creative activity	1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 16
2.	Freedom from	Article 22 – Right to	Preamble – freedom	Article 11 – Freedom	1, 2, 3, 4,

[17] Lisa Cosgrove, Justin Karter, Mallaigh McGinley & Zenobia Morrill, *Digital Phenotyping and Digital Psychotropic Drugs: Mental Health Surveillance Tools That Threaten Human Rights*, 22 HEALTH HUM RIGHTS. 2, 33- 39 (2020).

	want	social security Article 25 – Right to healthy standard of living Article 26 – Right to education	from want	from hunger Article 12 – Right to high standard of physical and mental health Article 12.d – Right to medical service and assistance	5, 6, 7, 8, 9, 10, 12, 13, 14, 15
3.	Freedom from fear	Article 3 – Right to security Article 6 – Protection from discrimination Article 14 – Right to seek and enjoy other countries asylum from persecution	Preamble – freedom from fear Article 6 – Right to life Article 7 – Protection from torture, cruelty and inhuman treatment Article 20 – Propaganda for war to be prohibited Article 26 – Protection from discrimination	Preamble – freedom from fear	1, 2, 3, 5, 10, 11, 16
4.	Uniqueness	Article 22 – Freedom of development-economic, social, cultural dignity Article 27 – Protection from	Article 13 – Freedom of human personal development	-	1, 2, 3, 5, 8, 10

		moral material resulting from science, literacy and artistic production			
5.	Unconditionality	Article 1 – Equal dignity and rights Article 15 – Right to nationality Article 28 – Entitled social and international order right	Preamble – Inherent dignity of people, promotion of universal respect of humans and freedoms Article 26 – Equal protection of law and equality before law	Article 2 – Protection against discrimination Article 3 – Right to enjoy social, cultural and economic rights	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17

COURT ROOM DEPENDANCE

With change in outlook and times, the need to bridge physical and mental divide in torts law, can be foreseen to be taken up by neuro-law. In legal use, neuro-technology shall facilitate more evidence-based decisions, evaluation of risk recidivism, reliability of lie detection, reliability of witnesses and memory erasure in violent criminals and trauma victims. In today's day and age, lie detectors, mental decoders and brain printers are used rarely. While John Stuart Mill provided the concept of liberty, the freedom of thought envisaged in ECHR and UDHR can be divided into 2 parts: *forum interim* (inner conscience thoughts that form the inviolable sphere) and *forum externum* (thoughts that can be assessed in times of greater purposes)[18]. Brain scanning typically involves neuroimaging the blood flow in the cerebral organs, dwelling with oxygen flow, magnetic signals and forming a mathematical algorithm based on computation of data. The brain fingerprinting was admissible in the case of ***State of Maharashtra v. Sharma***[19]**,** in India whereby it recognised BEOS as a form of admissible evidence.

[18] Hilary Rosenthal, *Scanning for Justice: Using Neuroscience to Create a More Inclusive Legal System*, COLUM. HUM. RTS. L. (2019).

[19] State of Maharashtra v. Sharma, Sessions Case No. 508 of 2007, decided on 12.06.2008 (Court of Sessions at Pune).

With this, the issue of whether the mere negative thoughts can call for sanctions. In ***Doe v. City of Lafayette***[20]**,** the court held the defendant liable merely because of his thoughts. Their reasoning being that thoughts restrict and are followed with actions, banning the thoughts would ban the ban itself. The issue cropping up is the basic human right of one's freedom of thought. There needs to exist a balance between forum interim and state interests (terrorist activities, etc.) In the USA, the qEEG reports was used as evidence in ***State v. Nelson***[21] to determine the quantum of sentence. In ***US v. Semrau***[22]**,** the fMRI lie detection was acknowledged as having future use in evidence law. PET Scan of one's brain image was used as an insanity proof of his schizophasia in ***People v. Goldstein***[23]**.** Based on this, countries like Italy, England, Wales and Netherland, discussed the need for a legal framework to protect people from unauthorized neurotech interventions.

In domestic context, Aditi Sharma was the first person convicted by means of an EEG test way back in 2008. Eventually Israel and Singapore developed the basis for neuroscience and its admissibility. In 2009, Italy convicted a murderer by means of genetic information and brain sampling[24]. Neurotechnology is not restricted to today's day and age in the judiciary. In 1981, the trial of President Ronald Reagan's assassinator brought up CT scans of the brain's accused. In ***Frey v. USA***[25]**,** the court linked neuro-rights to the 4th and 5th Amendment. Eventually issues came up whereby scientific evidence of neurotechnology received more impact on the judicial mind than verbal testimony of witnesses, affecting the right to a fair trial due to impartiality. The following conclusions can be drawn regarding the use of neuroscientific techniques and human rights: the state does not possess an inherent right over individuals' thoughts; partial thoughts should not be punishable; it is the state's obligation to safeguard its citizens from unauthorized actions by non-state actors, and individuals are not obligated to participate in these activities.

CHILE'S BILL ON NEURO RIGHTS

Taking up from the biomedical and genetic development, neuro-rights remained an unexplored regime in context of human rights. The '*1997 UDGHR, 2002 IDHGD, 2002 Universal*

[20] John Doe v. City of Lafayette, 377 F.3d 757 (7th Cir. 2004).
[21] State v. Nelson, 65 Wn.2d 189 (1964).
[22] United States v. Semrau, 693 F.3d 510 (6th Cir. 2012).
[23] People v. Goldstein, 146 Cal.App.2d 268 (Cal. Ct. App. 1956).
[24] Bublitz, *supra* note 5.
[25] Zachary T. Frey v. USA, No. 17-14445 (11th Cir. 2018).

Declaration on Bioethic and Human Rights' have recognised right of genetics in isolation while laying down rules to handle and collect data. Objection arose whereby the right inflation concept evolved, contending that eventually everything will be labelled as human rights under the moral devise. Based on this recently the concept of neural data evolved which is associated with personally identifiable information relating to one's neural state, its process and its structures[26]. The '*2020 Chile Bill*' along with '*Article 24 of the Spanish Charter of Digital Rights*' recognizes the establishment of neuro protection and AI digitalization. It develops neuro-rights recognising right to personal identity, right to free will, right to mental privacy, right to equal access of cognitive enhancement technology and protection against algorithmic bias. These rights have been built on the basic human rights of right to dignity, right of liberty, right to security, protection from non-discrimination, right to equal protection and right to privacy. The Senate discussion emphasizes on the failure to anticipate the recent Facebook-Cambridge scandal blurring the line between public and private information[27]. Data privacy can be seen as informational privacy and physical privacy. Informational privacy relates to personally identifiable information as provided in the 4th Constitutional Amendment and several other instrumentalities. While physical privacy links to blood or saliva samples being taken, and this form has been taken up for the first time in the Chile law.

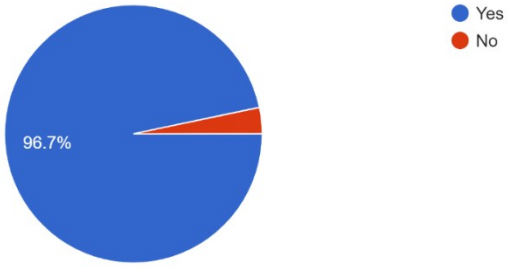
EMPIRICAL RESEARCH

A questionnaire was prepared and circulated via google form to students across the nation. The survey received 91 respondents, who were questioned about the interplay between neurotechnology and human rights. The results of the empirical research are displayed below and based on the critical analysis seem to correlate with the existing doctrinal research.

[26] Patrick Haggard, *Human volition: towards a neuroscience of will*, 9 NAT. REV. NEUROSCI. 934-946 (2008).
[27] Joseph J. Fins, *Giving Voice to Consciousness: Neuroethics, Human Rights, and the Indispensability of Neuroscience*, 25 CAMB Q HEALTH ETHICS 4, 583-599 (2016).

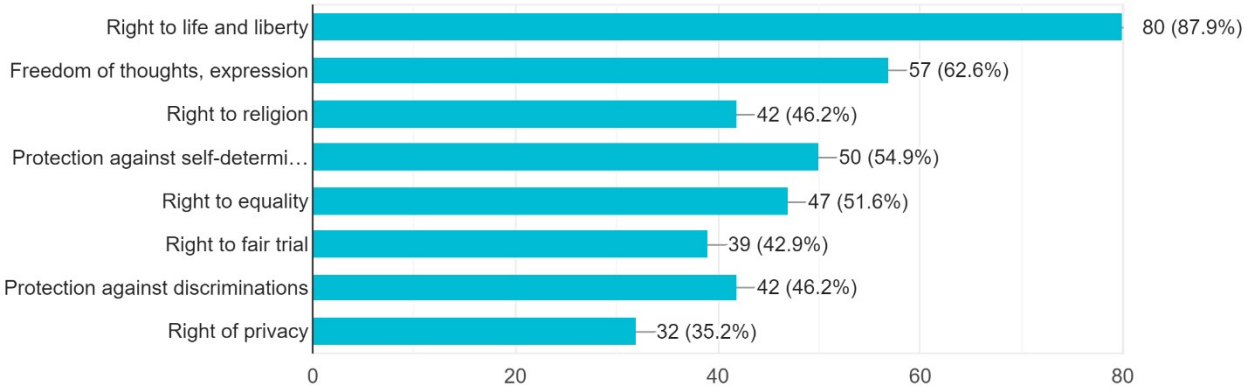
Are you aware of neurotechnology or its development in today's day and age? Technologies like SPECT, EEG, MEG, fMRI, PET which analyze one's mind and brain components.

91 responses



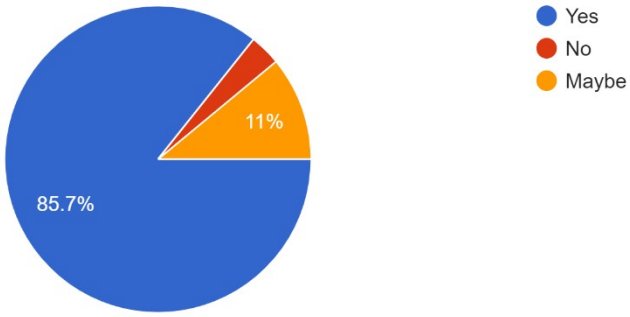
According to you which of the following according to you are basic and universal human rights?

91 responses



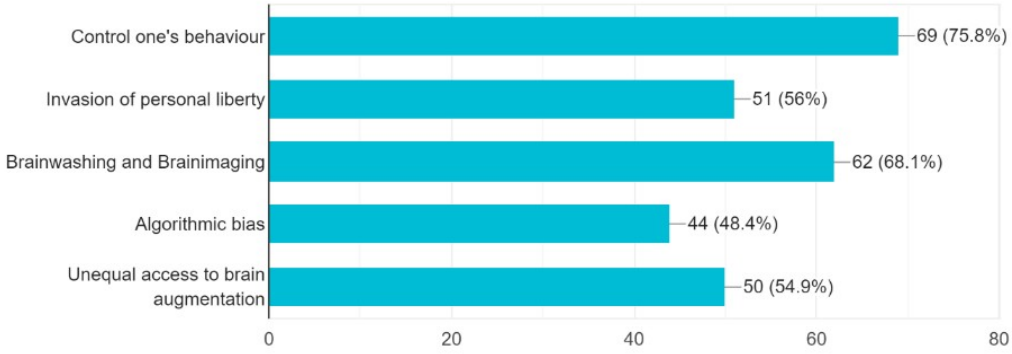
According to you, does the advancement of neuroscience hamper human rights as it dwells into one's neural brain structure and leave a scope for misuse?

91 responses



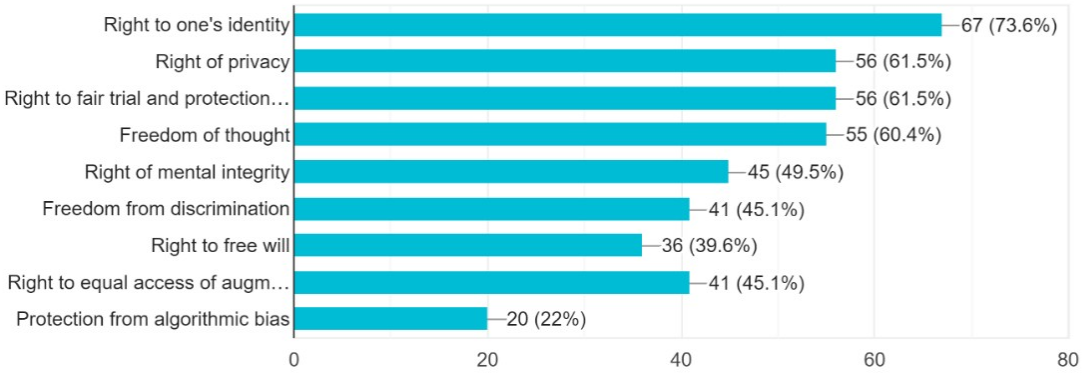
According to you, what are the risks associated with the rapid advancements of neurotechnology?

91 responses



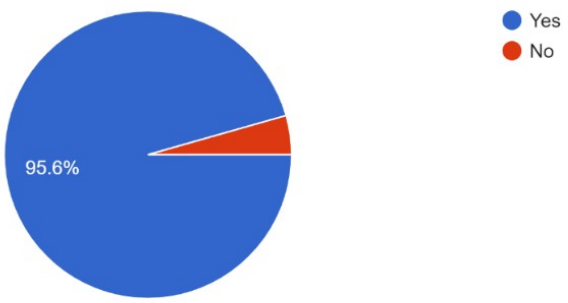
According to you, which human rights are likely to be violated when a neurotechnological process takes place?

91 responses



According to you, is there a need for the development of a separate law encompassing the concept of 'neuro-rights'?

91 responses



SUGGESTIONS

Based on the existing framework, there can be 3 options: a total or partial ban on neurotechnological practices; continuation of current state as total freedom without any standard; or developing a legal framework based on ethical and moral attitude[28]. In 2013, President Obama highlighted the potential future of neuroscience and its legal implications concerning privacy and the rights of personal agency. With the recent "*Presidential Commission for the Study of Bioethical issues on ethical consideration of neuroscience research and applications of neuroscience research findings*" along with the American Association for Advancement of Science established in 1848 aim at achieving a balance between science and human rights[29]. In 2001, the AAAS came up with a CASE Project (Court Appointed Scientific Experts) which sought to assist judges in using neurological aspects in courtrooms[30]. The body aims at understanding the maturing human brain while promoting human rights.

To keep up with the advancements in neurotech and balance human rights, there is a need to develop a symbiotic system. On the basis of ethical principles, a framework needs to be developed which encompasses:

1. Prevention of malign use in consistency with human rights and one's dignity
2. Safety precautions to be embedded
3. Creation of user-centered approaches
4. More inclusiveness and convergence
5. Avoiding a single central agency and creating a body to regulate with checks and balances
6. Formulating neuro-rights in its exclusive domain
7. Transparency and openness of process
8. Capacity and autonomy with public trust
9. Privacy and confidentiality with neural data

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[28] Eur. Consult. Ass., Report of the Comm. on Legal Affairs and Human Rights, October Standing Committee (videoconference) Sess., Doc. No. 15147 (2020).

[29] Sjors Ligthart, Thomas Douglas, Christoph Bublitz, Tijs Kooijmans & Gerben Meynen, *Forensic Brain-Reading and Mental Privacy in European Human Rights Law: Foundations and Challenges*, 14 NEUROETHICS 191-203 (2021).

[30] Simon McCarthy-Jones, *The Autonomous Mind: The Right to Freedom of Thought in the Twenty-First Century*, 2 FRONT. ARTIF. INTELL. (2019).

10. Defining limits of neuro-law and its applicability

The Human Rights Committee in its debates mentioned that no human should be compelled to reveal their thoughts. Despite the arguments, no framework outrightly recognizes neuro-rights. It highlights the need for horizontal application whereby states are mandated with a positive duty to protect its individuals from unconsented intervention by state and non-state actors. The recent Milan Conference on '*Neuroscience in European and North-American Case Law and Judicial Practice'* emphasized the need for international attention to widen human rights in the field of science[31].

CONCLUSION

While the scope of neurotechnology is wide, the issues of who will control it, its use, access and accountability remain unanswered. The capacity of voluntary action and free will is of utmost value intrinsic to humans. On one hand, technology intervening within the motor area and cortex in one's brain, helps solve health issues especially in cases of patients in vegetative state. On the other, the scope for misuse is rather extensive considering the arena is yet to be explored in totality. Rather than recognising neuro-rights in context of other universal human rights, there is a need to formulate and develop neuro law and its right as inclusivity. By defining set standards, the legal framework can demarcate between authorized and unauthorized intervention; state and non-state intervention, violations and remedies in the neuro-law domain. The freedom of an autonomous mind breaks the conventional shackles and layout of universal human rights.

[31] Frankel, *supra* note 6.