

MIND THE GAP: ADVOCATING FOR AN INDIAN LEGISLATIVE RESPONSE TO NEUROTECHNOLOGY

Ishika Garg and Abinand Lagiseti***

ABSTRACT

Neurotechnology is a rapidly evolving field that brings with it a range of benefits, especially in the healthcare sector. However, growing developments in this area pose significant risks to individual privacy, particularly in relation to the use of neurotechnology such as Brain-Computer Interfaces. This article argues that the recognition of neuro-rights embodied in the right to mental privacy can help address some of these challenges. While such recognition can be drawn from the Indian jurisprudential framework, it only provides the first step in what is a long journey for the protection of individuals from the unique problems that neurotechnology presents. In its present state, the Indian framework falls short of providing any tangible protection and a more concrete response can only be achieved through a comprehensive legislation that provides

*Ishika Garg is a third-year B.A. LLB. (Hons.) student at the NALSAR University of Law, Hyderabad. The author may be reached at ishikagarg2020@nalsar.ac.in.

**Abinand Lagiseti is a fourth-year B.A. LLB. (Hons.) student at the NALSAR University of Law, Hyderabad. The author may be reached at abinand.lagiseti@gmail.com.

guidelines for the production and use of neurotechnology. Drawing on examples from other jurisdictions such as Chile, this article advocates for India to take proactive steps in developing and implementing such legislation in line with the precautionary principle. In doing so, the article also highlights the missteps that the Chilean Legislature has made in order to ensure that the proposed Indian legislation is drafted with complete awareness of such pitfalls. A legislation of this nature would help ensure that individuals' mental privacy and autonomy are protected and would help build a foundation for the responsible use of neurotechnology in the future. Acknowledging that a holistic legal mechanism of the proposed nature is not an overnight process, the authors also recommend interim protections that can be put in place in order to ensure that individuals' neuro-rights are not compromised in the meantime.

I. INTRODUCTION

Neurotechnology involves the development of devices and technologies that can interface with the brain or nervous system, such as Brain Computer Interfaces (hereinafter, "BCI").¹ It is increasingly being used to improve the prospects of 'reading' brains in order to obtain information.² Research-driven technological development in

¹Oliver Müller and Stefan Rotter, 'Neurotechnology: Current Developments and Ethical Issues' (2017) 11 *Frontiers in Systems Neuroscience* 93.

²Melissa Heikkilä, 'Machines can read your brain. There's little that can stop them' (*Politico*, 31 August 2021) <<https://www.politico.eu/article/machines-brain->

neuroscience has presented complicated privacy issues surrounding neural data. For example, more sophisticated forms of BCIs are being developed rapidly. These allow a collaborative interface between a brain and an external device, which facilitates a direct communication pathway between the brain and the object to be controlled.³ Considering that BCIs essentially seek to allow individuals to control machines using their thoughts, studies highlight how the BCI technology can potentially allow persons with disabilities or injuries the ability to interact with their environment.⁴ Research also shows the possibility of such technology being used to improve the quality of life for blind individuals by aiding them in identifying the shape, size, and texture of objects around them.⁵ However, every rose has its thorn.

The dangers of the application of BCIs are best explained through Elon Musk's recent Neuralink experiment, in which a monkey was able to play a video game through a chip in its brain.⁶ In layman's terms, a BCI was used to facilitate direct communication between the chip in the monkey's brain and an external device. Meanwhile, the neurotechnology start-up Synchron has already implanted BCIs in humans, allowing them to achieve feats such as creating tweets just by thinking about them.⁷ Turning thoughts into words by decoding neural

neurotechnology-neuroscience-privacy-neurorights-protection/> accessed 5 March 2023.

³Sarah N Abdulkader, Ayman Atia, and Mostafa-Sami M Mostafa, 'Brain computer interfacing: Applications and Challenges' (2015) *Egyptian Informatics Journal* 213.

⁴Brown University, 'Brain-computer interface enables people with paralysis to control tablet devices' (*ScienceDaily*, 21 November 2018) <<https://www.sciencedaily.com/releases/2018/11/181121142420.htm>> accessed 5 March 2023.

⁵Paul Bach-y-Rita and Stephen W Kercel, 'Sensory substitution and the human-machine interface' (2003) 7 *Trends in Cognitive Science* 541.

⁶Isobel Asher Hamilton, 'Elon Musk's brain-chip company, Neuralink, released a video of a monkey playing video games with its mind' (*Business Insider*, 9 April 2021) <<https://www.businessinsider.nl/elon-musks-brain-chip-company-neuralink-released-a-video-of-a-monkey-playing-video-games-with-its-mind/>> accessed 5 March 2023.

⁷Anthony Cuthbertson, 'Brain Chip Allows Paralysed Man to Post First Ever 'Direct-Thought Tweet'' (*Independent*, 2021) <[22](https://www.independent.co.uk/life-</p></div><div data-bbox=)

signals is just the starting point of what neurotechnological innovations such as BCIs are set to achieve in the coming years.⁸ Neuralink recently claimed that its future products could enable someone with paralysis to use a smartphone with their mind faster than someone using thumbs.⁹ While these innovations could contribute to the betterment of countless lives, it also raises issues of privacy. This begs the question: *How do we protect ourselves?*

An answer is to be found in the world of neuro-rights. Neuro-rights refer to the legal and ethical principles of freedom and entitlement related to an individual's cerebral or mental domain.¹⁰ These can help provide a safeguard against the concerns that growing leaps in neurotechnology might be used, or rather abused, to alter an individual's thoughts, preferences, and interests. The most foundational principle that forms the bedrock of neuro-rights is the right to mental privacy, which would ensure that one possesses control over access to all aspects concerning their neural data thus, effectively addressing the aforementioned concerns.¹¹ In this article, the authors shall first provide a brief overview of what a right to mental privacy entails, in the context of growing developments in the field of neurotechnology. Thereafter, the article shall outline why the threat posed by such developments requires an immediate institutional response. The authors shall then locate the position of the right to

style/gadgets-and-tech/brain-chip-als-synchron-neuralink-computer-b1982745.html> accessed 5 March 2023.

⁸AS Deller, 'The future of brain-computer interfaces and the human machine' (*Wevolver*, 26 July 2019) <<https://www.wevolover.com/article/the.future.of.braincomputer.interfaces.and.the.human.machine>> accessed 5 March 2023.

⁹Sissi Cao, 'Brain Implant Technology Lets Paralysis Patients Move, Touch and Feel with Their Thoughts' (*Observer*, 16 February 2022) <<https://observer.com/2022/02/brain-computer-interface-blackrock-neurotech-interview/>> accessed 5 March 2023.

¹⁰Rafael Yuste et al, 'Four Ethical Priorities for Neuro-technologies and AI' (2017) 551 *Nature* 159.

¹¹Abel Wajnerman Paz, 'Is Mental Privacy a Component of Personal Identity?' (2021) *Frontiers in Human Neuroscience* 1.

mental privacy within the Indian jurisprudential framework. In this process, the authors shall highlight how the present jurisprudential framework is insufficient to tackle the unique challenges posed by neurotechnology and demonstrate how a legislative response would be better suited. Finally, the authors shall detail the proposed legislative framework in India. In doing so, reliance shall primarily be placed on the recently introduced neuro-rights legislation in Chile.¹²

II. A PRIMER TO THE RIGHT TO MENTAL PRIVACY

Building on Professor Alan Westin's conceptualisation of privacy, one can define 'mental privacy' as one's ability to determine for themselves when, how, and to what extent information about their thoughts is to be communicated to others.¹³ A more nuanced understanding of the term would reveal that mental privacy embodies the idea that one should possess control over the access to their neural data and to the information about their mental processes and states that can be obtained by analysing such data.¹⁴ In essence, protecting mental privacy invariably translates to protecting one's neural data. BCIs are computer-based systems that directly record, process, analyse, or modulate brain activity in the form of neural data that is then translated into an output command from the human to the machine.¹⁵ Neural data refers to the data generated by the nervous system which consists of the

¹²Lorena Guzmán H, 'Chile: Pioneering Protection of Neuro-rights' (*UNESCO Courier*, 4 January 2022) <<https://en.unesco.org/courier/2022-1/chile-pioneering-protection-neurorights>> accessed 5 March 2023.

¹³Alan F Westin, 'Privacy and Freedom' (1967) *Washington and Lee Law Review* 166.

¹⁴Abel Wajnerman Paz, 'Is Mental Privacy a Component of Personal Identity?' (2021) *Frontiers in Human Neuroscience* 1.

¹⁵Melissa Heikkilä, 'Machines can read your brain. There's little that can stop them' (*Politico*, 31 August 2021) <<https://www.politico.eu/article/machines-brain-neurotechnology-neuroscience-privacy-neurorights-protection/>> accessed 5 March 2023.

electrical activities between neurons or proxies of this activity.¹⁶ When neural data is linked, or reasonably linkable to an individual, it encompasses fundamentally personal information about one's neural states, processes and structures.¹⁷ The need for its protection stems from the idea that neural data is intimately related to one's identity and its manipulation can put their mental privacy at risk.¹⁸ A breach of privacy at the neural level is feared because it bypasses individual autonomy, leaving one unprotected from having their mind read without their will or consent. Individual autonomy refers to one's ability to act independently and of their own volition.¹⁹

We know that BCIs can allow humans to do things *through thoughts*, that is, without using the body as an intermediary.²⁰ For instance, at the 2014 FIFA World Cup in Brazil, a paralysed man delivered the kick-off via a BCI-controlled exoskeleton.²¹ Research shows that BCIs can allow one to extract private information about the man's memories, religious and political beliefs, prejudices, etc.²² The extracted information could then possibly be used to manipulate or coerce users, or otherwise harm them. For instance, it is not hard to imagine the consequences that may follow if an authoritarian regime is able to

¹⁶Abel Wajnerman Paz, 'Are Neural Data Protected by Bodily Integrity? A Discussion of the 'Organic' View on Neural Data Rights' (*Neuroethics Blog*, 12 May 2020) <<http://www.theneuroethicsblog.com/2020/05/are-neural-data-protected-by-bodily.html>> accessed 5 March 2023.

¹⁷Abel Wajnerman Paz, 'Is Your Neural Data Part of Your Mind? Exploring the Conceptual Basis of Mental Privacy' (2021) *Minds and Machines*.

¹⁸*ibid.*

¹⁹Onora O'Neill, *Autonomy and Trust in Bioethics* (CUP 2009) 1-48.

²⁰Anthony Cuthbertson, 'Brain Chip Allows Paralysed Man to Post First Ever 'Direct-Thought Tweet'' (*Independent*, 2021) <<https://www.independent.co.uk/life-style/gadgets-and-tech/brain-chip-als-synchron-neuralink-computer-b1982745.html>> accessed 5 March 2023.

²¹Alejandra Martins and Paul Rincon, 'Paraplegic in robotic suit kicks off World Cup' (*BBC*, 12 June 2014) <<https://www.bbc.com/news/science-environment-27812218>> accessed 5 March 2023.

²²Tamara Bonaci, Ryan Calo and Howard Chizeck, 'App Stores for the Brain: Privacy & Security in Brain-Computer Interfaces' (2015) *IEEE Technology & Society Magazine* 32.

extract the dissenting political views of any person who can challenge its power. Given such obvious risks, the right to mental privacy is critical in providing individuals with protection against the intrusion of third parties into their neural data.

III. NEUROTECHNOLOGY: THE CALL FOR AN IMMEDIATE RESPONSE

Neuro-rights laws present us with opportunities to regulate neurotechnology like BCIs. At this juncture, it is important to allay concerns that might hinder the authors' argument for the crystallisation of neuro-rights in the form of a legislative framework in India, in order to address the fears associated with neurotechnology. Critics may argue that nanotechnology, such as BCIs, has not yet reached a refined stage that would present any *real* dangers to one's mental privacy. Thus, their assertion might be that any legislation to codify neuro-rights and address the risks associated thereto would be unnecessary presently. In addressing such criticism, the authors concede that the legislation this article seeks to propose might be pre-emptive. This is not to deny that there are in fact immediate risks that are posed by BCIs in their current form. For instance, just this year, Musk's endeavour to test its Neuralink technology on humans was finally approved by the FDA after multiple rejections.²³ The prior rejections serve as a reminder of the undeniable risks of the technology, towards which even the FDA experts could not turn a blind eye. The approval of human trials, however, should not be misconstrued as a declaration that the risks associated with BCIs have been eliminated. Rather, experts argue that

²³Mike Snider, 'Elon Musk's Neuralink has FDA approval to chips in humans' brains' *USAToday* (9 June 2023) <<https://www.usatoday.com/story/tech/2023/06/09/musk-neuralink-brain-chips-fda-human-trials/70299875007/>> accessed 19 August 2023; Derek Saul, 'FDA Rejected Musk's Bid To Test Brain Chip Implants In Humans, Report Says' *Forbes* (2 March 2023) <<https://www.forbes.com/sites/dereksaul/2023/03/02/fda-rejected-musks-bid-to-test-brain-chip-implants-in-humans-report-says/?sh=59edfa14255c>> accessed 5 March 2023.

these trials have made the dangers associated with such technology more imminent.²⁴ This strengthens the authors' case for pre-emptive regulation of neurotechnology.

The risks of delaying regulation until after neurotechnology becomes fully developed is that the features associated with such technology might become too culturally entrenched by then to be altered.²⁵ Users may have already become accustomed to using the technology, and may be resistant to changing their habits or accepting new regulations. To quote a parallel, while practically different from the question of neurotechnology, a warning of 'what not to do' when it comes to regulating technology is found in the rise of social media giants, which use powerful algorithms to collect sensitive information about us by examining our digital footprints. By the time the risks of such collection were brought to the forefront, it was already too late and the line between private and public information had already been blurred. The take-home point is that waiting until after a technology has become widespread and has caused harm makes it much more difficult to regulate effectively.²⁶ In recognition of this argument, several experts have emphasised the importance of the approach of precautionary

²⁴Kari Paul and Maanvi Singh, 'Elon Musk's brain company is approved for human testing. How alarmed should we be?' *The Guardian* (4 June 2023) <<https://amp.theguardian.com/technology/2023/jun/04/elon-musk-neuralink-approved-human-testing-concern>> accessed 19 August 2023.

²⁵Ishika Garg, 'The Time is Now for a 'Neuro-Rights' Law in India' (*Vidhi Centre for Legal Policy*, 7 January 2022) <https://vidhilegalpolicy.in/blog/the-time-is-now-for-a-neuro-rights-law-in-india/?utm_source=rss&utm_medium=rss&utm_campaign=the-time-is-now-for-a-neuro-rights-law-in-india> accessed 5 March 2023.

²⁶Avi Asher-Schapiro, 'Out of my mind: Advances in brain tech spur calls for 'neuro-rights' (*Reuters*, 29 March 2021) <<https://www.reuters.com/article/us-global-tech-lawmaking-analysis-trfn-idUSKBN2BL1RH>> accessed 5 March 2023; Kari Paul and Maanvi Singh, 'Elon Musk's brain company is approved for human testing. How alarmed should we be?' *The Guardian* (4 June 2023) <<https://amp.theguardian.com/technology/2023/jun/04/elon-musk-neuralink-approved-human-testing-concern>> accessed 19 August 2023.

regulation in the context of emerging technology.²⁷ This approach involves anticipating the potential risks and harms associated with new technologies and implementing regulations to prevent or mitigate these risks before they can cause harm. This approach is supported by the ‘*precautionary principle*’, which holds that in situations of uncertainty, where a technology may pose a risk to human health or the environment, action should be taken to prevent harm even if there is no conclusive evidence of harm, yet.²⁸

Building upon our example of social media, it is now an accepted fact that its growing use has led to the spread of misinformation. In this context, precautionary regulation could have ensured that social media companies were required to design their platforms in a way that prevented the spread of fake news, hate speech, and harmful content. The authors’ position with respect to regulation in neurotechnology is perhaps most neatly summed up in the work of Professor Sheila Jasanoff, who notes the shift from a harm-based regulation model to a risks-based or a precautionary regulation model.²⁹ It is thus submitted that precautionary regulation serves as a solid basis to protect against the risks that come with technological innovation. When it comes to neurotechnology, it is better to err on the side of caution and take proactive steps to protect neuro-rights. In fact, in recognition of this, Chile recently provided constitutional protection for neuro-rights.

²⁷Gregory Kaebnick and others, ‘Precaution and governance of emerging technologies’ (2017) 354 *Science* 710.

²⁸Thérèse Murphy, *New Technologies and Human Rights* (OUP 2009) 161-194.

²⁹Sheila Jasanoff, *The Ethics of Invention: Technology and the Human Future* (Columbia University Press 2016); Sheila Jasanoff, *Science at the Bar: Law, Science, and Technology in America* (HUP 1997).

IV. UNPACKING THE INDIAN JURISPRUDENCE: THE NEED FOR LEGISLATIVE INTERVENTION

A. *Neurotechnology and mental privacy: Navigating the cross-roads*

There exists no explicit Indian jurisprudence in relation to neuro-rights. However, sufficient legal backing can be drawn from the landmark decision in the case of *K.S. Puttaswamy v. Union of India*, which explicitly recognised the existence of a right to privacy within the Indian constitutional framework.³⁰ In the context of neurotechnology, two facets of the right to privacy become of crucial significance: informational privacy and informational self-determination. In *Puttaswamy*, it was held that the right to informational privacy extends beyond just the protection of an individual's body and also includes their mind within its ambit.³¹ Its purpose is twofold: to safeguard an individual's autonomy by preventing the unjust disclosure of personal information, and to preserve the freedom of one's mind. Consequently, any technology that interferes with an individual's mental processes, which BCIs seek to, infringes upon these liberties.³² As clarified in *Puttaswamy*, the mind is an inseparable element of an individual's personality and its inviolability lies at the core of one's right to safeguard their personal space.³³ This understanding of informational privacy must be related to the second strand *that is*, the right to self-determination guaranteed under Article 21 of the Constitution. This

³⁰*KS Puttaswamy (Retd) and Anr v Union of India and Ors* (2017) 10 SCC 1.

³¹*ibid.*

³²Kari Paul and Maanvi Singh, 'Elon Musk's brain company is approved for human testing. How alarmed should we be?' *The Guardian* (4 June 2023) <<https://amp.theguardian.com/technology/2023/jun/04/elon-musk-neuralink-approved-human-testing-concern>> accessed 19 August 2023.

³³Thérèse Murphy, *New Technologies and Human Rights* (OUP 2009) 161-194.

right is built upon the premise of the protection of autonomous individuals who possess free will.

Informational self-determination is essentially the freedom granted to an individual to decide what information about them should cross the boundaries of their private sphere.³⁴ Inherent in this concept is the importance of individual autonomy. It is this facet of autonomy that, Justice Chandrachud has opined, forms the basis for the preservation of the sanctity of an individual's thought processes.³⁵ Weaving these strands of informational privacy and informational self-determination together, the Court in *Puttaswamy* created the fabric of mental privacy. In Justice Kaul's opinion, mental privacy was that facet of the right to privacy that captures the innermost thoughts and personal intimacies of any individual.³⁶ It includes within itself the freedom to control and make decisions regarding the access to the inner workings of their mind.

Attempts are being made to develop 'smart' BCIs which can communicate with the brain in ways that allow the technology to learn from previous data and prompt the users of BCIs to make decisions on the basis of their previous actions.³⁷ Essentially, the idea is to enhance the adaptability of BCIs.³⁸ While such technology has not yet been entirely developed, inserting such smart BCIs into one's brain poses serious questions about the self-governing and subsequently autonomous, nature of their actions. The fact remains that the right to mental privacy includes within its scope the right to have one's thought

³⁴Kari Paul and Maanvi Singh, 'Elon Musk's brain company is approved for human testing. How alarmed should we be?' *The Guardian* (4 June 2023) <<https://amp.theguardian.com/technology/2023/jun/04/elon-musk-neuralink-approved-human-testing-concern>> accessed 19 August 2023.

³⁵Thérèse Murphy, *New Technologies and Human Rights* (OUP 2009) 161-194.

³⁶*ibid.*

³⁷Gabriel A Silva, 'A New Frontier: The Convergence of Nanotechnology, Brain Machine Interfaces, and Artificial Intelligence' (2018) 12 *Frontiers in Neuroscience* 843.

³⁸*ibid.*

processes be free from external scrutiny, intimidation or coercion. When smart BCIs threaten one's ability to make their own choices without any external prompting, their right to mental privacy will undeniably be in peril.

The authors recognise the possibility of concerns regarding this conclusion. Playing the devil's advocate, some may argue that if such neurotechnology is used with the concerned individual's consent, then the question of a violation of their rights must not arise. Neurologist Eran Klein's work provides useful insight into why such an argument must be rejected.³⁹ He outlines the concept of *informed consent* which would essentially require an individual to understand and to have full knowledge of the information that the BCI will collect and the purpose for which such information will be used. However, the problem that exists is that BCI technology is still at a stage where it is evolving every day. While the consent process may detail that only a specific type of data shall be collected, other unexpressed thoughts, personality characteristics, or emotions might be later unintentionally extracted, without the individual's knowledge.⁴⁰ Such information then remains stored in the BCI and can potentially be used for purposes which could not have even been imagined at the time when the consent process took place. The association problems with this are further heightened in relation to smart BCIs, which are envisioned to be capable of self-adapting and learning, thus making the data they may collect wholly unpredictable and out of the control of even the researchers who worked on their production and design in the first place.

To better understand the risks linked with the 'consent' argument, one can take the example that Professor Nita Farahany presents in her work.⁴¹ She identifies how modern neurotechnology can eventually facilitate the collection of evidence during criminal investigations in

³⁹Eran Klein, 'Informed Consent in Implantable BCI Research: Identifying Risks and Exploring Meaning' (2016) *Science and Engineering Ethics* 1299.

⁴⁰*ibid.*

⁴¹Nita Farahany, 'Incriminating Thoughts' (2012) *Stanford Law Review* 351.

ways that may blur the traditional boundaries between physical and testimonial evidence.⁴² For instance, an accused may consent to providing a static brain image as physical evidence. Subsequently, the developments in neuroimaging technology can allow one to decipher certain information from this image which could be considered testimonial evidence, something the accused never consented to in the first place. At the time of giving their consent, an individual can neither foresee the boundaries of the neural data that will be collected nor imagine the possible inferences such data might provide in the future. Thus, their consent cannot be termed as *informed consent*, which is regarded as a crucial prerequisite in the context of neurotechnology in order to avoid the violation of one's rights.⁴³

Most developments in the field of neurotechnology, be it Neuralink or Synchron, have been at the hands of private actors. While fundamental rights are enforceable against the State and its actors in India, their non-availability against non-State instrumentalities is an accepted proposition. This presents a gaping hole in the protection of the right to mental privacy of individuals seeking to utilise neurotechnology, given that it is highly probable that their rights are infringed upon by private actors. This would leave such persons without any remedy under Part III of the Constitution. In light of this lacuna, the authors believe that a legislative intervention would provide a concrete framework for the protection of an individual's mental privacy even in situations where non-State actors are at play.

It is important to take note of the Supreme Court's recent decision in the case *Kaushal Kishore v. State of Uttar Pradesh*.⁴⁴ In this case, the majority held that a fundamental right under Articles 19 or 21 of the Constitution can be enforced even against persons other than the State or its instrumentalities. Given that mental privacy has been read into

⁴²ibid.

⁴³Marcello Ienca and Roberto Andorno, 'Towards new human rights in the age of neuroscience and neurotechnology' (2017) *Life Sciences, Society and Policy* 13.

⁴⁴*Kaushal Kishore v State of Uttar Pradesh* (2007) 2 SCC 126.

the right to privacy under Article 21 of the Constitution, this judgement would entail that this right is enforceable even against private players in the field of neurotechnology. This decision has not been without controversy and has been criticised for its unpardonably shoddy and muddled reasoning.⁴⁵ The authors have also elsewhere argued that the judgement in *Kaushal Kishore* is not legally tenable given that the authority failed to engage with existing jurisprudence on the subject matter and seemingly drew its conclusion out of thin air.⁴⁶ While Justice Kaul, in his concurring opinion in *Puttuswamy*, hinted at the availability of the fundamental right to privacy against non-state actors, in the absence of corresponding reasoning, the position remains unclear. Thus, it is asserted that the correct position in law remains to be the settled jurisprudence pre-*Kaushal Kishore* i.e., that Part III rights are not enforceable against non-State actors.

B. The insufficiency of a court-centric framework vis-a-vis neuro-rights

Even if one were to accept the Court's erroneous decision in *Kaushal Kishore*, allowing for the right to mental privacy to be extended to private actors, there exist other pressing reasons that justify a legislative intervention. First, the inherent risks posed by neurotechnology vis-a-vis the human brain raise pertinent questions regarding the potential production and utilisation of such technologies in India. The mere recognition of a constitutional right to mental privacy is in no way sufficient to address such questions. The question

⁴⁵Gautam Bhatia, 'Kaushal Kishor, Horizontal Rights, and Free Speech: Glaring Conceptual Errors' (*Indian Constitutional Law and Philosophy Blog*, 27 January 2023) <<https://indconlawphil.wordpress.com/2023/01/27/kaushal-kishor-horizontal-rights-and-free-speech-glaring-conceptual-errors/>> accessed 5 March 2023.

⁴⁶Ishika Garg and Abinand Lagiseti, 'Who Killed Article 12? - Horizontal Rights and the Judgment in Kaushal Kishor' (*Indian Constitutional Law and Philosophy Blog*, 10 January 2023) <<https://indconlawphil.wordpress.com/2023/01/10/guest-post-who-killed-article-12-horizontal-rights-and-the-judgment-in-kaushal-kishor/>> accessed 5 March 2023.

of who can produce such technologies is especially important given that, as mentioned above, most of the technological advancement in the field of neurotechnology has been achieved by private actors. To permit the unregulated production of such technologies by private actors with no regulatory intervention is a dangerous proposition.

The regulation of producers of sensitive technologies by mechanisms such as governmental licences has been previously adopted in India. For instance, with respect to the production of medical devices in India, the Drugs and Cosmetics Act, 1940, and the rules framed thereunder establish a regulatory framework for the grant of selective licences by the Drugs Licensing Authority upon review of individual applications.⁴⁷ Such a framework in the context of neurotechnology would ensure regulation over the entry of private actors and subject the production standards of such actors to review by a regulatory agency. A review of this nature would also allow the state to actively limit the purpose of development and the scope of application of such technologies.

Second, in the absence of a legislative framework governing neuro-rights, the existing Indian jurisprudence on mental privacy would only operate on a post-harm basis. Consequently, for there to be any protection of neuro-rights and neural data by Indian courts, there must first occur a violation of an individual's right to mental privacy. However, such a post-harm approach is rather unsatisfactory in the context of neurotechnology. This is for the reason that, oftentimes, the impact of such technology on the neural processes and mental privacy of an individual would tend to be irreversible and highly detrimental.⁴⁸ Given the risks involved in the usage of neurotechnology, the authors

⁴⁷The Drugs and Cosmetics Act, 1940, No 23, Acts of Parliament, 1940 (India); Rule 74, The Drugs and Cosmetics Rules, 1945.

⁴⁸UNESCO, *The Risks and Challenges of Neuro-technologies for Human Rights* (2023).

submit that an exclusively court-centric framework that would operate on a post-harm basis would be insufficient.

Lastly, the Indian Supreme Court's jurisprudence on mental privacy does not address further legal questions that arise in the context of neurotechnology. One such fundamental question is the impact of a BCI on an individual's ability to consent freely in their professional and personal capacities. As recognised by the Law Society of England and Wales, concerns arise as to whether a person wearing a BCI is consenting under the influence of said technology and whether they can be held responsible for such consent.⁴⁹ Similar concerns arise in the realm of criminal liability regarding the criminal responsibility of a criminal act performed under the influence of a BCI.⁵⁰ In light of such specific concerns arising with the emergence of neurotechnology, the authors submit that a pre-emptive legislative response lucidly stipulating the legal framework governing such technologies and their potential use is the need of the hour.

V. LEGISLATIVE INTERVENTION: PREVENTION IS BETTER THAN CURE

As mentioned above, the need for a pre-emptive legal framework vis-a-vis the prospective ills of developments in neurotechnology coupled with the inadequacy of the existing safeguards in India calls for a proactive legislative response. With numerous research studies being undertaken on the intersection of neurotechnology and legal regulation,

⁴⁹‘How will brain-monitoring technology influence the practice of law?’ (*The Law Society of England and Wales*, 9 August 2022) <[⁵⁰Miles Harmsworth, ‘How human are you? The Internet of Bodies is here, are we ready?’ \(*Taylor Wessing*, 30 January 2023\) <\[35\]\(https://www.taylorwessing.com/en/interface/2023/iot---next-gen/how-human-are-you-the-internet-of-bodies-is-here-but-are-we-ready/> accessed 5 March 2023.</p></div><div data-bbox=\)](https://www.lawsociety.org.uk/topics/research/how-will-brain-monitoring-technology-influence-the-practice-of-law#:~:text=The%20potential%20for%20defendants%20to,to%20the%20problem%20of%20crime.> accessed 5 March 2023.</p></div><div data-bbox=)

there has been a heightened call for legislative intervention.⁵¹ In this section, the authors shall unpack the Chilean legislative response to neuro-rights and evaluate the adoption of a similar response in the Indian context. Further, the authors shall also analyse the relevance and applicability of the Digital Personal Data Protection Bill, 2022 (hereinafter, “PDPB”) to the protection of personal data in relation to neurotechnology.

A. Deconstructing the Chilean approach: a novel idea with flawed implementation

While there have been recent attempts to codify privacy rights with the Digital Rights Charter in Spain and an amendment of the Brazilian Personal Data Protection Law, they do not address the question of neuro-rights.⁵² In this context, the Chilean legislative intervention of 2021 via-a-vis neuro-rights is the first of its kind globally. In December 2020, the Chilean Congress passed a resolution approving an amendment to Article 19 of the Chilean Constitution to include a protection of neuro-rights.⁵³ Previously, the text of Article 19 was limited to the right to life, the right to physical and psychological integrity, equality before the law and equal protection under the law.⁵⁴ In furtherance of this constitutional scheme, the amendment explicitly required scientific and technological development to respect the right to life and the right to physical and mental integrity.⁵⁵ Further, it stipulates that a law shall be formulated which shall especially protect

⁵¹‘Frameworks to inform Neurotechnology Policy’ (*The Neurorights Foundation*, 2023) <<https://neurorightsfoundation.org/mission/>> accessed 5 March 2023; Rafael Yuste, Jared Genser and Stephanie Herrmann, ‘It’s Time for Neuro-Rights’ (2021) *Horizons* 18.

⁵²‘Charter of Digital Rights’ (2021) <https://portal.mineco.gob.es/RecursosArticulo/mineco/ministerio/participacion_publica/audiencia/ficheros/Charter%20of%20Digital%20Rights.pdf> accessed 5 March 2023; Brazilian General Data Protection Law (Law No 13,583, 2020).

⁵³Law No 21.283 (14 October 2021).

⁵⁴Constitution of Chile, 1980 art 19.

⁵⁵*ibid.*

neuro-activity along with any information coming from such neuro-activity.⁵⁶ This constitutional amendment to Article 19 was signed into law by the Chilean President in October 2021.

In furtherance of Article 19's stipulation of a law protecting neuro-activity and neural data, the Chilean Legislature developed a Neuro-rights Bill which has been approved by the Senate and has been tabled before the House of Representatives.⁵⁷ The Bill aims to establish a comprehensive legal framework to regulate and minimise the risks posed by neurotechnology while also recognising the potential beneficial use of such technologies. It explicitly protects both mental privacy and the right to self-determination of individuals whilst simultaneously requiring the state to ensure equal access to enhancing technologies, especially in the medical field.⁵⁸

The Chilean approach to neuro-rights has been spearheaded by Senator Guida Girardi who is also a member of the Science and Technology Commission of the Senate.⁵⁹ As per Girardi, the purpose of the amendment to Article 19 and the Neuro-rights Bill is to protect human dignity against the use of new technologies with the human brain as their object.⁶⁰ However, this novel and proactive approach comes with concerns of its own. While the authors agree with the need for such an approach, it is the specificities of the Chilean approach that warrant scrutiny. The Neuro-rights Bill, being considered by the House of Representatives, limits its ambit to the use of neurotechnology in the

⁵⁶ibid.

⁵⁷'On the Protection of Neuro-rights and Mental Integrity' (Bulletin No 13828-19, 7 October 2020).

⁵⁸Allan McCay, 'Neuro-rights: The Chilean Constitutional Change' (2022) AI & Society.

⁵⁹Vladimir Garay, Maria Paz Canales and Michelle Bordachar, 'Neuro-rights for what?' (*Derechos Digitales*, 29 April 2021) <<https://www.derechosdigitales.org/15760/neuroderechos-para-que-maldita-sea/>> accessed 5 March 2023.

⁶⁰ibid.

field of healthcare while omitting other plausible uses.⁶¹ As per the Bill, neurotechnology must be registered with the Chilean Institute of Public Health which shall function as the regulatory authority over the utilisation of neurotechnology in the field of healthcare.⁶² However, limiting the regulatory framework solely to the field of healthcare fails to consider the dynamicity of any emerging technology. For instance, while the internet was developed for defence and national security purposes, it subsequently came to acquire an entirely different purpose.⁶³ Moreover, with respect to neuro-rights, Meta has already recognised the potential utility of BCIs in the field of augmented reality and targeted marketing.⁶⁴ Given that this is a pre-emptive legislative response, the authors submit that pre-emptively limiting the scope is not prudent.

B. Conceptualising the Indian approach: Lessons from a foreign field

The authors are wary of advocating for the transplantation of a foreign legislative approach to a different jurisdiction with a different socio-legal context.⁶⁵ However, given that both Chile and India are developing economies with similar goals of transformation and development, the Chilean approach to neuro-rights could function as the building block in conceptualising a uniquely Indian approach to the

⁶¹Karen Rommelfanger, Amanda Pustilnik and Arleen Salles, 'Mind the Gap: Lessons Learned from Neuro-rights' (2022) *Science & Diplomacy*.

⁶²*ibid*.

⁶³Ben Tarnoff, 'How the internet was invented' *The Guardian* (15 July 2016) <<https://www.theguardian.com/technology/2016/jul/15/how-the-internet-was-invented-1976-arpa-kahn-cerf/>> accessed 5 March 2023.

⁶⁴'Imagining a new interface: Hands-free communication without saying a word' (*Meta*, 30 March 2020) <<https://tech.facebook.com/reality-labs/2020/3/imagining-a-new-interface-hands-free-communication-without-saying-a-word/>> accessed 5 March 2023.

⁶⁵KG Balakrishnan, 'The Role of Foreign Precedents in a Country's Legal System' (2010) 22(1) *National Law School of India Review* 1.

same.⁶⁶ The authors shall borrow from the Chilean approach in relation to two aspects *that is*, the codification of a specific legislative response to neurotechnology and the role played by expert recommendations in codifying the said legislation. The Indian Parliament could also benefit by learning from the missteps of its Chilean counterpart.

On the first aspect, given that the existing Indian jurisprudence does not provide sufficient protections in the realm of neuro-rights, there is a need for a pre-emptive legislative intervention. However, for such a legislative intervention to effectively operate vis-a-vis private actors with commercial interests, the Indian Parliament must take note of the Chilean Bill's pitfalls. While the Chilean Bill limited its ambit to the application of neurotechnology in healthcare, the Indian approach should not be as limited in scope. Instead, to ensure effective regulation, the Indian legislature should constitute an independent regulatory authority that shall oversee developments in neurotechnology across fields including the prospective non-medical usage of such technologies as evidenced by Meta. Furthermore, the authors submit that in light of the dynamicity of neurotechnology, the Indian approach must incorporate a *sunset clause* that mandates periodic and potential review of the legislation to ensure parity with ever-changing technological developments. This would ensure the effectiveness of the legal framework and prevent the legislation from being rendered infructuous due to changing technology.⁶⁷

On the second aspect, the Indian legislature must take note of the detailed process of expert consultation and parliamentary review that the Chilean constitutional reform and the Neuro-protection Bill

⁶⁶Jorge Heine, 'India-Chile: Transcending Geography' (*Gateway House*, 8 February 2013) <<https://www.gatewayhouse.in/india-chile-transcending-geography/>> accessed 5 March 2023.

⁶⁷Sean Molloy, Maria Mousmouti and Franklin De Vrieze, 'Sunset Clauses and Post-Legislative Scrutiny: Bridging the Gap between Potential and Reality' (*Westminster Foundation for Democracy*, February 2022) <<https://www.wfd.org/sites/default/files/2022-01/2022-01-18%20PLS%20sunset%20clauses%20-%20final.pdf>> accessed 5 March 2023.

underwent. The initial reform to Article 19 of the Chilean Constitution underwent rigorous consultation with Columbia University's Neuro-rights Initiative and leading international scholars including Professor Rafael Yuste.⁶⁸ Subsequently, the Neuro-protection Bill that is currently before the House of Representatives and has undergone multiple rounds of review by both the Science and Technology Commission and the Commission for Future Challenges, Science, Technology and Innovation.⁶⁹ This indicates that there has been substantial involvement of field experts in the codification of a highly technical and jargon-intensive legislation. The authors propose that the Indian approach to a neuro-rights legislation should also incorporate such rigorous consultation with field experts in neurotechnology at the pre-bill consultation stage.

*C. An interim solution: The Digital Personal Data Protection
Bill*

Given that an independent legislation on the regulation of neurotechnology is an inherently time-consuming process, the authors propose an interim framework for the protection of neural data by way of the PDPB. The PDPB is a proposed legal framework to comprehensively regulate and protect digital personal data in India.⁷⁰ The Bill is currently scheduled to be tabled before the Parliament in 2023.⁷¹ While such an interim protection would be limited to the

⁶⁸'On the Protection of Neuro-rights and Mental Integrity' (Bulletin No 13828-19, 7 October 2020).

⁶⁹'Constitutional Procedure' (*The Chilean Senate*, October 2020) <https://www.senado.cl/appsenado/templates/tramitacion/index.php?boletin_ini=13828-19/> accessed 5 March 2023.

⁷⁰The Draft Digital Personal Data Protection Bill, 2022 (Ministry of Electronics & Information Technology) <<https://www.meity.gov.in/content/digital-personal-data-protection-bill-2022/>> accessed 5 March 2023.

⁷¹Ayushi Kar, 'Parliamentary Standing Committee has given nod for new PDP Bill' *Business Line* (2 March 2023) <<https://www.thehindubusinessline.com/news/parliamentary-standing-committee->

protection of neural data and would not extend to the regulation of neurotechnology and its impact on the autonomy of an individual, it is only intended to operate as a stop-gap mechanism.

Currently, there exists a lacunae vis-a-vis neural data in data protection laws across the world. For instance, even the European Union's General Data Protection Regulation (hereinafter, "GDPR"), often regarded as the most comprehensive data protection framework, falls short in this regard. Under the GDPR, the closest category for the protection of neural data is that of biometric data.⁷² However, while such neural data that is sufficient to identify an individual might fall within the ambit of biometric data, it does not protect an individual from inferences regarding their interests, health and mental state being drawn from their neural data.⁷³ Similarly, Section 2(13) of the PDPB limits the definition of personal data to such data that could be used to identify an individual.⁷⁴ In light of this legislative gap, the authors propose an amendment to the text of the draft Bill to explicitly include the category of neural data within the ambit of personal data as defined in the Bill.

VI. CONCLUSION

It is now undeniable that the advancement and development of neurotechnology pose significant concerns relating to the mental privacy of potential users. In furtherance of such concerns, there is now a growing call for codifying a pre-emptive response to such

has-given-nod-for-new-pdp-bill-vaishnav/article66572292.ece/> accessed 5 March 2023.

⁷²Matt Burgess, 'What is GDPR?' (*Wired*, 24 March 2020) <<https://www.wired.co.uk/article/what-is-gdpr-uk-eu-legislation-compliance-summary-fines-2018/>> accessed 5 March 2023.

⁷³'On the Protection of Neuro-rights and Mental Integrity' (Bulletin No 13828-19, 7 October 2020).

⁷⁴The Draft Digital Personal Data Protection Bill, 2022 (Ministry of Electronics & Information Technology), s 2(13) <<https://www.meity.gov.in/content/digital-personal-data-protection-bill-2022/>> accessed 5 March 2023.

technologies. The proactive steps undertaken by the Chilean Legislature in adopting a legislative framework for neuro-rights have paved the way for other jurisdictions to follow suit. Through the course of this article, the authors have sought to contextualise the need for neuro-rights by identifying the risks posed by emerging neurotechnology and by highlighting the need to act at the earliest.

Prior to advocating for a legislative response, the authors undertook an analysis of existing Indian jurisprudence on the right to mental privacy and its suitability and adequacy vis-a-vis emerging neurotechnology. Upon doing so, the authors identified an array of pressing reasons that necessitate Indian legislation regulating such technologies. To construct a uniquely Indian legislative response, the authors have taken inspiration from the path-breaking Chilean approach while simultaneously highlighting the missteps thereunder. Furthermore, recognising the time constraints in the codification of specialised legislation, the authors have also proposed an interim protective framework by way of an amendment to the PDPB, 2022 that is scheduled to be tabled before the Indian Parliament in 2023. In conclusion, the authors submit that the embryonic stage of neurotechnology development should not take away from an acknowledgment of its significant pitfalls and the time to act is *now*. A neuro-rights legislation is both the need of the hour and the forthcoming decades.