MIND OVER MATTER: CONTRACTING AWAY COGNITIVE LIBERTY

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Abstract

In the rapidly evolving field of neurotechnology, both private and government entities have discovered how to take advantage of the information we can track from the brain. Today, brain data is being used for many purposes from tracking worker productivity to helping people with quadriplegia regain the ability to type. However, in that same world, a billion-dollar market thrives on the sale of personal data, a practice most people tacitly or unknowingly accept in exchange for a curated digital experience.

With the rise of consumer EEG sensors, and brain-computer interfaces (BCI) such as Elon Musk's Neuralink, that allow a third party to surveille and engineer your brain, a new type of freedom enters the conversation on human rights—cognitive liberty. Cognitive liberty refers to the right to think independently and autonomously, to use the full power of your own mind, and to engage in multiple modes of thought. As today's neurotechnology continues to blur the lines between man and computer, can we contract away our cognitive liberty the same way we do other forms of personal data? And as the age-old question in philosophy goes—just because we can, should we?

This article argues that cognitive liberty should be recognized as a fundamental human right protected by law. However, allowing individuals to contract away their cognitive liberty poses significant ethical and legal risks, since control over one's own mental processes and consciousness is the essence of what makes us human. International

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law must protect against the voluntary waiver of cognitive liberty, absent medical justification, because current international frameworks for waiving human rights do not adequately address the unpredictable risk of cognitive manipulation. Furthermore, cognitive liberty anchors other inalienable rights that are simply too valuable to contract away. Finally, while Chile is a pioneer in the protection of neurorights, their framework does not sufficiently protect individuals from the potentially irreversible consequences of cognitive manipulation.

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I. INTRODUCTION

Cognitive liberty is defined as the right to think independently and autonomously, to use the full spectrum of your own mind, and to engage in multiple modes of thought.[1] Unlike freedom of thought, which focuses on the freedom of *what* to think, cognitive liberty focuses on *how* to think.[2] For instance, one's hatred of pineapple on pizza is functionally different from one's taste buds rejecting the flavor of warm,

1. *See Frequently Asked Questions,* CTR. FOR COGNITIVE LIBERTY & ETHICS (Sep. 15, 2003), https://www.cognitiveliberty.org/ccle1/faqs/faq_general.htm.

2. *See* Tharin Pillay, *Rethinking the Right to Freedom of Thought: On Drug Policy, Neurotechnology, and the Case for Cognitive Liberty*, 29 INT'L J. HUM. RTS. 213, 226 (2024).

sweet fruit on tangy tomato sauce. Or, on a more serious note, the way someone contemplates death may change depending on whether they have taken an antidepressant in the morning. If we think of the brain as a camera, cognitive liberty aims to protect against others distorting or obstructing its lens. A scratch or warp in the lens's glass affects every image it captures, in a way that cannot be changed by simply adjusting the lighting or angle of a scene. Hence, cognitive liberty is all about perception. Proponents of cognitive liberty believe that our perception should be free of external manipulation, control, and alteration[3] —that we reserve the right to use and maintain our "lens" however we choose.

Historically, the simple right to freedom of thought has been enshrined in legal instruments like Article 18 of the Universal Declaration of Human Rights (UDHR)[4] and the International Covenant on Civil and Political Rights (ICCPR).[5] Both recognize the right as nonderogable, meaning it cannot be suspended even during public emergencies.[6] However, these protections were conceived in a time when direct manipulation of thought was technologically unfeasible, making them largely symbolic. Today, the tangible potential for brain surveillance and manipulation has transformed these once-theoretical rights into urgent imperatives. In recent years, there has been a greater push to recognize cognitive liberty as an international human right due to the increasing prevalence of psychoactive drugs and technologies that directly interact with the brain.[7] "Mind-control" devices are no longer a thing of science fiction novels. In January of 2024, Elon Musk's Neuralink became the first human implantation of a brain-computer interface.[8] The Neuralink device is designed to record neural activity which is then translated into actions through external computer devices.[9] This

3. *See* Marcello Ienca & Roberto Adorno, *Towards New Human Rights in the Age of Neuroscience and Neurotechnology,* 13 LIFE SCI., SOC'Y & POL'Y. 5, 10 (2017).

4. G.A. Res. 217 (III) A, *Universal Declaration of Human Rights*, U.N. Doc. A/RES/217(III) (Dec. 10, 1948) art. 18.

5. International Covenant on Civil and Political Rights art. 18, *opened for signature* Dec. 16, 1966, 999 U.N.T.S 171 (entered into force Mar. 23, 1976).

6. *Absolute Rights,* AUSTL. GOV'T ATT'Y GEN.'S DEP'T., https://www.ag.gov.au/rights-and-protections/human-rights-and-anti-discrimination/human-rights-scrutiny/public-sector-guidance-sheets/absolute-rights (last visited Mar. 7, 2025).

7. *See generally* Rafael Yuste, Jared Genser & Stephanie Herrmann, *It's Time for Neuro-Rights: New Human Rights for the Age of Neurotechnology*, 18 HORIZONS 154, 154-55 (2021).

8. Isobel Asher Hamilton & Beatrice Nolan, *Neuralink's First Human Patient Has Been Revealed: Here's How We Got Here,* BUS. INSIDER (Mar. 22, 2024), https://www.businessinsider.com/neuralink-elon-musk-microchips-brains-ai-2021-2.

9. *Id.*

has become a ground-breaking evolution in treatments specifically for quadriplegia.[10]

Given the rapidly expanding landscape of neurotechnology, recognition of cognitive liberty as a standalone human right is essential for bridging this gap. Unlike rights that can be exercised externally, such as freedom of speech or assembly, cognitive liberty governs the internal domain of thought—a realm fundamental to individuality and free will.[11] Without robust protections, individuals risk losing control over their most intimate domain, compromising not only autonomy but also the foundation of other freedoms. This notion is well supported by legal scholars globally, with many recognizing it as a natural extension of the freedom of thought that aligns with the trend of neuro-technological advancements.[12] That said, one of the most contentious issues surrounding cognitive liberty is whether such a critical right can—or rather, *should*—be voluntarily waived.

Jan Christoph Bublitz, a German legal scholar and consultant to the United Nations, whose research focuses on the intersection of philosophy, law, and cognitive science,[13] tackled this issue, coining cognitive liberty as a right to "mental self-determination."[14] In other words, cognitive liberty is an individual's right against others interfering with their mind or making any regulations commanding them to do so.[15] Therefore, if an individual is in possession of such a right, they can also relinquish it and allow others to interfere with it. Bublitz further argues that formulating the right as an inalienable right, where the right-holder is not entitled to waive them, is controversial.[16] He notes that courts invoke such rights, not to protect the interest of an individual, but rather to protect against violations of dignity and uphold the integrity of these natural laws.[17] For instance, the inalienable right to life is hotly debated because while there is a right to not have your life

10. *Id.*

11. *See* Liz Mineo, *Fighting for Our Cognitive Liberty*, HARV. GAZETTE (Apr. 26, 2023), https://news.harvard.edu/gazette/story/2023/04/we-should-be-fighting-for-our-cognitive-liberty-says-ethics-expert/.

12. *See* Marcello Ienca, *On Neurorights*, 15 FRONTIERS ON HUM. NEUROSCI. 1, 4 (Sep. 24, 2021).

13. *Homepage of Jan Christop Bublitz*, https://www.chrisbublitz.de/ (last visited Mar. 7, 2025).

14. Jan-Christoph Bublitz, *My Mind is Mine!? Cognitive Liberty as a Legal Concept*, *in* COGNITIVE ENHANCEMENT 233, 252 (Elisabeth Hildt & Andreas G. Franke eds., Springer, 2013).

15. *Id.* at 252.

16. *Id.* at 253.

17. *Id.*

taken away from you, a right to suicide does not immediately follow.[18] Bublitz's main trouble with a paternalistic approach to cognitive liberty is that if the prohibition of unwanted mind-interventions is meant to protect primarily an individual's interests, then restricting individuals' from exercising those interests at-will is needlessly a prohibition against themselves and their self-determination.[19] He then contends that critics will nonetheless have to accept that there are exceptions where waiver should be allowed, such as for therapeutic purposes, and therein lies the added challenge of arguing and applying these exceptions consistently.[20]

While Bublitz's argument raises important considerations about self-determination, it overlooks the profound risks associated with contracting away cognitive liberty, risks that extend beyond the individual to the broader societal fabric.

The thesis of this paper takes a hard stance against such waivers, emphasizing that allowing individuals to contract away their cognitive liberty poses significant ethical and legal risks. Control over one's mental processes and consciousness is the essence of humanity itself, and as such, international law must establish robust safeguards to prevent the voluntary waiver of cognitive liberty, except in cases of compelling medical justification. Current frameworks for waiving human rights fail to address the unpredictable consequences of cognitive manipulation, underscoring the need to redefine the ethical scope of a waiver. Moreover, cognitive liberty underpins other inalienable rights—such as freedom of thought, personal integrity, and the right to life—that are too vital to be compromised. While Chile has pioneered efforts to protect neurorights, its approach lacks the specificity needed to prevent the potentially irreversible harms of cognitive manipulation. As neurotechnology advances, the international community must act decisively to protect this foundational right.

II. THE CHALLENGE OF ACHIEVING UNEQUIVOCAL WAIVER OF COGNITIVE LIBERTY AND INFORMED CONSENT

Cognitive liberty must be recognized as an inalienable right because it is not easily waived under international frameworks that govern the relinquishment of other significant, yet alienable, rights. There is ongoing debate about whether an individual can formally waive their

18. *Id.*
19. *Id.* at 255.
20. *Id.* at 253.

freedoms under conventions such as the European Convention on Human Rights (ECHR).[21] Such discussion primarily centers on whether the person has made a legitimate and voluntary decision to forgo their right in a specific situation like a contractual agreement. That said, the European Court of Human Rights, has progressively recognized that a waiver must be, "made in an unequivocal manner and must not run counter to any important public interest."[22] Various international instruments support the idea that the unequivocally of a waiver hinges upon informed consent.[23] The extent that an individual is informed of the impact of their decisions reinforces the unambiguity and voluntariness of those decisions.[24] But what does informed consent look like in the context of an ever-evolving study such as neuroscience?

A. Informed Consent and Medical Waivers

To better understand the concept of informed consent in this context, we can examine approaches to waivers in medical interventions. The Declaration of Helsinki notes that physicians must inform the patient of the risks involved and potential benefits of the intervention. [25] Needless to say, obtaining informed consent to this extent should be relatively straight-forward, like warning labels on medication bottles or an hours-long consultation with a doctor prior to a major operation. However, the scope of neuroenhancement and cognitive manipulation is still being studied today. So long as there are still many unknowns about the long-term side effects of direct manipulation of the brain, states should be wary of allowing others to contract away their protection with simple medical consent forms.

Accordingly, Bublitz acknowledges that when people harm themselves and there are severe negative consequences, states can intervene for paternalistic reasons. He then states that where neuroenhancers "live up to their promise," or are, in other words, effective, the risk of negative consequences is more tolerable.[26] Yet, as of 2024, the risks of

21. Nelly Arakelyan, *Waiver of Human Rights: A Right or a Challenge?*, 28 ADMIN. L. & PROCESS 5, 8 (2020).

22. *Id.* at 13.

23. *See* Olivier De Schutter, *Waiver of Rights and State Paternalism Under the European Convention on Human Rights*, 51 N. IR. LEGAL Q. 481, 489 (2000).

24. *Id.*

25. *See* World Med. Ass'n, *Declaration of Helsinki: Ethical Principles for Medical Research Involving Human Subjects*, JAMA (Nov. 27, 2013), https://jamanetwork.com/journals/jama/fullarticle/1760318.

26. Bublitz, *supra* note 14, at 256.

neurotechnologies are not as well-documented as perhaps the risks of prolonged pharmaceutical use.[27] Besides the Neuralink, deep brain stimulation (DBS) is another known procedure that directly stimulates brain activity through wire implants and is commonly performed on patients with Parkinson's disease.[28] DBS is known to have temporary side effects such as sensory changes, mood changes, seizures, and general risks associated with invasive surgery such as heart problems, infection, hemorrhaging.[29] These risks are inarguably serious but nonetheless well observed and more importantly, communicable to a patient seeking DBS treatment. A study on Parkinson's disease indicates that 72.5% of patients experience an improvement in motor function after DBS, with a patient satisfaction rate of 92.5%.[30] These statistics exemplify Bublitz's argument: when the benefits of a practice clearly outweigh its risks, there is less need for government regulation or intervention.

However, this argument does not present a definitive case for advocates of cognitive liberty waivers. Proponents of DBS often claim that the technology is "reversible," but this assertion is increasingly being scrutinized for its lack of nuance.[31] While the DBS implants can be turned off or physically removed with minimal immediate damage, new research has introduced the possibility that prolonged stimulation of this sort may produce long-term neural alteration underlying the persisting clinical effect.[32] Additionally, the mere absence of evidence about the long-term effects of DBS should weaken the reliability of its reversibility claims.[33] Furthermore, the FDA initially rejected Neuralink's application for clinical trials in 2022 due to lack of clear evidence that the device could be safely removed without causing

27. *See* Jonathan R. Wolpaw, *Neurotechnologies May Change the Brain in Unpredictable Ways*, *in* RISKS & CHALLENGES OF NEUROTECHNOLOGIES FOR HUMAN RIGHTS 15, 15 (UNESCO, 2023).

28. *See Deep Brain Stimulation,* MAYO CLINIC (Sep. 19, 2023), https://www.mayoclinic.org/tests-procedures/deep-brain-stimulation/about/pac-20384562.

29. *See id.*

30. Frederick L. Hitti et al., *Long-term Outcomes Following Deep Brain Stimulation for Parkinson's Disease*, 132 J. NEUROSURGI. 205, 208-209 (2019).

31. Jonathan Pugh, *No Going Back? Reversibility and Why It Matters for Deep Brain Stimulation*, 45 J. MED. ETHICS 225 (2019).

32. *Id.* at 226 (citing Diane Ruge et al., *Shaping reversibility? Long-term deep brain stimulation in dystonia: the relationship between effects on electrophysiology and clinical symptom,* 134 BRAIN 2106, 2106-15 (2011); Diane Ruge et al., *Long-term deep brain stimulation withdrawal: clinical stability despite electrophysiological instability*, 342 J. NEUROL. SCI. 197-99 (2014)).

33. *Id.* at 227.

permanent brain damage.[34] While Neuralink later on announced that they successfully removed an implant from a pig named Dorothy in a way that left her allegedly, "healthy, happy, and indistinguishable from a normal pig," removal procedures have never been performed on a human.[35] In early 2024, a Neuralink device was slightly retracted from their first human patient's back, and the company opted to tweak the software of the device rather than removing the implant or reattaching or adjusting the wires itself.[36] These uncertainties that are reluctantly highlighted by tech-optimists underscore the inherent risks of neurotechnology and challenge the premise that their benefits justify reduced regulation or unrestricted waivers.

To compare, psychoactive substances such as cannabis are among the clearest examples of brain-altering substances that are criticized for doing more harm than the purported good. Medical cannabis is increasingly used in the treatment of severe and chronic pain, multiple sclerosis, epilepsy, Crohn's disease, and Alzheimer's disease.[37] Despite growing public support for decriminalizing this form of "alternative medicine," supported by prevalent historical use across cultures, and the publication of over 30,000 cannabis-related studies over the past two centuries.[38] Many argue that, overall, the evidence shows the risks of long-term use—such as substance dependence and effects on brain development—outweigh its therapeutic benefits.[39] As a result, cannabis remains an illicit drug in most countries.[40]

In contrast, neurotechnology is a relatively recent innovation and lacks the extensive historical record and research base of cannabis. Yet, it is unlikely to face the same public skepticism and government

34. *See* Rachel Levy & Marisa Taylor, *U.S. regulators rejected Elon Musk's bid to test brain chips in humans*, *citing safety risks,* REUTERS (Mar. 2, 2023), https://www.reuters.com/investigates/special-report/neuralink-musk-fda/.

35. Leah Crane, *Elon Musk demonstrated a Neuralink brain implant in a live pig*, NEW SCIENTIST (Aug. 29, 2020), https://www.newscientist.com/article/2253274-elon-musk-demonstrated-a-neuralink-brain-implant-in-a-live-pig/.

36. *See PRIME Study Progress Update—User Experience,* NEURALINK BLOG (May 8, 2024), https://neuralink.com/blog/prime-study-progress-update-user-experience/.

37. Stephanie Watson & Kim Painter, *Medical Marijuana: Benefits and Side Effects*, WEBMD, https://www.webmd.com/a-to-z-guides/medical-marijuana-faq (last visited Oct. 4, 2025).

38. *See* Jeremy Y. Ng & Nathan Change, *A biometric analysis of cannabis and cannabinoid research literature*, 4 J. CANNABIS RSCH. 25 (2022).

39. *See* Nicola Black et al., *Cannabinoids for the treatment of mental disorders and symptoms of mental disorders: a systematic review and meta-analysis*, 6 LANCET PSYCHIATRY 995, 1004-07 (2019).

40. *See Countries Where Weed Is Illegal 2025*, WORLD POPULATION REV., https://worldpopulationreview.com/country-rankings/countries-where-weed-is-illegal (last visited Aug. 3, 2025).

pushback like cannabis. A key difference is that neurotechnology does not carry the same political ostracism or social stigma that has historically hindered cannabis from entering the mainstream. Therefore, it would be surprising if neurotechnology as a therapy faced similar delays in achieving widespread acceptance. However, the likelihood of sooner and greater public acceptance should not be interpreted as a justification for allowing individuals to waive their right to cognitive liberty to access neurotechnology. Instead, it signals a greater urgency to assess the risks of waiver and to confront the challenges that may accompany therapeutic neurotechnology's probable rapid and widespread use.

Moreover, unlike neurotechnology, cannabis use does not involve a third-party intervention; there is no external entity implanting a device into the brain and thus, no need for consent or waiver. The psychoactive effects of cannabis are entirely internal and self-contained. In contrast, neurotechnology establishes a continuous interface with the brain, producing not only internal therapeutic effects but also monitorable external outputs and data. This ongoing interaction introduces unique privacy and autonomy concerns that cannabis use does not.[41] As a result, the balance of benefits and risks in neurotechnology involves, not only concerns related to health and physiology, but also concerns of personal integrity and individual welfare which are not easily communicated when ensuring informed consent.

Notwithstanding these additional privacy and autonomy concerns, invasive neurosurgical procedures often represent a patient's last resort. At this stage, individuals are more willing to accept significant medical risks, even in the absence of thorough extensive research, for the possibility of relief from debilitating conditions.[42] Informed consent then hinges upon understanding the uncertainty of treatment itself—on being informed about the opacity of the risks. The mere prospect of neurotechnology's life-changing outcomes drives government approval of its continued research and experimentation.[43] Despite Neuralink's notable lack of transparency regarding its U.S. clinical trials,[44] the company announced that it will be expanding its clinical

41. *Id.*

42. *See* L.Y. Cabrera et al., *Authentic Self and Last Resort: International Perceptions of Psychiatric Neurosurgery*, 45 CULT. MED. & PSYCHIATRY 141 (2020).

43. *See* Hermann Garden & David Winickoff, *Issues in Neurotechnology Governance* at 7 (OECD, SCI., TECH. & INDUS. Working Paper No. 11, 2018).

44. *See* Andrew Ko & Nancy S. Jecker, *Elon Musk's Neuralink has Concerning Lack of Transparency and Could be Vulnerable to Hacking, Ethicists Warn*, LIVE SCIENCE (Feb. 19,

research in Great Britain.[45] Additionally, international human rights frameworks, such as Article 7 of the ICCPR, explicitly allow for voluntary participation in experimental medical procedures, even those involving life-threatening risks, provided informed consent is given.[46] This emphasizes the ethical and legal validity of waivers in medical contexts where interventions offer critical therapeutic value. However, when waivers are sought for non-essential purposes, their justification becomes far less clear and demands heightened regulatory oversight.

B. Informed Consent and Waivers for Non-Medical Purposes

Waiving cognitive liberty for non-medical purposes introduces unique ethical and legal challenges, especially when neurotechnology is used primarily for enhancement or convenience rather than medical necessity. Unlike therapeutic interventions, non-medical uses of neurotechnology often lack clear and measurable benefits to offset the potential risks. These risks include not only the possibility of physical harm but also more abstract threats to autonomy, identity, and cognitive integrity—dimensions of human existence that are poorly understood and difficult to quantify. This lack of clarity calls into question the validity of informed consent in non-medical contexts, especially when individuals may not fully comprehend the implications of waiving their cognitive liberty.

Neurotechnologies are increasingly being applied in non-medical contexts, transforming industries such as entertainment, education, and workplace management.[47] These primarily rely on noninvasive brain-computer interfaces and external electroencephalogram (EEG) sensors that record the electrical activity of the brain.[48] Such electrical activity can then be translated into information about brain function from emotional arousal to mental wellbeing.[49] In education, similar wearable devices are used to recognize students' preferred learning styles.[50] Such

2024), https://www.livescience.com/health/neuroscience/elon-musks-neuralink-has-concerning-lack-of-transparency-and-could-be-vulnerable-to-hacking-ethicists-warn.

45. *Musk's Neuralink to Test Brain Chips in Clinical Study in Great Britain*, REUTERS (July 31, 2025), https://www.reuters.com/investigates/special-report/neuralink-musk-fda/.

46. International Covenant on Civil and Political Rights, *supra* note 5, at 175.

47. *See* Marcello Ienca & Effy Vayena, *Direct-to-Consumer Neurotechnology: What Is It and What Is It for?*, 10 AJOB NEUROSCI. 149, 150 (2019).

48. *Id.*

49. *Id.* at 149 (citing Dan Ariely & Gregory S. Berns. *Neuromarketing: The Hope and Hype of Neuroimaging in Business*, 11 NAT. REV. NEUROSCI. 284 (2010)).

50. *See* Bingxue Zhang et al., *Design and Implementation of an EEG-Based Learning-Style Recognition Mechanism*, 11 BRAIN SCI. 613, 613-15 (2021).

neurotechnologies are even marketed as direct-to-consumer devices that can be used for improving meditation, stress management, and mindfulness.[51] Further, military and defense agencies are exploring implantable brain-computer interfaces (BCI) for controlling drones and monitoring soldiers' cognitive states to optimize performance in high-pressure environments.[52] Not to mention neuromarketing tools can be used to analyze brain responses to advertisements to refine marketing strategies.[53]

Furthermore, growing fascination with biohacking and integrating technological enhancements into daily life reflects a global trend towards self-empowered health and democratized science.[54] However, this enthusiasm warrants concern because it blurs the boundaries between voluntary adoption of technology and the involuntary or indirect loss of autonomy. Unlike personal data, which individuals often waive knowingly or willingly, brain activity and its responses to stimuli are not entirely under our conscious control.[55] Lack of agency over our cognitive processes make the potential exploitation of neurotechnologies particularly troubling, raising ethical questions regarding the extent to which individuals can genuinely consent to interventions or manage their implications. As neurotechnologies continue to permeate non-medical industries, it is important to consider the risks they pose to cognitive liberty and autonomy.

Proponents of non-medical neurotechnological waivers often rely on arguments about user control and the reversibility of interventions. For example, devices marketed for cognitive enhancement frequently emphasize that users can "pause" or "disengage" the technology at will. This model treats neurological data as something akin to digital data, where legal frameworks like Europe's General Data Protection Regulation (GDPR) requires that when users use opt-in to share their

51. *See* Andrew Y. Paek et al., *Concerns in the Blurred Divisions Between Medical and Consumer Neurotechnology*, 15 IEEE SYS. J. 3069, 3078 (2020).

52. Anika Binnendijk, Timothy Marler & Elizabeth M. Bartels, BRAIN-COMPUTER INTERFACES: U.S. MILITARY APPLICATIONS AND IMPLICATIONS, AN INITIAL ASSESSMENT (RAND Corporation, 2020) (citing Jack Corrigan, *The Pentagon Wants to Bring Mind-Controlled Tech to Troops*, NEXTGOV, (July 17, 2018), https://www.nextgov.com/emerging-tech/2018/07/pentagon-wants-bring-mind-controlled-tech-troops/149855/).

53. Paek et. al., *supra* note 51, at 3077.

54. *See* Jozef Keulartz & Henk van den Belt, *DIY-Bio-Economic, Epistemological and Ethical Implications and Ambivalences* 12 LIFE SCI., SOC'Y AND POL'Y 7 (2016).

55. *See The Battle for Your Brain: Defending the Right to Think Freely in the Age of Neurotechnology* at 9-10, 21-22 (St. Martin's Press, 2023) (creating a hypothetical scenario where an employee sees a co-worker and subconsciously feels romantic feelings, triggering a change in the brain activity recorded on his company-provided headset).

private data or waive their right to privacy, they retain the right to withdraw their consent and delete their shared data.[56] However, brain activity and its associated responses are intrinsically tied to a person's identity and consciousness. Once manipulated, the effects on an individual's cognitive processes may be irreversible or poorly understood, especially if prolonged use alters neural pathways or induces long-term psychological changes. Thus, it is unclear whether waivers for biotechnological interventions can ever truly meet the criteria for informed consent when the consequences are so deeply enmeshed with an individual's cognitive identity and social relationships.

Furthermore, reversibility fails to address how brain data may be recorded, stored, and used in ways that influence how a third-party monitor treats or responds to an individual. External monitoring and surveillance may produce unequal power dynamics; for instance, employees may feel coerced into using productivity-enhancing devices to remain competitive or meet employer expectations, even if they have reservations about the potential risks.[57]

There is also a broader societal risk in normalizing waivers for non-medical biotechnological applications. As these technologies become more integrated into daily life, they risk creating a culture where cognitive liberty is treated as a commodity, available for trade or sacrifice in exchange for convenience or perceived enhancement.[58] For example, in educational or consumer settings, individuals may feel pressured to adopt neurotechnologies to keep pace with societal demands for efficiency and optimization. This commodification of mental autonomy not only devalues the inherent dignity of cognitive liberty but also sets a dangerous precedent for the erosion of other fundamental rights. The cumulative effect is a slippery slope where the boundaries of acceptable neurotechnological interventions are continually pushed, raising the stakes for individuals and societies alike.

Moreover, the use of neurotechnology to enhance or control mental states complicates how legal liability is assigned. Philosopher Stephen Rainey of Technische Universiteit poses a hypothetical scenario

56. Regulation 2016/679 of the European Parliament and of the Council of 27 April 2016 on the Protection of Natural Persons with Regard to the Processing of Personal Data and on the Free Movement of Such Data, and Repealing Directive 95/46/EC, art. 7, 2016 O.J. (L 119) 1 (EU) [hereinafter GDPR].

57. Tara Francis Chan, *China is Monitoring Employees' Brain Waves and Emotions – and the Technology Boosted One Company's Profits by $315 million*, BUS. INSIDER (Apr. 30, 2018), https://www.businessinsider.com/china-emotional-surveillance-technology-2018-4.

58. *See* Bublitz, *supra* note 14, at 259-62.

in which two BCI users, Smith and Jones, get into a car accident.[59] Smith argues that his brain-computer interface, marketed as a tool to maximize concentration, made him a safer driver and that this enhancement should absolve him of liability.[60] Jones, by contrast, contends that his BCI was designed to significantly influence brain activity, and therefore he should not be held responsible for the device's failure to prevent the accident.[61]

Rainey uses this scenario to illustrate the "responsibility gap" created by the hybrid nature of neurotechnology.[62] While the initial decision to use a neural device is a human one, the resulting mental state is technologically influenced—raising questions about whether users can or should be held fully accountable for their actions.[63] These questions stem directly from the waiver of cognitive liberty. By using devices that alter their mental states, both Smith and Jones relinquished some control over their actions.

This raises broader concerns about not only individual autonomy but also the societal consequences of permitting technologies that disconnect people from full agency in the real world. If Smith's argument prevails, regulators may be forced to consider whether individuals are negligent for not waiving their cognitive liberty in order to enhance concentration while driving.[64] If Jones's argument succeeds, regulators must then grapple with whether waiving cognitive liberty can absolve an individual's liability entirely when their behavior is controlled by malfunctioning technology.[65]

Anticipating such legal dilemmas adds yet another layer of complexity to the doctrine of informed consent. When existing legal frameworks have yet to recognize this kind of agentic relationship in which an individual may have little to no control over their actions, it becomes increasingly difficult to fully inform users of the legal risks.

The scope of non-medical neurotechnology is expansive and continues to permeate various aspects of daily life, creating more uncertainty around its impact on both individual wellbeing and broader societal structures. As with many technologies, individuals often

59. *See* Stephen Rainey, *An Anticipatory Approach to Ethico-Legal Implications of Future Neurotechnology*, 30 SCI. AND ENG'G. ETHICS 1, 4-5 (2024).

60. *Id.*

61. *Id.*

62. *Id.* at 5.

63. *See id.* at 4.

64. *See id.* at 6-7.

65. *See id.*

sacrifice elements of personal freedom to access modern conveniences, often without fully understanding or foreseeing the long-term consequences for themselves or for society. To prevent the erosion of cognitive liberty, waiver must account for both personal and legal risks, ensuring that the adoption of non-medical neurotechnologies remains ethical, practical, and grounded in informed choice.

III. COGNITIVE LIBERTY ANCHORS OTHER INALIENABLE RIGHTS

It has been emphasized throughout this paper that the uncertainties of developing neurotechnology warrant making cognitive liberty a non-derogable right. In spite of this, the question remains of whether cognitive liberty should be waivable anyway. At this point, an appeal to futility becomes very attractive. Everything has a catch, everything has its risks, big and small—so who cares about whether the long-term risks of cognitive manipulation are unknown? From a technical standpoint, a right is not truly inalienable if an exception is made for medical justifications. We encounter the same dilemma when it comes to the right to life and related right to suicide. The greatest takeaway from this issue is that humans have trouble governing one another's humanity. While it is easy to regulate actions, it is not as easy to regulate the very essence of what makes us human. If the essence of humanity lies in elements such as consciousness, individuality, and social relationships—as emphasized across numerous philosophical traditions[66] — then the control center behind these very elements must be considered equally fundamental. From this perspective, it becomes evident that cognitive function is as integral to our humanity as the act of breathing or the beating of a heart. If life itself is defined by the presence of our brain, then protecting cognitive liberty is not merely a moral or philosophical obligation but a practical necessity for preserving human dignity. To treat cognitive liberty as waivable or conditional is to risk undermining the very foundation upon which all other rights and freedoms depend.

Cognitive liberty's centrality to our understanding of humanity makes it the cornerstone of all inalienable rights. While rights such as freedom of thought, personal integrity, and the right to life are often considered distinct, cognitive liberty serves as the thread that connects and supports them. It transforms abstract concepts like freedom of

66. *See* John F. Dovidio & Martijn van Zomeren, *Introduction: The Human Essence, in* THE OXFORD HANDBOOK OF THE HUMAN ESSENCE 3-18 (Martijn van Zomeren & John F. Dovidio eds., 2018).

thought into tangible protections against risks of external interference and manipulation. This interconnectedness not only strengthens the case for cognitive liberty as an inalienable right but also highlights its indispensability in safeguarding other fundamental freedoms.

A. The Right to Personal Integrity

Cognitive liberty also reinforces the right to personal integrity, a cornerstone of human dignity. Article 7 of the ICCPR prohibits torture, cruel treatment, and any acts that degrade human autonomy or integrity.[67] While this right has traditionally been applied to protect individuals from physical harm, the advent of neurotechnologies requires additional protections against mental and cognitive interference. Whether through BCIs, psychoactive substances, or EEG monitoring, direct manipulation of cognitive processes can profoundly alter an individual's sense of self, stripping autonomy in ways that physical coercion cannot.[68] The imperative to preserve cognitive liberty becomes even more urgent with the advent of neurotechnologies that aim to reduce the "friction" between thought and action.[69] For example, traditional tools like a mouse or keyboard require intermediary steps: thinking about an action, then physically executing it.[70] Neurotechnologies bypass these steps by enabling direct brain-to-device interactions, creating seamless control over external systems.[71] While these advancements facilitate unprecedented efficiency and integration, they also position neurotechnology as an intermediary for how individuals control their lives, risking potential manipulation.

The military's exploration of BCIs exemplifies these risks, highlighting how waiving cognitive liberty can expose individuals to threats against their personal integrity.[72] BCIs, envisioned for enhancing communication, decision-making, and human-machine collaboration, offer significant operational benefits on the battlefield. However,

67. International Covenant on Civil and Political Rights, *supra* note 5, at 175.

68. *See* Oliva Scott, *Understanding the Debate on Neurorights and Personal Identity in Neurotechnology,* ALL. FOR CIVIC ENGAGEMENT BLOG (Sep. 6, 2024), https://ace-usa.org/blog/research/research-technology/understanding-the-debate-on-neurorights-and-personal-identity-in-neurotechnology/.

69. Luisa Rodriguez & Keiran Harris*, Nita Farahany on the Neurotechnology Already Being Used to Convict Criminals and Manipulate Workers*, 80,000 HOURS (Dec. 7, 2023), https://80000hours.org/podcast/episodes/nita-farahany-neurotechnology/.

70. *Id.*

71. *Id.*

72. *See* Binnendijk, Marler & Bartels, *supra* note 52, at 25 (citing Ienca & Adorno, *supra* note 3).

their use introduces profound ethical and legal concerns.[73] For instance, BCIs in military applications could subject soldiers to external control or monitoring of their cognitive states, thereby enabling unprecedented invasions of mental autonomy.[74] While monitoring stress levels, cognitive workload, or emotional states might optimize performance, these enhancements could increase soldiers' utility in combat, often at the cost of their autonomy.[75]

Consider a scenario in which a soldier equipped with a BCI implant gains complete control over an arsenal of drones. An adversary seeking to hijack or neutralize these drones might target the individual with the implant, shifting the focus from dismantling the weapons to disabling the human operator. This dynamic effectively merges the brain and the weapon, needlessly exposing the individual to risks to their physical and cognitive integrity. Furthermore, the potential for hacking or external manipulation of BCIs raises the alarming possibility of adversaries influencing a soldier's thoughts or actions and compromising their mental autonomy.[76]

The UN has already expressed concern regarding such neurotechnological advancements, stating, "Currently, compliance with fundamental principles on the battlefield, such as human dignity, agency, and humanity, cannot be meaningfully ensured."[77] They have also advised against the use of such neurotechnology for coercive purposes, such as reducing soldiers' need for sleep, while advocating for strict limitations on non-coercive uses.[78] These concerns are compounded by the power asymmetries in military contexts,[79] where soldiers' willingness to tolerate or expose themselves to human rights violations is shaped by a complex bureaucratic system that relies on their sacrifice. Waiving cognitive liberty represents a dangerous proposition in which neurotechnological interventions could grant governments excessive

73. *Id.* at 10.

74. *Id.* at 25.

75. *Id.*

76. *Id.* at 22.

77. HUM. RTS. COUNCIL, Impact, Opportunities and Challenges of Neurotechnology with Regard to the Promotion and Protection of All Human Rights, U.N. Doc. A/HRC/57/61, at 13 (2024) (citing Development, Concepts and Doctrine Centre, Human Augmentation: The Dawn of a New Paradigm (U.K. Ministry of Defence, 2021), at 52; Sebastian Sattler et al., *Neuroenhancements in the Military: A Mixed-Method Pilot Study on Attitudes of Staff Officers to Ethics and Rules,* 15(1) NEUROETHICS (2022)).

78. *See* HUM. RTS. COUNCIL, *supra* note 77, at 8 (citing Michael Tennison & Jonathan Moreno, *Neuroscience, Ethics, and National Security: The State of the Art*, 10 PLOS BIOL. 3 (2012)).

79. *See id.*

discretion to control and manipulate neuro-enhanced soldiers in tenuous circumstances like combat.

Anchoring the right to personal integrity in cognitive liberty allows international law to more effectively address the unprecedented challenges posed by neurotechnology. Unlike physical injuries, disruptions to cognitive integrity leave no visible scars but can deeply affect an individual's identity, autonomy, and sense of self. Third parties such as governments may also take advantage of the technology to augment individuals for their own gain and political purposes. Therefore, it is critical to recognize cognitive liberty as an essential component of personal integrity that protects both the physical and mental autonomy of individuals.

B. The Right to Life

Cognitive liberty is deeply intertwined with the way we live life, not merely as a biological condition but as a state of conscious self-awareness. Philosophical traditions, such as John Locke's theory of personal identity, emphasize that life's essence lies in the continuity of thought and consciousness.[80] Similarly, certain Buddhist principles equate consciousness with the essence of life itself, suggesting that awareness and mental clarity are the foundations of existence and spiritual growth.[81] Both perspectives highlight the brain not just as a biological organ but as the seat of identity, agency, and autonomy. Without cognitive freedom, this essence is compromised. The ability to think freely, reflect, and engage with the world is fundamental to a life of meaning and purpose.

Exploring this relationship further requires new dimensions to what has traditionally been understood as "the right to life." Legally, this right is often interpreted narrowly as protections against being killed or the arbitrary deprivation of life.[82] However, there is a strong argument to expand this understanding to include the right to control one's own life. Cognitive function and perception are inseparable from the human experience. Accordingly, the right to life involves not only protection against the loss of life, but also the ability to shape how we perceive, interpret, and engage with the world around us.

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80. Jessica Gordon-Roth, *Locke on Personal Identity*, STANFORD ENCYCLOPEDIA OF PHIL. (Feb. 11, 2019), https://plato.stanford.edu/entries/locke-personal-identity/.

81. Christian Coseru, *Mind in Indian Buddhist Philosophy*, STANFORD ENCYCLOPEDIA OF PHIL. (Dec. 3, 2009), https://plato.stanford.edu/entries/mind-indian-buddhism/.

82. *See Article 2: Right to Life*, EQUAL. & HUM. RTS. COMM'N (Jun. 3, 2021), https://www.equalityhumanrights.com/human-rights/human-rights-act/article-2-right-life.

By recognizing cognitive liberty as foundational to the right to life, international law can affirm that mental autonomy is essential to living a meaningful and self-directed existence. Just as protections for physical integrity are designed to prevent bodily harm, safeguards for cognitive liberty are necessary to ensure individuals retain control over their thoughts, emotions, and decisions. This approach reframes the right to life as not only physical survival but also the freedom to think, reflect, and experience life without interference. It ensures that technologies designed to enhance the mind serve to strengthen human agency, rather than erode it, preserving the authenticity of individual thought and action that define the human condition.

Philosophical debates surrounding dualism[83], which questions whether the mind and body are truly separate, may shift as technology increasingly serves as an intermediary between internal thoughts and physical actions, making their connection more apparent. This emerging reality suggests that the mind and body are deeply interconnected and should be treated as a unified whole. Protecting both under the right to life to secure both mental and physical autonomy is vital to preserving the core of what it means to be human in a neurotechnological age.

C. Anchoring All Inalienable Human Rights

With the brain serving as the control center for all human actions and thoughts, there is no inalienable right recognized by international human rights law that is not inherently grounded in cognitive liberty. This connection becomes clearer when considering why humans are deemed deserving of such rights in the first place. The drafters of the Universal Declaration of Human Rights (UDHR) emphasized the intrinsic and inviolable dignity of all humans as the foundation for these rights.[84] Dignity, as articulated in the preamble and reiterated throughout the document, was intentionally left undefined to serve as a universal concept.[85]

The UDHR drafters relied on dignity as a heuristic concept to ground human rights universally while avoiding metaphysical or

83. Justin Skirry, *René Descartes: The Mind-Body Distinction*, INTERNET ENCYC. OF PHIL., https://iep.utm.edu/descartes-mind-body-distinction-dualism/ (last visited Mar. 7, 2025).

84. *See* Glenn Hughes, *The Concept of Dignity in the Universal Declaration of Human Rights*, 39 J. RELIGIOUS ETHICS 1, 3 (2011).

85. *See id.*

religious disputes.[86] This universality reflects the shared recognition that dignity is an essential feature of human existence, one that binds humanity together despite differences. Many traditions interpret dignity as the key ontological difference between humans and other animals, rooted in the uniquely evolved use of our brains.[87] In this sense, our cognitive faculties and consciousness become the very source of our dignity.

By anchoring all inalienable rights in cognitive liberty, we affirm that autonomy over mental processes is the bedrock of human dignity. Cognitive liberty is not simply one right among many but the precursor of all other inalienable rights. Without the freedom to think and process autonomously, other rights lose their meaning. The right to life, for instance, is deprived of its essence, freedom of thought becomes an empty guarantee, and protections against torture or coercion are rendered useless. Such interconnectedness demonstrates why cognitive liberty cannot be conditional or waivable.

The recognition of cognitive liberty as a naturally non-derogable right supports the idea that it should be reconceptualized as part of existing human rights rather than established as a novel one.[88] This approach addresses concerns about "rights inflation," which warns against the proliferation of standalone rights that could dilute the impact of the human rights framework.[89] Treating cognitive liberty as an extension or pillar of existing inalienable rights can ensure it is robustly protected without fragmenting the system or introducing a categorically new right that may require new exceptions or limitations.

Neurorights provide a critical framework for adapting established human rights to the challenges posed by advancing neurotechnologies.[90] Recognizing cognitive liberty as a non-derogable extension of existing rights allows international law to address emerging vulnerabilities, such as malicious brain manipulation or the exploitation of brain data, without losing sight of its foundational principles.[91] This

86. *See id.* at 8.

87. *See* José Justo Megías Quirós, *Ser Humano y Animales: Estatuto Ontológico y Jurídico Diferentes* [Human Beings and Animals: Different Ontological and Legal Status], 31 CUADERNOS DE BIOÉTICA 59, 59 (2020).

88. *See* José M. Muñoz & José Ángel Marinaro, *Neurorights as Reconceptualized Human Rights*, 5 FRONTIERS POL. SCI. 1, 3 (2023).

89. *See* Ienca & Andorno, *supra* note 3, at 9.

90. *See* Christoph Bublitz, *Neurotechnologies and Human Rights: Restating and Reaffirming the Multi-Layered Protection of the Person*, 28 INT'L J. HUM. RTS. 782 (2024).

91. *See id.* at 783.

approach ensures that human rights remain dynamic and responsive to the ethical challenges of the 21st century.[92]

IV. CHILE'S ASPIRATIONAL EFFORTS TO PROTECT NEURORIGHTS

The ongoing advancement of neurotechnologies presents unprecedented challenges to the legal frameworks intended to safeguard human rights. Chile's pioneering effort to recognize neurorights within its Constitution represents a significant step forward in adapting to these challenges, but it also underscores the complexities of implementing such protections in practice.[93] While the amendment signals a proactive approach to addressing the ethical and legal risks posed by neurotechnologies, it simultaneously reveals critical gaps that limit its effectiveness. These gaps are most evident in the lack of specificity regarding how neurotechnological data is regulated, the ambiguity surrounding enforcement mechanisms, and the absence of robust consent frameworks tailored to this rapidly evolving field. Such shortcomings highlight a pressing need for additional regulatory guidance to ensure that the principles enshrined in the neurorights framework translate into tangible protections for individuals. Until such guidance is established, the scope and impact of cognitive liberty waivers are latent.

Chile's approach exemplifies how nations can take a leading role in shaping the discourse around neurotechnologies, but it also serves as a reminder that the regulation of such emerging fields requires continuous adaptation. The need for clarity, enforceability, and international collaboration has never been greater, as neurotechnological applications grow increasingly global in scope. Without these elements, the risks of exploitation, misuse, and uneven enforcement may weaken the very rights Chile seeks to protect.

A. Chile's Development of Neurorights Protections

In October 2021, Chile became the first country in the world to legally recognize neurorights by amending its Constitution.[94] The amendment states that "scientific and technological development shall be at the service of people and shall be carried out with respect for life

92. *See id.*

93. *See* Sergio Ruiz et al., *Neurorights in the Constitution: From Neurotechnology to Ethics and Politics*, 379 PHIL. TRANSACTIONS ROYAL SOC'Y B: BIOLOGICAL SCI. 1, 2 (2024).

94. *Id.* at 1.

and physical and mental integrity."[95] This groundbreaking move aims to protect individuals from potential abuses arising from neurotechnologies, such as brain-computer interfaces, cognitive surveillance, and manipulation of mental processes.[96] The legislation also emphasizes the ethical use of such technologies, requiring them to respect mental integrity and human dignity.[97] Thus, personal brain data receives the same status as an organ such that it cannot be bought or sold, trafficked, or manipulated.[98]

Chile's neurorights framework was shaped by growing awareness of the ethical dilemmas posed by neurotechnology.[99] Influenced by collaboration with neuroscientists and ethicists, such as those associated with Spanish neurobiologist Rafael Yuste's NeuroRights Initiative, the Chilean government recognized the urgency of acting before neurotechnologies became ubiquitous.[100] The legislation reflects an anticipatory approach, aiming to establish guardrails before the risks of cognitive manipulation become widespread and irreversible.[101] This foresight was further informed by increasing public discourse on the potential dangers of unregulated neurotechnologies, including the ability to alter thought patterns, surveil brain activity, and influence decision-making.[102]

Despite its pioneering amendment, Chile's broader efforts to enshrine neurorights into a new constitution faced setbacks. In 2022, a referendum to adopt a new constitution with more robust and explicit neurorights protections failed to pass.[103] This rejection left the original amendment intact but highlighted the challenges of achieving widespread public consensus on such forward-looking policies. The absence of the proposed broader protections has raised questions about the enforceability and specificity of the existing framework. This lack of specificity in Chile's existing framework became particularly

95. *Id*. at 3-4; CONSTITUCIÓN POLÍTICA DE LA REPÚBLICA DE CHILE [C.P.] (Aug. 8, 1980), art. 19.

96. *See* Ruiz et al., *supra* note 93, at 3.

97. *See id.* at 3-4.

98. Lorena Guzmán H., *Chile: Pioneering the Protection of Neurorights*, UNESCO COURIER (last updated Oct. 13, 2023), https://courier.unesco.org/en/articles/chile-pioneering-protection-neurorights.

99. *See id*.

100. *See id*.

101. *See id*.

102. *See id*.

103. *See* John Otis, *Chileans Have Rejected a New, Progressive Constitution*, NPR (Sep. 5, 2022), https://www.npr.org/2022/09/04/1121065756/chile-constitution-referendum.

apparent in the case of *Girardi Lavin v. Emotiv*, which tested the practical application of the constitutional amendment.[104] The case illustrated the complexities of enforcing neurorights protections in the face of emerging neurotechnological abuses and the pressing need for more detailed regulatory mechanisms.[105] The plaintiff, former Chilean senator Guido Girardi Lavin, alleged that Emotiv Inc., a company specializing in consumer EEG devices, had violated his neurorights by collecting and processing his brain data without clear consent.[106] The plaintiff argued that the use of his brain activity data for commercial purposes, including targeted advertising and product development, infringed upon his mental privacy and autonomy.[107] Emotiv countered by asserting that Girardi had voluntarily agreed to the data collection through a user agreement, and that the harms claimed were speculative rather than tangible.[108] However, Lavin contends that this was an adhesive contract, where he would be unable to make optimal use of the device without accepting Emotiv's terms of services.[109] The court ultimately grappled with whether the collection of brain data could constitute a violation of cognitive liberty and whether such harms could be deemed sufficiently concrete under existing legal frameworks.[110] In a landmark ruling, Chile's Supreme Court ordered Emotiv to delete all personal brain data collected from Senator Girardi and instructed Chilean authorities to determine what is legally appropriate to ensure the commercialization and use of the Emotiv Insight.[111] This case illuminated the challenges of applying broad constitutional protections, like those in Chile's neurorights amendment, to specific instances of technological abuse. It also highlighted the need for more precise regulatory frameworks to address the evolving risks associated with neurotechnology.

104. *See* Corte Suprema de Justicia [C.S.J.] [Supreme Court], 9 agosoto 2023, *Girardi Lanvin, Guido c. Emotiv Inc.*, Rol de la causa No. 105065-2023, Constitucional (Chile).

105. *See id.*

106. *See id.*

107. *See id.*

108. *See id.*

109. *See id.*

110. *See* Hunter T. Carter, Neural Rights: Landmark Ruling, ARENTFOX SCHIFF: NEWS (Oct. 18, 2023), https://www.afslaw.com/perspectives/news/neural-rights-landmark-ruling.

111. *See id*.

B. Chile's Pioneering Step for Neurorights

Chile's amendment is laudable for its proactive stance, positioning the country as a global leader in protecting mental integrity.[112] It serves as a model for other nations by demonstrating that legal systems can adapt to technological challenges before, they fully materialize. Additionally, Chile's recognition of neurorights underscores the necessity of framing cognitive liberty as a matter of public interest, paving the way for international discourse and potential treaty frameworks. Chile's framework reflects not only a bold legal initiative but also a profound respect for the contributions of academics and scientists in shaping its direction. The country's commitment to engaging with experts in neuroscience and law has allowed its legislation to be both scientifically informed and ethically focused.[113] Such academic partnerships exemplify the importance of interdisciplinary dialogue in addressing challenges at the intersection of technology and human rights. Other nations should look to Chile's collaborative strategy as a blueprint for navigating the complexities of regulating neurotechnologies. Each country brings its own academic strengths, resources, and cultural perspectives to the table, creating a rich global tapestry of research and insights into this rapidly expanding field. A collaborative approach that draws on these diverse academic traditions not only enhances the legitimacy, consistency, and effectiveness of regulatory frameworks but also fosters international solidarity in protecting cognitive liberty.

The inherent challenge for neurotechnology is that the private sector often shapes the scope and priority of potential regulation.[114] The rate of technological development, the questions that arise from conflicts between private actors, and the practical realities of what can be regulated direct federal and state action accordingly. This dynamic makes Chile's proactive legislative effort even more remarkable. Despite not being at the forefront of neurotechnology development or facing immediate pressures from commercial trends, Chile has chosen to address these emerging risks head-on. Its leadership shows that the importance of safeguarding cognitive liberty transcends market-driven imperatives, highlighting the universal significance of these rights.

112. *See* Beth Do et al., *Privacy and the Rise of Neurorights in Latin America*, FUTURE PRIV. F. (Mar. 20, 2024), https://fpf.org/blog/privacy-and-the-rise-of-neurorights-in-latin-america/.

113. *See* Ruiz et al., *supra* note 93, at 3.

114. *See* Hermann Garden et al., Responsible Innovation in Neurotechnology Enterprises (OECD SCI. TECH. & INDUS. Working Paper 2019/05, 2019), https://dx.doi.org/10.1787/9685e4fd-en.

This proactive stance serves as a testament to the principle that human rights protections should not wait for the exigencies of technological or commercial forces but must instead reflect society's most fundamental values.

C. Weaknesses of Chile's Approach

While Chile's constitutional amendment to protect neurorights is a groundbreaking step, it is not without significant shortcomings. The amendment was largely declarative, calling specific attention to the need for scientific advancements that also respects the right to physical and mental integrity. It mandates regulation of such advancements but leaves the critical term, "mental integrity,"[115] undefined. This vagueness creates uncertainty about the scope of protection and the standards by which violations will be assessed. It remains unclear what constitutes an infringement on mental integrity: Is it the collection of brain data, direct manipulation of cognitive processes, or even subtle influences on decision-making? Without clear definitions, the enforcement of these protections' risks becoming inconsistent or overly reliant on judicial interpretation, which can lead to uneven application and potential loopholes.

The case of *Girardi v. Emotiv* further illustrates the challenges posed by Chile's undefined framework.[116] While the court ultimately ruled that there was a constitutional violation, it deferred to Chile's designated authorities to determine whether brain data requires its own special category of protections and to define how it might be encompassed within existing regulations for other forms of personal data.[117] This decision underscores the inherent difficulty in regulating neurotechnology as an ever-evolving field. Courts lack the expertise to make these determinations themselves and acknowledge that neurodata has unique characteristics, though they cannot yet predict with certainty what information such data might reveal as technology advances.

Unlike biological materials like DNA, which can be directly linked to an individual, brain data such as electric activity and brain waves collected by devices like Emotiv's Insight cannot (yet) be traced

115. *See* María Isabel Cornejo-Plaza, Roberto Cippitani & Vincenzo Pasquino, *Chilean Supreme Court Ruling on the Protection of Brain Activity: Neurorights, Personal Data Protection, and Neurodata*, 15 FRONT. PSYCHOL. 1, 4 (2024).

116. *See id*. at 1.

117. *See id.* at 6.

back to its source, especially when it has been anonymized.[118] However, the court's decision acknowledged the possibility that anonymized brain data could become identifiable in the future as technology evolves.[119] This acknowledgment reflects the inherent tension in this area of law: while neurotechnology remains underexplored and its potential for misuse is uncertain, the proactive establishment of legal protections seeks to prevent harm before it materializes.

Researcher, Marcello Ienca, anticipated this issue, stating that "sporadic nature" of academic discovery in nanotechnology leads to "semantic-normative ambiguity and conceptual confusion."[120] Meaning, while people have a general understanding of what mental integrity entails and can envision potential abuses, legislators struggle to define these concepts precisely. Consequently, Chile established broad protections to preemptively guard against feared dystopian scenarios like those depicted in science fiction. Here, Chile created a bright line but very broad constitutional right to mental integrity while relying on future technological developments to substantiate the broader implications for misuse and violations that we fear may become possible. Such "hypothetical dangers" were central to Emotiv's defense in this case.[121] However, the fact that the Chilean Supreme Court did not accept the argument that hypothetical danger equates to "no danger" indicates that they, too, wish to be proactive. By ruling against Emotiv, the Court has effectively passed the baton to the original architectures of the law, urging them to provide more detailed guidance and regulations to address these emerging challenges.

D. The Need for Additional Guidance

The hope is that additional guidance will provide accountability mechanisms that clarify what remedies are available to individuals whose mental privacy has been compromised or whether companies can be held liable for unintentional infringements. This gap diminishes the current framework's effectiveness in safeguarding cognitive liberty, as rights without enforceable remedies can become little more than symbolic gestures. Moreover, guidance should address the global nature of neurotechnological risks. Many neurotechnology companies operate internationally, and the cross-border nature of data collection

118. *See id.* at 2.

119. *Id.* at 3.

120. Ienca, *supra* note 12, at 6.

121. *See* Cornejo-Plaza, Cippitani & Pasquino, *supra* note 115, at 2.

and processing complicates enforcement. Without collaboration with other nations or the establishment of international standards, Chile's protections may be threatened by practices occurring beyond its jurisdiction. A coordinated global effort to complement and reinforce Chile's pioneering work is needed.

Additionally, Chile's framework would benefit from addressing several other gaps that limit its practical applicability. For instance, the current legislation lacks specificity regarding how neurotechnological data should be classified, stored, and accessed. Without clear regulations, companies and researchers may exploit ambiguities, potentially exposing individuals to misuse of their brain data. Guidance is also needed to establish clearer consent mechanisms, ensuring that individuals fully understand and agree to the ways in which their neural data will be used.[122] The rapid pace of neurotechnological innovation makes it increasingly difficult for consumers to grasp the implications of their consent, particularly when dealing with complex or proprietary technologies.

Another critical gap lies in defining oversight and enforcement authorities.[123] Chile's framework does not yet provide a clear roadmap for which regulatory bodies will monitor compliance or how violations will be penalized. This lack of clarity could result in inconsistent enforcement, undermining the credibility and effectiveness of the protections.

These gaps only further highlight how current iterations of the law leave individuals unprepared with the unilateral power to waive their cognitive liberty. Even if these gaps are addressed, the question remains: is there a world where the law could fully and adequately address all the unknowns presented by neurotechnology? Perhaps. But does that mean cognitive liberty should then become waivable? Not necessarily. Even with complete knowledge of the risks, there remains a broader ethical question about how far humanity should integrate itself with digital tools. This is not just a legal or technological challenge but an existential one. Where does the boundary lie between enhancement and dilution of our humanity?

Similar issues with foresight and integration are evident in the regulation of artificial intelligence. AI regulation, while still an ongoing process, struggles to address ethical, social, and economic implications for a technology that is already prevalent—even more than direct-to-

122. *See id.* at 4, 6.
123. *See id.* at 4-5.

consumer neurotechnology.[124] This comparison underscores the magnitude of the task for legislators: if progress is slow for a widely adopted technology like AI, the path to comprehensive guidance for a still-evolving technology like neurotechnology will likely require even greater effort and long-term commitment. Addressing these challenges with proactive, and more importantly, iterative, globally coordinated efforts will be essential for ensuring the robust protection of cognitive liberty in the face of rapid technological change.

Alternatively, Chilean legislators might consider explicitly incorporating brain data into their existing personal data protection laws. A precedent for this approach exists in Colorado, USA, where in April 2024, Governor Jared Polis signed an amendment to the Colorado Privacy Act that expanded the definition of "sensitive data" to include "biological data" encompassing neural data.[125] While this regulation is still in its infancy, and practical assessment of its efficacy is yet to be conducted, it currently restricts the collection and use of brain data. However, questions remain about how it will adapt to future technologies that may necessitate either more lenient or stringent regulatory approaches. Through this approach, cognitive liberty is incorporated into a waivable context like the right to privacy, but only to a certain degree. Here, one would waive their cognitive liberty as it only pertains to data collection but not cognitive liberty as a principle. Still, this method may encounter challenges as neurotechnology applications and potential misuses become more apparent—at this point, that is an inherent aspect of regulating any emerging technology.

V. CONCLUSION

Cognitive liberty is not merely a theoretical construct; it is the cornerstone upon which our humanity rests. As neurotechnologies continue to evolve at an unprecedented pace, the need to recognize and protect cognitive liberty as an inalienable right becomes increasingly urgent. Chile's pioneering efforts offer a vital starting point, demonstrating how constitutional protections can preemptively address the

124. Rahul Tongia, *Why Regulating AI Can Be Surprisingly Straightforward, When Teamed with Eternal Vigilance*, WORLD ECON. F. (May 28, 2024), https://www.weforum.org/stories/2024/05/why-regulating-ai-can-be-surprisingly-straightforward-providing-you-have-eternal-vigilance/.

125. *See* Sigal Samuel, *Your Brain's Privacy Is at Risk. The US Just Took Its First Big Step Toward Protecting It*, VOX (Apr. 18, 2024), https://www.vox.com/future-perfect/24078512/brain-tech-privacy-rights-neurorights-colorado-yuste; H.B. 24-1058, 74th Gen. Assemb., Reg. Sess. (Colo. 2024).

ethical and legal dilemmas posed by these technologies. Yet, the gaps in its framework underscore the challenges of regulating an evolving field where the risks are still emerging.

The international community must take inspiration from Chile's leadership while striving for a globally coordinated approach. Clear definitions, enforceable remedies, and robust oversight mechanisms are imperative to prevent the exploitation of cognitive liberty. By anchoring cognitive liberty within the framework of existing non-derogable rights, we can ensure that it is treated with the gravity it deserves without fragmenting the human rights landscape. This approach avoids the pitfalls of rights inflation while reinforcing the centrality of mental autonomy to all other freedoms. Furthermore, protections must account for the diverse applications of neurotechnology, from medical therapies to non-essential enhancements, ensuring that individual dignity and autonomy are preserved across all contexts. The question of whether cognitive liberty can be voluntarily waived remains one of the most pressing ethical issues of our time. Even when the risks of neurotechnology are understood, humanity must still confront how far we are willing to integrate our cognitive processes with digital tools in the name of convenience or efficiency. This is not merely a legal or regulatory issue—it is an existential question about the very essence of what it means to be human.