

IN BRIEF ...

FREEDOM OF RELIGION OR BELIEF AND NEUROTECHNOLOGIES

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INTRODUCTION

The intersection of neurotechnologies with the enjoyment of the right to freedom of religion or belief presents novel, exceptional challenges. As brain-computer interfaces (BCIs), neural implants, and cognitive enhancement technologies advance rapidly, they raise profound questions about the sanctity of mental privacy, spiritual autonomy, and the protection of religious beliefs and practices. Freedom of thought, conscience and religion, enshrined in Article 18 of the Universal Declaration of Human Rights¹ and protected under other international covenants, encompasses both the internal forum of belief and the external manifestation of faith.² Neurotechnologies, by their very nature of interfacing with the human brain, potentially intrude upon the most intimate sphere of human experience – consciousness itself.

This convergence demands urgent attention in an era where technological capabilities continue in many spheres to outpace ethical considerations and, indeed, effective responses through the application of regulatory frameworks. The risks are particularly high given that religious freedom serves as both an individual liberty and a cornerstone of pluralistic democratic societies.³ Understanding how neurotechnology developments might enhance, threaten, or fundamentally alter beliefs or religious experience is crucial for rights holders, policymakers, scientists, technologists, faith-based and religious communities alike.

KEY CLINICAL AND CONSUMER APPLICATIONS OF NEUROTECHNOLOGIES

CONSUMER APPLICATIONS

Consumer markets increasingly offer neurotechnologies-based devices and applications for practices including meditation, guided engagement in spiritual experiences, and the exploration of consciousness.⁴ Certain brain stimulation devices are currently marketed for ‘transcendental experiences’ intend to induce altered states of consciousness traditionally achieved through practices such as prayer, meditation, or ritual.⁵ Virtual and augmented reality systems aim to create immersive religious experiences, potentially substituting for, or supplementing, traditional modes of worship. Certain neurofeedback devices already available to consumers claim to facilitate deeper spiritual connection and enhanced contemplative practices.⁶

CLINICAL APPLICATIONS

Clinical neurotechnologies applications can intersect with concerns relating to the enjoyment of the right to freedom of religion or belief with regard to psychiatric and neurological treatments.⁷ Deep brain stimulation for depression may alter personality traits, convictions and inclinations vis-à-vis beliefs. Neurotechnology-based therapies and treatments, increasingly available in clinical settings in certain jurisdictions, directly engage with consciousness in a manner that may overlap with spiritual and religious experiences. The use of neural prostheses and brain-computer interfaces (BCIs) raise questions with respect to the integrity of human consciousness. In addition, technologies may pose challenges to concepts of moral responsibilities that feature in many beliefs and religious traditions.

BENEFITS AND OPPORTUNITIES

Neurotechnologies could offer significant potential cognitive benefits for individuals for whom religious practice and spiritual wellbeing plays an important part in their life. For individuals with neurological conditions that may impair their ability to engage in traditional religious observances, neurotechnologies might restore cognitive functions that better enable access and engagement to spiritual practices. For example, neurotechnologies such as brain-computer interfaces (BCIs) and other assistive devices could enable individuals with neurodegenerative diseases that impair mobility to more actively participate in collective religious practices and attend places of worship in their communities.⁸ Neurofeedback systems might genuinely enhance meditative practices and spiritual development, complementing rather than replacing traditional methods.

Research on applications of neurotechnologies could deepen understanding of religious experience, potentially validating the neurological basis of spiritual phenomena and contributing to greater understanding and interfaith dialogue.⁹ For religious and faith-based communities, these technologies could offer new tools for pastoral care, particularly in addressing an array of mental health challenges that intersect with spiritual wellbeing.¹⁰ The therapeutic benefits of clinical neurotechnologies could potentially align with convictions and values of healing, restoration and preservation of human dignity.

RISKS AND CHALLENGES

Risks to the enjoyment of the right to freedom of religion or belief from the advance of neurotechnologies are multifaceted and profound. Direct manipulation of neural activity raises concerns about the authenticity and voluntariness of the experience of religion and faith. Where spiritual states may be induced through a technological intervention, questions can arise as to the genuineness and how events are actually experienced, essentially raising question as to their substance, validity and rationality.¹¹ Absent safeguards, the commercialisation of spiritual and religious experiences through neurotechnologies-based interventions may commodify aspects of phenomena connected to religion or belief that potentially undermine their spiritual significance.

Privacy concerns are certainly paramount, as neurotechnologies capable of collecting and processing neural data could potentially access thoughts pertaining to religion, beliefs, and experiences. Such capabilities raise spectres of religious persecution or discrimination based on the misuse of neural data.¹² Furthermore, the involuntary use of neurotechnologies, whether applied through coercion or as conditions of employment or social participation, could constitute violations of freedom of conscience.

Additionally, cultural and theological challenges may emerge where neurotechnological interventions alter personality, memory, or consciousness in ways that conflict with religious anthropologies. Faith traditions such as specific beliefs, practices, and rituals that reflect convictions, consciousness, and human dignity may be challenged by how certain neurotechnological applications function and influence cognition.¹³

STATE RESPONSIBILITIES

States bear the primary responsibility for protecting religious freedom and belief in the context of neurotechnologies development. This includes maintaining or establishing robust regulatory frameworks that prevent discriminatory applications of neurotechnology, and to ensure processes for informed consent and other forms of permission that permit the use of neurotechnology-based interventions and treatments adequately address religious and faith-based concerns. Governments must balance promoting beneficial neurotechnological innovation with protecting fundamental rights.

International human rights law requires States to ensure that neurotechnological development and deployment do not infringe upon the right to freedom of religion or belief. This includes preventing both direct coercion and indirect pressures that might compromise the autonomy of the individual. States should ensure clear legal protections for privacy and data protection apply to the use of neurotechnologies, and prohibit the collection, processing or retention of personal data, including neural data, for purposes that constitute religious profiling or discrimination.¹⁴

As regards educational and awareness within communities, the State's responsibilities include ensuring that religious communities have adequate information about neurotechnologies developments to make informed decisions. States should facilitate dialogue between religious leaders, technologists, and policymakers to address emerging challenges proactively.

CORPORATE GOVERNANCE ISSUES

Businesses developing neurotechnologies face significant ethical responsibilities and human rights concerns regarding freedom of religion and belief: corporate governance frameworks must therefore address the potential implications of their products and services in this regard. This includes implementing data security measures such as privacy-by-design principles (PbD)¹⁵ that protect the broad array of thoughts, actions and experiences sampled by devices and therapeutics from unauthorized access or analysis.

Enterprises should establish ethical review processes and human rights impact assessments (HRIAs) that include perspectives pertaining to religion and belief when developing neurotechnologies applications.¹⁶ Transparent disclosure of how products might affect religious practice or belief is essential for informed choice, both in the consumer context and clinical setting. Corporate responsibility extends to preventing the marketing of neurotechnological products in ways that exploit religious vulnerabilities or make unsubstantiated spiritual claims.

Industry self-regulation may prove complex when developing standards that respect religious diversity and protect spiritual autonomy. As such, it may prove beneficial for collaborative efforts with religious organizations and faith groups to support development and testing that could assist in identifying potential concerns before deployment on the market.

REDRESS AND REMEDIES

Effective redress mechanisms for violations of the enjoyment of the right to freedom of religion or belief in neurotechnologies-based contexts require both legal and extra-legal approaches. Importantly, justice systems may need specialised expertise to adjudicate complex cases involving neurotechnologies, safeguards and rights related to religion and belief.¹⁷ Alternative dispute resolution mechanisms, including religious arbitration where appropriate, may offer more culturally sensitive remedies.¹⁸

Regulatory agencies overseeing neurotechnology development should establish clear complaint procedures for concerns that engage matters of religious freedom. Professional licensing bodies for healthcare providers using neurotechnologies should incorporate religious accommodation requirements into their standards of practice.¹⁹

International human rights mechanisms, including treaty bodies and special procedures, may need to develop specialised guidance on interdependent human rights that engage religious freedom and neurotechnologies. In addition, communities, religious orders, advocates for religious freedom and other faith-based organisations across civil society will require resources and expertise to effectively monitor and respond to emerging challenges that arise from the advance and deployment of neurotechnologies.

CONCLUSION

The intersection of neurotechnologies and the enjoyment of the right to freedom of religion or belief represents one of the most complex human rights challenges of the digital age. As these technologies continue to advance, the potential for both enhancement and violation of religious liberty grows exponentially. Proactive engagement by all stakeholders – governments, businesses, healthcare providers, regulatory bodies, religious communities, and civil society – is essential to ensure that the progress neurotechnologies can deliver best serves to ensure every individual's quality of life and the enjoyment of their human rights.

The path forward requires unprecedented collaboration across disciplines and communities, guided by principles of human dignity, autonomy, and respect for diversity. Only through such comprehensive approaches can society harness the benefits of neurotechnology while safeguarding the sacred right to freedom of religion or belief that is a core element of our lived human experience.

KEY CHALLENGES

1. **Privacy Protection:** Developing technical and legal safeguards to maintain data security to ensure data protection and prevent unauthorized access to personal data pertaining to beliefs or religious thoughts and experiences.
2. **Authenticity of Neurotechnologies-Mediated Religious Experience:** Determining the validity and meaning of spiritual states induced through neurotechnologies.
3. **Regulatory Framework Development:** review and determine whether existing laws provide sufficient safeguards; ensure comprehensive governance structures that balance innovation with human rights promotion and protection.
4. **Cross-Cultural Sensitivity Towards Faiths and Religions:** Addressing diverse religious perspectives on consciousness, dignity and human nature in neurotechnologies developments.
5. **Preventing Discriminatory Applications:** Ensuring neurotechnologies are not used to profile, target, or persecute individuals based on religious beliefs.

CRITICAL QUESTIONS FOR FURTHER RESEARCH

- How can existing legal and regulatory frameworks effectively distinguish between beneficial clinical/therapeutic or consumer neurotechnology applications and those that impermissibly interfere with aspects of human autonomy vis-à-vis freedom of religion or belief?
- What constitutes adequate informed consent for neurotechnological interventions that may affect an individual's beliefs or practice? In what circumstances are other legal bases permissible for allowing interventions e.g. where a person is incapable of providing consent due to medical incapacitation?
- How should society balance the potential therapeutic benefits of consciousness-altering neurotechnologies with concerns about their use amongst different religious or faith-based groups?
- What role should religious communities play in the development and regulation of neurotechnologies?
- How should international human rights law evolve to effectively address emerging challenges from neurotechnological advancement?

END NOTES

- 1 Article 18 states: "Everyone has the right to freedom of thought, conscience and religion; this right includes freedom to change his religion or belief, and freedom, either alone or in community with others and in public or private, to manifest his religion or belief in teaching, practice, worship and observance." Universal Declaration of Human Rights (UDHR), 1948, Available at: <https://www.un.org/en/about-us/universal-declaration-of-human-rights>
- 2 International Covenant on Civil and Political Rights (ICCPR) Article 18(3). See also Article 5 of the Convention on the Elimination of All Forms of Racial Discrimination (CERD), UN Declaration on the Elimination of All Forms of Intolerance and of Discrimination Based on Religion or Belief 1981 (UN 1981 Dec.) Article 1, and Article 14 of the Convention on the Rights of the Child (CRC); American Convention on Human Rights, Article 27(2); African Charter on Human and Peoples' Rights, Article 8; European Convention for the Protection of Human Rights and Fundamental Freedoms 1950 (ECHR), Art. 9.
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- 8 Haston, Shona, et al. "Horizon Scanning Report: Neurotechnology for Mental Health, Healthy Ageing and Physical Disability." *National Institute for Health Research Innovation Observatory* (2024).
- 9 See, for example: MATAR, Amal. "How Do Arabic Cultural and Ethical Perspectives Engage with New Neuro-technologies? A Scoping Review." *Neuroethics and Cultural Diversity* (2024): 193-216.
- 10 See: Brenninkmeijer, Jonna. *Neurotechnologies of the self: Mind, brain and subjectivity*. Springer, 2016; Wildman, Wesley J., and Kate J. Stockly. *Spirit tech: The brave new world of consciousness hacking and enlightenment engineering*. St. Martin's Press, 2021; Boguszewicz, Christina, et al. "The fourth industrial revolution-cyberspace mental wellbeing: Harnessing science & technology for humanity." *Global foundation for cyber studies and research* (2021).
- 11 Mercer, Calvin, Tracy J. Trothen, and Ron Cole-Turner. *Religion and the technological future*. Cham: Springer International Publishing, 2021.
- 12 See, for example: Kellmeyer, Philipp. "Big brain data: On the responsible use of brain data from clinical and consumer-directed neurotechnological devices." *Neuroethics* 14.1 (2021): 83-98; Yuste, Rafael. "Advocating for neurodata privacy and neurotechnology regulation." *Nature Protocols* 18.10 (2023): 2869-2875; Butorac, Isobel, Filippa Lentzos, and Christine Aicardi. "Gray Matters: Exploring Technologists' Perceptions of Dual-Use Potentiality in Emerging Neurotechnology Applications." *Health security* 19.4 (2021): 424-430.
- 13 Heinrichs, Jan-Hendrik. "Neuroethics, cognitive technologies and the extended mind perspective." *Neuroethics* 14.1 (2021): 59-72.
- 14 See further: Ashraf, Cameran. "Exploring the impacts of artificial intelligence on freedom of religion or belief online." *The International Journal of Human Rights* 26.5 (2022): 757-791; Bublitz, Christoph. "Neurotechnologies and human rights: restating and reaffirming the multi-layered protection of the person." *The International Journal of Human Rights* 28.5 (2024): 782-807.
- 15 See further: Cavoukian, Ann. "Privacy by design: The seven foundational principles." *IAPP Resource Center* (2021). See also: Okon, Samuel Ufom, et al. "Incorporating privacy by design principles in the modification of AI systems in preventing breaches across multiple environments, including public cloud, private cloud, and on-prem." *Including Public Cloud, Private Cloud, and On-prem (September 03, 2024)* (2024); Andrade, Vinicius Camargo, et al. "Privacy by design and software engineering: A systematic literature review." *Proceedings of the XXI Brazilian Symposium on Software Quality*. 2022;
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- 18 See further: Illes, J., Dudley, M., Machova Urdzikova, L., Podina, I., & Pyrrho, M. (2025). The risk of neurotechnology as an instrument of colonialism. *Brain Communications*, 7(3), fcaf139; Eke, D. (2024). Ethics and governance of Neurotechnology in Africa: lessons from AI. *JMIR Neurotechnology*, 3(1), e56665; Ng, J. Y. (2025). Exploring the intersection of brain-computer interfaces and traditional, complementary, and integrative medicine. *Integrative Medicine Research*, 14(2), 101142.
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