NEUROMARKETING ETHICS IN EMERGING MARKETS: PRIVACY, AUTONOMY, AND THE REGULATORY VACUUM IN PAKISTAN

Dr. Emadul Karim
Associate Professor
Faculty of Management Sciences and Information Studies,
Greenwich University, Karachi, Pakistan
emad@greenwich.edu.pk

Dr. Musarrat Shamshir
Professor
Department of Business Administration and Economics
Greenwich University, Karachi, Pakistan
dr.musarrat.adnan@greenwich.edu.pk

Mohammad Ahmer Abbas Khan Saldera
PhD Scholar
Department of Business, Economics & Finance
Greenwich University, Karachi, Pakistan
saldera25@gmail.com

ABSTRACT

Neuromarketing tools such as electroencephalography (EEG), eye tracking, facial coding and galvanic skin response capture signals that consumers cannot consciously filter, raising serious concerns about privacy, informed consent and autonomy. This paper examines these risks in Pakistan and assesses whether Pakistani law is equipped to govern them. The study combines an integrative review of the neuromarketing ethics and neurorights literature, a doctrinal analysis of Pakistani legal instruments against ten safeguards derived from international standards (including the EU General Data Protection Regulation, the EU Artificial Intelligence Act, Chilean neurorights jurisprudence and the 2025 UNESCO Recommendation on the Ethics of Neurotechnology), and a secondary analysis of reconciled results from a doctoral survey of 1,152 marketing professionals in Karachi. None of the ten safeguards is fully provided by Pakistani law in force: six are absent and four are only partly covered by general provisions. Meanwhile, professionals show strong readiness to adopt neuromarketing (mean intention 3.92 on a five point scale), driven by organisational resources ($\beta = 0.266$) rather than professional norms ($\beta = 0.008$, not significant). Adoption is therefore advancing faster than governance; a condition we characterise as an institutional void. The paper constitutes the first regulatory gap analysis of

neuromarketing in Pakistan, consolidates principlism, contextual integrity, institutional theory and Islamic business ethics into a novel conceptual framework, derives five testable propositions, and recommends a phased policy roadmap prioritizing on the recognition of neural data as sensitive data, explicit consent, measures for the protection of children, and ethics review of commercial studies.

KEYWORDS

Ethics in Neuromarketing; Neural Data; Consumer Privacy; Informed Consent; Autonomy; Data Protection; Institutional Voids; Pakistan.

JEL Classification: M31, M38, K24, O33

INTRODUCTION

Neuromarketing uses neuroscience and psychophysiology to answer marketing questions. It tracks the human responses to product stimuli – brain signals, eye movements, tiny facial expressions and skin moisture, for instance, that can be used to tell where a person is paying attention, how they feel about something and whether they prefer it (Lee et al., 2007; Plassmann et al., 2015). These signals are all generated involuntarily, automatically; a human being can obscure an answer to a survey but not hide their pupil's reflex (Murphy et al., 2008; Stanton et al., 2017).

The discussion has moved away from imagining some sort of neural "buy button" (Wilson et al., 2008; Ariely & Berns, 2010) to more concrete ethical issues about neural data as a specific type of personal data, about consent and whether what we currently have in law is sufficient (Ienca & Andorno, 2017; Goncalves et al., 2024; Ferrell et al., 2025) policy has followed. Chile amended its Constitution in 2021 to protect mental integrity, and its Supreme Court ordered a consumer EEG company to delete a user's neural data in 2023 (Cornejo-Plaza et al., 2024). Colorado, California and Montana now treat neural data as sensitive (Ruder, 2025), and in November 2025 UNESCO adopted a global standard that calls on states to impose specific rules on neuromarketing (UNESCO, 2025).

Almost all of this activity has occurred in high income jurisdictions with mature data protection regimes. Pakistan, with more than 241 million people (Pakistan Bureau of Statistics, 2023) and an increasingly data driven marketing profession, has no operative comprehensive data protection law: the Personal Data Protection Bill remains unenacted and no independent regulator exists (Ahmed, 2025; Chambers and Partners, 2026). Large breaches, including the confirmed leak of 2.7 million citizens' records from the national identity database between 2019 and 2023, show how weakly personal data is protected (Ahmed, 2025). Meanwhile, the first author's doctoral survey of 1,152 marketing professionals in Karachi found strong intentions to adopt

neuromarketing (Karim, 2025), yet it did not measure ethical or privacy concerns.

This paper asks what happens when professional readiness to adopt a data intensive technology runs ahead of the structures that should govern it. We address four research questions:

RQ1. What ethical risks does neuromarketing pose to privacy, consent, autonomy and data protection, and how does the Pakistani context amplify them?

RQ2. To what extent does Pakistan's legal framework provide the safeguards that international standards now require for neural data?

RQ3. What does survey evidence on professionals' adoption readiness imply for the urgency and design of governance?

RQ4. What governance framework and policy measures are appropriate for Pakistan?

The paper contributes the first regulatory gap analysis of neuromarketing in Pakistan; an integrated framework combining principlism, contextual integrity, institutional theory and Islamic business ethics; a link between the ethics and technology adoption literatures; and five testable propositions with a phased policy roadmap.

LITERATURE REVIEW

Neuromarketing and the Nature of Neural Data

Neuromarketing began with functional magnetic resonance imaging (fMRI) and EEG studies of brand preference and advertising (Lee et al., 2007; Plassmann et al., 2015). Commercial practice has since moved towards portable EEG, webcam eye tracking and automated facial coding offered as scalable services (Hsu, 2017). Because these methods can be employed in the wild, they blur the line between consented research and everyday deployment (Lim, 2018). Fisher et al. (2010) warned of the likelihood of portable technologies being applied to covert retail measurement and, as Nemorin and Gandy (2017) demonstrate, the field is very dependent upon remote sensing. Neural and psychophysiological data differ from ordinary personal data in three ways: they are non-voluntary, created prior to any deliberate disclosure (Farah & Wolpe, 2004); they have high inferential capacity, because signals intended to measure attention can later reveal mood, personality, and health (Ienca et al., 2018); and they are durable, as data can be re-analyzed using future techniques. Ienca and Andorno (2017) argue that these features justify recognising mental privacy as a distinct right.

Consumer Privacy and the Context Problem

The dominant paradigm of marketing privacy research has been the notice and choice paradigm which argues that consumers should be able to understand what they are told in order to make informed choices (Martin & Murphy, 2017). The problem with the notion of informed choice for ordinary data is already apparent, much less that of meaning of signals whose meaning the consumer is unable to understand. Nissenbaum (2004)'s theory of contextual integrity is more relevant in this case, where privacy is infringed not by the movement of information, but by its movement in unintended ways: the participant with an EEG headset in a pre-approved advertising test cannot reasonably expect to have his signals kept forever, matched with his purchasing data, and used to predict or sell that he has or may develop a health problem.

Solove's (2006) taxonomy describes aggregation, secondary use, and exclusion (the data subject's inability to know or correct what is held) as separate privacy harms, each of which is especially relevant to neural data. Goncalves et al. (2024) note that machine learning can uncover latent features in neuromarketing signals that human analysts would not detect, meaning the information content of a dataset may surpass what was originally intended to be collected. In a rapid review of 47 studies, Ferrell et al. (2025) found that privacy and confidentiality were discussed in 41, making this one of the two most prominent themes in the field.

Informed Consent and Vulnerable Groups

Informed consent requires disclosure, comprehension, voluntariness and competence (Beauchamp & Childress, 2019). Neuromarketing strains all four. Procedures are hard to explain in lay terms; participants cannot foresee what their signals will reveal, so consent may not cover everything actually learned (Farah & Wolpe, 2004; Murphy et al., 2008); incentives or recruitment through employers may compromise voluntariness; and children lack competence altogether. Children also have limited ability to recognise persuasive intent (Calvert, 2008), and Nairn and Fine (2008) argue that marketing which works through implicit, low attention processing is problematic for them whatever the method used to design it. Ferrell et al. (2025) did find at least a little to be concerned about among the least developed themes in the literature. Lastly, since a lot of the commercial neuromarketing occurs outside of institutional ethics review, safeguarding participants relies on practitioners voluntarily adhering to codes that are inconsistently followed (Hensel et al., 2017; NMSBA, 2013).

Autonomy, Persuasion and Manipulation

Perhaps the most longstanding worry is manipulation, the kind of influence that works by circumventing or undermining the deliberative capacity of individuals (Susser et al., 2019). Some argue this might induce purchasing decisions without conscious acquiescence (Wilson et al., 2008), but defenders claim that all marketing appeals to emotion and that what neuroscience reveals is just the kind of thing advertisers have always done (but simply with a better measure to produce better-consumer-oriented products) (Ariely & Berns, 2010). Stanton et al. (2017) adopt an intermediate position: it is not that neuromarketing itself is inherently unethical, but that use of it to exploit those known to be vulnerable is. Calo (2014) considers that real evil lies in 'digital market manipulation' by the combination of biometric and neural data with insight into cognitive bias, which allows the targeting of consumers at moments of reduced resistance (Sunstein, 2016): influence is more likely to respect the individual's autonomy when the influencee could discover and object to it. Ferrell et al. (2025) highlight how "The literature is dominated by fear of 'mind control' (42 of 47) although there are currently no tools that allow us to read specific thoughts." and caution against vendor hyperbole that stokes those fears.

The Global Regulatory Environment

Commercial neuroscience has mostly been regulated by analogy, that is through broader regulations on research ethics, privacy and marketing (Ulman et al., 2015). Table 1 summarizes this transition to more specific regulation.

Table 1. *International instruments applicable to neuromarketing*

Instrument	Year and status	Relevance
UNESCO Recommendation on the Ethics of Neurotechnology	2025; soft law	Treats neural data as highly sensitive; calls for specific neuromarketing rules and limits on neural marketing to children
Colorado, California and Montana neural data laws	2024 to 2025; binding	Classify neural data as sensitive within consumer privacy statutes
Proposed MIND Act (United States Senate)	2025; proposed	Would direct the Federal Trade Commission to study neural data, including targeted advertising and manipulation
EU Artificial Intelligence Act, Article 5	2024; binding	Prohibits purposefully manipulative or subliminal AI techniques and emotion recognition in workplaces and schools
Chilean Supreme Court, *Girardi v. Emotiv*	2023; binding	Treated neural data as sensitive, requiring specific consent; ordered deletion
Chilean constitutional amendment (Law 21.383)	2021; constitutional	Protects mental integrity and brain activity
OECD Recommendation on Responsible Innovation in Neurotechnology	2019; soft law	Calls for safeguarding personal brain data
EU General Data Protection Regulation, Article 9	2016; binding	Protects biometric and health data; neural data not named
NMSBA Code of Ethics	2013; voluntary	Consent, privacy, transparency and care with minors

Sources: Cornejo-Plaza et al. (2024), NMSBA (2013), OECD (2019), Regulation (EU) 2016/679, Regulation (EU) 2024/1689, Ruder (2025), UNESCO (2025) and U.S. Senate Committee on Commerce, Science, and Transportation (2025).

Two trends stand out: a move from voluntary codes towards binding law, reflecting the view that self-regulation has been insufficient (Ferrell et al., 2025), and a debate about whether new rights are needed.

Advocates of "neurorights" argue for new protections of mental privacy and integrity (Ienca & Andorno, 2017; Yuste et al., 2017); critics argue that rigorous application of existing data protection suffices (Bublitz, 2022). For a country without a functioning data protection regime, both positions presuppose a baseline that does not yet exist.

The Pakistani Context and Research Gap

Article 14 of the Constitution of Pakistan protects "the dignity of man and, subject to law, the privacy of home", and the Supreme Court has extended it to communications (*Benazir Bhutto v. President of Pakistan*, 1998). Alternatively, it is distributed among the laws of particular sectors like that of the Prevention of Electronic Crimes Act 2016 (PECA). The Personal Data Protection Bill 2023 has completed consultation but is not law (Chambers and Partners, 2026), and the National AI Policy 2025 creates no data protection regulator (Dawn, 2025). Culturally, Pakistan is a collectivist country with high and modestly high power distance (Hofstede, 2011), so, decisions to participate in consumer research are usually brokered by an employer, a traditional authority such as a family head. Morally, Islamic business ethics encourages honest trading (Qur'an 49:12) and prohibits lying and spying (Saeed et al., 2001; Beekun and Badawi, 2005) – this resource has not been implemented in neuromarketing.

Four gaps are identified. Most neuromarketing ethics literature is Western and normative (Ferrell et al., 2025). The neurorights literature presumes a baseline of data protection. Adoption research, including our own (Karim, 2025; Karim & Shaiq, 2025), has not examined ethical or regulatory factors. No study has compared Pakistani law to neural data protections.

THEORETICAL FRAMEWORK AND PROPOSITIONS

No single theory covers individual ethics, information flows, and institutions, so we combine four complementary perspectives.

Principlism and Contextual Integrity

This provides the normative test in the form of principlism (Beauchamp & Childress, 2019). Its biomedical ethics background has relevance here, as neuromarketing uses biomedical technology and generates data which may include health-related information. Respect for autonomy demands informed consent and no manipulation; non maleficence demands securing the data and no harmful inference; justice demands attention to populations at greater risk (children, digital illiterates). Contextual integrity (Nissenbaum, 2004) explains when a flow of neural data is a violation. It shows why the same EEG

data can be moral in a lab experiment with consent, but immoral if left, combined or sold, and what the law has to do to impose transmission principles (consent, purpose, no sale) to preserve neural data's context.

Institutional Theory and the Regulatory Vacuum

Scott (2014) describes institutions as built on regulative (law and enforcement), normative (professional norms) and cultural-cognitive (shared understanding) pillars. Khanna and Palepu (1997) talk of emerging markets as characterized by institutional voids, the conditions where the rules and support systems to enable markets are absent, and Mair et al. (2012) demonstrate that voids are the spaces in which actors create rules, often to the disadvantage of weaker entities. We term the absence of support within the regulative pillar a regulatory vacuum for neural data. In this case the responsibility for protection shifts to normative and cultural pillars that are more likely to be weak.

Islamic Business Ethics

In a Muslim majority society, Islamic business ethics is, as previously noted, part of the foundational and cultural cognitive pillars. It proscribes lies and avarice against information asymmetries, enjoins fairness in the conduct of transactions and regards privacy as a moral obligation (Saeed et al., 2001; Beekun & Badawi, 2005). Its overlap with principlism enhances the cultural appropriateness of the system and in doing so provides culturally rooted authenticity of the regulation.

Governance as a Facilitating Condition

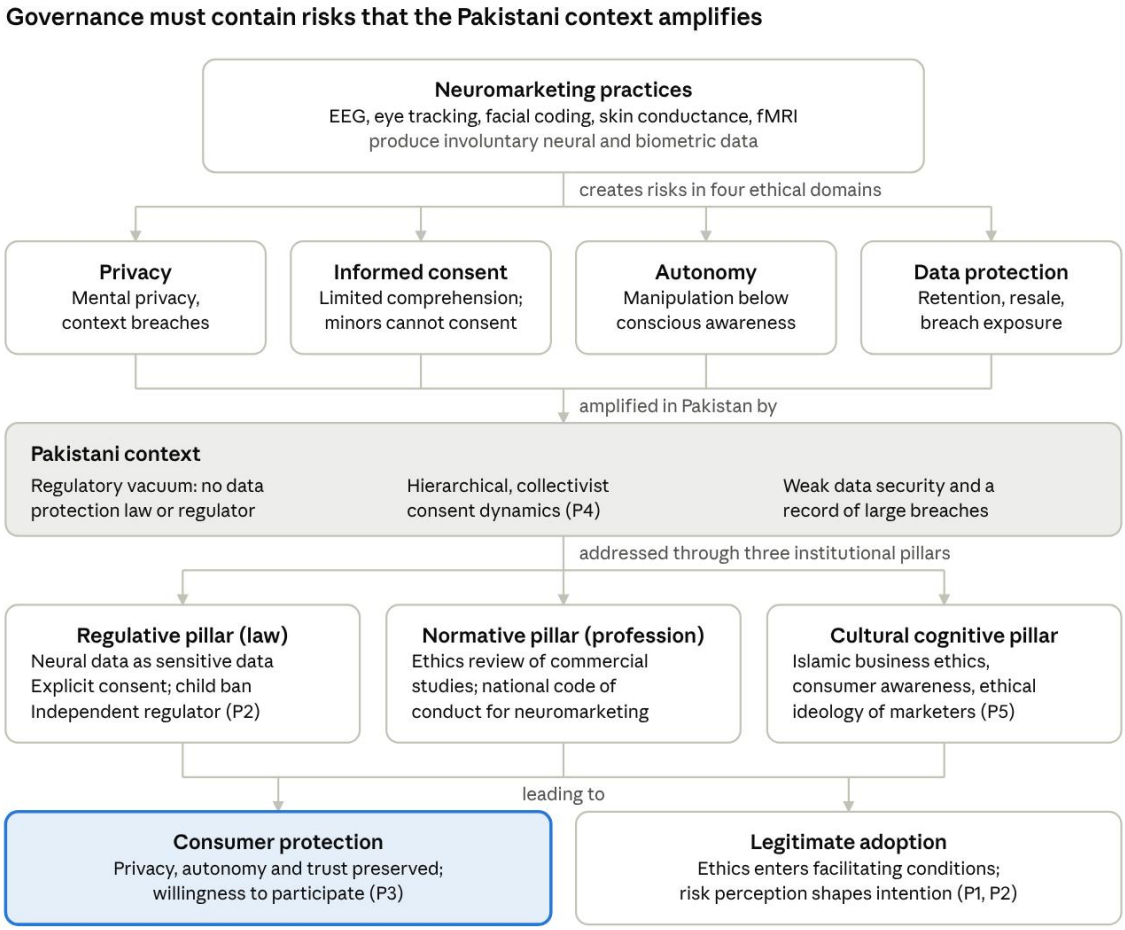
We connect the framework to the Unified Theory of Acceptance and Use of Technology (UTAUT), in which the facilitating conditions construct refers to the organisational and technical infrastructure that enables use (Venkatesh et al., 2003). We suggest that, for technologies handling sensitive data, legal clarity, ethics review, and professional codes should also be considered part of facilitating conditions. In their absence, adoption tends to rely only on technical and financial resources. Hunt and Vitell (1986) suggest that ethical evaluation occurs only when practitioners recognise an ethical issue, which is less likely if no external rule highlights one.

Integrated Framework and Propositions

Figure 1 captures these elements. At the core are neuromarketing activities producing neural and biometric data which, in turn, gives rise to risk in four areas of ethical concern and which, as a consequence of the Pakistani context, escalates across four levels of risk when governed through the three

institutional pillars, and is managed by each pillar with consequences for consumer protection and the legitimacy of adoption.

Figure 1. *Integrated framework for neuromarketing ethics and governance in Pakistan*



Note. P1 to P5 indicate the point at which each proposition applies. Created by authors.

Since we have not measured the ethics in the secondary data, we do not test hypotheses. As suggested by Jaakkola (2020), we propose five propositions to be tested in the future:

- **P1.** Professionals' perceived ethical risk of neuromarketing is negatively associated with adoption intention, over and above the four UTAUT predictors.

- **P2.** Perceived regulatory clarity is positively associated with adoption intention and strengthens the effect of facilitating conditions.
- **P3.** Consumers' trust in data protection is positively associated with willingness to participate in neuromarketing studies.
- **P4.** Lower source side voluntariness (quality) and lower understanding (quality) was found with consent given through third parties, such as employers, institutions, and family head compared with direct consent for higher power distance individuals.
- **P5.** Ethical ideology, including adherence to Islamic business ethics, weakens the link between adoption intention and willingness to use covert or non consensual practices.

METHODOLOGY

Design and Strands

The study uses a qualitative, conceptual design (Jaakkola, 2020) that triangulates three strands. Strand A, an integrative review (Snyder, 2019), accessed English-language peer-reviewed and official sources from 2004 to 2026 on neuromarketing, ethics, neural data, neurorights, consent, manipulation, and data protection, searching Scopus, Web of Science, PhilPapers, and Google Scholar, with backward citation tracking from recent reviews. It was purposive rather than a PRISMA systematic review. Sources were coded thematically under four initial domains. Strand B, a doctrinal and document analysis (Bowen, 2009; Hutchinson & Duncan, 2012), examined Article 14 of the Constitution; PECA 2016 and its 2025 amendment; the draft Personal Data Protection Bill 2023; Section 10 of the Competition Act 2010; the Sindh (2014) and Punjab (2005) consumer protection statutes; the National AI Policy 2025; and research ethics arrangements. Each was coded against ten safeguards (S1 to S10, Table 4) derived from the instruments in Table 1, as Provided (explicit and enforceable), Partial (general or untested provisions), or Absent. Drafts were recorded but not counted. First author coded all instruments and second author reviewed all decisions; borderline Partial codes were checked against primary texts and consensus reached through discussion. Strand C relies on reconciled aggregate results from the doctoral survey (Karim, 2025). In Karachi, 1,550 professionals were invited using purposive quota sampling; 1,220 responded (78.7%), and 1,152 valid cases were analysed with PLS SEM in SmartPLS 4. The survey received approval from the Greenwich University Research Ethics Committee, and no new data were collected for this paper.

Audit of the Source Thesis

We audited the thesis before the survey was administered. Table 2 shows the issues and resolutions; generally we refer to tabulated bootstrapped output rather than the body of text.

Table 2. *Audit of the source thesis and resolutions*

Issue	Resolution
Direct effects reported inconsistently across the Abstract, Table 12 and Sections 4.6, 4.8 and 4.11 (for example, PE as 0.110, 0.284 and 0.104)	Table 12 values adopted
Moderation summary (Section 4.11) contradicts Tables 13 to 15; stray reference to "religious framing moderation"	Tables adopted; moderation results not used
Reliability given as 0.86 to 0.92 in text but 0.763 to 0.877 in Table 8	Table 8 adopted
27.08% of ages coded "Other" and described as possibly "children", although age bands begin at 31	Age results treated as unreliable pending recoding
Nominal marketing domain entered as a continuous moderator	Not used; multigroup analysis recommended (Henseler et al., 2016)
Items SI3 and SI4 measure organisational support; HTMT for SI and BI is 0.845	Null social influence effect interpreted cautiously
R^2 of 0.804 includes interaction terms; Q^2 (0.808) exceeds R^2	Explained variance not used as evidence
Published article reports n = 392 (Karim & Shaiq, 2025) versus 1,152 in the thesis	Overlap disclosed
No ethics, privacy or regulation construct measured	No inferences about practitioners' ethical attitudes

FINDINGS

Ethical Risk Map (RQ1)

The synthesis validated four risk domains (Table 3). Three cross cutting insights surfaced. First, practical risk is less "mind reading" than the retention, combination and reuse of involuntary signals (Ienca et al., 2018; Ferrell et al., 2025). Second, risk concentrates where research becomes deployment: a consented laboratory study and an always on in-store facial coding system use

similar tools but differ sharply in ethical standing. Third, consent loses protective value when recruitment runs through hierarchies.

Table 3. *Ethical risks of neuromarketing and their amplification in Pakistan*

Domain	Mechanism of harm	Pakistani amplifier
Privacy	Involuntary signals support unanticipated inferences about health or personality	No legal category for neural data held by firms; no retention limits
Informed consent	Participants cannot foresee what is learned; children cannot consent	Recruitment via employers, universities and families; no review of commercial studies
Autonomy	Messages engineered to act below conscious evaluation	Deception rules target false information, not techniques that bypass deliberation
Data protection	Datasets combined, resold or breached	Documented large breaches; no breach notification duty in force

To make these risks concrete, we offer three *illustrative scenarios*. They are hypothetical constructions based on the literature and on public descriptions of commercial tools; they are not observations from Pakistan and are not presented as findings.

- **Scenario A (In-store Measurement).** A retail chain deploys webcam facial expression monitoring on shelf endcaps to collect shoppers' responses to promotions. In this context, with the instruments in place, we find no obligation to inform shoppers, seek their consent, or restrict the retention of biometric data derived from such tools.
- **Scenario B (Hierarchical Recruitment).** A consumer goods company sponsors an EEG advertising test run through a university, and students are recruited by their own faculty. A consent form is signed, but students may feel unable to refuse and are not told whether raw recordings will reach the sponsor.
- **Scenario C (Children).** An agency pretests a snack advertisement using eye tracking with ten year old recruited through a school. Parental consent is obtained, but no rule restricts using the insights to design advertising that exploits children's limited ability to recognize persuasive intent.

Regulatory Gap Analysis (RQ2)

Of the ten safeguards, none is fully provided, four are partial and six are absent (Table 4).

Table 4. *Pakistan's legal framework against ten neural data safeguards*

Code	Safeguard	Status in force	Closest provision; pending drafts
S1	Neural data as sensitive data	Absent	Draft bill proposes a sensitive category; neural data not named
S2	Explicit informed consent	Absent	Draft bill proposes general consent
S3	Purpose limitation; no sale	Absent	Draft bill proposes purpose limitation
S4	Data subject rights	Absent	Draft bill proposes access and correction
S5	Independent regulator	Absent	Only criminal enforcement under PECA; draft proposes a commission
S6	Ethics review of commercial studies	Absent	Ethics committees cover academic and health research only
S7	Protection of children	Partial	General rules against misleading advertising
S8	Ban on manipulative techniques	Partial	Competition Act 2010, s. 10, covers false or misleading information
S9	Security duties and sanctions	Partial	PECA 2016, ss. 3, 4 and 16; no breach notification
S10	Constitutional mental privacy	Partial	Article 14, read expansively in *Benazir Bhutto* (1998)

Note. Status as of October 2026. Sources: Chambers and Partners (2026), Ahmed (2025), Dawn (2025) and primary texts.

The gap is not only technical: all six absent protections both require legislation and a regulator. The partial protections are based on legislation targeting other issues: PECA providing a recourse after unauthorised access, but not duties on lawful data collectors; Section 10 regulating falsehoods, but that is not the main issue in neuromarketing; and Article 14 being untested on biometric or neural data. Even if adopted, the proposed bill would not touch on neural data or expression and manipulation, and the benchmark countries of the US and EU are inching towards individual-specific rules. The 2025 trends do not narrow the gap: the PECA amendment establishes a social media regulator, and the AI strategy is silent on binding privacy responsibilities.

Professional Readiness to Adopt (RQ3)

Table 5 reports the reconciled survey results.

Table 5. *Reconciled survey results (N = 1,152)*

Construct	Mean	SD	Alpha	AVE	β to intention	p
Performance expectancy	4.12	0.68	0.826	0.661	0.110	< .001
Facilitating conditions	3.89	0.71	0.787	0.609	0.266	< .001
Behavioural intention	3.92	0.79	0.877	0.619	not applicable	not applicable
Effort expectancy	3.78	0.75	0.763	0.586	0.183	< .001
Social influence	3.45	0.84	0.790	0.615	0.008	.828

Note. Five point scales. Source: Karim (2025), Tables 6, 8 and 12.

Readiness is high: expected benefits (4.12) and intention (3.92) lie close to "agree". Facilitating conditions is the strongest predictor (β = 0.266), while social influence has no effect (β = 0.008, p = .828), although this may partly reflect the item overlap noted in Table 2. Adoption therefore appears resource led rather than norm led. The survey cannot show whether practitioners recognise the risks in Table 3, but it does show that the drivers of adoption are in place while governance is not. We call this **ethics silent adoption**.

DISCUSSION

The Regulatory Vacuum as an Institutional Void

The central conclusion is that the conditions driving neuromarketing adoption in Pakistan are developing faster than those that would make it safe. Institutional void theory predicts the consequence: where formal rules are absent, private arrangements favour the better informed party (Khanna & Palepu, 1997; Mair et al., 2012), and in neuromarketing that is almost always the firm, since consumers cannot know what their signals reveal. This extends void theory from market intermediaries to data governance. It also qualifies the neurorights debate (Yuste et al., 2017; Bublitz, 2022): for an emerging economy the priority is to build an ordinary data protection architecture that names neural data from the outset, which is easier than retrofitting.

Ethics Silent Adoption

The survey evidence suggests unformed norms. Hunt and Vitell's (1986) model tells us that with out legal or professional indicators, the cue to detect an ethical issue will be weak, and this matches Hensel et al.'s (2017) indication that the organisation is there to embed the ethics. Two conclusions follow. To strengthen the theory of adoption, those signals of legality and professional standards could be factored into the enabling conditions (P1, P2), if regulation is viewed as an enabler as well as a constrainer. And to inform policy, the empty normative pillar provides a chance to set the standards and norms before the practice settles (Ferrell et al., 2025).

Consent, Culture and Religious Ethics

Consent must also be culturally contextualized. In a hierarchical, collectivist environment (Hofstede, 2011), a signed form can coexist with limited voluntariness. Processes can safeguard choice by decoupling access to decision-makers and indicators of understanding (P4). Supporting standards in Islamic commercial practice might help ground their legitimacy, as bans on deception and espionage correspond to transparency and mental privacy (Saeed et al., 2001; Beekun & Badawi, 2005); whether these norms curtail undercover practice is an empirical question for testing (P5).

Comparison with Prior Research

Our findings are consistent with the existing research which demonstrates the important role of privacy and manipulation (Stanton et al., 2017; Goncalves et al., 2024; Ferrell et al., 2025) but differ in two ways. In a weak data protection environment, the most pressing concern is data abuse, rather than manipulation. And, hierarchy in recruitment does more than affect children (Nairn & Fine, 2008); it introduces a structural weakness that the literature has missed.

IMPLICATIONS, RECOMMENDATIONS AND CONCLUSION

Theoretical and Managerial Implications

Theoretically, the paper extends this to data governance, argues the enabling conditions are legal and ethical infrastructure, shows hierarchical consent as a structural vulnerability, and combines Islamic business ethics with principlism and contextual integrity. Managerially, there need be no wait for legislation. Firms should regard neural and biometric data as sensitive by default, before collecting it should identify what is necessary, aggregate recordings separate from identities, keep data only as long as necessary and not allow resale. Agencies and vendors should adopt the NMSBA (2013) code as a contractual

minimum and pursue independent ethics review. Brand owners should not fund neuromarketing studies on children to produce advertising targeted at children, and emotion recognition in-shop should be informed and opt-in.

Policy Recommendations

Table 6 provides a trajectory by phases. Rules should be about the uses of data rather than the devices; rules should be proportionate and make consented and reviewed research simple and minimise the covering measuring and targeting of the vulnerable.

Table 6. Phased Policy Roadmap

Phase	Measure	Safeguards	Lead institutions
Within 12 months	Enact the data protection bill, naming neural and biometric data as sensitive, requiring explicit consent and banning sale	S1 to S4	Ministry of IT and Telecommunication; Parliament
Within 12 months	Establish an independent data protection commission with audit and fining powers	S5, S9	Federal government; Parliament
Within 12 months	Issue guidance applying Section 10 of the Competition Act to exploitative neuro informed advertising	S8	Competition Commission of Pakistan
One to three years	Prohibit neuromarketing on under 18s for designing advertising aimed at them	S7	Parliament; PEMRA; provincial consumer authorities
One to three years	Require registration and ethics review of commercial neural data studies; adopt a national code of conduct	S6 to S8	Data protection commission; National Bioethics Committee; Pakistan Advertisers Society

Phase	Measure	Safeguards	Lead institutions
Three years and beyond	Regulate manipulative uses of neural data, drawing on Article 5 of the EU AI Act and UNESCO (2025)	S8	Parliament; data protection commission
Three years and beyond	Consider statutory or constitutional recognition of mental privacy and integrity, informed by Chile's experience	S10	Parliament; Law and Justice Commission of Pakistan
Continuous	Integrate neuroethics and data protection into marketing curricula and public awareness campaigns	All	Higher Education Commission; universities; civil society

Limitations

This is a conceptual paper: the propositions are untested and the scenarios hypothetical. The review is not systematic and therefore other non-English work or work in the grey literature may have been overlooked. The legal review is as at October 2026, draws on secondary sources and involves interpretive judgment in coding borderline provisions. The survey is a cross sectional, purposive quota sample from Karachi with self reported data, no ethics measures and the issues listed in Table 2, so it indicates readiness rather than actual use and cannot be generalised to all of Pakistan. Consumers' own perceptions remain unmeasured.

Directions for Future Research

1. Test P1 and P2 by adding validated measures of perceived ethical risk and regulatory clarity to the UTAUT model, using multigroup analysis for categorical moderators (Henseler et al., 2016).
2. Survey and run experiments with Pakistani consumers to test P3, and compare direct with hierarchically mediated consent to test P4.
3. Interview agencies, vendors and brand managers to document how neuromarketing is actually conducted and how data is stored.
4. Compare Pakistan with other South Asian and Muslim majority economies such as Bangladesh, Indonesia and Malaysia.

5. Examine whether Islamic work ethic or religiosity restrains willingness to use covert techniques (P5).
6. Track the Personal Data Protection Bill and assess whether, once enacted, it is interpreted to cover neural data.

CONCLUSION

Pakistani marketers are ready to use neuromarketing, but that readiness is not matched by protection. None of the ten safeguards that international standards associate with neural data is fully provided by law in force, and adoption is driven by resources rather than norms. There is now a regulatory gap which makes it possible to collect and reuse the most involuntary kinds of personal data with very few restrictions. By naming neural data in its data protection law, creating an independent regulator, protecting children, requiring ethics review and drawing on its own ethical traditions, Pakistan can make responsible neuromarketing the norm before irresponsible practice takes hold.

REFERENCES

Ahmed, O. N. (2025, December 11). Data privacy in peril: Pakistan's legal vacuum and its consequences. *The Friday Times*. https://www.thefridaytimes.com/11-Dec-2025/data-privacy-peril-pakistan-s-legal-vacuum-consequences

Ariely, D., & Berns, G. S. (2010). Neuromarketing: The hope and hype of neuroimaging in business. *Nature Reviews Neuroscience, 11*(4), 284–292. https://doi.org/10.1038/nrn2795

Beauchamp, T. L., & Childress, J. F. (2019). *Principles of biomedical ethics* (8th ed.). Oxford University Press.

Beekun, R. I., & Badawi, J. A. (2005). Balancing ethical responsibility among multiple organizational stakeholders: The Islamic perspective. *Journal of Business Ethics, 60*(2), 131–145. https://doi.org/10.1007/s10551-004-8204-5

Benazir Bhutto v. President of Pakistan, PLD 1998 SC 388 (Supreme Court of Pakistan 1998).

Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal, 9*(2), 27–40. https://doi.org/10.3316/QRJ0902027

Bublitz, J. C. (2022). Novel neurorights: From nonsense to substance. *Neuroethics, 15*(1), Article 7. https://doi.org/10.1007/s12152-022-09481-3

Calo, R. (2014). Digital market manipulation. *George Washington Law Review, 82*(4), 995–1051.

Calvert, S. L. (2008). Children as consumers: Advertising and marketing. *The Future of Children, 18*(1), 205–234. https://doi.org/10.1353/foc.0.0001

Chambers and Partners. (2026). *Data protection & privacy 2026: Pakistan* [Practice guide]. https://practiceguides.chambers.com/practice-guides/data-protection-privacy-2026/pakistan

Cornejo-Plaza, M. I., Cippitani, R., & Pasquino, V. (2024). Chilean Supreme Court ruling on the protection of brain activity: Neurorights, personal data protection, and neurodata. *Frontiers in Psychology, 15*, Article 1330439. https://doi.org/10.3389/fpsyg.2024.1330439

Dawn. (2025, July 30). Federal cabinet approves National AI Policy 2025. *Dawn*. https://www.dawn.com/news/1927634/federal-cabinet-approves-national-ai-policy-2025

Farah, M. J., & Wolpe, P. R. (2004). Monitoring and manipulating brain function: New neuroscience technologies and their ethical implications. *Hastings Center Report, 34*(3), 35–45. https://doi.org/10.2307/3528418

Ferrell, M. L., Beatty, A., & Dubljević, V. (2025). The ethics of neuromarketing: A rapid review. *Neuroethics, 18*(1), Article 19. https://doi.org/10.1007/s12152-025-09591-8

Fisher, C. E., Chin, L., & Klitzman, R. (2010). Defining neuromarketing: Practices and professional challenges. *Harvard Review of Psychiatry, 18*(4), 230–237. https://doi.org/10.3109/10673221.2010.496623

Goncalves, M., Hu, Y., Aliagas, I., & Cerdá, L. M. (2024). Neuromarketing algorithms' consumer privacy and ethical considerations: Challenges and opportunities. *Cogent Business & Management, 11*(1), Article 2333063. https://doi.org/10.1080/23311975.2024.2333063

Hensel, D., Iorga, A., Wolter, L., & Znanewitz, J. (2017). Conducting neuromarketing studies ethically: Practitioner perspectives. *Cogent Psychology, 4*(1), Article 1320858. https://doi.org/10.1080/23311908.2017.1320858

Henseler, J., Ringle, C. M., & Sarstedt, M. (2016). Testing measurement invariance of composites using partial least squares. *International Marketing Review, 33*(3), 405–431. https://doi.org/10.1108/IMR-09-2014-0304

Hofstede, G. (2011). Dimensionalizing cultures: The Hofstede model in context. *Online Readings in Psychology and Culture, 2*(1). https://doi.org/10.9707/2307-0919.1014

Hsu, M. (2017). Neuromarketing: Inside the mind of the consumer. *California Management Review, 59*(4), 5–22. https://doi.org/10.1177/0008125617720208

Hunt, S. D., & Vitell, S. (1986). A general theory of marketing ethics. *Journal of Macromarketing, 6*(1), 5–16. https://doi.org/10.1177/027614678600600103

Hutchinson, T., & Duncan, N. (2012). Defining and describing what we do: Doctrinal legal research. *Deakin Law Review, 17*(1), 83–119.

Ienca, M., & Andorno, R. (2017). Towards new human rights in the age of neuroscience and neurotechnology. *Life Sciences, Society and Policy, 13*(1), Article 5. https://doi.org/10.1186/s40504-017-0050-1

Ienca, M., Haselager, P., & Emanuel, E. J. (2018). Brain leaks and consumer neurotechnology. *Nature Biotechnology, 36*(9), 805–810. https://doi.org/10.1038/nbt.4240

Jaakkola, E. (2020). Designing conceptual articles: Four approaches. *AMS Review, 10*(1–2), 18–26. https://doi.org/10.1007/s13162-020-00161-0

Karim, E. (2025). *Examining the impact of neuromarketing adoption on marketing professionals' intentions: An analysis through the lens of the UTAUT model* [Doctoral dissertation, Greenwich University, Karachi].

Karim, E., & Shaiq, M. (2025). The moderating role of market domain in neuromarketing adoption: A UTAUT-based investigation among marketing professionals in an emerging economy. *Periodicals of Management Studies, 5*(4), 99–117.

Khanna, T., & Palepu, K. (1997). Why focused strategies may be wrong for emerging markets. *Harvard Business Review, 75*(4), 41–51.

Lee, N., Broderick, A. J., & Chamberlain, L. (2007). What is "neuromarketing"? A discussion and agenda for future research. *International Journal of Psychophysiology, 63*(2), 199–204. https://doi.org/10.1016/j.ijpsycho.2006.03.007

Lim, W. M. (2018). Demystifying neuromarketing. *Journal of Business Research, 91*, 205–220. https://doi.org/10.1016/j.jbusres.2018.05.036

Mair, J., Martí, I., & Ventresca, M. J. (2012). Building inclusive markets in rural Bangladesh: How intermediaries work institutional voids. *Academy of Management Journal, 55*(4), 819–850. https://doi.org/10.5465/amj.2010.0627

Martin, K. D., & Murphy, P. E. (2017). The role of data privacy in marketing. *Journal of the Academy of Marketing Science, 45*(2), 135–155. https://doi.org/10.1007/s11747-016-0495-4

Murphy, E. R., Illes, J., & Reiner, P. B. (2008). Neuroethics of neuromarketing. *Journal of Consumer Behaviour, 7*(4–5), 293–302. https://doi.org/10.1002/cb.252

Nairn, A., & Fine, C. (2008). Who's messing with my mind? The implications of dual-process models for the ethics of advertising to children. *International Journal of Advertising, 27*(3), 447–470. https://doi.org/10.2501/S0265048708080062

Nemorin, S., & Gandy, O. H., Jr. (2017). Exploring neuromarketing and its reliance on remote sensing: Social and ethical concerns. *International Journal of Communication, 11*, 4824–4844.

Neuromarketing Science & Business Association. (2013). *NMSBA code of ethics*.

Nissenbaum, H. (2004). Privacy as contextual integrity. *Washington Law Review, 79*(1), 119–157.

Organisation for Economic Co-operation and Development. (2019). *Recommendation of the Council on responsible innovation in neurotechnology* (OECD/LEGAL/0457).

Pakistan Bureau of Statistics. (2023). *7th population and housing census 2023: Final results*. Government of Pakistan.

Plassmann, H., Venkatraman, V., Huettel, S., & Yoon, C. (2015). Consumer neuroscience: Applications, challenges, and possible solutions. *Journal of Marketing Research, 52*(4), 427–435. https://doi.org/10.1509/jmr.14.0048

Ruder, K. (2025, July 23). States pass privacy laws to protect brain data collected by devices. *KFF Health News*; republished by *Route Fifty*. https://www.route-fifty.com/digital-government/2025/07/states-pass-privacy-laws-protect-brain-data-collected-devices/406920

Saeed, M., Ahmed, Z. U., & Mukhtar, S.-M. (2001). International marketing ethics from an Islamic perspective: A value-maximization approach. *Journal of Business Ethics, 32*(2), 127–142. https://doi.org/10.1023/A:1010718817155

Scott, W. R. (2014). *Institutions and organizations: Ideas, interests, and identities* (4th ed.). Sage.

Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research, 104*, 333–339. https://doi.org/10.1016/j.jbusres.2019.07.039

Solove, D. J. (2006). A taxonomy of privacy. *University of Pennsylvania Law Review, 154*(3), 477–564. https://doi.org/10.2307/40041279

Stanton, S. J., Sinnott-Armstrong, W., & Huettel, S. A. (2017). Neuromarketing: Ethical implications of its use and potential misuse. *Journal of Business Ethics, 144*(4), 799–811. https://doi.org/10.1007/s10551-016-3059-0

Sunstein, C. R. (2016). *The ethics of influence: Government in the age of behavioral science*. Cambridge University Press.

Susser, D., Roessler, B., & Nissenbaum, H. (2019). Technology, autonomy, and manipulation. *Internet Policy Review, 8*(2). https://doi.org/10.14763/2019.2.1410

U.S. Senate Committee on Commerce, Science, and Transportation. (2025, September 24). *Sens. Cantwell, Schumer, Markey introduce legislation to shield Americans' brain data from exploitation* [Press release]. https://www.commerce.senate.gov/2025/9/sens-cantwell-schumer-markey-introduce-legislation-to-shield-americans-brain-data-from-exploitation

Ulman, Y. I., Cakar, T., & Yildiz, G. (2015). Ethical issues in neuromarketing: "I consume, therefore I am!" *Science and Engineering Ethics, 21*(5), 1271–1284. https://doi.org/10.1007/s11948-014-9581-5

UNESCO. (2025). *Recommendation on the ethics of neurotechnology*. United Nations Educational, Scientific and Cultural Organization.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly, 27*(3), 425–478. https://doi.org/10.2307/30036540

Wilson, R. M., Gaines, J., & Hill, R. P. (2008). Neuromarketing and consumer free will. *Journal of Consumer Affairs, 42*(3), 389–410. https://doi.org/10.1111/j.1745-6606.2008.00114.x

Yuste, R., Goering, S., Arcas, B. A. y, Bi, G., Carmena, J. M., Carter, A., Fins, J. J., Friesen, P., Gallant, J., Huggins, J. E., Illes, J., Kellmeyer, P., Klein, E., Marblestone, A., Mitchell, C., Parens, E., Pham, M., Rubel, A., Sadato, N., … Wolpaw, J. (2017). Four ethical priorities for neurotechnologies and AI. *Nature, 551*(7679), 159–163. https://doi.org/10.1038/551159a