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A Study on Impact of Neuromarketing Techniques on Consumer Buying Behaviour

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ABSTRACT
This study examines the impact of neuromarketing techniques on consumer buying behaviour in the Indian context. With a sample of 104 respondents collected through a structured questionnaire, the research employs a mixed-methods approach combining descriptive statistics, Likert-scale analysis, and qualitative insights. The study investigates consumer awareness of neuromarketing, the perceived influence of various techniques including emotional branding, colour psychology, subliminal messaging, and sensory cues, and the ethical dimensions of neuromarketing practice. Findings indicate that while 70.2% of respondents are familiar with neuromarketing, the actual self-reported influence on buying decisions remains moderate, with most consumers remaining cautious about manipulation. Emotional branding emerged as the most influential technique. The paper concludes that neuromarketing holds significant promise for marketers but must be practised within a robust ethical framework.

Keywords: Neuromarketing, consumer buying behaviour, emotional branding, colour psychology, sensory marketing, subliminal messaging, India.

1. INTRODUCTION

The global marketplace has undergone a dramatic transformation in the 21st century, necessitating organisations to look beyond conventional marketing paradigms. Traditional research tools such as focus groups, surveys, and interviews, although useful, are constrained by the fact that consumers often cannot accurately report their subconscious motivations. It is now well-established in behavioural neuroscience that the majority of purchase decisions are governed by emotional and subconscious neural processes rather than purely rational deliberation.

Neuromarketing, a discipline that combines neuroscience with consumer behaviour research, offers marketers a scientific lens through which the hidden drivers of purchase decisions can be studied. By employing technologies such as functional Magnetic Resonance Imaging (fMRI), Electroencephalography (EEG), eye-tracking, facial coding, and sensory stimuli, neuromarketing enables the mapping of brain responses to marketing stimuli in real time.

India, with its vast and demographically diverse consumer base, presents a particularly interesting context for studying the intersection of neuroscience and marketing. The rapid expansion of digital media,

increasing urbanisation, and the proliferation of global brands have exposed Indian consumers to an unprecedented variety of advertising stimuli. Understanding how these stimuli are processed at the neurological level holds immense commercial significance.

This paper aims to study the awareness, perception, and influence of neuromarketing techniques on consumer buying behaviour among a cross-section of Indian consumers. Primary data collected from 104 respondents through a structured questionnaire forms the empirical basis of this study.

2. REVIEW OF LITERATURE

The term 'Neuromarketing' was coined by Ale Smidts of Erasmus University in 2002 and is broadly defined as the applied extension of neuroscience to the study of consumer responses to marketing stimuli (Hammou et al., 2013). Neuromarketing integrates behavioural psychology, consumer neuroscience, and economics to decode subconscious consumer decision-making.

Devaru (2018) described neuromarketing as a discipline that bridges the gap between what consumers say and what they genuinely feel, noting that the old brain the reptilian brain stem is the primary locus of purchase decisions, driven by emotions and instincts. The classic Pepsi-Coke experiment, cited widely in neuromarketing literature, demonstrated that brand knowledge activates emotional and memory centres of the brain, influencing taste perception and purchase preference (Devaru, 2018).

Lee et al. (2006) noted the academic debate over whether neuromarketing is a pure science or a business practice, while Fisher et al. (2010) argued it is best understood as the practical application of brain imaging to market research. The most widely used neuromarketing tools include fMRI, EEG, eye-tracking, facial coding, and sensory marketing. EEG offers superior temporal resolution to track moment-by-moment cognitive and emotional responses, while fMRI provides spatial resolution to identify specific brain regions activated by stimuli.

Sensory marketing manipulating ambient environment through sound, scent, and touch has been shown to significantly influence in-store purchase behaviour. Psychological nudges, such as removing currency symbols from price tags or positioning healthy menu items on the left, leverage subtle cognitive biases to steer consumer choices (Devaru, 2018).

On the ethical front, Wilson (2008) and colleagues highlighted concerns regarding consumer autonomy and informed consent. The Neuromarketing Science and Business Association (NMSBA, 2013) subsequently established a Code of Ethics to govern industry practice. Advocates argue that neuromarketing ultimately helps create products that genuinely satisfy consumer needs, while critics warn of the risk of manipulating vulnerable populations.

Wilson et al. (2008) critically examined the ethical implications of neuromarketing, particularly focusing on the concept of consumer free will. The authors argued that as neuromarketing techniques gain the ability to access subconscious processes, they may challenge traditional notions of informed consumer choice. Their study highlighted concerns that such techniques could potentially manipulate vulnerable consumers without their awareness. However, they also acknowledged that when used responsibly, neuromarketing can enhance consumer satisfaction by aligning products more closely with genuine needs. This dual perspective positions neuromarketing as both an opportunity and a responsibility for marketers.

The Neuromarketing Science and Business Association (NMSBA, 2013) established a formal Code of Ethics to regulate the application of neuromarketing practices. The framework emphasizes principles such as transparency, informed consent, privacy protection, and the avoidance of exploitation, particularly among vulnerable groups like children. The guidelines serve as an important step toward legitimizing

neuromarketing as a credible discipline while addressing growing public concerns. The ethical code reinforces the need for balancing commercial objectives with consumer rights in an increasingly data-driven marketing environment.

Butler (2008) explored the conceptual foundations of neuromarketing and questioned the extent to which it truly generates new knowledge about consumer behavior. The study argued that while neuromarketing provides sophisticated tools for measuring brain activity, its interpretation often depends on existing psychological theories. Butler emphasized that neuromarketing should not be viewed as a replacement for traditional research methods but rather as a complementary approach that enhances understanding of consumer cognition and emotion.

Pop et al. (2014) focused on the ethical responsibility of organizations employing neuromarketing techniques. Their research highlighted that companies must ensure that their practices do not cross the line into manipulation or deception. The study emphasized corporate accountability and suggested that ethical neuromarketing can strengthen brand trust and long-term customer relationships. It also pointed out that consumer awareness is increasing, making ethical conduct not just a moral obligation but also a strategic necessity.

Murphy et al. (2008) contributed to the emerging field of neuroethics by examining the moral challenges associated with neuromarketing. Their work addressed issues such as consumer autonomy, data privacy, and the potential misuse of neuroscientific findings. The authors argued that ethical guidelines must evolve alongside technological advancements to prevent misuse. They stressed the importance of interdisciplinary collaboration between neuroscientists, marketers, and policymakers to ensure responsible application.

Nyoni and Bonga (2017) discussed neuromarketing as a transformative tool for improving consumer understanding. Their study highlighted how integrating neuroscience with marketing enables businesses to decode complex consumer preferences that are often inaccessible through conventional methods. The authors concluded that neuromarketing enhances decision-making efficiency for organizations by providing deeper insights into emotional and cognitive responses, ultimately leading to more effective marketing strategies.

Sharma et al. (2014) positioned neuromarketing as an advanced alternative to traditional marketing tools. Their research emphasized that conventional techniques like surveys and interviews often fail to capture subconscious influences on consumer behavior. By contrast, neuromarketing provides real-time insights into brain activity, enabling marketers to design more impactful campaigns. The study concluded that neuromarketing represents a significant evolution in marketing research, particularly in highly competitive markets.

Jayakrishnan (2011) explored the potential application of neuromarketing in rural Indian markets. The study highlighted that although neuromarketing is often associated with urban and technologically advanced environments, its principles can be adapted to understand rural consumer behavior as well. By focusing on emotional triggers, cultural values, and sensory cues, marketers can effectively connect with rural consumers. The research emphasized that neuromarketing could play a crucial role in bridging the gap between modern marketing strategies and traditional consumer segments in India.

3. OBJECTIVES OF THE STUDY

The specific objectives of this study are:

- To assess the level of consumer awareness about neuromarketing and its techniques.

- To identify the neuromarketing techniques that most significantly influence consumer buying behaviour.
- To examine the role of media channels in shaping purchase decisions through neuromarketing stimuli.
- To analyse consumer attitudes towards the persuasive potential and ethical dimensions of neuromarketing.
- To derive actionable implications for marketing practitioners in the Indian context.

4. RESEARCH METHODOLOGY

4.1 Research Design

This study adopts a mixed-methods research design, integrating quantitative survey analysis with qualitative content examination of open-ended responses. The research is descriptive and exploratory in nature, aimed at uncovering patterns in consumer awareness, attitudes, and self-reported behaviour related to neuromarketing.

4.2 Data Collection

Primary data were collected through a structured Google Form questionnaire distributed to respondents across India between January 2026. The questionnaire comprised 20 items covering demographic details, awareness of neuromarketing and its techniques, media preferences, Likert-scale attitudinal statements, and open-ended questions on personal experiences with emotionally driven advertisements.

4.3 Sample

A total of 104 valid responses were obtained using purposive and snowball sampling techniques. The sample included consumers across age groups (18–45 years), educational backgrounds, and occupational categories.

4.4 Instrument

Sections of the questionnaire included: (i) demographic profile; (ii) awareness of neuromarketing; (iii) technique recognition and perceived influence; (iv) media channel influence; (v) six-item Likert scale (Strongly Agree to Strongly Disagree) measuring attitudinal constructs; and (vi) perception of ethical concerns.

5. DATA ANALYSIS AND FINDINGS

5.1 Demographic Profile of Respondents

Table 1 presents the demographic composition of the 104 respondents surveyed.

Table 1: Demographic Profile of Respondents

Category	Sub-category	Frequency (%)
Gender	Male	73 (70.2%)
	Female	29 (27.9%)
Age Group	18-25	57 (54.8%)
	26-35	40 (38.5%)
	36-45	5 (4.8%)
Qualification	High School	15 (14.4%)
	Under-Graduate	36 (34.6%)
	Post-Graduate	45 (43.3%)
	Professionals	6 (5.8%)

Occupation	Student	42 (40.4%)
	Employed	33 (31.7%)
	Self-employed	23 (22.1%)
	Homemaker	4 (3.8%)

The sample is predominantly male (70.2%) and young, with 54.8% belonging to the 18–25 age group and 38.5% in the 26–35 bracket. A majority held post-graduate qualifications (43.3%), and the largest occupational category was students (40.4%), followed by employed respondents (31.7%). This profile is reflective of a digitally active, urban Indian consumer base with exposure to contemporary advertising across multiple media platforms.

5.2 Consumer Awareness of Neuromarketing

Table 2: Consumer Awareness of Neuromarketing

Question	Yes / Familiar	No / Not Sure
Familiar with Neuromarketing	73 (70.2%)	28 (26.9%)
Heard of Neuromarketing Techniques	50 (48.1%)	38 (36.5%) / 14 Not Sure
Noticed Emotional/Sensory Ads	65 (62.5%)	33 (31.7%)

A noteworthy 70.2% of respondents reported familiarity with the term 'neuromarketing', indicating growing public discourse around the field. However, only 48.1% had heard of specific techniques such as eye-tracking, emotional advertising, or sensory marketing, suggesting that conceptual familiarity does not necessarily translate to technique-specific knowledge. Significantly, 62.5% confirmed they had noticed advertisements that appealed to their emotions or senses, corroborating the real-world penetration of neuromarketing stimuli in Indian advertising.

5.3 Neuromarketing Techniques Influencing Consumer Choices

Table 3 presents the distribution of perceived technique influence.

Table 3: Perceived Influence of Neuromarketing Techniques

Neuromarketing Technique	Frequency	Percentage
Emotional Branding	34	32.7%
Subliminal Messaging	23	22.1%
Color Psychology	18	17.3%
Sensory Cues (Touch/Sound/Smell)	14	13.5%
Eye-Tracking & Visuals	6	5.8%
Celebrity Endorsement	6	5.8%

Emotional branding emerged as the most widely perceived influential technique (32.7%), consistent with the neurological principle that purchase decisions are primarily emotionally driven before being rationalised (Devaru, 2018). Subliminal messaging was second (22.1%), followed by colour psychology (17.3%) and sensory cues (13.5%). Celebrity endorsement and eye-tracking were comparatively less cited (5.8% each). The dominance of emotional branding aligns with findings from the Coke-Pepsi study, which demonstrated that brand familiarity and emotional association rather than objective product quality drive consumer preference.

5.4 Frequency of Advertisement Influence on Purchase Decisions

When asked how often advertisements influence their purchase decision, the responses indicated that 38.5% of respondents are rarely influenced, 25.0% are sometimes influenced, and 10.6% are often influenced, while 25.0% reported never being influenced by advertisements. This pattern suggests that

while neuromarketing stimuli are pervasive, a significant segment of Indian consumers maintains critical distance from advertising persuasion attempts.

5.5 Media Channels Influencing Buying Decisions

Table 4 illustrates the most influential media channels as reported by respondents.

Table 4: Media Channel Influence on Buying Decisions

Media Type	Frequency	Percentage
TV Commercials	32	30.8%
Social Media Ads	29	27.9%
In-store Displays	21	20.2%
Word of Mouth	13	12.5%
Email / SMS Ads	6	5.8%

Television commercials (30.8%) and social media advertisements (27.9%) collectively dominate as the most influential media channels, together accounting for nearly 58.7% of responses. This finding has significant strategic implications: neuromarketing investments in video-based, emotionally resonant content particularly on television and digital/social platforms are most likely to yield returns. In-store displays (20.2%) remain important, particularly for impulse purchase categories, while word of mouth (12.5%) reflects the role of social proof in buying behaviour.

5.6 Attitudinal Analysis: Likert Scale Responses

Table 5 presents the attitudinal responses to six Likert-scale statements (SA = Strongly Agree, A = Agree, N = Neutral, D = Disagree, SD = Strongly Disagree).

Table 5: Likert Scale Attitudinal Responses (n=104)

Statement	SA	A	N	D	SD
Q12: Emotionally products	7	19	27	31	19
Q13: Visual design affects purchase	6	24	23	33	19
Q14: Trust /sensory brands	10	23	27	33	13
Q15: NM ads more persuasive	5	15	35	24	20
Q16: NM makes me try new products	6	22	23	28	22
Q17: Influenced by subtle messages	4	24	29	32	15

Analysis of the Likert-scale responses reveals a nuanced picture. For Q12 (emotional purchase tendency), the highest single category was 'Disagree' (31 respondents), though 19 respondents each chose 'Agree' and 'Strongly Disagree', with 27 remaining neutral. This suggests that while a significant minority acknowledge emotional influence, a larger proportion is resistant to admitting its a finding consistent with the well-documented gap between implicit and explicit consumer responses (Devaru, 2018).

Q13 (visual design impact) similarly shows a divided response, with 33 disagreeing and 29 agreeing or strongly agreeing. Q14 (trust in emotional/sensory brands) and Q15 (persuasiveness of neuromarketing ads) show the largest neutral responses (27 and 35 respectively), indicating ambivalence. Q17 (susceptibility to subliminal messages) recorded 29 neutral responses, reflecting consumers' uncertainty about their own subconscious influences arguably the most theoretically significant finding, as this very uncertainty is central to the value proposition of neuromarketing research.

5.7 Consumer Perception of Ethical Risks

Table 6: Belief in Unfair Manipulation by Neuromarketing

Response	Frequency	Percentage
No	47	45.2%
Yes	41	39.4%
Unsure	13	12.5%

On the question of whether neuromarketing can manipulate consumers unfairly, responses were notably divided. The largest group (45.2%) answered 'No', while 39.4% believed it can manipulate consumers, and 12.5% remained unsure. This near-split underscores the ethical sensitivity surrounding neuromarketing practice and aligns with the scholarly debate between advocates who see neuromarketing as mutually beneficial and critics who highlight risks to consumer autonomy (Wilson, 2008; Devaru, 2018).

5.8 Qualitative Insights from Open-Ended Responses

The open-ended question asking how neuromarketing affects purchase decisions yielded rich qualitative data. Recurring themes included: emotional connection (it triggers emotions and attracts attention), visual appeal ('flashy images gain attention and affect purchase decisions'), brand familiarity ('makes certain brands feel familiar and comfortable'), and FOMO fear of missing out ('limited-time offers created urgency'). Several respondents articulated sophisticated self-awareness, noting that neuromarketing 'subconsciously influences choices' or 'makes products feel more attractive before comparing prices or features.' Frequently mentioned brands that respondents associated with emotionally resonant advertising included Coca-Cola, Nike, Apple, Amazon, Dairy Milk (Cadbury), Netflix, Starbucks, and Jio reflecting both global and Indian market leaders.

6. DISCUSSION

The findings of this study contribute several insights to the existing body of literature on neuromarketing and consumer behaviour in India. The high awareness rate (70.2%) suggests that neuromarketing is entering mainstream consumer consciousness, possibly due to increased media coverage and the proliferation of marketing education. However, the gap between conceptual awareness and specific technique familiarity indicates that public understanding remains surface-level.

The dominance of emotional branding as the most recognised influential technique corroborates the foundational neuromarketing principle that purchase decisions are rooted in emotional brain activity (Devaru, 2018). The preference for television and social media as influential channels mirrors global trends in digital marketing, where video content is increasingly the medium of choice for emotionally immersive advertising.

The moderate-to-low Likert scores on emotional purchase influence may reflect social desirability biasconsumers are reluctant to explicitly acknowledge being emotionally manipulated, even when their behaviour suggests otherwise. This is precisely the gap that neuromarketing aims to bridge: by measuring subconscious neural responses rather than relying on self-report, it circumvents this cognitive bias.

The near-equal split on ethical concerns is perhaps the most consequential finding for practitioners. Indian consumers are alert to the potential for manipulation, and brands that deploy neuromarketing techniques without transparency risk eroding consumer trust. The NMSBA Code of Ethics (2013), which mandates informed consent and data confidentiality, provides a useful governance framework that Indian industry associations should actively adopt and promote.

7. APPLICATIONS OF NEUROMARKETING IN THE INDIAN CONTEXT

The findings of this study have specific applications across several marketing domains in India:

7.1 Advertising and Brand Communication

Given the high influence of emotional branding, Indian advertisers should prioritise emotionally resonant storytelling. Campaigns that connect products to values like family, aspiration, patriotism, and nostalgia are likely to activate emotional memory centres and foster brand loyalty. Television and social media should be the primary channels, with visual content taking precedence over text.

7.2 Product Packaging and Visual Design

Colour psychology and visual design were identified as influential by a significant minority of respondents. Fast-moving consumer goods (FMCG) companies and e-commerce platforms in India should invest in neuromarketing research to optimise packaging colours, product imagery, and digital UI elements to subconsciously direct consumer attention.

7.3 Retail and In-Store Experience

In-store displays remain the third most influential media channel. Retail chains and supermarkets can leverage sensory marketing ambient music, strategic product placement, and olfactory cues to increase dwell time and impulse purchases. Neuromarketing-guided planogram design can significantly improve conversion rates.

7.4 Digital and Social Media Marketing

With social media ads ranking second in influence, digital marketers must incorporate neuromarketing principles into content strategy. This includes A/B testing ad creatives using EEG-based consumer feedback, deploying colour-coded call-to-action buttons based on psychological research, and leveraging facial coding to evaluate pre-launch campaign emotional impact.

8. LIMITATIONS OF THE STUDY

The study is subject to several limitations. First, the sample, though diverse, was collected primarily through digital channels and therefore skews towards younger, digitally literate, and relatively educated respondents, potentially underrepresenting rural and older consumer segments. Second, the study relies on self-reported data, which is susceptible to social desirability bias particularly for questions assessing susceptibility to advertising influence. Third, the relatively small sample size (n=104) limits the generalisability of findings. Future research should employ larger, geographically stratified samples and, where possible, complement survey data with actual neuroimaging measurements.

9. CONCLUSION

This study provides empirical evidence that neuromarketing is a significant and growing force in shaping consumer buying behaviour in India. While awareness of the field is high, consumers demonstrate a complex and often self-contradictory relationship with advertising influence acknowledging the power of emotional stimuli while simultaneously claiming to resist it. Emotional branding is the most influential neuromarketing technique, and television and social media are the dominant channels through which neuromarketing stimuli reach Indian consumers.

The ethical dimensions of neuromarketing cannot be overlooked. With nearly 40% of respondents believing that neuromarketing can be used to manipulate consumers unfairly, marketers and industry bodies must prioritise transparent, consent-based practices. When used responsibly, neuromarketing has

the potential to benefit both businesses through more effective campaigns and consumers through products and experiences that genuinely align with their needs and desires.

As neuromarketing research methodologies become more accessible and affordable, their adoption in India is set to accelerate. Future research should explore sector-specific applications, cross-cultural comparisons, and the long-term effects of neuromarketing stimuli on brand equity and consumer well-being.

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