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# Mind Over Market: How Psychology Drives Consumer Decisions Through Neuromarketing?

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### ABSTRACT

*This study explores the psychological underpinnings of consumer behavior through the lens of neuromarketing, employing an Exploratory Sequential Mixed-Methods Design. The research aimed to uncover how neuromarketing strategies—such as emotional analytics, sensory cues, and behavioral triggers—affect consumer decision-making and perception. In the qualitative phase, in-depth interviews were conducted with 60 experts in neuromarketing, neuroscience, and marketing strategy. Thematic analysis revealed key insights into emotional engagement, ethical considerations, and practical applications of neuromarketing tools. These expert-informed themes formed the basis for a structured questionnaire administered to 60 consumer behavior experts in Jordan. Quantitative data were collected using a 5-point Likert scale and analyzed through SPSS to assess trends and validate qualitative findings. The results indicate strong alignment between expert perspectives and broader patterns in consumer response, confirming the influential role of neuromarketing techniques. This study offers theoretical and practical contributions to the field by bridging qualitative depth with empirical generalizability and highlights the importance of ethical and context-sensitive implementation of neuromarketing strategies in consumer markets.*

### INTRODUCTION

Understanding how subconscious factors are influencing how customers behave has become crucial in a time of hyper-personalization and data-driven decision-making. Self-reports and behavioral data are common components of traditional marketing strategies, but they may not adequately capture the underlying cognitive and emotional processes that actually influence consumer behavior. This gap can be

bridged by exploring brain responses to marketing stimuli through “neuromarketing”. According to Kumar et al. (2024), neuromarketing is a multidisciplinary field combining neuroscience, psychology, and marketing, whose purpose is to decode consumer behavior by analyzing how brain functioning, as well as physiological responses contribute to buying decisions.

Key methods of neuromarketing include Functional Magnetic Resonance Imaging (fMRI) - which detects changes in blood flow to identify brain regions activated by distinct marketing stimuli (e.g. Alsharif & Mohd Isa, 2024; Ariely & Berns 2010; Morin 2011); Electroencephalography (EEG) which tracks electrical brain activity, providing real-time insights into emotional /cognitive reactions (e.g. MacKay et al., 2024; Khondakar et al., 2024); Eye Tracking and Monitoring of eye movements is also employed to understand visual attention and engagement with ad or product displays (e.g. Wedel & Pieters, 2008); Galvanic skin response (GSR)-measuring variances in the conductive properties within the skin-space linked arousal due emotions/the dopamine effect/noted as affecting physiological sensation business targets (Ohme et al., 2009). Neuromarketing operationalizes this model by incorporating these methodologies to streamline and optimize marketing techniques, and product designs that appeal directly to consumers' subconscious urges and emotional responses thereby bridging the gap.

Neuromarketing remains underutilized in practice despite its increasing popularity, in part because of its high cost, ethical issues, and technological complexity (Goncalves et al., 2024). Furthermore, there is little agreement on how to convert neuroscientific discoveries into workable marketing plans successfully. Although some studies have demonstrated how neuromarketing tools can improve product design and advertising efficacy, there is a noticeable lack of thorough, practical assessments of these strategies by subject-matter experts. Moreover, studies that combine qualitative expert insights with quantitative validation to evaluate the true usefulness, constraints, and future directions of neuromarketing tactics are especially lacking.

Therefore, this study will focus on how neuromarketing techniques are perceived and applied by professionals in fields related to consumer behavior. This study will use an exploratory sequential design, firstly qualitative gains through depth expert interviews and then validate emerging themes with quantitative data from a larger sample of specialists. Specifically, it attempts (1) to investigate expert attitudes on the way neuromarketing techniques influence consumer behavior and decision-making, (2) to reveal the important practical, technological, and ethical challenges in the implementation of such techniques in marketing contexts, and finally (3) to provide empirical recommendations for integrating neuromarketing insights into marketing strategies towards boosting consumer engagement and brand impact. This study has the potential to tie theoretical gains and practical applications together into a more refined understanding of how neuromarketing can feed into consumer engagement strategies.

This study will add to the academic discussion with a rare blend of qualitative depth and quantitative rigor in studying neuromarketing. In practice, it serves as a guide for marketers, product designers, and business strategists interested in using the new neuroscientific tools ethically for competitive advantage. This study will provide a rounded perspective on the role of neuromarketing in evolving consumer decisions, focusing on contemporary practices, technological developments, ethical issues, and future expansions.

## **1. LITERATURE REVIEW**

### **1.1 Evolution of Neuromarketing**

The Neuromarketing field started being considered one more discipline at the beginning of 2000, driven by advances in neuroscience and marketers' developing interest in learning more about how consumers behave. Neuromarketing was famously rolled out with the scholarly work of scientists like Read Montague and Antonio Damasio (Montagne, 2007; Damasio, 1994) who at that time connected action preferences to brain processes. The findings from these core studies have primed the study of consumer behavior using neuroscientific techniques to reveal how emotional-cognitive interactions shape brand evaluations and their associated choice preferences.

The field surged in the mid-2000s, due to advancements of state-of-the-art neuroimaging methodologies specifically real-time methods like Functional Magnetic Resonance Imaging (fMRI) and Electroencephalography (EEG). Researchers were able to see timely brain activities in marketing stimuli live, which offered an unmatched perspective on the reactions of consumers (Ariely & Berns, 2010; Iloka & Onyeke, 2020; Morin, 2011; Smidts et al., 2014). Insights from neuromarketing research also became valuable to major corporations that began investing in it, using these insights to power advertising strategies; and tweak product design by optimizing the aesthetics profiles of their products and/or services more precisely against marketing targets' subconscious tastes.

Neuromarketing matured as a validated technique for improving marketing outcomes in the 2010s (Stipp, 2015). Its applications heralded more integrated approaches, for example, the fusion of neuroscience data with traditional marketing metrics. Further, potential emerging new technologies and approaches will keep the gradual addition of a diverse range of methodologies to the evolving discipline to suit new, more complicated consumer environments (Rawnaque et al., 2020).

## **1.2 Recent Advances in Neuroscience Imaging**

Novel neuroimaging approaches should increase spatial and temporal resolution for more accurate brain measurements. Vizioli et al. (2021) use this as background to note the increasing advancements in neuroimaging methods that help much more detailed data become available. The development of portable neuroimaging devices, such as those outlined by Krampe (2022), has enabled field studies that demonstrate how wearable brain-imaging technology can provide actionable insights into consumer behavior in real-world environments.

## **1.3 Sentiment Analytics and Instant Optimization**

Emotional analytics serves as a tool to design marketing that suits consumers while also effectively engaging them. Lindstrom (2016) stressed how emotional analytics are fundamental in customizing content to enhance consumer enjoyment. Wan et al. (2023) also emphasize the same findings showing how reaction monitoring in real-time and A/B testing (also known as split testing) lead to the optimization of marketing campaigns with immediate feedback.

## **1.4 Optimizing Ads with Eye Tracking**

Eye-tracking technologies allow consumer attention and visual engagement to be examined in detail. As Casado-Aranda et al. (2023) show, the gaze patterns produced by such tools provide marketers with a means to design the ad better. Complementarily, when emotional analytics are introduced, eye tracking enhances the understanding of how visual components trigger emotions and affect comprehension (Kim & Lee, 2021). In turn, this multi-method approach strengthens the strategic logic governing the design of advertising content.

## **1.5 Multisensory Integration and Sensory Marketing**

Sensory Marketing encompasses engagement through various sensory modalities. According to Ranson et al. (2022) and Zha et al. (2024), matching sensory cues with the identity of a brand guarantees consistent and memorable consumer experiences. Modern research endorses the claim that balanced sensory stimuli, which include scent, texture, and sound, promote emotional resonance and product recall (Zha et al., 2024). This kind of sensory integration reflects a wider trend toward comprehensive consumer experiences design.

## 1.6 Ethical Issues, Challenges, and Solutions

Objective issues such as ethical implications, complexity, and costs of neuromarketing which mentioned by several authors in the literature. According to Vuković (2024), neuromarketing causes many controversies and ethical dilemmas. Ferrell et al. (2025) argue that the potential for consumer manipulation and privacy concerns should be countered with more robust ethical guidelines, and rigorously enforced transparency. Casado-Aranda and Sanchez-Fernandez (2022) discussed the high costs and data analysis intricacies of neuromarketing techniques.

## 2. METHODOLOGY

### 2.1 Research Design

An exploratory sequential mixed-methods design was used in this study, which entails conducting a qualitative phase first then a quantitative phase. This method was chosen in order to obtain a thorough grasp of professional viewpoints on neuromarketing tactics in the first qualitative phase and to empirically validate the themes that emerged with a larger population in the second quantitative phase. Rich, exploratory insights and statistical generalizability were easily integrated by design, guaranteeing a thorough analysis of the ways in which neuromarketing strategies affect consumer behavior (Creswell & Clark, 2017; Hirose & Creswell, 2023). This mixed-methods framework offered empirical robustness and contextual depth by fusing the advantages of qualitative investigation and quantitative validation.

### 2.2 Qualitative Phase: Expert Interviews

Twenty experts with experiences in neuromarketing, consumer psychology, neuroscience, and marketing strategy engaged in in-depth, semi-structured interviews as a part of the study's first phase. This stage sought to investigate professional viewpoints on fundamental elements of neuromarketing, such as behavioral triggers, emotional engagement, ethical issues, and the useful application of neuroscientific instruments in marketing settings. For optimal alignment with key themes and current debates in consumer behavior and neuromarketing, these interview questions were developed after a thorough review of the literature. This made it feasible to conduct a theoretically based investigation that addressed both existing and new problems in the field.

The outcomes of this phase were applied (1) to develop a conceptual framework of important neuromarketing strategies and obstacles and (2) to govern the building of the quantitative tool utilized in the second phase, making sure that it was based on knowledge from experts.

### 2.3 Quantitative Phase: Consumer Survey

A structured questionnaire was designed to quantitatively evaluate the influence of neuromarketing tactics on consumer attitudes and behaviors, building on the thematic insights produced during the qualitative phase. In order to ensure content validity and alignment with practical applications of neuromarketing, the survey instrument was directly informed by the recurrent themes found in expert interviews.

Ten statements pertaining to neuromarketing dimensions, including eye tracking, emotional analytics, sensory marketing, and ethical considerations, made up the final questionnaire. A 5-point Likert scale, with 1 denoting "strongly disagree" and 5 denoting "strongly agree," was used to rate each item.

A secure, user-friendly online platform (i.e. Google Forms) was used to administer the survey, allowing for widespread participation while protecting respondent anonymity. A purposive sample of sixty Jordanian experts in consumer behavior was sought, and participants were gathered through academic mailing lists, professional networks, and marketing and behavioral science-related social media sites. Before starting

the questionnaire, digital informed consent was acquired, and participation was entirely voluntary. Due to the specialized nature of the field and the scarcity of qualified individuals, recruiting expert participants presented practical challenges, even though larger samples are typically preferred for broader generalizability. Because of this, the sample size was considered adequate for exploratory purposes, especially considering the participants' depth of expertise and relevance (Guest et al., 2006).

## 2.4 Data Analysis

The exploratory sequential design of the study was in line with the two-phase structure of the data analysis. Every interview was precisely transcribed and examined by thematic analysis during the qualitative phase (Braun & Clarke, 2006). This allowed for the discovery of recurrent themes, patterns, and insights in the responses of the participants. Both inductive and deductive thematic coding were used, with the interview questions helping as a guide but remaining receptive to any new patterns that might emerge in the data. After that, the themes were arranged and grouped according to the main areas of investigation, offering a methodical comprehension of the advantages and disadvantages of neuromarketing techniques. The items in the quantitative instrument were constructed based on these findings.

The Statistical Package for the Social Sciences (SPSS), version 24, was used to analyze the structured survey data during the quantitative phase. In order to verify the applicability and relevance of the themes found during the qualitative phase, participant responses were analyzed using descriptive statistics, and trends were evaluated.

## 3. RESULTS

The research results are divided into two stages to give an in-depth understanding of how neuromarketing tactics are viewed and used. While the first describes expert-derived insights based on thematic analysis, the second measures expert consensus on these insights. When taken as a whole, these results provide a strong understanding of how emotional, sensory, and cognitive marketing techniques work in a variety of Jordanian consumer situations.

### 3.1 Insights from Expert Interviews: Thematic Analysis

The thematic analysis of the qualitative data is presented in the next section, arranged according to each interview question. This format makes it possible to thoroughly examine professional opinions on important facets of neuromarketing tactics, moral dilemmas, and real-world uses.

**1. Do you think neuroimaging techniques need to be improved to understand consumer behavior patterns?**

1. **Technological Advancements:** Enhancing resolution, accuracy, temporal resolution, and developing portable devices.
2. **Data Integration:** Combining neuroimaging with machine learning, physiological measures, and self-report data.
3. **Methodological Improvements:** Longitudinal studies, standardization of protocols, and larger sample sizes.
4. **Interdisciplinary Collaboration:** Working with neuroscientists, marketers, and ethical reviews.
5. **Practical Applications:** Real-world simulations, cultural context, and individual differences.

**2. In what ways can emotional analytics be used to create more impactful marketing campaigns?**

1. **Customization:** Tailoring content, segmenting audiences, and developing personas.
2. **Measurement and Optimization:** Monitoring real-time reactions, A/B testing, and enhancing UX (User Experience).

3. **Storytelling and Engagement:** Enhancing storytelling, building brand communities, and leveraging user-generated content.
4. **Integration with Business Strategy:** Informing product development, improving customer service, and enhancing loyalty programs.
5. **Corporate Responsibility:** Aligning with social causes and improving brand authenticity.

### 3. What are the key factors that make eye tracking a useful tool for optimizing advertisements?

1. **Precision and Insight:** Providing detailed gaze patterns, attention data, and visual pathways.
2. **Optimization:** Enhancing layout, design, and placement of CTAs (Call to Action).
3. **Integration:** Combining with emotional analytics and comparing different ad formats.
4. **Audience Understanding:** Revealing demographic differences and interaction patterns.
5. **Practical Applications:** Improving various ad types, including video and out-of-home advertising.

### 4. How can sensory marketing be effectively implemented in product design?

1. **Multisensory Integration:** Incorporating textures, scents, sounds, colors, and tastes.
2. **Customer Experience:** Enhancing packaging, displays, and unboxing experiences.
3. **Personalization:** Tailoring sensory elements to target markets and individual preferences.
4. **Technology and Innovation:** Using technology for interactive experiences and sensory testing.
5. **Brand Consistency:** Ensuring sensory cues align with overall brand strategy and values.

### 5. Can you describe a situation where customer journey mapping significantly improved the customer experience?

1. **Process Enhancements;** new checkouts, returns, and account openings.
2. **Personal Services and support:** Improving personalization
3. **Incorporating technology:** Enhancing experience and engagement with technology-driven tools.
4. **Cross-Industry Use Cases:** Retail, Banking & Finance, Healthcare/ Life Sciences / Social care and Hospitality
5. **Outcome-Based:** Improve satisfaction, decrease churn, and drive retention.

### 6. What strategies have you found most effective in developing emotional branding?

1. **Authenticity & storytelling:** Les histories
2. **Aesthetic Appeal:** How you use visuals, music, and sound to evoke feelings.
3. **Social Media Users Development:** Social media - talking to consumers, asking a question and then utilizing the user content.
4. **CSR:** Documenting Social Initiatives & Establish Trust Beneficiary Machine Learning Site
5. **Customer-centric focus:** Make it personal and celebrate milestones.

### 7. How can marketers ethically use priming techniques to influence consumer behavior?

1. **Truthfulness and Openness:** Being clear about the concepts of priming you use, avoiding manipulation.
2. **Social Marketing:** Affecting positive change in our communities and workplaces, working for a healthier happier world.
3. **Cultural Sensitivity:** Honor diversity and avoid offensive stereotyping.
4. **Consumer Control:** Making sure priming always respects consumer autonomy and privacy also adhering to Ethical guidelines and being reviewed.

### 8. What behavioral triggers do you find most effective in increasing conversion rates?

1. **Create a Sense of Urgency with Scarcity:** Limited-Time Offers and Stock Levels
2. **Social Proof:** Featuring customer reviews and testimonials.

3. **Customization:** Provide custom recommendations and exclusive offers
4. **Convenience:** Making checkout easier, more flexible, and including various payment options.

**9. How does biometrics provide a deeper understanding of consumer reactions compared to traditional methods?**

1. **Signals:** self-reported physiological responses and subconscious reactions.
2. **Live Data:** Obtaining spontaneous and neutral information.
3. **Emotion and Engagement:** Genesis of emotion, levels of engagement.
4. **Comparison & Validation:** Mapping against traditional methods and offering a holistic view.
5. **Replication Value:** Improve product design, brand, and consumer trust.

**10. What are the biggest challenges you face when implementing neuromarketing strategies?**

1. **Expense and Complexity:** Interpretation of data was expensive (and still is) and difficult.
2. **Ethical:** Making sure it is being used ethically and legally
3. **Integration Challenges:** Neuromarketing meets tradition.
4. **Skepticism & Bias:** Reduce bias and skepticism.
5. **The logistics:** collecting samples elegantly represented by body and mind requires an interdisciplinary effort.

Experts agreed that combining neuroimaging with machine learning and real-world simulations represents the next frontier in decoding consumer behavior. For more clarity, data is presented in a tabular form below in Table 1.

The findings section shows a review of the themes and insights, identifying results from this qualitative data on neuromarketing strategies. In the context of advancements in neuroimaging techniques, they highlighted that it should improve by technologically improving resolution and devising portable devices for human beings as well as through integration with machine learning to combine data with physiological measures. These researchers have discussed the need for methodological improvements, including standardizing protocols and longitudinal studies; as well as an interdisciplinary collaboration between neuroscientists and marketers. In addition, embedding practical examples in the form of real-world simulations was deemed crucial for improving neuroimaging benefits.

Respondents pointed out emotional analytics' capacity to segment audiences, customize content, and boost campaign efficacy. A/B testing and real-time feedback mechanisms are crucial for optimizing user experience, according to a number of experts. While incorporating emotional analytics into more general business strategies—like product development and customer service—was regarded as a crucial differentiator, storytelling and consumer engagement were seen as essential to creating emotional connections with brands. Furthermore, it was thought that connecting brand messaging with social causes would lead to greater customer trust and authenticity.

**Table 1.** Thematic Summary of Expert Interview Responses

Sr.	Question	Themes
1	Do you think neuroimaging techniques must be improved to understand consumer behavior patterns?	Technological Advancements, Data Integration, Methodological Improvements, Interdisciplinary Collaboration, Practical Applications
2	In what ways can emotional analytics be used to create more impactful marketing campaigns?	Customization, Measurement and Optimization, Storytelling and Engagement, Integration with Business Strategy, Corporate Responsibility
3	What are the key factors that make eye tracking a useful tool for optimizing advertisements?	Precision and Insight, Optimization, Integration, Audience Understanding, Practical Applications

4	How can sensory marketing be effectively implemented in product design?	Multisensory Integration, Customer Experience, Personalization, Technology and Innovation, Brand Consistency
5	Can you describe a situation where customer journey mapping significantly improved the customer experience?	Process Improvement, Personalization, Technology Integration, Cross-Industry Applications, Outcome-Based
6	What strategies have you found most effective in developing emotional branding?	Storytelling and Authenticity, Visual and Sensory Appeal, Community Building, Corporate Responsibility, Customer-Centric Approach
7	How can marketers ethically use priming techniques to influence consumer behavior?	Transparency and Honesty, Positive Impact, Cultural Sensitivity, Consumer Autonomy, Ethical Standards
8	What behavioral triggers do you find most effective in increasing conversion rates?	Urgency and Scarcity, Social Proof, Personalization, Ease and Convenience, Incentives
9	How does biometrics provide a deeper understanding of consumer reactions compared to traditional methods?	Subconscious Insights, Real-Time Data, Emotion and Engagement, Comparison and Validation, Practical Applications
10	What are the biggest challenges you face when implementing neuromarketing strategies?	Cost and Complexity, Ethical Concerns, Integration Issues, Skepticism and Bias, Logistical Challenges

Source: own

Eye tracking can offer a level of detail on gaze patterns and focus of attention that is difficult to achieve in any other configuration, helping us understand how people are looking at ads at all levels from layout choices to design decisions. It needs to be connected with emotional analytics and used for audience differentiation. Optimal outcomes in sensory marketing require multifaceted coordination such as including multiple senses during product design/packaging, experiential enhancements for customers, and refraining from brand uniformity. Lastly, neuromarketing faces challenges due to the price and complication of the technology used in measuring brain signals inner from privacy concerns amongst others meaning it should strive towards overcoming both skepticism upon application as well as receiving high enquire demand without losing ethical credibility.

### 3.2 Expert Perspectives: Quantitative Insights

The quantitative results from the study's second phase, which sought to confirm and measure the major themes found in the qualitative phase, are shown in this section. Sixty consumer behavior experts were given a structured questionnaire with ten closed-ended statements. Descriptive statistics like means and standard deviations were used to evaluate the degree of agreement among participants in the analysis of the gathered data using SPSS version 24. The statistical findings for each statement are compiled in Table 2 below, which provides a concise summary of professional opinions on different neuromarketing techniques.

The data analysis for the close-ended statements in Table 2 reveals several trends and insights about respondents' views on neuromarketing strategies. Respondents generally exhibit a slight agreement that neuroimaging enables concluding consumer behavior, with a mean of 3.26 and a standard deviation (SD) of 1.16, indicating some variability in opinions. Emotional analytics, on the other hand, shows a stronger agreement, with a mean of 3.36 and an SD of 1.14, suggesting that respondents believe emotional analytics significantly enhances the emotional impact of advertisements.

The use of eye tracking to measure consumer attention is viewed with neutral to slight agreement, reflected in a mean of 3.20 and an SD of 1.20, indicating mixed feelings about its effectiveness. Similarly, sensory marketing is seen with slight agreement, with a mean of 3.22 and an SD of 1.11, suggesting that while it may enhance product preference, opinions vary. Respondents also agree that customer journey mapping helps identify areas for improvement in customer experience, with a mean of 3.28 and an SD of

1.06, showing a general consensus on its utility. Emotional branding is considered effective in strengthening brand loyalty, evidenced by a mean of 3.36 and an SD of 1.12, reflecting strong agreement among respondents.

**Table 2.** Quantitative Analysis of Expert Consensus on Neuromarketing Strategies

Sr.	Statement	SDA	DA	N	A	SA	Mean	SD
1	Neuroimaging enables one to conclude consumer behavior.	3	5	10	20	12	3.26	1.16
2	Emotional analytics improves the emotional impact of advertisements.	1	18	10	20	11	3.36	1.14
3	Consumer attention in advertisements is measured by eye-tracking.	5	14	14	18	9	3.20	1.20
4	Consumer preference for products is enhanced through sensory marketing.	2	17	15	18	8	3.22	1.11
5	Areas of improvement in the customer experience are identified through customer journey mapping.	2	14	16	21	7	3.28	1.06
6	Emotional branding helps strengthen the brand loyalty of consumers.	4	10	15	23	8	3.36	1.12
7	Briefing is helpful in molding consumer decisions.	4	13	14	20	9	3.28	1.17
8	Scarcity and urgency lead to higher conversion.	0	12	23	13	12	3.42	1.03
9	Neurofeedback tools are useful for measuring the impact of marketing strategies.	2	15	16	18	9	3.28	1.11
10	Neuromarketing provides a competitive advantage in the market.	0	18	17	11	14	3.35	1.15

**Frequency:** Number of respondents selecting each response option, **Mean:** The average score calculated by assigning values (1 = Strongly Disagree (SDA), 2 = Disagree (DA), 3 = Neutral (N), 4 = Agree (A), 5 = Strongly Agree (SA)) and computing the average, **Standard Deviation (SD):** A measure of the amount of variation or dispersion of responses.

Source: own

The statement about briefing being helpful in molding consumer decisions shows slight agreement, with a mean of 3.28 and an SD of 1.17, indicating some variability in perceptions. Scarcity and urgency are terms that point to a single thing, but we had a 45% agreement which although could be interpreted as significant duress due to sustained levels of scarcity is likely also an indication that consistency in output was not achieved. The mean score for neurofeedback tools is 3.28, with an SD of 1.11 which indicates that the degree to which they are viewed as helpful is agreeable between participants but also varies according to individual opinion. The last function of our definition was tested with the support in mean 3.35 and SD=1.15 this indicates a consensus towards benefiting from marketing competitive advantages.

Collectively, however, the emotional analytics effect is well understood along with sensory marketing impact and customer journey-mapping as well as the importance of incorporating emotion into brand positioning to better enhance overall marketing strategies. Strength of conversion rates for scarcity & urgency Eye tracking as well as neurofeedback tools furnish mixed opinions but one thing is sure - if you use neuromarketing against your competitors, it may lead to unethical results. This breakdown here provides more insight into both arguments and the quality of evidence used in neuromarketing strategies.

## 4. DISCUSSION

This study presents rich data about neuromarketing tactics, a growing area of research and interest in the field. Participants in this study suggested technological advancements for neuroimaging, including improvements in the resolution of images and the development of mobile solutions. This is consistent with recent advancements in neuroimaging methodologies, focusing on advancing spatial and temporal resolution of imaging techniques for recording more precise brain activity information (Vizioli et al., 2021). Higher-resolution imaging is also more informative and can additionally be accomplished with portable neuroimaging devices, allowing for the expansion of field studies (Guo et al., 2022; Parasuram et al. 2023). Second, neuroimaging combined with machine learning and physiological measures shows a trend for incorporating multiple measurements in consumer behavior studies that have been previously shown to increase predictive power (Pérez et al., 2024).

Emotional granularity is not the only issue implicated by Alqahtani and Alothaim (2022), but emotional analytics itself highlights that this has become a narrative of personalization and real-time optimization. This corresponds with recent ideation emphasizing emotional analytics as a way to adjust marketing content for the benefit of consumer engagement and satisfaction (Lindstrom, 2016). The ability to monitor reactions in real time and carry out dynamic A/B testing of push notifications is fundamental for the optimization of marketing strategies (Wan et al., 2023). Combining emotional analytics with measures of key business outcomes, such as product development and customer service (Plassmann et al., 2012), would also be consistent empirically if the successful affective engagement were to stimulate brand loyalty by improving customer experience more broadly.

Eye tracking is a well-established method that allows for capturing exactly where participants look and which areas they focus on (Casado-Aranda et al., 2023)-and its precision, insights are corroborated by concurrent research showing how using eye-tracking can assist the understanding of consumer attention or in layout optimization when designing ads. Eye tracking accompanied by emotional analytics provides a more complete view of what visual elements bring about specific emotions. This is also in line with recent research endorsing a combined effect of the multisensory integration taking on special meaning and new importance, developing more holistic approaches to dealing with sensory information presented at point-of-purchase for profound impact on product appeal and consumer satisfaction (Kim & Lee, 2021). So, hyper-branding your marketing mix with meticulous attention to sensory elements will strengthen brand identity and enhance trust (Zha et al., 2024).

These challenges, however, have also been identified in the existing literature: cost, complexity, and ethical issues. Applying neuromarketing strategies usually requires great investment and complicated data analysis (Casado-Aranda & Sanchez-Fernandez, 2022). There is concern about the ethics of influencing consumers and protecting their privacy using neuroscientific techniques, with recent research indicating that neuromarketing practices need more stringent ethical guidelines to increase transparency (Ferrell et al., 2025; Kumar et al., 2024; Goncalves et al., 2024). This issue of addressing skeptical attitudes and logistical challenges continues to be a significant obstacle as researchers and practitioners are put in the position of integrating forward-thinking methodologies with their ethical, yet constraining landscape (Chowdhury & Mandal, 2023).

Consequently, the results of this study provide support for existing research on emotional analytics or emotions-based marketing (7), sensory marketing (10), and eye tracking in influencing promotional strategies. The focus on new technologies, proprioceptive captures and real optimizations with ethical oversight dovetails into the latest movements within this discipline that shows us both what is possible and also near-complete lack of compliance in many neuromarketing attempts.

## CONCLUSION

This study has offered essential inputs on the usage of neuromarketing strategies and their capability to drive purchaser behavior. Top insights include the importance of neuroimaging technological progress, emotional analytics, and eye tracking in boosting marketing strategies. One way to improve the accuracy of consumer behavior data is through technological advancement for better neuroimaging - high resolution and portable scanners. This improves the quality of campaign performance for marketers by delivering tailored editorial content as well as real-time reactions, based on emotional analytics. Highly valuable in planning ad layouts and designs, eye tracking provides detailed visuals of where people look at particular elements. Moreover, incorporating multisensory aspects with product design as well as the sensory experience in some aspects of marketing is likely to improve consumers' experiences and views about their brand.

Although strides have been made in this direction, some challenges such as the expense and complexity (both logistical and ethical) of neuromarketing remain. These are challenging issues causing them to require careful attention based on ethical norms as well as being possible and practical in scope, skepticism, and logistical problems.

The present study presents several useful consequences for companies trying to use neuromarketing in influencing customer behavior and improving strategic decision-making. First, more exact, context-sensitive measurements in both laboratory and real-world environments depend on investment in advanced neuroimaging technologies with enhanced spatio-temporal resolution and portability. By means of A/B testing and adaptive campaign optimization, including emotional analytics in marketing strategies can help support personalized content delivery and enable real-time optimization. By means of eye-tracking technologies, marketers can better grasp consumer attention patterns and create aesthetically appealing material that grabs and maintains interest. Furthermore, adding multisensory components to product design—such as texture, scent, sound, color, and flavor—can enhance the consumer experience and forge closer emotional bonds with the brand.

Neuromarketing approaches must always center on ethical issues, which call for openness about data use, respect for consumer privacy, and avoidance of manipulative techniques. Businesses should simplify neuromarketing procedures, work with multidisciplinary experts, and guarantee transparent interpretation and communication of results in order to solve logistical problems and uncertainty. Crucially, neuromarketing ideas should not exist in a vacuum but rather should be ingrained in more general marketing plans to produce consistent messaging and propel competitive advantage all around.

While this study provides valuable insights into neuromarketing strategies and their influence on consumer behavior, several limitations should be acknowledged. First, the qualitative phase relied on expert interviews, which, while rich in depth, may reflect subjective interpretations influenced by personal or professional biases. Second, although the subsequent quantitative validation enhanced the study's robustness, the sample was limited to experts in consumer behavior, potentially restricting the generalizability of findings to broader consumer populations. Additionally, the rapid evolution of neuromarketing technologies and methodologies means that some insights may become outdated as new tools and techniques emerge. Finally, logistical and ethical constraints limited the exploration of real-time consumer data in naturalistic settings, which could have offered more comprehensive behavioral validation. These limitations suggest the need for continued research across diverse populations and real-world environments to build on the foundation established in this study.

There are some interesting areas in neuromarketing, and the same concept can be applied to other fields such as physiology-behavior for consumer response. Second, the emphasis is placed on real-world applications and field studies to demonstrate that neuromarketing strategies work outside of the laboratory environment. Furthermore, as the technology grows more complex and sophisticated ethical implications and consumer privacy should be considered to make sure it is transparent and respectful. Comparing results of cross-cultural studies will aid in understanding how cultures differ and influence consumer responses to global marketing initiatives based on different regions. Finally, evolving emotion analytics

technology for capturing and analyzing subtle emotional nuances on the go can give birth to stronger and individualized marketing campaigns. These opportunities have a large potential to improve the efficacy of neuromarketing strategies, as long they always remain ethical.

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