USING NEUROMARKETING TO INCREASE COMPETITIVE ADVANTAGE– A BRIEF LITERATURE REVIEW

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Abstract. Neuromarketing research is constantly expanding, offering new insights into how companies can gain a competitive advantage. Globally, the evolution of this field is marked by technological progress and a better understanding of human behavior. In Romania, neuromarketing research is still emerging, but interest in its use has increased in recent years. This paper aims to make an analysis of the specialized literature that will provide a clear perspective of researchers and practitioners on neuromarketing and the potential of this field. Over the past two decades, consumer behavior research has experienced significant growth in the use of neuroimaging and physiological techniques. These advancements have enabled researchers to observe and gain deeper insights into the decision-making processes and purchasing behaviors of consumers. This paper reviews the primary neuromarketing methods commonly applied in such studies and evaluates their outcomes. Its objectives include: (a) highlighting the benefits of neuromarketing as a research tool compared to traditional approaches; (b) presenting the most frequently utilized neuromarketing tools and techniques; (c) examining studies that demonstrate the practical applications and results of these methods; and (d) identifying key limitations associated with neuromarketing research. The findings suggest that neuromarketing techniques provide a profound understanding of consumer decision-making and behavior.

Keywords: neuromarketing, competitive advantage, consumer behavior

Rezumat: Cercetarea în domeniul neuromarketingului este într-o continuă expansiune, oferind noi perspective despre modul în care companiile pot obține un avantaj competitiv. La nivel global, evoluția acestui domeniu este marcată de progresul tehnologic și o mai bună înțelegere a comportamentului uman. În România, cercetarea în neuromarketing este încă în fază incipientă, dar interesul pentru utilizarea sa a crescut în ultimii ani. Această lucrare își propune să realizeze o analiză a literaturii de specialitate, care să ofere o perspectivă clară asupra neuromarketingului și a potențialului acestui domeniu din punctul de vedere al cercetătorilor și practicienilor. În ultimele două decenii, cercetarea comportamentului consumatorilor a înregistrat o creștere semnificativă a utilizării tehnicilor de neuroimagistică și fiziologice. Aceste progrese au permis cercetătorilor să observe și să obțină perspective mai profunde asupra proceselor de luare a deciziilor și a comportamentelor de cumpărare ale consumatorilor. Lucrarea trece în revistă principalele metode de neuromarketing utilizate în astfel de studii și evaluează rezultatele acestora. Obiectivele includ: (a) evidențierea beneficiilor neuromarketingului ca instrument de cercetare comparativ cu abordările tradiționale; (b) prezentarea celor mai frecvent utilizate instrumente și tehnici de neuromarketing; (c) examinarea studiilor care demonstrează aplicațiile practice și rezultatele acestor metode; și (d) identificarea principalelor limitări asociate cercetării în neuromarketing. Rezultatele sugerează că tehnicile de neuromarketing oferă o înțelegere profundă a proceselor decizionale și a comportamentului consumatorilor.

Cuvinte-cheie: neuromarketing, avantaj competitiv, comportamentul consumatorului

Introduction

Defining neuromarketing is a complex task due to varying interpretations and differing perspectives on the term. On one hand, some scholars refer to this domain as Consumer Neuroscience (Kenning et al., 2010; Alvino, 2019), while others use the term Neuromarketing (Ariely et al., 2010;

Lee et al., 2007). Within the academic context, there is an important, albeit subtle, distinction between these two terms.

According to Kenning and Linzmajer (2010), Consumer Neuroscience focuses on addressing issues related to consumption and marketing by employing methods and findings derived from neuroscience. They describe it as a sub-discipline of neuroeconomics.

Conversely, Neuromarketing can be more broadly defined as the application of neuroscientific techniques to analyze and comprehend human behavior in the context of markets and marketing interactions (Lee et al., 2007). This definition has two key implications. First, it broadens the scope of neuromarketing beyond the exclusive use of neuroimaging by commercial entities for their benefit. Second, it expands neuromarketing's research focus beyond consumer behavior, encompassing other areas of interest, such as intra- and inter-organizational studies, which are frequently discussed in marketing literature (Lee et al., 2007).

The distinction between the two terms lies in their intended research purposes. While Consumer Neuroscience typically refers to studies conducted for purely academic objectives, Neuromarketing often denotes research aimed at practical, industry-focused applications. For the purpose of this article, however, the term "neuromarketing" will be used in a general sense.

This paper employs a literature review approach to provide an overview of the benefits and limitations of neuromarketing as a marketing research tool. It is organized into several sections: Section 2 outlines the methodology employed in this study. Section 3 examines the advantages of incorporating neuroscience tools into marketing research and highlights key studies utilizing these tools. Section 4 addresses common challenges in Consumer Neuroscience experiments, while the final section discusses the study's limitations and conclusions.

Methodology

The methodology employed for this research involved a systematic and comprehensive review of existing academic literature. Articles were carefully selected based on their relevance to the research topic, determined by examining the title, abstract, and keywords. The search process was conducted across three prominent databases—Emerald Insights, Scopus, and Google Scholar—to ensure a broad and multidisciplinary collection of sources.

The chosen articles were drawn from academic journals spanning various domains, with a specific focus on publications where Consumer Neuroscience or Neuromarketing featured as central topics of inquiry. This approach ensured the inclusion of both theoretical and empirical studies that addressed key issues in the field, including the application of neuroscience techniques in marketing, the ethical considerations of neuromarketing, and its implications for consumer behavior research.

The selection criteria aimed to capture a diverse range of perspectives, including foundational studies that established the field, as well as recent advancements reflecting its current state. By leveraging multiple databases, the review incorporated works from high-impact journals and emerging research areas, providing a comprehensive overview of the topic.

Benefits of Using Neuroscience Tools in Marketing Research

In recent years, neuromarketing has adopted a diverse range of techniques to study consumer behavior. This section provides a concise overview of the most frequently used methods, their data output, and their suitability for specific applications.

A significant segment of the neuromarketing toolkit includes brain imaging techniques like functional magnetic resonance imaging (fMRI) and electroencephalography (EEG). Functional magnetic resonance imaging (fMRI) is a powerful neuroimaging method that monitors deoxygenated hemoglobin levels, which correlate closely with neural activity (Huettel et al., 2014). According to Stanton et al. (2017), fMRI offers excellent spatial resolution at a millimeter scale and good temporal resolution to track second-by-second changes in brain activity. However, its use in marketing research is limited due to the high costs of acquiring and operating an MRI scanner. For instance, Berns and Moore (2012) employed fMRI to assess adolescents' brain responses to songs by relatively unknown artists. Over three years, these neural responses demonstrated a positive correlation with the aggregate sales of the same songs, suggesting that fMRI could predict future sales performance.

On the other hand, EEG represents a cost-effective neuroimaging alternative, measuring electrical brain activity via scalp-mounted electrodes. It provides exceptional temporal resolution, capturing millisecond-level changes in brain function, though its spatial resolution is relatively poor compared to fMRI (De Martino et al., 2006). EEG is limited in its ability to detect brain activity from deeper regions, which poses challenges in studying complex decision-making processes. In 2015, Boksem and Smidts demonstrated that EEG-based brain responses to movie trailers predicted audience preferences with greater accuracy than self-reported measures. Weng et al. (2016) also showed that narratively structured video commercials elicited high cognitive and emotional engagement, with repeated exposure enhancing product preference.

Beyond neuroimaging, neuromarketing research frequently incorporates peripheral physiological measures, such as heart rate, respiration, skin conductance, pupillometry, eye tracking, and electrodermal activity (EDA). These tools capture physical responses linked to emotional and cognitive states. Smith et al. (2019) revealed that children displayed heightened arousal when exposed to their favorite branded products compared to non-branded equivalents, illustrating emotional connections to branding. Similarly, Langner et al. (2015) found that emotional arousal associated with loved brands was comparable to the response to close friends, though less intense than interpersonal love. Eye-tracking studies further highlighted the role of gaze duration in purchase decisions; for example, Krajbich et al. (2010) observed that longer fixations on specific items increased the likelihood of their selection, a finding supported by Graham and Jeffery (2012), who showed that participants spent more time looking at labels on products they purchased.

The integration of neuroscience techniques into marketing research offers valuable insights into consumer preferences and decision-making processes. Garczarek-Bak et al. (2021) compared EEG, EDA, and eye-tracking in predicting brand preferences, finding EDA to be the most efficient predictor of brand engagement. While EEG effectively measures product preference formation, EDA excels in gauging emotional arousal to stimuli. Eye tracking visually documents the consumer's interaction with products, enabling researchers to analyze their journey throughout the study (Garczarek-Bak et al., 2021). Additionally, fMRI demonstrates robust potential for forecasting product success, as evidenced by Berns and Moore's (2012) study on music sales. Ariely et al. (2010) further emphasized its applicability during the product development and advertising stages to predict sales outcomes.

In summary, each neuromarketing technique offers unique advantages, from predicting future sales and understanding brand preferences to enhancing product development and advertising effectiveness.

Limitations in Conducting Neuromarketing Research

Neuromarketing research, while highly innovative and insightful, is subject to a number of limitations and challenges. Below are the key limitations commonly identified:

- High Costs - Techniques like fMRI and MEG (Magnetoencephalography) involve expensive equipment, facilities, and specialized expertise. This restricts their accessibility and increases the overall cost of conducting studies;

- Ethical Concerns - Neuromarketing often faces scrutiny regarding privacy and manipulation. Critics argue that understanding the subconscious mechanisms of consumer behavior could lead to unethical exploitation, such as influencing consumer decisions in ways that may not align with their best interests;

- Limited Ecological Validity - Many neuromarketing studies are conducted in controlled lab environments, which may not accurately reflect real-world consumer behavior. The artificial nature of the setting can impact the reliability of the results when applied outside the lab;

- Small Sample Sizes - Due to the high cost and complexity of neuromarketing techniques, many studies involve small sample sizes. This can lead to results that are less generalizable or statistically significant;

- Complex Data Interpretation - Neuroscience techniques like fMRI and EEG generate vast amounts of data, which require specialized expertise to interpret. Moreover, the relationship between neural activity and specific behavioral outcomes is not always straightforward, leading to potential misinterpretations;

- Focus on Correlation, Not Causation - Neuromarketing often identifies correlations between brain activity and behavior but struggles to establish causation. For instance, while certain neural patterns may be associated with preference, it's not always clear whether these patterns cause the preference or are a result of it;

- Technological Limitations - Techniques like EEG provide excellent temporal resolution but poor spatial resolution, making it difficult to pinpoint specific brain regions involved in decision-making. Similarly, fMRI, while offering good spatial resolution, has low temporal resolution and cannot capture rapid neural changes;

- Overemphasis on Individual Responses - Many neuromarketing studies focus on individual brain responses, which may not account for cultural, social, or environmental factors that significantly influence consumer behavior at a group level;

- Regulatory and Legal Restrictions - In many countries, regulations around data privacy and human experimentation can limit the scope of neuromarketing research. For example, obtaining consent for studies involving neural data collection can be a complex and time-consuming process;

- Limited Understanding of Neural Mechanisms - Despite advances in neuroscience, our understanding of how complex neural processes translate into specific behaviors is still incomplete. This can result in oversimplified conclusions in neuromarketing studies.

- Difficulty in Replicating Results - Due to variations in methodologies, sample populations, and environmental conditions, neuromarketing studies often face challenges in replicability, which is critical for establishing reliable and valid findings.

These conclusions highlight neuromarketing's transformative potential while acknowledging the complexities and responsibilities involved in its application.

Conclusions

Neuromarketing techniques provide unique, in-depth insights into the subconscious processes underlying consumer decision-making. They allow researchers to understand consumer preferences and emotional responses more accurately than traditional methods. Neuromarketing is effective in various domains, including predicting product success, understanding brand preferences, enhancing product development, and optimizing marketing campaigns. Each technique, such as fMRI, EEG, or eye-tracking, contributes unique data, enriching the overall understanding of consumer behavior. The complementary strengths of different neuromarketing tools (e.g., fMRI's spatial resolution vs. EEG's temporal resolution) highlight the importance of integrating multiple methods to overcome individual limitations and provide a more comprehensive understanding of consumer behavior. Addressing ethical concerns and navigating regulatory frameworks are critical for the responsible use of neuromarketing techniques. Ensuring transparency and prioritizing consumer welfare are essential for gaining public trust and promoting broader acceptance.

With ongoing advancements in technology, neuromarketing has significant potential to evolve and contribute further to both academic and industry-focused consumer behavior research. However, resolving current limitations, improving data interpretation methods, and enhancing ecological validity will be key to its future success.

In summary, while neuromarketing provides groundbreaking tools to better understand consumer behavior, its limitations underscore the need for careful application, robust methodologies, and ongoing ethical considerations.

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