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Current Trends in Neuromarketing Research: Bibliometric Review

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ABSTRACT

This study provides a comprehensive bibliometric analysis of neuromarketing research published between 2020 and 2025, offering updated insights into the field's intellectual structure, key contributors, and evolving research themes. Utilizing data from the Scopus database and visualization tools such as VOSviewer, the research identifies the most cited authors, productive countries, influential journals, and dominant keywords in recent neuromarketing literature. Findings reveal three major clusters of co-citation networks representing theoretical foundations, applied neuroscience methods, and bibliometric analyses. The results highlight a growing interdisciplinary integration and methodological sophistication in neuromarketing, with increasing contributions from Asia alongside traditionally dominant Western countries. This study contributes to the consolidation of neuromarketing as a field by providing actionable insights for both academic researchers and marketing practitioners.

Keywords: *Neuromarketing, Consumer Neuroscience, Bibliometric Analysis, EEG, Consumer Behavior, VOSviewer, Decision-Making, Marketing Strategy, Neuroeconomics.*

ABSTRAK

Studi ini memberikan analisis bibliometrik komprehensif dari penelitian neuromarketing yang diterbitkan antara tahun 2020 dan 2025, menawarkan wawasan terbaru tentang struktur intelektual lapangan, kontributor utama, dan tema penelitian yang berkembang. Memanfaatkan data dari *database* Scopus dan alat visualisasi seperti VOSviewer, penelitian ini mengidentifikasi penulis yang paling banyak dikutip, negara produktif, jurnal berpengaruh, dan kata kunci dominan dalam literatur neuromarketing baru-baru ini. Temuan mengungkapkan tiga kelompok utama jaringan kutipan bersama yang mewakili landasan teoretis, metode ilmu saraf terapan, dan analisis bibliometrik. Hasilnya menyoroti integrasi interdisipliner yang berkembang dan kecanggihan metodologis dalam pemasaran saraf, dengan peningkatan kontribusi dari Asia bersama negara-negara Barat yang dominan secara tradisional. Studi ini berkontribusi pada konsolidasi neuromarketing sebagai bidang dengan memberikan wawasan yang dapat ditindaklanjuti bagi peneliti akademis dan praktisi pemasaran.

Kata kunci: Neuromarketing, Ilmu Saraf Konsumen, Analisis Bibliometrik, EEG, Perilaku Konsumen, VOSviewer, Pengambilan Keputusan, Strategi Pemasaran, Neuroekonomi.

INTRODUCTION

Neuromarketing has emerged as a vibrant interdisciplinary field that integrates neuroscience, psychology, and marketing to better understand consumer behavior (Ariely & Berns, 2010; Lee et al., 2007). The use of neuroscientific tools such

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as electroencephalography (EEG), functional magnetic resonance imaging (fMRI), eye tracking, and galvanic skin response (GSR) allows researchers to analyze the unconscious processes that influence decision-making (Karmarkar & Plassmann, 2019; Smidts et al., 2014). Over the past decade, the interest in neuromarketing has grown exponentially, with researchers applying neuroscientific techniques to investigate branding, advertising, product design, and consumer responses (Hsu & Yoon, 2015; Plassmann et al., 2012). Despite its growing popularity, the field continues to evolve, prompting the need for updated bibliometric analyses to identify prevailing trends, key contributors, and future directions.

Earlier bibliometric studies have provided important insights into the development of neuromarketing. For instance, Lee et al. (2018) examined trends from 2002 to 2017 and identified the early emergence of influential authors and themes. Lim (2018) and Morin (2011) highlighted the foundational theoretical frameworks that informed neuromarketing practices. However, the most comprehensive bibliometric analysis to date was conducted by Alsharif et al. (2021), who examined neuromarketing publications from 2015 to 2020. Their study revealed a steady increase in scholarly output, with the United States, Spain, and the United Kingdom as major contributors. They also identified top-cited articles, prolific authors, and the integration of various neuromarketing tools. Nonetheless, considering the fast-paced nature of this domain, an updated bibliometric analysis is needed to understand how the field has evolved in the last five years.

In response to this gap, the present study continues the work initiated by Alsharif et al. (2021) by conducting a bibliometric review of neuromarketing research published between 2020 and 2025. With the continuous development of neuroscience technologies and increased academic attention toward consumer-centric marketing approaches Harris et al. (2018), a new wave of research is shaping the landscape of neuromarketing. Bibliometric methods provide a systematic and objective means of evaluating scientific literature (Donthu et al., 2021), enabling researchers to map the intellectual structure and identify emerging patterns, productive institutions, influential authors, and dominant topics (Aria & Cuccurullo, 2017; Zupic & Čater, 2015).

The purpose of this study is threefold. First, it seeks to identify the most-cited articles in the neuromarketing domain between 2020 and 2025 (RQ1). Citation analysis serves as a proxy for influence and helps trace the theoretical and methodological foundations that have shaped recent research (Bornmann & Daniel, 2008). Second, the study aims to examine the most productive countries and authors in this domain over the last five years (RQ2), thereby highlighting leading research hubs and key contributors (Abramo & D'Angelo, 2015; Ellegaard & Wallin, 2015). Third, it explores which studies have employed neuromarketing tools in this period (RQ3), providing insight into technological preferences and methodological trends in recent research (Cherubino et al., 2019; Lim, 2018). by applying these background and methods, this study aims to answer critical questions:

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RQ1: What are the most-cited articles in the neuromarketing domain between 2020 and 2025?

RQ2: What are the most productive countries and authors in the neuromarketing domain between 2020 and 2025?

RQ3: What are the studies that employed neuromarketing tools in the last five years?

By focusing exclusively on the 2020–2025 timeframe, this study aims to capture the most recent developments in neuromarketing, including the adoption of AI-integrated tools, mobile neuroimaging, and digital behavioral analytics (Ramsøy, 2015). Furthermore, recent studies suggest a rising interest in ethical considerations and consumer privacy in neuromarketing, highlighting a critical area for further investigation (Fisher et al., 2010; Stanton et al., 2017). Identifying current trends can assist scholars in recognizing underexplored topics and aligning future research with industry practices and consumer expectations.

In summary, this research builds upon prior bibliometric studies and contributes to the ongoing mapping of neuromarketing's intellectual structure. It provides a timely assessment of recent contributions and technological shifts, while also uncovering key actors and impactful publications. Through bibliometric visualization and citation-based analysis, the study offers valuable insights for academics, practitioners, and policymakers interested in the evolving field of neuromarketing.

METHOD

This study adopts a bibliometric analysis approach to investigate the current trends, patterns, and intellectual structure of neuromarketing research published between 2020 and 2025. Bibliometric analysis is a proven quantitative method used to evaluate and map scholarly outputs, offering insights into publication trends, influential authors, collaborative networks, and thematic development within a given field (Donthu et al., 2021). The Scopus database was selected as the primary data source due to its comprehensive indexing of high-quality peer-reviewed literature across disciplines, and its compatibility with bibliometric software tools (Baas et al., 2020). A structured search query was constructed using keywords such as “neuromarketing”, “consumer neuroscience”, and “neuroeconomics”, applied to the title, abstract, and keywords (TITLE-ABS-KEY). The search was limited to documents published in English between Januari 1, 2020, and March 31, 2025.

The bibliometric mapping and visualization were conducted using VOSviewer, a widely accepted tool for analyzing scientific literature and generating visual representations of bibliometric networks. The software was used to create co-authorship maps (authors, institutions, countries), keyword co-occurrence maps, and citation and bibliographic coupling networks. Data cleaning was performed to standardize author names, institution names, and keywords to ensure consistency

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and accuracy in the network visualizations. A minimum occurrence threshold was set for each analysis for instance, only keywords appearing in at least five publications were included in the co-occurrence map to identify the most significant themes. This methodology follows the precedent set by Alsharif et al., 2021 who also used bibliometric techniques to analyze neuromarketing trends in the previous five-year period (2015-2019). By updating and extending this prior work, the current study provides a fresh perspective on how neuromarketing research has evolved in recent years, especially in the wake of digital transformation and post-pandemic shifts in consumer behavior.

RESULT AND DISCUSSION

The section will explain the stages of the research using the Systematic Literature Review with reference to the PRISMA Flowchart. There are 4 stages of the review process that must be carried out, including: 1) identification; 2) screening; 3) eligibility; and 4) analysis.

Identification Process

The identification process is carried out by identifying articles using Scopus. In the next stage, we search for relevant articles using specific keywords. We use strings taken from three main criteria to find strings/keywords: Neuromarketing, Consumer Behavior, Technology. Using these keywords, we found 471 articles from Scopus.

Filtering Process

139 articles obtained from data identification will be filtered based on criteria. There are four criteria used in this study, namely year (2020-2025), document type (article), source type (journal), and language (English). The results of the search will later be downloaded and where the information to be exported includes citation information, bibliographic information, abstracts &keywords, and other information.

Eligibility Process

At this stage, a recheck will be carried out regarding the database, this check is carried out by manually filtering the data by understanding the abstract thoroughly. At this stage is review the title, abstract, and keywords. We had 138 articles out of 139. This through check was done to ensure that each article met the necessary criteria for inclusion in the study, ensuring the reliability and relevance of the research findings.

Table 1. Keyword Search

Topic	String
Neuromarketing	(neuromarketing OR "consumer neuroscience" OR neuroeconomics OR "marketing neuroscience")

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Consumer Behavior	("consumer behavior" OR "decision-making" OR "emotional response" OR "brand perception" OR "advertising effectiveness" OR "purchase intention" OR "marketing strategy" OR "customer engagement")
Technology	(EEG OR fMRI OR "eye-tracking" OR biometric OR "facial expression analysis")
Full String	(neuromarketing OR "consumer neuroscience" OR neuroeconomics OR "marketing neuroscience") AND ("consumer behavior" OR "decision-making" OR "emotional response" OR "brand perception" OR "advertising effectiveness" OR "purchase intention" OR "marketing strategy" OR "customer engagement") AND (EEG OR fMRI OR "eye-tracking" OR biometric OR "facial expression analysis")

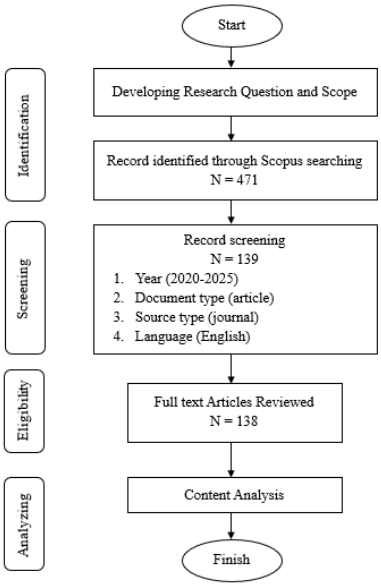

Figure 1. Prism Diagram
Source: Data Processed (2025)

Leading Country

Table 2. The 10 Most Productive Countries in Neuromarketing

Country	Publications	Citations
United States	23	296
United Kingdom	20	162
Spain	19	204
Italy	14	140
India	12	81
China	11	33
Iran	8	48
Malaysia	7	104
Croatia	7	22
Germany	6	85

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Source: Data Processed (2025)

Between 2020 and 2025, the United States emerged as the most productive country in neuromarketing research with 23 publications and 296 citations, followed by the United Kingdom (20 documents, 162 citations) and Spain (19 documents, 204 citations), the latter showing strong citation impact. Italy, India, and China also contributed significantly, though China had the lowest citation count (33). Notably, Malaysia showed high research impact with 104 citations from just 7 publications. Germany, Iran, and Croatia rounded out the top ten, with Germany displaying high citation efficiency. These results indicate strong contributions from Western countries, with growing participation from Asia.

Leading Authors

Table 3. The 5 Most Productive Authors in Neuromarketing Topic

Author	Publications	Citations
Sola, Hedda Martina	8	24
Khawaja, Sarwar	7	19
Qureshi, Fayyaz Hussain	7	19
Alsharif, Ahmed H.	4	92
Salleh, Nor Zafir MD	4	92

Source: Data Processed (2025)

The analysis of the most productive authors in neuromarketing between 2020 and 2025 shows that Sola, Hedda Martina leads in publication count with 8 documents, followed by Khawaja, Sarwar and Qureshi, Fayyaz Hussain, each with 7 publications and 19 citations. Although publishing fewer papers, Alsharif, Ahmed H. and Salleh, Nor Zafir MD stand out with the highest citation impact each receiving 92 citations from just 4 publications highlighting the significant influence of their work within the field.

Journal Outcomes

Table 4. The 5 Most Productive Journals in Neuromarketing Topic

Journal	Documents	Citations
Frontiers in Psychology	11	166
Frontiers in Human Neuroscience	5	48
Frontiers in Neuroscience	5	35
Behavioral Sciences	5	31
Psychology and Marketing	4	145

Source: Data Processed (2025)

The journal Frontiers in Psychology leads in neuromarketing publications between 2020 and 2025, with 11 articles and 166 citations, indicating both high output and influence. While Frontiers in Human Neuroscience, Frontiers in

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Neuroscience, and Behavioral Sciences each published five documents, their citation impact varies, with 48, 35, and 31 citations respectively. Notably, Psychology and Marketing, despite publishing only four articles, garnered 145 citations highlighting its strong influence and relevance in the field.

Keyword Analysis

Table 5. Top 10 High-Frequency Keywords in Neuromarketing Research (2020–2025)

Keyword	Occurrences	Total Link Strength
Neuromarketing	88	118
Human	40	190
Decision Making	40	167
Article	36	179
Electroencephalography	32	107
Consumer Neuroscience	31	66
EEG	30	78
Adult	29	152
Female	27	144
Male	26	139

Source: Data Processed (2025)

The keyword co-occurrence analysis highlights the thematic focus and trending topics within neuromarketing research from 2020 to 2025. The term "Neuromarketing" is the most dominant keyword with 88 occurrences and a total link strength of 118, affirming its role as the core concept around which other research themes are structured. The keyword "Human" appears 40 times and shows the highest link strength (190), suggesting a strong emphasis on human-centered experimental designs and behavioral responses. Similarly, "Decision Making", also with 40 occurrences and a link strength of 167, indicates that cognitive processes and consumer choices remain central to neuromarketing studies. The presence of "Article" (36 occurrences, 179 link strength) reflects metadata-related indexing but also points to frequent scholarly discussion and citation networks. Neurophysiological techniques are also evident, with "Electroencephalography" (32 occurrences, 107 strength) and "EEG" (30 occurrences, 78 strength) reinforcing the increasing use of brainwave monitoring tools in measuring consumer attention and emotional responses. Additionally, "Consumer Neuroscience" (31 occurrences) emerges as a significant interdisciplinary bridge, linking neuroscience, psychology, and marketing. Demographic descriptors like "Adult" (29), "Female" (27), and "Male" (26) suggest a sustained interest in studying gender and age-specific patterns in consumer behavior. Overall, the co-word network reveals a strong intersection of neuroscience techniques, human behavior, and decision-making frameworks as dominant trends shaping the neuromarketing research landscape.

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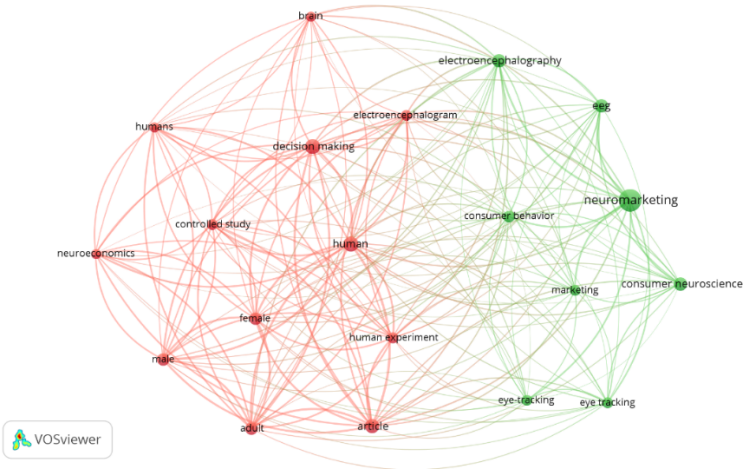

Figure 2. The Co-occurrence Network Mapping

Co-citation Network Analysis and Data Clustering

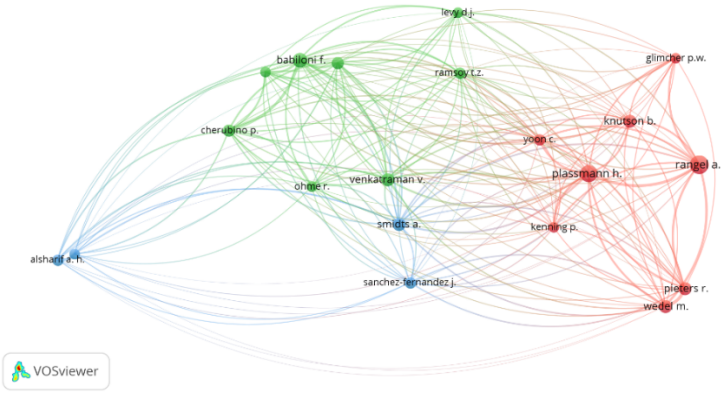

Figure 3. Map of Documents Citations Network

The co-citation network analysis reveals three distinct clusters of influential authors in the neuromarketing research landscape from 2020 to 2025, each representing a thematic or methodological focus. Cluster 1 (Red) includes foundational figures such as Rangel A. (112 citations), Plassmann H. (96), and Knutson B. (55), highlighting a strong emphasis on decision neuroscience, valuation processes, and neural mechanisms of consumer behavior. This cluster reflects the theoretical backbone of neuromarketing grounded in neuroeconomics and cognitive neuroscience. Cluster 2 (Green) is characterized by authors like Babiloni F. (76), Venkatraman V. (57), and Cherubino P. (53), indicating a focus on applied neuroscience methods, especially the use of EEG and biometric tools in marketing contexts. These researchers are known for advancing methodological approaches and integrating neurophysiological data into consumer analysis. Cluster 3 (Blue) includes scholars such as Smidts A. (57) and Sanchez-Fernandez J. (44) along with Alsharif A.H.

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(42) and Baharun R. (37), who contribute significantly to recent bibliometric, conceptual, and thematic analyses in the field. This cluster reflects a more emerging, analytical perspective, connecting bibliometric insight with practical implications. Together, these clusters show how neuromarketing research is evolving across theoretical, technical, and analytical dimensions, with each group of scholars playing a pivotal role in shaping the field's trajectory.

IMPLICATION OF THE RESEARCH FINDINGS FOR THEORY AND PRACTICE

The findings of this bibliometric analysis carry significant implications for both theoretical development and practical application in the field of neuromarketing. The identification of co-citation clusters underscores the field's multidimensional structure spanning foundational theories from neuroeconomics (e.g., Rangel, Plassmann, Knutson), applied methodologies (e.g., Babiloni, Venkatraman), and emerging bibliometric perspectives (e.g., Alsharif, Smidts). Theoretically, this segmentation calls for greater synthesis across domains to develop unified models that integrate decision neuroscience with consumer behavior constructs (Plassmann et al., 2012). Practically, the increasing application of tools such as EEG and eye-tracking confirms their relevance in decoding emotional and cognitive responses, thus equipping marketers with empirical tools to refine campaigns, packaging, and customer experiences.

Furthermore, the rising influence of countries such as Malaysia and India suggest the growing democratization of neuromarketing research. These trends point to a need for more culturally sensitive and geographically inclusive studies. For practitioners, the insights derived from co-occurrence networks highlighting themes such as "decision-making" and "emotional response" validate the importance of neuroscience-driven personalization strategies in modern marketing.

CONCLUSION AND LIMITATIONS

This study enriches the academic landscape of neuromarketing by mapping its recent evolution from 2020 to 2025. Through a rigorous bibliometric approach, it identifies the most influential contributors, core research themes, and intellectual clusters that structure the field. The findings illustrate a dynamic and increasingly collaborative environment, characterized by methodological innovation and geographic diversification. As neuromarketing continues to intersect with fields such as artificial intelligence and behavioral economics, this research offers a valuable reference point for scholars and practitioners navigating its expanding terrain.

However, this study is not without limitations. The analysis is confined to the Scopus database, potentially omitting relevant literature indexed elsewhere. Additionally, the bibliometric approach, while systematic, does not assess the quality or theoretical depth of individual studies. Future research could incorporate

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qualitative meta-analyses or longitudinal case studies to complement the quantitative insights presented here. As the field matures, integrating ethical perspectives and cross-cultural considerations will be crucial to ensuring the responsible and inclusive growth of neuromarketing.

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