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"Decoding The Consumer Brain: A Bibliometric Analysis Of The Intellectual Foundations And Global Evolution Of Neuromarketing."

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Abstract
This study examines neuromarketing as an interdisciplinary field that combines consumer behaviour and neuroscience to understand the cognitive and emotional drivers of purchasing decisions. Using bibliometric analysis of Web of Science data, it maps publication trends, key contributors, influential journals, and major research themes. The study provides a structured overview of the field, identifies research gaps, and offers directions for future studies to strengthen theoretical and methodological development in neuromarketing.
Keywords: *Neuromarketing; Consumer Behaviour; Consumer Neuroscience; Bibliometric Analysis; Research Trends; Decision-Making; Marketing Science*

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I. Introduction

Neuromarketing has emerged as a rapidly developing interdisciplinary domain that integrates neuroscience with marketing to enhance the understanding of consumer behavior and decision-making processes. It is broadly defined as the application of neuroscientific methods to study human behavior in relation to market exchanges (Lee et al., 2017, Ortigueira-Sánchez & Risco-Martínez, 2021). Advances in neuroimaging and psychophysiological measurement tools have enabled researchers to examine the cognitive and emotional mechanisms underlying consumer responses to marketing stimuli, thereby offering insights that extend beyond traditional self-report methods (Sung et al., 2020). The growing scholarly and managerial interest in neuromarketing can largely be attributed to its potential to generate information that conventional marketing approaches may not capture (Ariely & Berns, 2010, Ortigueira-Sánchez & Risco-Martínez, 2021). By providing "an exciting new window into the underlying mental processes" experienced by consumers, neuroscience contributes significantly to the advancement of marketing theory and practice (Lim, 2018). As a result, neuromarketing has gained substantial attention among academics and practitioners, reflected in the increasing volume of related publications across marketing journals (Sung et al., 2020).

Despite its rapid expansion, the neuromarketing literature remains fragmented and characterized by conceptual ambiguity, methodological challenges, and ethical concerns. Researchers have questioned the academic efficacy of neuroscientific techniques, their practical applicability, and the ethical implications surrounding their use in marketing contexts (Lim, 2018). Furthermore, conflicting definitions and heterogeneous professional practices have contributed to uncertainty regarding the boundaries and legitimacy of the field (Fisher et al., 2010). Ethical issues such as privacy, informed consent, and transparency of neuroscientific findings further highlight the need for systematic scholarly evaluation (Murphy et al., 2008, Lim, 2018).

Given these complexities, it becomes essential to develop a structured understanding of the intellectual landscape of neuromarketing research. Bibliometric analysis offers a robust methodological approach for achieving this objective, as it enables scholars to quantitatively examine large bodies of literature and identify patterns related to publication trends, influential contributors, and collaborative networks. Bibliometric studies are increasingly adopted across research domains due to the richness of insights they provide and their relative simplicity in analyzing scholarly metadata (Pineda Escobar & Merigó, 2020, Ortigueira-Sánchez & Risco-Martínez, 2021). Moreover, citation-based analyses facilitate the evaluation of research impact and help uncover emerging thematic clusters within a field (Moed, 2019, Ortigueira-Sánchez & Risco-Martínez, 2021).

As neuromarketing continues to evolve, mapping its knowledge structure is critical for understanding its developmental trajectory and identifying avenues for future inquiry. Examining the contributions of countries, journals, authors, and institutional networks can provide valuable insights into the production and diffusion of knowledge within the field (Ortigueira-Sánchez & Risco-Martínez, 2021). Such an assessment is particularly important for consolidating neuromarketing as a mature research domain and supporting the advancement of more integrative and programmatic scholarship.

Therefore, the present study conducts a comprehensive bibliometric analysis of neuromarketing literature to evaluate its intellectual structure, research performance, and thematic evolution. By systematically

synthesizing existing research, this study aims to reduce fragmentation in the field and provide a foundation for future academic investigations.

Research Questions

To address the identified gaps and achieve the objectives of this study, the following research questions are proposed:

RQ1: What are the major publication trends in neuromarketing research over time?

RQ2: Who are the most influential authors, journals, institutions, and countries contributing to the neuromarketing literature?

RQ3: What intellectual structures and collaboration networks characterize the field?

RQ4: Which thematic areas and research clusters have emerged in neuromarketing scholarship?

RQ5: What potential directions can be identified for future research based on the TCCM framework?

Rationale for the Study

Neuromarketing has emerged as a rapidly expanding interdisciplinary field that integrates neuroscience with marketing to better understand consumer cognition and emotional responses to marketing stimuli (Hansen & Kenning, 2008; Sung et al., 2020). Its growing academic and managerial relevance is reflected in the increasing volume of publications across marketing journals, indicating heightened scholarly engagement with neuroscientific approaches to consumer research (Sung et al., 2020).

Despite this expansion, the neuromarketing literature remains fragmented and characterized by conceptual ambiguity, methodological challenges, and ethical concerns (Lim, 2018). Scholars have questioned the academic efficacy and practical applicability of neuroscientific techniques, while ethical debates surrounding privacy, informed consent, and potential manipulation continue to shape the discourse (Fisher et al., 2010; Murphy et al., 2008). Conflicting definitions and heterogeneous professional practices have further contributed to uncertainty regarding the field's boundaries and legitimacy (Lee et al., 2007). Given these complexities, there is a compelling need to develop a structured and systematic understanding of the intellectual landscape of neuromarketing research. Bibliometric analysis provides a robust methodological approach for achieving this objective, as it enables scholars to quantitatively examine large bodies of literature, identify publication trends, and map influential contributors and collaborative networks (Donthu et al., 2021). Citation-based analyses further facilitate the evaluation of research impact and the identification of emerging thematic clusters within a field (Moed, 2019, Ortigueira-Sánchez & Risco-Martínez, 2021).

Mapping the knowledge structure of neuromarketing is particularly important for understanding its developmental trajectory and identifying future research opportunities (Ortigueira-Sánchez & Risco-Martínez, 2021). Such an assessment contributes to consolidating neuromarketing as a mature research discipline and supports the advancement of more integrative and programmatic scholarship (Lee et al., 2018).

Accordingly, the present study undertakes a comprehensive bibliometric analysis to evaluate the intellectual structure, research performance, and thematic evolution of neuromarketing literature. By systematically synthesizing existing research, the study aims to reduce fragmentation, enhance conceptual clarity, and provide a strong foundation for future theoretical and methodological advancements in this rapidly evolving domain.

Theoretical Underpinnings

Neuromarketing research is grounded in an inherently interdisciplinary theoretical framework that integrates perspectives from marketing, psychology, and neuroscience. Rather than relying on a single dominant theory, the field adopts a theory-integrative approach, combining behavioural and biological explanations to better understand consumer decision-making processes. This synthesis enables researchers to move beyond self-reported data and examine subconscious cognitive and emotional mechanisms that shape consumer responses to marketing stimuli.

At its core, Consumer Behaviour Theory serves as the foundational lens for neuromarketing research. Traditional consumer behaviour models explain how individuals search for information, evaluate alternatives, and make purchase decisions. However, these models often depend on conscious reporting and rational evaluation, which may not fully capture the automatic processes influencing behaviour. Neuromarketing extends this foundation by incorporating neuroscientific tools to uncover latent drivers of consumer choice, thereby strengthening the explanatory power of behavioural frameworks.

Closely aligned with this foundation is Consumer Neuroscience, which functions as the primary integrative framework within the domain. By applying neuroscientific methods such as electroencephalography (EEG), functional magnetic resonance imaging (fMRI), eye-tracking, and facial expression analysis, researchers are able to map marketing stimuli to neural activity and subsequent behavioural outcomes. This biological grounding enhances theoretical precision by linking cognitive processes with measurable brain responses, offering a deeper understanding of attention, memory, and emotional engagement.

A substantial portion of neuromarketing literature implicitly reflects the principles of Dual-Process Theory, which distinguishes between fast, automatic, and emotion-driven thinking (System 1) and slower, deliberative reasoning (System 2). Consumer decisions are frequently influenced by intuitive and affective reactions rather than purely rational deliberation. The growing reliance on physiological and neurological measures supports this perspective, as these tools capture rapid, non-conscious responses that traditional surveys may overlook.

Complementing this perspective is Affective Neuroscience, which emphasizes the central role of emotions in shaping consumer behaviour. Emotional arousal and valence often precede cognitive evaluation, particularly in advertising and brand-related contexts. By analysing neural and physiological indicators of emotional engagement, neuromarketing studies demonstrate that affective responses significantly influence attitudes, preferences, and purchase intentions.

Additionally, Information Processing Theory provides a supporting cognitive framework for understanding how consumers allocate attention, process marketing stimuli, and encode information into memory. Given the limitations of human cognitive capacity, marketers must design stimuli that effectively capture attention while minimizing cognitive overload. Techniques such as eye-tracking have been particularly valuable in examining visual attention patterns and information processing efficiency.

An emerging yet increasingly important dimension of neuromarketing scholarship involves ethical and normative frameworks. As neuroscientific tools become more sophisticated, concerns regarding consumer autonomy, privacy, and potential manipulation have gained scholarly attention. This stream of research highlights the necessity of responsible application and governance, ensuring that technological advancements align with ethical marketing practices.

Overall, the theoretical landscape of neuromarketing reflects a convergence of behavioural and neuroscientific traditions. While this interdisciplinary integration has enriched the field, it has also resulted in a domain that is largely theory-integrative rather than theory-driven. The absence of a unified theoretical framework suggests a critical opportunity for future research to consolidate existing perspectives and develop more structured theoretical models. Advancing such integration will not only strengthen conceptual clarity but also enhance the methodological rigor and practical relevance of neuromarketing scholarship.

II. Research Methodology

This study adopts a bibliometric research design to systematically evaluate the intellectual structure, research performance, and thematic evolution of neuromarketing literature. Bibliometric analysis was conducted using the Bibliometrix package in R (Aria & Cuccurullo, 2017), enabling performance analysis, science mapping, and thematic evolution assessment. Bibliometric analysis is widely recognized as a rigorous quantitative approach for mapping knowledge domains, identifying influential contributors, and uncovering emerging research patterns within a field (Donthu et al., 2021). By analysing large volumes of scholarly metadata, the method enables an objective assessment of publication trends, citation networks, journals, authors, and collaborative structures.

Given the interdisciplinary and rapidly expanding nature of neuromarketing, bibliometric techniques provide a comprehensive framework for synthesizing existing knowledge while minimizing subjective bias. Such approaches are particularly valuable for consolidating fragmented research streams and guiding future theoretical and methodological development (Ortigueira-Sánchez & Risco-Martínez, 2021).

Data Source and Search Strategy

The dataset for this study was extracted from the WoS database, a leading repository of peer-reviewed academic literature known for its extensive coverage across marketing, psychology, and neuroscience disciplines. WoS is frequently employed in bibliometric investigations due to its reliability, structured metadata, and analytical compatibility (Donthu et al., 2021).

A structured keyword search was conducted using the primary term "neuromarketing", supplemented with related constructs such as "consumer neuroscience," "brain-based marketing," and "neuro-based consumer research." The search was restricted to peer-reviewed journal articles published in English to ensure academic quality and comparability of findings.

Inclusion and Exclusion Criteria

To enhance methodological rigor, explicit screening criteria were established prior to data extraction:

Inclusion criteria:

- Peer-reviewed journal articles
- Publications explicitly focused on neuromarketing or consumer neuroscience
- Studies indexed within WoS
- English-language publications

Exclusion criteria:

- Conference papers, book chapters, editorials, and dissertations
- Non-English publications
- Studies lacking substantive relevance to marketing applications
- Duplicate records

Applying these criteria ensured that the final dataset represented high-quality and conceptually relevant scholarship.

PRISMA-Based Screening and Selection Process

The article selection procedure followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework, which promotes transparency, replicability, and methodological clarity in evidence synthesis (Donthu et al., 2021).

Identification

The initial database search generated a comprehensive 1124 Articles pool of records related to neuromarketing research. All retrieved citations were exported, and duplicate entries were removed to prevent data redundancy.

Screening

Titles, abstracts, and keywords were systematically reviewed to evaluate topical relevance. Studies that did not directly address consumer behavior, marketing applications, or neuroscientific measurement were excluded at this stage. After screening 178 duplicates were removed.

Eligibility

The remaining articles underwent full-text assessment to confirm conceptual alignment with the objectives of the study. Particular attention was given to theoretical contribution, methodological clarity, and relevance to neuromarketing scholarship, of which 68 records were excluded after abstract/full text review.

Inclusion

Following the multi-stage evaluation, the final sample of 878 articles was retained for bibliometric analysis. This structured filtering process ensured a robust dataset capable of supporting reliable conclusions regarding publication trends, influential contributors, thematic evolution, and research performance.

Synthesis Approach

The final synthesis integrates bibliometric analysis, methodological assessment, and theory-driven interpretation. Rather than treating studies in isolation, the review identifies dominant patterns, inflection points, and gaps across the WoS corpus.

Analysis of Publication Trend and Citation Structure

RQ1: What are the current publication trends in the field of neuromarketing?

The analysis of annual scientific production reveals a progressive increase in neuromarketing research, indicating the expanding academic importance of the field. The dataset was extracted from the Web of Science database and analysed to identify temporal patterns in publications and citations (Web of Science database, Clarivate).

Neuromarketing research began modestly, with the earliest publication recorded in 2006. Between 2006 and 2014, the field remained in its formative stage, producing only a limited number of studies each year. During this period, cumulative citations grew slowly, suggesting restricted scholarly diffusion and relatively low academic visibility.

A gradual transition toward growth became evident after 2015, as publication output increased and reached a notable rise in 2017. This upward trajectory reflects heightened scholarly engagement and may be attributed to technological advancements in neuroscientific tools as well as the growing acceptance of interdisciplinary research approaches. Correspondingly, cumulative citations continued to expand, demonstrating improved knowledge dissemination and research impact.

Between 2018 and 2022, the field exhibited steady yet consistent development. Although minor fluctuations in annual publications were observed, the continuous rise in citation counts indicates that existing studies were gaining recognition within the academic community. This phase can be interpreted as a consolidation stage, where neuromarketing evolved from an emerging research topic into a more structured scholarly domain.

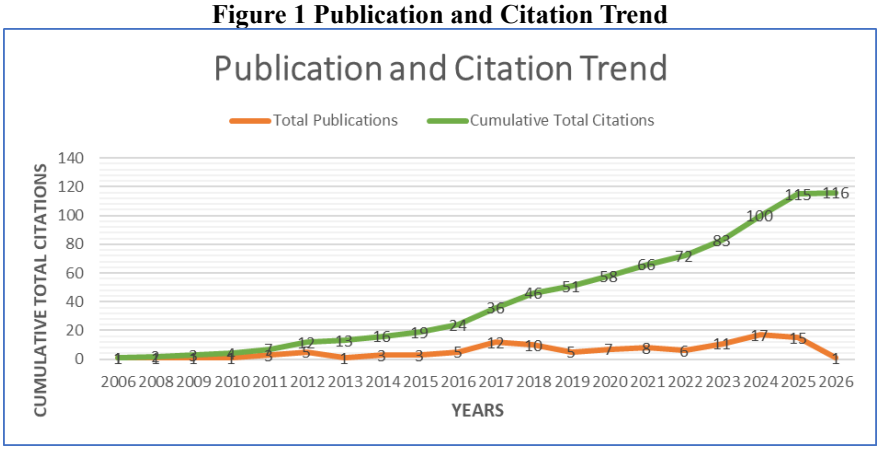
The most significant acceleration occurred after 2022, marking a phase of rapid expansion. Publications increased sharply, reaching their highest level in 2024, while cumulative citations approached 100, highlighting

the growing intellectual influence of neuromarketing research. Despite a slight decline in publications in 2025, citation totals continued to rise, reinforcing the sustained relevance and impact of the field.

The single publication recorded for 2026 should be interpreted cautiously, as the year is ongoing and the dataset is likely incomplete. Nevertheless, the cumulative citation count has already surpassed previous benchmarks, emphasizing the continued expansion of neuromarketing scholarship.

Overall, the parallel rise in publication output and citation counts reflects the maturation of neuromarketing as a research discipline. The trajectory follows the typical evolution of emerging scientific fields—beginning with an exploratory phase, progressing through steady growth, and ultimately transitioning into a stage of rapid academic expansion. This pattern suggests that neuromarketing is moving toward greater theoretical refinement and methodological sophistication within contemporary marketing research

Figure 1 Publication and Citation Trend



RQ2: Who are the key contributors shaping neuromarketing research?

As shown in Table 2, based on the author-level bibliometric evidence, neuromarketing scholarship is shaped by a small but highly influential group of authors whose impact is driven more by citation intensity than sheer publication volume. Among the most prominent contributors, Ale Smidts (Netherlands) stands out as a foundational figure, with 6 publications, 283 total citations, and an h-index of 3, reflecting sustained influence since his initial contributions in 2015 from Erasmus University Rotterdam, one of the most productive institutional hubs in neuromarketing research. Closely associated scholars such as M.A.S. Boksem, also from Erasmus University Rotterdam, demonstrate exceptionally high citation efficiency (TC/NP = 74) despite fewer publications, highlighting the theoretical depth and cross-disciplinary relevance of their work.

From Asia, Eun-Ju Lee (South Korea) emerges as a leading contributor with the highest h-index (5) among listed authors, accumulating 200 citations across 5 publications since 2014, primarily affiliated with Sungkyunkwan University (SKKU), thereby positioning South Korea as a key geographic contributor to neuromarketing research. In Australia, scholars such as Nicolas Hamelin (SP Jain School of Global Management) and Park Thaichon (Griffith University) exhibit strong citation impact relative to output, indicating the region's growing role in applied and managerial neuromarketing studies.

The United States also features prominently, with influential authors such as Scott A. Huettel (Duke University), whose work shows the highest citation density (TC/NP = 112.5) despite a modest publication count, underscoring the integration of neuroscience-driven methodologies into marketing research. Similarly, long-standing contributors like Jeannie Gaines and Ronald Paul Hill reflect early engagement with neuromarketing-related themes, with publication starting years as early as 2008, indicating the field's gradual evolution over time.

European contributions extend beyond the Netherlands, with authors from Spain, England, and Turkey—including Enrique Bigne (University of Valencia), Laura Chamberlain and Leif Brandes (University of Warwick), and Erdogan Koc (Balikesir University)—demonstrating steady influence through high citation-to-publication ratios. Emerging contributions from India are also visible, with scholars affiliated with institutions such as MDI Gurgaon, BIT Noida, NIT Rourkela, and Lovely Professional University, although their publication start years (2023–2024) suggest a relatively recent entry into the neuromarketing research landscape.

Overall, the most influential neuromarketing authors are characterized by high citation impact, moderate h-indices, and strong institutional anchoring in globally reputed universities, particularly Erasmus University Rotterdam, Duke University, and Sungkyunkwan University. The dominance of authors with early publication start years (2008–2015) further indicates that intellectual leadership in neuromarketing is concentrated among scholars who contributed during the formative years of the field, while newer contributors signal its continued expansion and diversification across countries and institutions.

RQ3: Which journals exert the greatest influence in this domain?

As mentioned in table 3, the analysis of top journals publishing neuromarketing research reveals that the domain is firmly situated within high-impact, academically rigorous publication outlets, underscoring its growing legitimacy within marketing and interdisciplinary scholarship. A significant concentration of publications appears in ABDC A and A* ranked journals, indicating strong methodological standards and theoretical contributions. For instance, the *Journal of Consumer Behaviour* emerges as the most productive outlet with 15 total publications and 285 citations, accompanied by the highest m-index (0.90), which reflects consistent annual scholarly influence. Similarly, the *Journal of Business Research* demonstrates both depth and visibility in the field, with 395 total citations and an impact factor of 10.969, highlighting its role as a major platform for advancing neuromarketing discourse.

Several elite A* journals further reinforce the intellectual credibility of the field. The *Journal of Consumer Psychology* stands out with 941 citations despite only four publications, suggesting exceptionally high citation intensity and theoretical importance. The *European Journal of Marketing* and *International Journal of Research in Marketing* also contribute meaningfully, supported by strong impact factors and sustained citation performance. Such patterns indicate that neuromarketing research is not merely exploratory but increasingly theory-driven and integrated into core marketing conversations.

Another notable trend is the presence of journals with high impact factors but moderate publication counts, such as the *Journal of Retailing and Consumer Services* (Impact Factor ≈ 10.972) and *Psychology & Marketing* (Impact Factor ≈ 5.507). This suggests that while the volume of neuromarketing studies may still be developing, the research that does get published tends to generate substantial academic attention. Furthermore, newer contributors like the *Asia Pacific Journal of Marketing and Logistics* (m-index = 0.71) and the *Journal of Theoretical and Applied Electronic Commerce Research* (m-index = 0.75) exhibit strong annual productivity rates, signaling emerging research momentum and expanding geographic diversity in the literature.

The dataset also highlights the role of WoS-indexed journals—including *Consumption Markets & Culture* and *European Research on Management and Business Economics*—which broaden the disciplinary reach of neuromarketing by connecting it with cultural, technological, and managerial perspectives. Meanwhile, the inclusion of premier outlets such as *Tourism Management* (Impact Factor = 12.879) and *California Management Review* (Impact Factor = 11.678) indicates that neuromarketing insights are increasingly influencing adjacent fields like tourism, strategy, and innovation.

Overall, the combination of strong citation metrics (TC), steady publication output (TP), and robust m-index scores demonstrates that neuromarketing has transitioned from a niche research interest to a credible, high-impact, and rapidly evolving research stream. The dominance of ABDC-ranked journals, supported by substantial impact factors, confirms both scholarly acceptance and future growth potential. Collectively, these patterns suggest that neuromarketing field appears to be transitioning toward theoretical consolidation, while continuing to attract interdisciplinary attention, positioning it as a critical frontier in understanding consumer cognition and decision-making.

Table 2

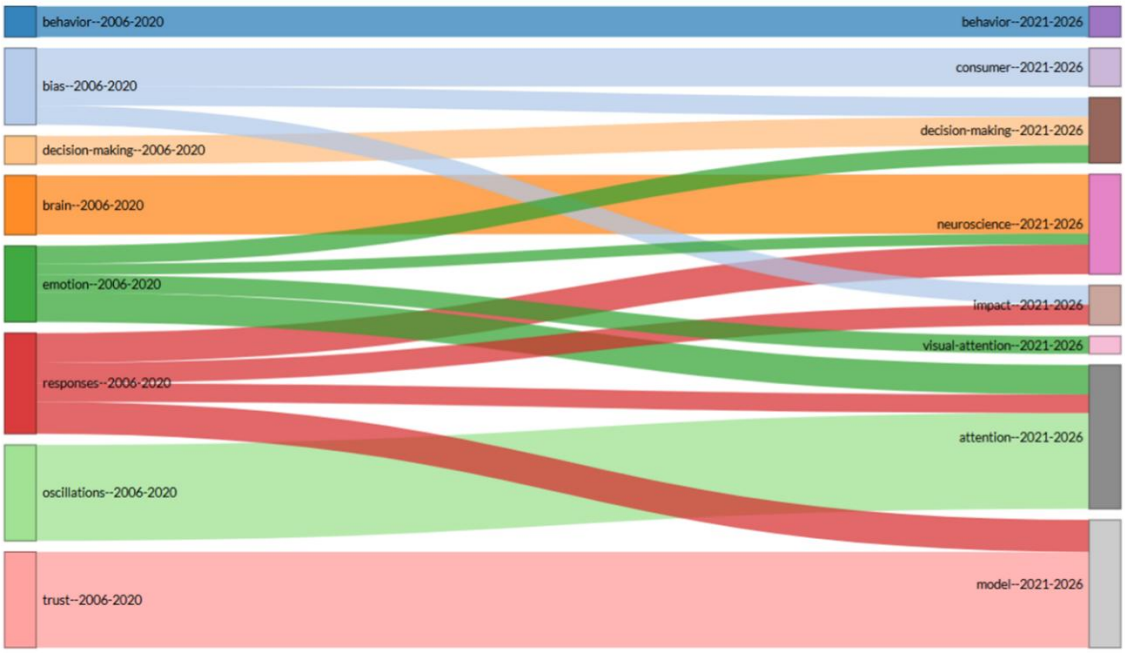
Sr.No.	Author	h_index	Country	Affiliations	TC	NP	TC/NP	PY_start
1	Smidts, Ale	3	Netherlands	Erasmus University Rotterdam	283	6	47.17	2015
2	Lee, Eun-Ju	5	South Korea.	Sungkyunkwan University (SKKU)	200	5	40	2014
3	Boksem, MAS	2	Netherlands	Erasmus University Rotterdam	222	3	74	2015
4	Hamelin, Nicolas	2	Australia	SP Jain School of Global Management	139	3	46.33	2017
5	Singh, Nripendra	2	USA	Penn Western Univ	27	3	9	2024
6	Thaichon, Park	2	Australia	Griffith University	139	3	46.33	2017
7	Behl, Abhishek	2	India	Management Dev Inst, Gurgaon	35	2	17.5	2023
8	Bigne, Enrique	2	Spain	Univ Valencia, Fac Econ, Dept Mkt & Market Res, Valencia	42	2	21	2023
9	Boz, Hakan,	2	Turkey	School of Applied Sciences, Usak University, Usak, Turkey	97	2	48.5	2014
10	Brandes, Leif	2	England	University of Warwick	107	2	53.5	2017
11	Casado-Aranda	2	Spain	Univ Granada, Mkt & Market Res Dept, Granada, Spain	42	2	21	2023
12	Chamberlain, Laura	2	England	University of Warwick	107	2	53.5	2017
13	Ciorciari, Joseph	2	Australia	Department of Psychological Sciences, Swinburne	161	2	80.5	2018

				University of Technology, Hawthorn, VIC, Australia				
14	Daugherty, Terry	1	USA	Department of Marketing, The University of Akron, Akron, OH, United States	36	2	18	2018
15	Gaines, Jeannie	2	USA	College of Business and Mass Communication, Brenau University, Gainesville, GA, United States	117	2	58.5	2008
16	Gountas, John I.	2	Australia	Department of Psychological Sciences, Swinburne University of Technology, Hawthorn, VIC, Australia	161	2	80.5	2018
17	Gupta, Shankar Lal	2	India	Birla Institute of Technology, Noida	25	2	12.5	2024
18	Gutmann, Justin	2	London	NA	4	2	2	2017
19	Herrando, Carolina	2	Spain	Univ Zaragoza, Dept Mkt, Fac Econ & Business, Zaragoza	18	2	9	2023
20	Hill, Ronald Paul	2	USA	Villanova School of Business, Philadelphia, PA, United States	117	2	58.5	2008
21	Huettel, Scott A.	2	USA	Department of Psychology and Neuroscience, Duke University, Durham, NC, United States	225	2	112.5	2012
22	Kansra, Pooja	2	India	Lovely Profess University, Dept Econ, Phagwara	25	2	12.5	2024
23	Koc, Erdogan	2	Turkey	Department of Business Administration, Balikesir Üniversitesi, Balikesir, Balikesir, Turkey	97	2	48.5	2014
24	Kumar, Arvind	1	India	National Institute of Technology Rourkela	4	2	2	2024
25	Kwon, Gusang	2	South Korea.	Amorepacific, Seoul, Yongsan-gu, South Korea	72	2	36	2014

Table 3:

Source	m_index	TC	NP	PY_start	ABDC	Scopus	Impact Factor
JOURNAL OF CONSUMER BEHAVIOUR	0.9	285	15	2017	A	✓	3.199
JOURNAL OF BUSINESS RESEARCH	0.64	395	9	2016	A	✓	10.969
INTERNATIONAL JOURNAL OF MARKET RESEARCH	0.14	33	8	2006	A	✓	2.513
ASIA PACIFIC JOURNAL OF MARKETING AND LOGISTICS	0.71	132	7	2020	A	✓	4.643
EUROPEAN JOURNAL OF MARKETING	0.56	200	6	2018	A*	✓	5.181
INTERNATIONAL JOURNAL OF CONSUMER STUDIES	0.6	41	6	2022	A	✓	7.096
JOURNAL OF ADVERTISING RESEARCH	0.41667	171	6	2015	A	✓	3.031
JOURNAL OF RETAILING AND CONSUMER SERVICES	0.4	202	6	2017	A	✓	10.972
PSYCHOLOGY & MARKETING	0.45455	152	6	2016	A	✓	5.507
JOURNAL OF CONSUMER PSYCHOLOGY	0.23529	941	4	2010	A*	✓	4.551
JOURNAL OF THEORETICAL AND APPLIED ELECTRONIC COMMERCE RESEARCH	0.75	21	3	2023	B	✓	5.318
AMFITEATRU ECONOMIC	0.15385	38	2	2014	NA	✓	2.304
CONSUMPTION MARKETS & CULTURE	0.13333	69	2	2012	Scopus	✓	2.46
EUROPEAN RESEARCH ON MANAGEMENT AND BUSINESS ECONOMICS	0.28571	16	2	2020	Scopus	✓	4.75
INTERNATIONAL JOURNAL OF RESEARCH IN MARKETING	0.33333	52	2	2021	A*	✓	8.047
JOURNAL OF ADVERTISING	0.11111	31	2	2009	A	✓	6.528
JOURNAL OF BUSINESS-TO-BUSINESS MARKETING	0.66667	6	2	2024	B	✓	3.045
JOURNAL OF BUSINESS ETHICS	0.15385	163	2	2014	C	✓	6.331
JOURNAL OF MARKETING MANAGEMENT	0.2	60	2	2017	A	✓	4.707
JOURNAL OF MARKETING RESEARCH	0.08333	220	2	2015	C	✓	6.664
ORGANIZATIONAL RESEARCH METHODS	0.25	80	2	2019	A*	✓	8.247
AFRICAN JOURNAL OF BUSINESS MANAGEMENT	0.0625	20	1	2011	WOS	NA	NA
BUSINESS HISTORY	0.16667	19	1	2021	A	✓	0.8

CALIFORNIA MANAGEMENT REVIEW	0.1	67	1	2017	A	✓	11.678
CLOTHING AND TEXTILES RESEARCH JOURNAL	0.1	40	1	2017	Scopus, WOS	✓	0.985
ELECTRONIC COMMERCE RESEARCH	0.25	10	1	2023	A	✓	3.462
INFORMATION SYSTEMS RESEARCH	0.0625	206	1	2011	A*	✓	5.49
JOURNAL OF BRAND MANAGEMENT	0.16667	34	1	2021	A	✓	4.35
JOURNAL OF CONSUMER AFFAIRS	0.05263	88	1	2008	A	✓	2.603
JOURNAL OF DESTINATION MARKETING & MANAGEMENT	0.11111	91	1	2018	A	✓	7.158
JOURNAL OF INTERACTIVE MARKETING	0.16667	49	1	2021	A	✓	11.318
JOURNAL OF PRODUCT AND BRAND MANAGEMENT	0.09091	28	1	2016	Scopus, WOS	✓	5.248
JOURNAL OF SERVICE MANAGEMENT	0.2	21	1	2022	A	✓	9.45
MARKETING INTELLIGENCE & PLANNING	0.16667	24	1	2021	A	✓	4.338
MARKETING LETTERS	0.06667	36	1	2012	A	✓	3.426
MARKETING THEORY	0.07143	58	1	2013	A	✓	3.476
SOUTH AFRICAN JOURNAL OF BUSINESS MANAGEMENT	0.09091	2	1	2016	C	✓	0.836
SPORT MARKETING QUARTERLY	0.33333	1	1	2024	B	✓	2.395
TECHNOLOGICAL FORECASTING AND SOCIAL CHANGE	0.25	24	1	2023	A	✓	10.884
TOURISM MANAGEMENT	0.07692	51	1	2014	A*	✓	12.879
TOURISM MANAGEMENT PERSPECTIVES	0.1	46	1	2017	A	✓	7.608



RQ4: What major themes and research streams characterize neuromarketing literature?

The thematic profile of neuromarketing literature reveals a clear intellectual progression from foundational neuroscientific constructs to more refined consumer-centric and analytical frameworks. Early research (2006–2020) was primarily anchored in themes such as brain activity, emotional processing, decision-making, behavioral responses, trust, and neural oscillations, reflecting the field's initial effort to integrate neuroscience with marketing theory. This formative stage aligned with the emergence of influential scholars such as Gaines (2008) and Hill (2008), whose early contributions helped establish the conceptual legitimacy of neuromarketing within consumer research. Concurrently, high-impact outlets such as the *International Journal of Market Research* (PY_start = 2006) provided an early publication platform, signaling the scholarly acceptance of neuroscientific approaches in marketing

The subsequent phase demonstrates a shift toward methodological rigor and theoretical consolidation. Authors including Huettel (2012), with 225 total citations and a TC/NP ratio of 112.5, exemplify the increasing reliance on neuroscientific tools to decode consumer cognition, while Smidts (2015) and Boksem (2015) further strengthened the knowledge base through influential contributions from Erasmus University Rotterdam. During this period, journals such as the *Journal of Business Research* (TC = 395; Impact Factor = 10.969) and *Psychology & Marketing* became central dissemination channels, indicating the field's transition from exploratory inquiry to

empirically grounded scholarship. Recent thematic developments (2021–2026) highlight a movement toward attention mechanisms, consumer behavior modeling, visual attention, impact assessment, and advanced neuroscience integration, suggesting growing analytical sophistication and managerial relevance. The prominence of the *Journal of Consumer Behaviour* (NP = 15; m-index = 0.9) and A* outlets such as the *European Journal of Marketing* illustrates the increasing concentration of neuromarketing research within high-quality ABDC-ranked journals. Emerging contributors such as Behl (2023) and Gupta (2024) further indicate geographic expansion into developing research ecosystems, reinforcing the global diffusion of neuromarketing scholarship. Collectively, the thematic evolution—from neural and emotional foundations to attention-driven consumer models—demonstrates that neuromarketing has matured into a multidisciplinary, high-impact research domain. The convergence of influential authors, high-citation journals, and advanced thematic trajectories suggests a field appears to be transitioning toward theoretical consolidation, although further integrative frameworks remain necessary while simultaneously expanding its practical relevance for strategic marketing decision-making.

Consolidated Methodological Profile of Neuromarketing Literature			
	Dimension	**Category**	**Percentage (%)**
1	**Research Design**	**Conceptual**	**3.45**
2		**Quantitative**	**53.45**
3		**Qualitative**	**2.59**
4		**Mixed**	**2.59**
5		**Review**	**22.41**
6		**Neurophysiological and Biometric Measures**	**15.52**
	Data Collection Tools	**Field Experiment**	**62.93**
1		**Interview**	**2.59**
2		**Surveys**	**1.72**
3		**EEG/fMRI/GSR/Eye Tracking/Facial Coding**	**32.76**

Methodological Profile of Neuromarketing Literature

The methodological configuration of neuromarketing scholarship reflects a strong empirical foundation, underscoring the field's commitment to scientific rigor and objective measurement. Quantitative research designs predominate, representing 53.45% of the sampled studies, thereby illustrating the discipline's reliance on statistically driven investigations to decode neurological and behavioral determinants of consumer decision-making. Review articles constitute a notable 22.41%, indicating the gradual consolidation of knowledge and signaling the transition of neuromarketing toward a more structured and mature research domain. Conversely, conceptual (3.45%), qualitative (2.59%), and mixed-method (2.59%) approaches remain marginal, suggesting that theory-building and interpretive perspectives have yet to achieve proportional scholarly attention. The 15.52% categorized as "other" further points to methodological pluralism, a hallmark of interdisciplinary fields undergoing intellectual expansion.

Regarding data acquisition strategies, field experiments emerge as the dominant methodological instrument (62.93%), reaffirming neuromarketing's dependence on controlled experimental paradigms and neuroscientific technologies—such as electroencephalography (EEG), functional magnetic resonance imaging (fMRI), and eye-tracking—to capture preconscious consumer responses with heightened precision. Traditional self-report techniques, including interviews (2.59%) and surveys (1.72%), appear significantly underutilized, reflecting a paradigmatic shift from declarative data toward neurophysiological evidence. Notably, the absence of sentiment analysis and secondary data suggests a methodological lacuna, particularly in light of the growing prominence of artificial intelligence and big-data analytics within marketing research. The considerable 32.76% classified under "other tools" further evidences technological diversification and the adoption of advanced biometric methodologies.

Taken together, the extant methodological architecture positions neuromarketing as a data-intensive, experiment-oriented discipline that privileges measurement accuracy over perceptual interpretation. However, the limited integration of qualitative and mixed-method designs highlights an important avenue for future inquiry. Greater methodological triangulation would not only enhance theoretical robustness but also foster contextual sensitivity, thereby advancing the epistemological depth and scholarly legitimacy of neuromarketing research.

Thematic and Research Stream Profile of Neuromarketing Literature

The neuromarketing literature exhibits a coherent intellectual progression, evolving from foundational neuroscientific inquiry toward analytically robust and managerially relevant research streams. Early scholarship was primarily grounded in constructs such as brain activity, emotional processing, decision-making, and behavioral responses, reflecting the discipline's effort to integrate neuroscience with marketing theory (Smidts, 2002; Lee et al., 2007). This formative phase established the conceptual legitimacy of neuromarketing by

demonstrating that consumer behavior could be examined through objective neurophysiological mechanisms rather than relying solely on self-reported measures (Ariely & Berns, 2010).

As the field matured, its thematic orientation crystallized into several dominant research streams. The most established stream focuses on consumer decision-making and purchase behavior, where tools such as electroencephalography (EEG), functional magnetic resonance imaging (fMRI), and eye-tracking are employed to decode subconscious reactions to marketing stimuli. This shift toward neural evidence has enhanced predictive accuracy and reduced response bias in consumer research (Plassmann et al., 2015).

A closely related stream centers on advertising effectiveness and emotional engagement, examining how affective stimuli and sensory cues activate neural pathways associated with attention, memory encoding, and reward processing (Venkatraman et al., 2015). Complementing this perspective is the stream on brand perception and loyalty formation, which explores the neural correlates of trust, familiarity, and preference to explain enduring consumer–brand relationships (Reimann et al., 2011). Together, these streams signify the transition of neuromarketing from exploratory experimentation toward theoretically grounded models of consumer cognition.

Recent thematic developments indicate further intellectual expansion. Growing scholarly attention to ethical considerations and consumer privacy reflects heightened awareness of the implications of accessing subconscious processes, particularly regarding manipulation and consumer autonomy (Murphy et al., 2008). Concurrently, the integration of artificial intelligence, big data analytics, and predictive modeling with neuroscientific techniques signals increasing analytical sophistication and technological convergence within the field (Daugherty et al., 2019).

Collectively, the thematic evolution—from neural and emotional foundations to attention-driven consumer models and technology-enabled analytics—demonstrates that neuromarketing has transitioned into a multidisciplinary and strategically significant research domain. The consolidation of these research streams suggests a field advancing toward theoretical consolidation, although further integrative frameworks remain necessary for strengthening its managerial relevance.

Future Research Directions Linked with the TCCM Framework

Applying the TCCM framework enables a structured understanding of how neuromarketing can evolve into a theoretically mature and methodologically robust discipline while addressing current fragmentation in the literature.

Theory – Strengthening Theoretical Coherence

Neuromarketing is currently characterized by interdisciplinary integration but lacks a unified theoretical foundation, highlighting the need for programmatic theory-building. Future research should explicitly connect neuromarketing constructs—such as attention, arousal, valuation, and trust—with established consumer-behavior frameworks including dual-process theory, affective mechanisms, and information processing models. Testing mediated pathways from marketing stimulus → neural response → cognitive state → behavior would enhance explanatory precision and prevent neural signals from being treated as isolated outcomes (Lee et al., 2007; Plassmann et al., 2012, 2015).

Methods – Methodological Pluralism and Data Expansion

The dominance of quantitative experiments necessitates methodological diversification. Future studies should adopt mixed-method triangulation by combining neuroscientific tools (EEG, fMRI, eye-tracking) with qualitative techniques such as think-aloud protocols and in-depth interviews to improve interpretability and external validity (Donthu et al., 2021; Lim, 2018). Additionally, expanding data ecosystems represents a critical methodological frontier. Integrating neurophysiological data with digital trace metrics—such as clickstream behavior, dwell time, and social media reactions—and leveraging machine learning for segmentation and prediction can create hybrid predictive models validated against real market outcomes like advertising ROI and sales performance (Daugherty et al., 2019; Sung et al., 2020).

Context – Cross-Cultural and Situational Generalizability

Although neuromarketing scholarship is expanding geographically, cross-country research remains limited. Future work should examine whether neural responses to attention, emotion, and value differ across cultures, economic settings, product categories (e.g., FMCG vs. luxury), and purchase environments (online vs. offline). Such contextual diversification would strengthen generalizability and support the development of globally relevant theory (Ortigueira-Sánchez & Risco-Martínez, 2021; Sung et al., 2020).

Characteristics – Ethics, Governance, and Consumer Protection

The increasing sophistication of neuroscientific tools raises significant concerns regarding consumer autonomy, privacy, and potential manipulation. Future research should therefore establish ethical norms related

to informed consent, transparency, and responsible data usage while proposing governance frameworks for commercial applications. Investigating consumer perceptions of neuromarketing and defining safeguards for vulnerable populations will further enhance the legitimacy and societal acceptance of the field (Fisher et al., 2010; Murphy et al., 2008).

Integrated Insight

Collectively, aligning future research with the TCCM framework suggests that neuromarketing is transitioning toward theoretical refinement, technological convergence, and stronger managerial relevance. Advancing theory, diversifying contexts, embedding ethical safeguards, and adopting innovative methods will help consolidate neuromarketing as a mature research domain capable of generating both academic and practical value.

Limitations of the Research

Despite its comprehensive bibliometric approach, this study is subject to several limitations that should be acknowledged.

First, the analysis relies on a single bibliographic database Web of Science, which may limit coverage of relevant publications indexed elsewhere. Although these databases are widely recognized for their rigor and interdisciplinary breadth, reliance on one source may exclude region-specific journals or emerging outlets not yet indexed.

Second, the study includes only English-language publications. While this ensures comparability and consistency in metadata analysis, it may underrepresent contributions from non-English-speaking research communities, potentially affecting the global interpretation of neuromarketing scholarship.

Third, bibliometric analysis primarily evaluates publication and citation patterns rather than the methodological depth or theoretical richness of individual studies. Consequently, highly cited articles may not necessarily reflect superior methodological rigor, and less-cited yet innovative studies may receive limited visibility in performance metrics.

Finally, citation-based indicators inherently favour older publications due to cumulative citation effects. This temporal bias may understate the influence of recently published research that has not yet had sufficient time to accumulate citations.

These limitations suggest that future studies could adopt multi-database approaches, incorporate multilingual datasets, and complement bibliometric mapping with systematic or qualitative content analyses to provide a more nuanced understanding of neuromarketing research development.

III. Conclusion

Neuromarketing stands at a pivotal juncture. While empirical sophistication and interdisciplinary diffusion have accelerated its expansion, theoretical integration and ethical governance remain critical for long-term legitimacy. By consolidating fragmented streams through structured frameworks such as TCCM, the field can evolve from technological experimentation toward theory-driven strategic insight. The next decade will determine whether neuromarketing matures into a foundational pillar of marketing science or remains a technologically impressive yet conceptually dispersed research niche.

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