



From Neural Engagement to Financial Resilience: How Neuromarketing Insights Drive Sales Stability and Business Sustainability in Green SMEs

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Abstract

This paper investigates the critical nexus between neuromarketing insights and the long-term financial resilience of green small and medium-sized enterprises (SMEs). While contemporary neuromarketing research has extensively documented its ability to decode consumer attention, emotion, and purchase motivation, its strategic contribution to the tangible financial outcomes and sustainability of green SMEs remains significantly under-explored. This study addresses this gap by proposing a conceptual framework that integrates neuro-consumer behavior with corporate financial performance. Drawing on a conceptual review of multidisciplinary literature, the study develops a framework explaining how neuro-consumer insights indirectly contribute to financial resilience in green SMEs. The findings reveal that neuromarketing does not function as a direct driver of liquidity; instead, it acts as a cognitive catalyst that optimizes marketing efficiency, consumer engagement, and brand loyalty. These psychological optimizations facilitate superior marketing performance, which subsequently strengthens cash-flow stability, reinvestment capacity, and the ability to adapt to market uncertainties. Furthermore, the study identifies critical research frontiers, including the necessity for longitudinal empirical evidence and the development of cost-effective neuro-tools tailored for resource-constrained green SMEs. By bridging the divide between neuro-sensory stimuli and financial sustainability metrics, this research provides a theoretical roadmap for managers and scholars to leverage neuromarketing as a strategic capability for fostering resilient and financially sustainable green enterprises.

Keywords: Neuromarketing; Green SMEs; Financial Sustainability; Financial Resilience; Consumer Behavior



1. Introduction

In recent years, marketing has advanced considerably in its efforts to gain a deeper understanding of consumer behaviour. One of the most challenging questions for both researchers and marketers is identifying the factors that influence consumers' purchasing decisions. Specifically, understanding why consumers choose one product over another remains a complex issue. As a result, extensive research on consumer behaviour and decision-making has led to the emergence and rapid development of new interdisciplinary fields that provide deeper insights into these processes (Morin, 2011).

A product's market performance is largely influenced by the extent to which it satisfies consumer expectations. When there is a gap between customers' anticipated value and a company's actual offerings, the likelihood of business failure increases. For this reason, identifying and understanding consumer expectations before developing or marketing a product is a crucial step toward achieving long-term business success (Ismajli et al., 2022). According to the marketing concept, a company's success depends on its ability to create, deliver, and communicate superior value to its target customers. Achieving this requires offering greater value than competitors through effective marketing strategies that address the needs of specific market segments (Panda, 2009). Marketing is often viewed as a controversial concept because it is perceived differently by different people. While some consider it a valuable tool that benefits businesses and consumers, others believe it can have negative effects. In reality, marketing can serve both positive and negative purposes, depending on how its principles and practices are applied (Baker & Hart, 2016). The concept of neuromarketing was developed to help researchers understand customer preferences and brain activity, enabling them to apply these insights in advertising, marketing, and business. In its strict sense, neuromarketing refers to the use of brain imaging techniques to examine the neural processes underlying cognitive functions, emotions, perceptions, and other psychological responses from a biological perspective (Neff, 2011). Neuromarketing practices involve the measurement of biometric variables that capture changes in physiological responses, including respiratory rhythm, skin conductance, pupil dilation, heart rate, sweating, eye fixation movements, and facial expressions (Pluta-Olearnik & Szulga, 2022). Traditional market research methods (such as questionnaires, interviews, surveys and etc.) are often costly and susceptible to errors. Consumers often feel influenced by social desirability, may be uncertain about their genuine feelings, or might provide answers they think marketers expect to hear. Consequently, the findings may not accurately represent actual consumer preferences. Neuromarketing offers a valuable alternative by directly measuring brain responses to marketing stimuli, which provides deeper insights into consumer behavior (Mehta, 2025). The growing significance of neuromarketing is also influenced by the increasing demand for personalized marketing strategies. By analyzing consumers' neural responses, marketers can develop campaigns that create stronger emotional connections, leading to higher levels of engagement and improved conversion rates (Geetha & Hegde, 2024). As markets become increasingly competitive, neuromarketing has emerged as a valuable tool for achieving competitive advantage by providing deeper insights into consumer motivations. Its applications go beyond advertising, branding, product development, and digital marketing, making it an important element of modern marketing research (Dutta, 2024).

Despite the growing importance of neuromarketing in understanding consumer decision-making, existing studies have mainly focused on consumer-related outcomes such as attention, emotional engagement, purchase intention, and brand perception (Bhardwaj et al., 2024). The extent to which neuromarketing insights can be translated into measurable business and financial outcomes — including marketing efficiency, financial performance, and long-term sustainability — remains insufficiently explored. This gap is particularly relevant for green SMEs, which often face challenges related to higher production costs, limited market reach, and the need to communicate the value of sustainable products credibly (Momtaz & Parra, 2024). While sustainability-oriented practices can contribute to financial performance, green SMEs require effective approaches to strengthen customer relationships, stabilize revenues, and enhance long-term viability (Akisanmi et al., 2025; Momtaz & Parra, 2024). Therefore, this study develops a conceptual framework explaining how neuromarketing insights can influence marketing performance and subsequently contribute to financial outcomes, financial sustainability, and financial resilience, with particular emphasis on their potential contribution to the long-term survival of green SMEs.



2. What is Neuromarketing?

Neuromarketing offers a new approach to understanding consumer behaviour, advertising, and product development by incorporating neurophysiological data that is often not captured through traditional research methods. Neuromarketing is based on the idea that consumers are often unaware of the underlying factors that influence their purchasing decisions. Their choices are largely driven by unconscious emotional and cognitive processes that cannot be fully captured through traditional self-report methods (Karmarkar & Plassmann, 2019). Cognitive neuroscience supports this view, suggesting that as much as 95% of human decision-making takes place at a subconscious level (Zaltman, 2003) (Razbadauskaitė Venskė, 2024). There are multiple interpretations of the significance of this field.

Neuromarketing is an emerging interdisciplinary field that integrates neuroscience, psychology, and marketing to study how consumers make purchasing decisions at a subconscious level. In contrast to traditional research methods such as surveys and focus groups, it employs advanced techniques including functional Magnetic Resonance Imaging (fMRI), Electroencephalography (EEG), eye-tracking, and other biometric measures to analyze how the brain responds to marketing stimuli. By analyzing how consumers' brains respond to marketing stimuli, organizations can develop products, advertisements, pricing strategies, and retail environments that better align with subconscious preferences and motivations. This alignment can enhance brand performance and strengthen competitive advantage in the market (Ismajli et al., 2022). Neuromarketing insights help identify which types of content, such as colours, sounds, or messaging styles, generate the strongest emotional responses, thereby improving advertising design and effectiveness (Ram Kailash et al., 2024). It also enables the identification of emotional triggers, allowing brands to deliver more personalized and contextually relevant advertisements that enhance consumer engagement (Ariely & Berns, 2010). It is important to study not only consumer behaviour but also the consumer mind, including decision-making processes, emotions, and perceptions influenced by brands, products, and advertising. Consumers make purchasing decisions based not only on rational thinking but also on emotional states at the time of decision-making. Therefore, a deeper analysis of consumer reality is required, focusing on hidden desires and emotions in order to predict human behaviour better and support more human-centered business strategies that prioritize consumer satisfaction and well-being (Gaczek, 2016).



2.1 The emergence of Neuromarketing

The field was formally recognized in the early 2000s and has expanded rapidly since then (Ismajli et al., 2022). Early in the 20th century, research emphasized the importance of emotions in marketing, which contributed to the emergence of neuromarketing as an interdisciplinary field. It integrates knowledge from disciplines such as medicine, biology, physics, and chemistry to better understand consumer behaviour. Its major development, however, was driven by advances in neuroscience in the late 20th century, which provided deeper insights into brain structure and function (Gregor & Wdowiak, 2016). Advances in technology and the decreasing cost of neuroimaging tools have made neuromarketing more accessible to commercial organizations (Ismajli et al., 2022). In today's rapidly evolving digital marketplace, consumer behaviour has become increasingly complex due to shifting preferences, technological progress, and the growing role of subconscious influences. Traditional marketing research methods, including surveys and focus groups, are largely based on self-reported data, which may not fully reflect the true motivations behind consumer choices. This limitation has contributed to the development of neuromarketing, an interdisciplinary field that integrates neuroscience, psychology, and marketing to examine the unconscious processes underlying consumer behaviour (Kalaganis et al., 2021). On the other hand, Marketing has long played a central role in business by identifying consumer needs and developing products or services that satisfy them. Neuromarketing applies neuroscience methods to study the consumer decision-making process. It is based on the idea that a significant part of human behaviour, including purchasing decisions, is influenced by unconscious brain processes (Misra, 2023). Professor Ale Smidts is widely recognized as a pioneering figure in the development of neuromarketing and is often referred to as one of the founders of the field (Pluta-Olearnik & Szulga, 2022).

2.2 Different types of Neuromarketing tools

Several tools help researchers obtain information about customers' behaviours to understand and predict their subconscious behaviours in response to various stimuli. These techniques assess brain activity, emotional responses, and physiological reactions, offering deeper insights into consumers' responses to marketing stimuli. The most commonly used tools in this field are as follows:

2.2.1 Electroencephalography (EEG)

Electroencephalography (EEG) records the brain's electrical activity and is especially valuable for evaluating emotional engagement and memory recall when individuals are exposed to marketing stimuli (Crespo-Pereira et al., 2020) (Vecchiato et al., 2011). In neuromarketing, it is used to examine consumers' emotional reactions to various stimuli. It assesses factors such as attention, engagement, arousal, emotional valence, cognition, memory encoding, and approach or withdrawal responses. This method is commonly used to evaluate advertisements, marketing campaigns, movie trailers, website design and usability, in-store experiences, and promotional taglines (Misra, 2023).

2.2.2 Eye-tracking (ET)

Eye-tracking is a method that uses cameras and software to monitor consumers' eye movements and visual attention. It measures factors such as fixation, gaze patterns, attention, and pupil dilation. This technique is commonly used to evaluate website usability, advertisements, packaging, product placement, and in-store experiences, as well as to understand how consumers process and prioritize visual information (Misra, 2023). This method identifies the areas of an advertisement that attract consumers' initial attention, enabling



marketers to improve layout design and enhance visual appeal (Wedel & Pieters, 2008). Eye-tracking methodologies make it possible to identify the points where the gaze is most likely to pause, therefore revealing which elements attract the highest level of attention (Pluta-Olearnik & Szulga, 2022).

2.2.3 Functional Magnetic Resonance Imaging (fMRI)

Functional magnetic resonance imaging (fMRI) identifies the brain regions activated during exposure to advertisements, providing valuable insights into the emotional and cognitive processes that influence consumer decision-making (Hubert & Kenning, 2008). In other words, this technique uses magnetic fields to detect changes in blood flow within the brain, which allows researchers to examine the brain's response to marketing stimuli such as product packaging, advertisements, and pricing strategies. It provides insights into cognitive and emotional factors, including memory, sensory perception, emotional valence, trust, brand preference, loyalty, and brand recall (Misra, 2023).

2.2.4 Galvanic Skin Response (GSR)

Galvanic skin response (GSR), also known as skin conductance activity (SCA), is a widely used physiological measure that tracks continuous changes in the skin's electrical properties. These changes occur due to variations in sweat gland activity, which are linked to different levels of physiological arousal (Pluta-Olearnik & Szulga, 2022). GSR is also defined as a technique used to measure physiological responses and is often applied to assess emotional arousal elicited by digital advertising content (Ram Kailash et al., 2024).

2.2.5 Electromyography (EMG)

Electromyography (EMG) is a technique that measures muscle activity, particularly in the face, to detect subtle contractions associated with emotional responses. In neuromarketing, it is used to

evaluate changes in consumers' emotional reactions to different marketing stimuli (Trojan & Gut, 2020).

2.2.6 Magnetoencephalography (MEG)

Magnetoencephalography (MEG) is a neuroimaging technique that records the magnetic fields produced by brain activity. In neuromarketing, it is used to examine consumers' neural responses to marketing stimuli, such as product packaging, advertisements, and pricing. With its high temporal and spatial resolution, MEG helps evaluate perception, attention, and memory, making it valuable for product development, advertising, packaging design, and sensory testing (Misra, 2023).

2.2.7 Positron emission tomography (PET)

Positron emission tomography (PET) is an advanced neuroimaging technique used for the in vivo examination of brain function. It enables the precise assessment of cerebral blood flow, metabolic activity, and receptor binding within the brain (Alsharif et al., 2021).

2.2.8 Electrocardiogram (ECG)

Electrocardiography (ECG) is a widely used medical tool for measuring the heart's electrical activity. Research has shown a relationship between emotional states and cardiac responses, as situations such as anxiety or fear can alter heart rate patterns. In neuromarketing, ECG data is used to better understand changes in consumers' emotional states during testing, with heart rate variations also being associated with levels of attention and concentration (Chmielewska, 2013).

2.2.9 Facial Recognition/Facial Coding System (FACS)

Facial expression analysis, also known as facial coding, was originally developed by Carl-Herman Hjortsjö and later advanced by Paul Ekman and Wallace Friesen in the 1970s. This method examines changes in facial muscle activity to identify individuals' emotional responses to different stimuli. The human face provides rich nonverbal cues, particularly through areas such as the eyes, eyebrows, and mouth. Because facial expressions are generally spontaneous, visible, and difficult to control, this technique is considered a reliable tool for capturing emotional reactions (Angie et al., 2011).



2.2.10 Biometric Measures

Biometric measures (e.g., heart rate variability, skin conductance) It measures arousal and is used for predicting market performance (Misra, 2023).

However, because of the high cost and technical complexity of these tools, many neuromarketing techniques are not widely accessible. As a result, researchers most commonly rely on methods such as EEG, eye tracking, and fMRI (Lakshminarayana et al., 2024).

3. Benefits and Limitations of Neuromarketing

As with any scientific and research tool, neuromarketing has both advantages and limitations that should be carefully considered when evaluating its overall value and application.

3.1 Benefits: The benefits of neuromarketing include several key advantages that can be highlighted as follows:

3.1.1 Emotional Branding and engagement: Neuromarketing focuses on understanding consumers' decision-making processes to identify effective strategies for attracting potential customers. This approach has significantly contributed to improving brands and businesses by facilitating the analysis of market segments and supporting the development of appropriate marketing strategies. It also helps in designing the marketing mix, including product, price, promotion, and place, to better meet the needs of different consumer groups (Nilashi et al., 2020). Neuromarketing enables brands to design advertising that engages consumers' emotional systems, builds trust, and encourages a sense of alignment with the brand's values (Simmonds et al., 2018).

3.1.2 Technological developments: As neuroimaging technologies continue to advance, including functional magnetic resonance imaging (fMRI), electroencephalography (EEG), and magnetoencephalography (MEG), they are expected to provide a deeper understanding of how brain activity influences consumer behaviour (Kenning & Plassmann, 2008).

3.1.3 Combining machine learning and Artificial Intelligence: Integrating artificial intelligence (AI) and machine learning (ML) into neuromarketing research has significant potential to enhance the analysis and interpretation of neurophysiological data (Calvo et al., 2015). Researchers can apply AI and ML algorithms to identify patterns and relationships within large datasets, enabling a more detailed understanding of the factors that influence consumer behaviour (Davenport & Harris, 2007). These technologies can also facilitate the development of personalized marketing strategies that consider individual interests and values, thereby encouraging more sustainable purchasing behavior (Ladeira et al., 2019).

3.1.4 Economic side of neuromarketing: Neuromarketing insights enable businesses to allocate resources more efficiently, thereby increasing the return on investment (ROI) in digital advertising. By identifying which elements of advertisements generate the strongest neural responses, companies can refine and optimize their marketing strategies. This approach is supported by the growing need for cost-effective and high-impact marketing techniques in an increasingly competitive digital environment (Ram Kailash et al., 2024).

3.1.5 Testing and optimizing packaging and product design: Beyond advertising, neuromarketing also plays an important role in product design and packaging decisions. Research using neuroimaging techniques has demonstrated that packaging elements such as colour, shape, texture, and visual imagery can trigger specific brain responses linked to emotional engagement and product choice (Reimann et al., 2011). By examining these subconscious responses, marketers are able to develop product displays that better match consumers' psychological expectations and sensory preferences, which in turn enhances visual appeal and improves product recall (Kostovski et al., 2025).

3.1.6 Social wellbeing: Neuromarketing research can contribute to social value by offering insights into consumers' psychological well-being and promoting outcomes that are beneficial for society as a whole (P. Singh et al., 2023).

3.2 Challenges and Limitations: Although neuromarketing offers various benefits, it is also associated with



a number of challenges and limitations that hinder its broader adoption and should not be overlooked.

3.2.1 Lack of transparency: The application of neuromarketing techniques is not always fully transparent, and consumers may be unaware that their behavior is being observed or that their personal data is being collected. Such a lack of transparency can undermine trust between companies and consumers (Misra, 2023).

3.2.2 Presence of misconceptions about neuromarketing: Some businesses view neuromarketing as a costly or ineffective approach, while others question its validity and reliability. Such misconceptions can limit its adoption, despite its potential to provide valuable insights into consumer behavior. However, research suggests that increasing awareness and providing education about these methods can enhance their acceptance and encourage wider use of neuromarketing techniques (K. Singh et al., 2024).

3.2.3 High Cost of Neuromarketing Research: One of the main challenges of neuromarketing is the high cost and technical complexity of neuroscience tools such as fMRI and EEG, which require specialized equipment and professional expertise. In addition, interpreting neural data demands interdisciplinary knowledge, making the adoption of these techniques difficult for many organizations (K. Singh et al., 2024). This is especially important for newly established companies, such as small and medium-sized enterprises.

3.2.4 Rapidly Evolving Technology: Neuromarketing is a fast-growing field, and the tools, methods, and results presented in studies and researches, may eventually be updated or replaced as new technologies and research approaches continue to emerge (Gupta, 2026).

3.2.5 Ethical Concerns: Ethical concerns represent a major issue in neuromarketing. The ability to access and potentially influence subconscious processes raises important questions regarding consumer manipulation, privacy, and informed consent (Sposini, 2024). There is a fine distinction between persuasion and manipulation, and crossing this boundary can weaken consumer trust. Therefore, ethical principles such as transparency, informed consent, and data protection are essential for the responsible use of neuromarketing techniques. In addition, regulatory frameworks and ethical guidelines play an important role in addressing these issues and ensuring the integrity of the field (Dutta, 2024).

3.2.6 Misuse of data: The misuse of neuromarketing data may pose risks to individuals. For example, personal information related to preferences and behavioural patterns can be exploited to deliver highly targeted marketing messages, which raises concerns about manipulation and potential exploitation (Misra, 2023).

4. Ethical considerations

Neuromarketing has attracted significant attention as an interdisciplinary field because of its ability to provide deeper insights into consumer behaviour and decision-making processes (Fugate, 2007). The application of neuroscience to marketing provides valuable insights into how consumers process, store, and recall brand-related information. It also helps researchers examine whether certain advertising strategies or marketing practices may contribute to negative outcomes, such as excessive consumption (Lee et al., 2007). However, alongside its potential benefits, it has also raised important ethical concerns regarding its application. The use of neuromarketing raises ethical concerns related to deception, privacy, and informed consent (Murphy et al., 2008). Here are some ethical considerations outlined below:

4.1 Privacy and data protection: Neuromarketing studies often involve the collection of participants' sensitive neurophysiological data, including brain activity patterns and various biometric responses (Fisher et al., 2010). Researchers argue that the misuse of neuromarketing techniques may allow companies to identify and exploit consumers' vulnerabilities for commercial purposes. This raises important concerns about privacy, data security, and the ethical collection and use of personal information. Consequently, organizations and companies should ensure transparent data practices and obtain informed consent from participants. In addition, some critics believe that neuromarketing may influence consumers' subconscious minds in ways that encourage purchasing decisions (Pluta-Olearnik & Szulga, 2022).

4.2 Social Impact of Neuromarketing: Neuromarketing, like traditional marketing, can produce both negative and positive outcomes. For example, persuasive advertising may contribute to harmful behaviours such as excessive alcohol consumption. At the same time, neuroscience-based techniques can also be used to promote



beneficial behaviours, including improving the effectiveness of health-related campaigns (Masinter, 2019).

4.3 Sensible consent: Informed consent is a fundamental principle of research ethics, ensuring that participants are fully aware of a study's objectives, procedures, potential risks, and benefits. However, in neuromarketing research, the complexity of the methods involved may make it difficult for participants to fully understand the process, thereby complicating the attainment of truly informed consent (Murphy et al., 2008). Researchers should ensure that participants are given the opportunity to ask questions about the study and to withdraw at any time without facing any consequences. In addition, the study's objectives and procedures should be communicated in a clear and concise manner (Dimoka et al., 2011).

5. From Neuromarketing Insights to Financial Outcomes: A Conceptual Framework for Green SMEs

Translating Neuromarketing Metrics into Marketing Indicators

While the previous sections introduced the concepts, tools, and applications of neuromarketing, the next step is to explain how these neural insights can be translated into measurable marketing indicators. Neuromarketing metrics provide organizations with deeper information about consumers' cognitive and emotional reactions, allowing marketers to better understand the mechanisms underlying engagement, trust formation, purchase intention, and loyalty (Bhardwaj et al., 2024). Rather than directly representing marketing outcomes, these neural responses should be considered early-stage indicators that influence subsequent consumer behaviors and market performance.

One of the most important neuromarketing indicators is attention. Attention reflects the extent to which consumers allocate cognitive resources to marketing stimuli, such as advertisements, product designs, or digital interfaces. Through tools such as eye-tracking and EEG, marketers can identify whether a stimulus successfully captures consumer focus. However, attention should be considered an early-stage cognitive indicator rather than an equivalent measure of engagement or purchase behavior. Previous studies indicate that attention plays an important role in information processing, memory formation, and subsequent consumer evaluation (Bhardwaj et al., 2024; Chawla et al., 2025).

Emotional response represents another critical neuromarketing dimension. Consumers' emotional reactions toward brands and products influence how they evaluate marketing messages and form preferences. Positive emotional responses generated through advertising, product presentation, or brand storytelling can support stronger brand trust and purchase intention by creating more meaningful psychological connections with consumers. Neuromarketing techniques such as EEG, facial expression analysis, and physiological measurements enable researchers to capture these implicit emotional reactions beyond traditional self-reported methods (Bhardwaj et al., 2024; Durán Mero, 2025).

Visual attention and fixation patterns obtained through eye-tracking provide additional insights into consumer interaction with marketing stimuli. By identifying which elements attract consumers' attention, businesses can optimize website structures, advertising layouts, packaging designs, and digital customer journeys. Although such optimization may improve conversion potential, visual fixation alone does not necessarily indicate positive evaluation or actual purchase behavior (Chavan et al., 2025).

Beyond immediate attention and emotional reactions, neuromarketing also provides insights into memory activation and purchase motivation. Stronger memory encoding can improve brand recall and may support long-term customer relationships, while purchase motivation reflects consumers' willingness to progress from intention toward buying decisions (Bhardwaj et al., 2024; Durán Mero, 2025). These indicators are particularly relevant for SMEs because limited marketing resources require more accurate consumer insights and more efficient allocation of promotional investments (Chawla et al., 2025; Sharabati et al., 2024).

The relationship between neuromarketing metrics and marketing indicators can be summarized as follows:

Table 1. Conceptual Translation of Neuromarketing Metrics into Marketing Indicators



Neuromarketing Metric	Consumer Response	Marketing Indicator
Attention	Cognitive processing of marketing stimuli	Customer Engagement Potential
Emotional Response	Affective evaluation and brand perception	Brand Trust and Purchase Intention
Fixation and Visual Attention	Visual salience and information processing	Interface Effectiveness and Conversion Potential
Memory Activation	Brand Recall	Brand Recognition and Recall Potential
Purchase Motivation	Purchase Propensity	Conversion Potential

For green SMEs, translating neuromarketing insights into marketing indicators is particularly valuable due to their limited financial resources and challenges associated with communicating sustainability-oriented value propositions (Sharabati et al., 2024; Momtaz & Parra, 2024). Unlike large corporations, green SMEs often need to justify higher product prices, build consumer trust, and overcome uncertainty regarding sustainability claims (Momtaz & Parra, 2024). These challenges have financial implications because ineffective communication may reduce marketing efficiency and limit the returns generated from promotional investments. Therefore, improving consumer understanding can support more efficient allocation of scarce financial resources (Akisanmi et al., 2025; Sharabati et al., 2024). Consequently, neuromarketing can support green SMEs by improving communication effectiveness, reducing inefficient marketing expenditures, and enhancing the potential return from limited promotional budgets (Bhardwaj et al., 2024; Sharabati et al., 2024; Durán Mero, 2025). These improvements in marketing efficiency create the foundation for potential financial benefits, which are discussed in the following section.

Financial Impact of Neuromarketing on SME Performance

Building on the marketing indicators discussed in the previous section, neuromarketing insights can be conceptually connected to financial performance through a sequential mechanism. By improving the understanding of consumer preferences and decision-making processes, neuromarketing enables firms to design more effective marketing strategies, which can enhance customer engagement, improve conversion outcomes, and contribute to sales growth and profitability (Bhardwaj et al., 2024; Durán Mero, 2025). However, the financial contribution of neuromarketing should be interpreted as an indirect value-creation mechanism. Neuromarketing does not generate financial outcomes independently; rather, it improves the quality of marketing decisions that influence revenue generation, cost efficiency, and long-term customer value (Akisanmi et al., 2025; Durán Mero, 2025).

The relationship between neuromarketing and financial performance can be explained through several interconnected pathways, including revenue improvement, return on investment (ROI), cost efficiency, customer lifetime value (CLV), and pricing strategies for green products.

Sales Growth and Revenue Improvement

Neuromarketing allows businesses to identify the cognitive and emotional factors influencing consumer decisions. By understanding which visual elements, messages, and product characteristics generate stronger consumer responses, companies can improve advertising effectiveness and product presentation (Bhardwaj et al., 2024; Chawla et al., 2025). For SMEs, these insights are particularly important because inefficient marketing decisions can represent a significant financial burden due to limited available resources and restricted marketing capabilities (Sharabati et al., 2024; Chawla et al., 2025).



From a financial perspective, improved marketing effectiveness can increase the likelihood that promotional expenditures generate customer acquisition and sales outcomes. However, the financial benefit depends on whether additional revenues exceed implementation costs (Akisanmi et al., 2025).

Research on eye-tracking-based neuromarketing demonstrates that optimizing digital interfaces based on consumer visual attention patterns can improve user experience and increase conversion performance. However, conversion improvement should be interpreted as a potential financial outcome resulting from better marketing decisions rather than as a direct consequence of a single neuromarketing metric (Chavan et al., 2025).

Return on Investment (ROI) and Marketing Efficiency

One of the potential financial implications of neuromarketing is improved marketing efficiency and more informed evaluation of marketing investments. By providing deeper insights into consumer reactions before implementing large-scale campaigns, neuromarketing can help firms identify ineffective messages, optimize promotional content, and allocate marketing budgets more efficiently (Bhardwaj et al., 2024; Durán Mero, 2025).

For SMEs with constrained financial resources, improved allocation of marketing investment is particularly important because return on investment depends not only on revenue generation but also on controlling unnecessary expenditure and improving resource utilization (Akisanmi et al., 2025; Sharabati et al., 2024).

The general mechanism can be described as follows:

Marketing Investment → Consumer Response Analysis → Marketing Optimization → Potential Revenue and Cost-Efficiency Gains → Net Financial Benefit → Improved Marketing ROI

Therefore, the financial value of neuromarketing should be assessed by comparing additional financial benefits with adoption costs, including technology, expertise, data collection, and analytical expenses.

Evidence from digital marketing research supports the broader relationship between marketing efficiency and SME performance. However, digital marketing ROI studies should be considered complementary evidence rather than direct evidence of neuromarketing profitability because they examine broader digital strategies rather than neuroscience-based methods (Akisanmi et al., 2025; Sharabati et al., 2024).

Beyond improving investment returns, neuromarketing may also influence financial performance by reducing inefficient marketing expenditures and improving customer acquisition efficiency.

Cost Efficiency and Customer Acquisition

Traditional marketing approaches often rely on observable behavioral metrics that provide limited information about why consumers engage or disengage with a brand. Neuromarketing provides additional insights into implicit consumer preferences and underlying decision-making processes, enabling firms to refine campaigns and reduce ineffective marketing activities (Chawla et al., 2025; Bhardwaj et al., 2024; Chygryn et al., 2024). By improving targeting accuracy and reducing inefficient promotional spending, neuromarketing-informed strategies may improve marketing cost efficiency and support more effective allocation of limited marketing resources (Bhardwaj et al., 2024; Chawla et al., 2025).

For SMEs with limited financial capacity, this improved resource allocation can contribute to stronger operational efficiency and better utilization of marketing investments (Sharabati et al., 2024).

Customer Lifetime Value and Long-Term Revenue Stability

Neuromarketing insights are not limited to immediate purchasing decisions. By identifying emotional drivers, trust-related factors, and memory formation processes, businesses can develop stronger relationships with customers and encourage repeat purchasing behavior (Bhardwaj et al., 2024; Chawla et al., 2025).

Higher customer satisfaction, stronger brand attachment, and improved loyalty may contribute to increased customer lifetime value (CLV) by supporting repeat purchases and more predictable future revenues (Durán Mero, 2025; Chawla et al., 2025).

From a financial sustainability perspective, higher customer lifetime value can strengthen revenue predictability and reduce dependence on continuous customer acquisition expenditure. This is particularly



important for green SMEs, where building consumer trust requires significant communication and relationship-building efforts (Momtaz & Parra, 2024).

Premium Pricing Opportunities for Green Products

Green SMEs frequently face the challenge of communicating the value of sustainable products while operating with potentially higher production costs. Consumers may recognize environmental benefits but remain uncertain about paying premium prices unless sustainability claims are perceived as credible and valuable (Momtaz & Parra, 2024).

Neuromarketing can support green SMEs by identifying the emotional and cognitive factors that influence consumer perceptions of sustainability, trust, and product value (Bhardwaj et al., 2024; Durán Mero, 2025). Rather than directly creating premium pricing, neuromarketing can help firms communicate sustainability benefits more effectively, which may increase consumers' willingness to accept higher prices.

This mechanism has financial relevance because effective value communication may improve product differentiation, support higher margins, and strengthen the internal resources available for reinvestment and growth (Momtaz & Parra, 2024).

Research on sustainability-oriented SMEs indicates that credible sustainability practices and ESG-related information can positively influence financial performance (Momtaz & Parra, 2024).

Overall, the financial impact of neuromarketing can be understood as an indirect value-creation process, as illustrated in Figure 1.



Figure 1. Neuromarketing Pathway to Financial Outcomes in Green SMEs



For green SMEs, this pathway suggests that neuromarketing functions as a strategic capability that improves the efficiency of market-related investments and supports financial outcomes through stronger customer relationships, improved resource allocation, and more stable revenue generation (Akisanmi et al., 2025; Kurniasari et al., 2025; Momtaz & Parra, 2024).

Financial Sustainability of Green SMEs

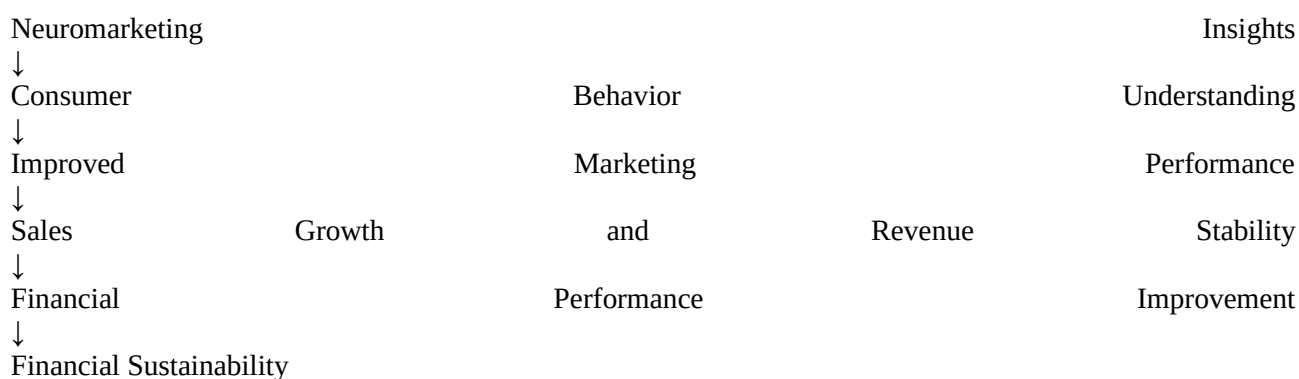
Financial sustainability refers to the ability of an organization to maintain financial viability and continuity over the long term, rather than focusing solely on short-term profitability (Gleißner et al., 2022). For SMEs, financial sustainability also involves the capacity to generate sufficient resources for continued operations and growth while maintaining an adequate financial position (Kurniasari et al., 2025).

Financial sustainability can be assessed through multiple dimensions of long-term financial condition, including profitability, growth, financial stability, and the firm's capacity to maintain operations over time (Gleißner et al., 2022).

In the context of green SMEs, financial sustainability becomes particularly important because sustainable business models often require balancing environmental objectives with economic viability. Green SMEs may face additional challenges related to investment requirements, market development, consumer awareness, and the need to communicate the long-term value of sustainable products.

Unlike large corporations, SMEs generally have fewer financial resources and lower capacity to absorb financial pressures, making efficient resource allocation and stable revenue generation critical factors for long-term survival (Momtaz & Parra, 2024; Sharabati et al., 2024).

The previous sections demonstrated that neuromarketing can influence financial outcomes through improved consumer understanding, stronger engagement, and more effective marketing decisions. However, neuromarketing does not create financial sustainability directly. Instead, its contribution occurs through an indirect pathway:



By improving the understanding of customer preferences, emotional responses, and purchasing motivations, neuromarketing-informed strategies may help green SMEs develop more effective communication approaches, strengthen customer relationships, and create more predictable revenue streams.

From a financial sustainability perspective, revenue predictability can improve operating cash-flow stability and strengthen SMEs' ability to allocate resources toward innovation, environmental improvements, and long-term investments (Momtaz & Parra, 2024; Kurniasari et al., 2025).

Empirical evidence supports the relationship between business performance and broader sustainability outcomes in SMEs. Kurniasari et al. (2025) found that business performance has a significant positive influence on business sustainability, demonstrating that stronger operational and financial performance provides a foundation for long-term sustainability. However, business sustainability should not be considered identical to financial sustainability; rather, financial performance represents an important component contributing to broader sustainability outcomes (Kurniasari et al., 2025). Furthermore, Momtaz & Parra (2024) demonstrate that sustainability-related practices and ESG disclosure can influence SME financial performance, with externally validated ESG information showing particularly strong value-creating effects. For green SMEs, this relationship highlights the financial importance of trust creation because consumer acceptance of



sustainable products can influence revenue generation, market expansion, and the ability to maintain economically viable operations (Momtaz & Parra, 2024).

Another important aspect of financial sustainability is the ability to maintain performance under changing economic conditions. Tolner et al. (2024) show that SMEs experiencing economic shocks may face slower subsequent development compared with unaffected firms, highlighting that short-term adaptation does not necessarily guarantee long-term financial stability.

Therefore, green SMEs require not only sustainable revenue generation but also stronger financial foundations that allow them to absorb market uncertainty and continue investing in sustainable innovation (Tolner et al., 2024).

Overall, neuromarketing can be considered a supporting capability that strengthens the marketing and financial mechanisms underlying SME sustainability. By improving customer understanding, enhancing marketing efficiency, and supporting stronger customer relationships, neuromarketing-informed strategies may contribute to the financial conditions required for the long-term survival and growth of green SMEs.

Table 2. Neuromarketing Pathways Linking Consumer Insights to Financial Sustainability in Green SMEs

Neuromarketing Insight	Marketing Outcome	Financial Outcome	Financial Sustainability Implication
Attention and visual processing	Higher engagement with marketing stimuli	Improved potential and conversion sales	More stable revenue generation
Emotional response	Brand trust and purchase intention	Customer loyalty and potential CLV improvement	Stronger long-term customer relationships
Eye-tracking and interface optimization	Improved digital experience	Higher marketing efficiency and potential ROI improvement	Better allocation of limited SME resources
Memory activation	Stronger brand recall	Repeat purchasing behavior	Greater revenue predictability
Sustainability-related emotional communication	Increased perceived value of green products	Potential premium pricing and improved margins	Greater reinvestment capacity
Consumer behavior insights	More effective marketing decisions	Reduced inefficient marketing expenditure	Improved financial resource management

Financial Resilience of Green SMEs

Financial resilience represents a distinct but complementary concept to financial sustainability (Tolner et al., 2024). While financial sustainability refers to an organization's ability to maintain stable operations, generate sufficient financial resources, and continue business activities under normal conditions, financial resilience reflects the ability of a firm to absorb, adapt to, and recover from unexpected disruptions. These disruptions may include economic downturns, increases in input costs, demand reductions, credit constraints, and broader market instability.



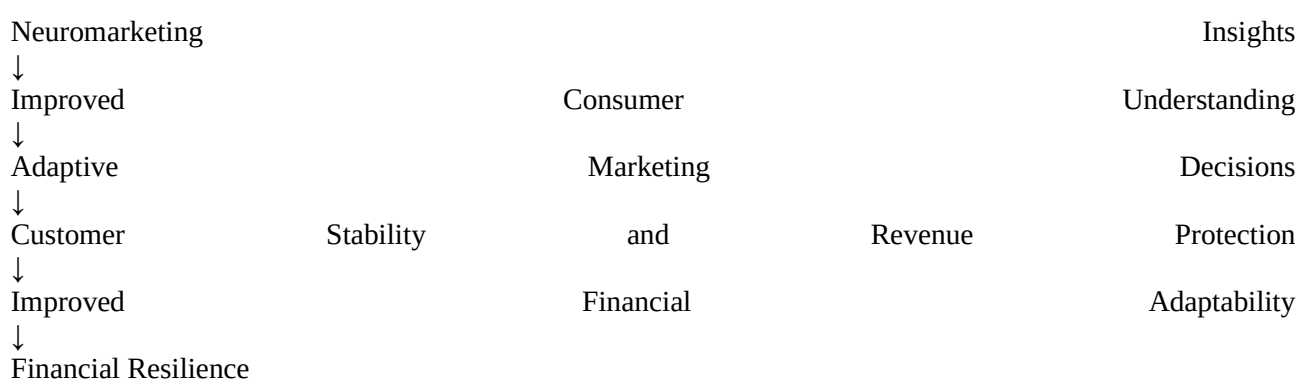
For green SMEs, financial resilience is particularly important because sustainable business models often require balancing environmental objectives with economic viability. Green SMEs may face additional challenges related to investment requirements, evolving consumer markets, and the need to establish credibility regarding sustainability practices.

Compared with larger organizations, SMEs generally operate with fewer financial resources and lower capacity to absorb financial pressures, making adaptive capabilities, efficient resource allocation, and stable revenue generation important factors for long-term survival (Momtaz & Parra, 2024; Sharabati et al., 2024).

Research on SME resilience highlights that experiencing a shock can have persistent consequences even after short-term recovery. Tolner et al. (2024) demonstrate that SMEs affected by economic shocks may continue to lag behind unaffected firms in subsequent development outcomes, suggesting that resilience should not be understood merely as surviving a crisis but as maintaining the capacity for recovery and continued growth over time.

From a financial management perspective, resilience therefore involves not only maintaining profitability during stable periods but also preserving liquidity, protecting cash-flow continuity, and maintaining sufficient flexibility to adjust resource allocation when external conditions change (Tolner et al., 2024; Božović et al., 2025).

The contribution of neuromarketing to financial resilience does not occur through directly preventing financial shocks. Instead, neuromarketing can strengthen the organizational capabilities that support resilience through an indirect pathway:



Customer Loyalty as a Resilience Mechanism

One important pathway through which neuromarketing can contribute to financial resilience is strengthening customer loyalty. During periods of economic uncertainty, firms with stronger customer relationships may experience more stable demand because loyal customers are more likely to maintain relationships with trusted brands and continue engaging with them over time (Chawla et al., 2025).

Neuromarketing contributes to loyalty formation by identifying emotional responses, attention patterns, trust-related signals, and cognitive factors that influence consumer attachment to brands. These insights allow firms to better understand the psychological mechanisms underlying engagement, purchase intention, and repeat purchasing behavior (Bhardwaj et al., 2024; Chawla et al., 2025).

For green SMEs, this mechanism is particularly relevant because sustainable products often require consumers to develop trust in environmental claims and perceive alignment between their personal values and the company's sustainability objectives. Credible sustainability communication and stakeholder trust can strengthen consumer acceptance of green products and support stronger market relationships (Momtaz & Parra, 2024).

From a financial perspective, stronger customer loyalty can contribute to revenue stability by reducing dependence on continuous customer acquisition and creating a more predictable demand base. This stability is particularly valuable for SMEs because fluctuations in sales revenue directly influence liquidity, operational continuity, and investment capacity (Kurniasari et al., 2025; Momtaz & Parra, 2024).



Therefore, neuromarketing insights may contribute to resilience by supporting stronger customer relationships and reducing revenue volatility during periods of market uncertainty (Chawla et al., 2025; Bhardwaj et al., 2024).

Better Decision Making Under Uncertainty

A second contribution of neuromarketing to financial resilience is improving decision-making capability under uncertain market conditions. Traditional marketing indicators often reveal changes in consumer behavior only after they have affected sales outcomes. In contrast, neuromarketing-based insights provide additional information regarding consumer attention, emotional responses, and changing preferences, allowing firms to adapt their strategies more proactively (Bhardwaj et al., 2024; Chawla et al., 2025).

For green SMEs operating with limited resources, earlier identification of changes in consumer preferences can support better allocation of marketing investments, adaptation of sustainability communication, and more effective demand management.

This capability has financial relevance because early recognition of market changes allows SMEs to adjust expenditure priorities, avoid inefficient resource commitments, and protect financial flexibility during uncertain periods. More informed marketing and resource-allocation decisions may therefore support more efficient use of limited financial resources and contribute to SME financial performance (Akisanmi et al., 2025).

The importance of data-driven decision-making is also supported by recent research on financial risk management in SMEs. Božović et al. (2025) demonstrate that analytical approaches based on advanced data processing can improve financial risk classification and provide early-warning capabilities by identifying complex patterns within financial and operational data.

These capabilities support more informed decisions and contribute to strengthening SME adaptability under uncertain conditions (Božović et al., 2025).

Neuroeconomics and Financial Risk Management

Beyond consumer-facing applications, insights from neuroeconomics provide an additional perspective on financial resilience by addressing the internal decision-making processes of entrepreneurs and managers. Financial decisions are not always based on purely rational evaluations; cognitive biases and psychological factors can influence risk perception, resource allocation, and responses to financial pressure. De los Reyes Marín et al. (2025) highlight that entrepreneurial financial decisions may be influenced by neurobiological mechanisms and cognitive biases, including overconfidence, illusion of control, and distorted perceptions of liquidity. These mechanisms can encourage excessive risk-taking during periods of success and generate reactive decision-making during periods of financial stress.

For SMEs, these behavioral biases have direct financial consequences because inappropriate risk assessment may lead to inefficient investment decisions, excessive resource allocation, and weakened financial flexibility. Recognizing these mechanisms can therefore support stronger financial governance, more disciplined capital allocation, and improved risk management practices (De los Reyes Marín et al., 2025). For green SMEs, integrating awareness of these behavioral mechanisms into managerial decision processes can strengthen financial discipline and reduce the influence of cognitive distortions during periods of uncertainty.

Consequently, neuroeconomic insights complement the marketing role of neuromarketing by addressing the internal financial decision-making dimension of resilience, where managerial judgment influences liquidity management, investment decisions, and long-term financial stability. Overall, financial resilience in green SMEs emerges from the interaction between market adaptability, customer relationship strength, financial flexibility, and managerial decision quality. Neuromarketing contributes to these capabilities by improving consumer understanding, enabling adaptive responses to market changes, and supporting more informed managerial decisions under uncertainty (Chawla et al., 2025; Božović et al., 2025; De los Reyes Marín et al., 2025).



Integrated Conceptual Framework

The previous sections established that the relationship between neuromarketing and long-term survival and financial sustainability of green SMEs follows a sequential value-creation process. Neuromarketing tools do not generate financial outcomes directly; rather, they provide deeper insights into consumer cognitive and emotional processes, which improve marketing decisions and subsequently influence financial outcomes.

The proposed framework is also consistent with a resource-based perspective, suggesting that intangible capabilities such as consumer knowledge, analytical capability, and decision-making quality can improve resource utilization and contribute to superior business outcomes (Kurniasari et al., 2025; Sharabati et al., 2024).

At the first stage, neuromarketing tools, including EEG, eye-tracking, and emotional response measurement, provide information regarding consumer attention, preferences, memory activation, and purchase motivation. These insights allow firms to better understand consumer behavior beyond traditional self-reported measures (Bhardwaj et al., 2024; Chawla et al., 2025).

The second stage involves translating consumer insights into marketing performance improvements. By understanding consumer engagement, trust formation, and decision-making processes, firms can optimize communication strategies, improve customer experience, and increase conversion potential (Chawla et al., 2025; Chavan et al., 2025).

Improved marketing performance can subsequently influence financial outcomes through higher sales growth, improved marketing efficiency, and stronger return on marketing investments. Although direct financial effects of neuromarketing remain an emerging research area, evidence from digital marketing studies indicates that effective marketing investment and ROI measurement are associated with improved SME financial performance (Akisanmi et al., 2025; Durán Mero, 2025).

From a financial perspective, this stage represents the conversion of marketing capability into measurable economic outcomes, including revenue growth, profitability improvement, and more efficient allocation of limited financial resources (Akisanmi et al., 2025).

For green SMEs, stronger financial performance provides the foundation for financial sustainability by supporting cash-flow stability, reinvestment capacity, and long-term business continuity. Previous research indicates that business performance contributes to sustainability outcomes, while sustainability-oriented practices can influence financial performance through stakeholder trust and market acceptance (Kurniasari et al., 2025; Momtaz & Parra, 2024).

Therefore, financial sustainability in this framework represents not only profitability maintenance but also the preservation of financial capacity required for continued operation, innovation investment, and adaptation to changing market conditions (Kurniasari et al., 2025).

Finally, financial sustainability can contribute to financial resilience by providing a stronger financial foundation for SMEs to absorb economic disruptions, adapt to changing market conditions, and recover from external shocks (Bunjamin & Mauludin, 2026). Research on SME resilience emphasizes that long-term survival depends on developing adaptive capabilities under uncertainty (Tolner et al., 2024; Božović et al., 2025).

From a financial management perspective, resilience involves preserving liquidity, managing financial risks, and maintaining strategic flexibility when revenues, costs, or market conditions become unstable (Legenzova et al., 2025).

Figure 2 presents the proposed integrated conceptual framework linking neuromarketing insights to marketing performance, financial outcomes, and the long-term survival of green SMEs.



Figure 2. Integrated Conceptual Framework of Neuromarketing-Driven Financial Sustainability and Resilience in Green SMEs

Research Gaps and Future Research Directions

Despite growing interest in neuromarketing and its applications in consumer behavior analysis, several important research gaps remain regarding its financial implications for green SMEs.

First, existing research has primarily focused on consumer responses, engagement mechanisms, and marketing effectiveness, while limited attention has been given to green SMEs as a specific organizational context. These firms face unique challenges, including higher investment requirements, limited financial resources, and difficulties in communicating sustainability value, which require further investigation (Momtaz & Parra, 2024).



Second, a major limitation in current literature is the lack of direct financial measurements linking neuromarketing adoption to objective business outcomes. Existing studies mainly emphasize behavioral and marketing indicators, while financial measures such as cash-flow stability, profitability, return on investment (ROI), and long-term revenue performance remain insufficiently explored (Akisanmi et al., 2025; Chavan et al., 2025).

Third, the accessibility of neuromarketing tools remains a significant challenge for SMEs. High costs related to technology, expertise, and data analysis may restrict adoption among resource-constrained firms. Future research could examine whether artificial intelligence-based approaches and lower-cost behavioral analytics can reduce implementation barriers and improve accessibility for SMEs (Bhardwaj et al., 2024).

Fourth, current evidence is largely based on cross-sectional studies, limiting understanding of the long-term financial consequences of neuromarketing adoption. Future longitudinal research should examine whether neuromarketing-informed strategies generate sustained improvements in profitability, customer retention, financial sustainability, and resilience over time (Kurniasari et al., 2025; Tolner et al., 2024).

Future studies should therefore develop empirical models that directly measure the financial value of neuromarketing investments in green SMEs, including actual ROI estimation, profitability effects, and the role of technology-driven solutions in reducing adoption costs.

6. Future Perspectives

To advance the integration of neuromarketing into the strategic management of green SMEs, future scholarly inquiry must transition from descriptive consumer-level observations to rigorous, outcome-oriented investigations. Based on the gaps identified in this review, we propose four critical research trajectories.

6.1. Translating Neuro-Insights into Financial Metrics

A primary imperative for future research is to establish a causal link between neuromarketing-informed decisions and objective financial outcomes. Current literature predominantly focuses on psychological proxies such as attention or emotion (Bhardwaj et al., 2024), often overlooking the bottom-line impact. Future empirical studies should attempt to quantify the “Neuro-ROI” by connecting neurological indicators to measurable metrics, including marketing efficiency, customer lifetime value (CLV), and sales growth (Akisanmi et al., 2025; Durán Mero, 2025). Specifically, research should investigate whether the ability to decode complex consumer responses directly correlates with improved cash-flow stability and reinvestment capacity in resource-constrained environments.

6.2. Technological Scalability and SME Accessibility

A significant barrier to neuromarketing adoption is the high cost and technical complexity of advanced neuro-tools. While high-fidelity equipment like fMRI offers depth, its utility for SMEs is limited by financial and expertise constraints. Consequently, a vital research frontier lies in identifying “low-cost, high-reliability” alternatives. Future studies should evaluate the efficacy of accessible modalities—such as eye-tracking, EEG, and physiological sensors—as scalable tools for small-scale enterprises (Alsharif et al., 2021; Kalaganis et al., 2021). The goal should be to determine whether integrated, low-cost neuro-technologies can provide sufficient granularity to optimize marketing spend without compromising the SME’s financial health.

6.3. Longitudinal Dynamics and the Green Value Proposition

The temporal dimension of neuromarketing remains largely unexplored. Most existing studies provide a “snapshot” of consumer reactions, which may not reflect long-term behavioral shifts. We call for longitudinal research designs to examine whether neuromarketing-driven strategies foster sustained customer loyalty and long-term financial resilience rather than merely driving short-term impulse purchases (Kurniasari et al., 2025; Tolner et al., 2024). Furthermore, within the green SME context, research should delve into how neuro-insights can mitigate the “green gap”—the psychological friction consumers face when navigating the higher costs or complex information inherent in sustainable products (Momtaz & Parra, 2024; Sharabati et al., 2024).

6.4. Ethical Governance and Data Integrity



As neuromarketing capabilities evolve, so do the ethical risks associated with cognitive privacy and consumer autonomy. Future scholarship must move beyond theoretical ethical concerns to develop practical frameworks for “Responsible Neuromarketing.” This includes investigating best practices for informed consent, data transparency, and the prevention of manipulative marketing practices (Fisher et al., 2010; Murphy et al., 2008). Establishing these ethical guardrails is essential for maintaining consumer trust, which is a cornerstone of both brand equity and financial sustainability for green enterprises.

7. Conclusion

This review has synthesized the emerging literature to elucidate the potential role of neuromarketing in fostering the long-term survival of green small and medium-sized enterprises (SMEs). Unlike traditional research methods that often rely on self-reported data, neuromarketing offers a more granular understanding of the subconscious drivers of consumer behavior, including attention, emotion, and purchase motivation (Karmarkar & Plassmann, 2019; Bhardwaj et al., 2024).

The central contribution of this study is the conceptualization of a sequential value-creation mechanism. We argue that neuromarketing does not function as a direct driver of financial outcomes; rather, it operates as a cognitive catalyst. The process initiates with the generation of neuro-consumer insights, which inform more precise marketing strategies, thereby optimizing marketing performance. This heightened performance—manifested through increased customer engagement, brand loyalty, and marketing efficiency—subsequently serves as a precursor to improved financial metrics, such as profitability and sales growth (Durán Mero, 2025). For green SMEs, this mechanism is critical: by optimizing the communication of sustainability-related value propositions, these firms can overcome the psychological barriers associated with higher price points and complex environmental information (Momtaz & Parra, 2024).

Ultimately, the integration of neuromarketing insights into the strategic toolkit of green SMEs can bolster both financial sustainability—the capacity to maintain viable operations—and financial resilience—the ability to navigate market turbulence. However, this study acknowledges a significant empirical gap: while the link between neuro-insights and marketing outcomes is well-documented, direct causal evidence linking neuromarketing adoption to long-term financial stability remains nascent.

In conclusion, neuromarketing should be viewed not as a substitute for traditional managerial judgment or financial analysis, but as a complementary strategic capability. For resource-constrained green SMEs, its value lies in its ability to enhance the precision of marketing resource allocation. While further longitudinal research is essential to validate the direct financial impact of these technologies, this review provides a foundational theoretical roadmap for leveraging neuro-intelligence to drive sustainable and resilient business growth.

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