

Neuromarketing and Consumer Decision-Making: A Psychological Approach to Brand Perception

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ABSTRACT

This study investigates the influence of neuromarketing stimuli on consumer decision-making through the mediating roles of emotional engagement and cognitive response, with brand perception as a key outcome variable. Employing a quantitative approach and utilizing Partial Least Squares Structural Equation Modeling (PLS-SEM) via SmartPLS, data were collected from 250 consumers in the electronics sector. The results reveal that neuromarketing stimuli significantly affect cognitive responses, which in turn strongly influence brand perception and consumer purchase decisions. While emotional engagement is also stimulated, its effect on brand perception and purchasing behavior is not statistically significant. The findings underscore the central role of cognitive mechanisms in transforming neuromarketing inputs into favorable consumer actions, particularly in high-involvement product contexts. This research contributes to the growing body of knowledge on consumer neuroscience and offers practical implications for marketers aiming to enhance brand strategy effectiveness through psychologically grounded approaches.

ABSTRAK

Penelitian ini mengkaji pengaruh stimulus neuromarketing terhadap pengambilan keputusan konsumen melalui peran mediasi keterlibatan emosional dan respons kognitif, dengan persepsi merek sebagai variabel hasil utama. Dengan menggunakan pendekatan kuantitatif dan metode *Partial Least Squares Structural Equation Modeling* (PLS-SEM) melalui SmartPLS, data dikumpulkan dari 250 konsumen di sektor elektronik. Hasil penelitian menunjukkan bahwa stimulus neuromarketing secara signifikan memengaruhi respons kognitif, yang pada gilirannya secara kuat memengaruhi persepsi merek dan keputusan pembelian konsumen. Meskipun keterlibatan emosional juga terstimulasi, pengaruhnya terhadap persepsi merek dan perilaku pembelian tidak signifikan secara statistik. Temuan ini menegaskan peran sentral mekanisme kognitif dalam mengubah input neuromarketing menjadi tindakan konsumen yang menguntungkan, terutama dalam konteks produk dengan keterlibatan tinggi. Penelitian ini memberikan kontribusi terhadap pengembangan literatur neurosains konsumen dan menawarkan implikasi praktis bagi pemasar dalam meningkatkan efektivitas strategi merek melalui pendekatan yang berlandaskan psikologi.

1. Introduction

The rapid evolution of consumer behavior in the digital era has necessitated a deeper understanding of the psychological mechanisms that underlie decision-making processes. Traditional marketing approaches, often reliant on self-reported data, have proven insufficient in capturing the subconscious drivers of consumer choices [1]. Neuromarketing, which integrates neuroscience with marketing, offers a robust framework for examining the neural and psychological responses to marketing stimuli, thereby providing a more accurate depiction of consumer behavior which can be seen on Figure 1 [2], [3]. This paradigm shift underscores the need to examine the emotional and cognitive pathways through which consumers perceive brands and make purchase decisions.

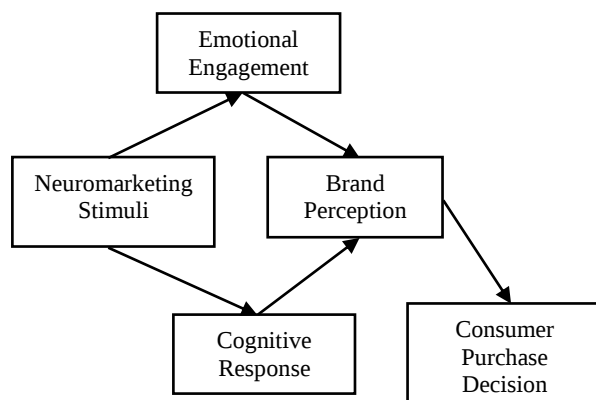


Figure 1. Framework

Neuromarketing techniques—such as eye-tracking, EEG, and fMRI—have revealed that emotions significantly influence brand perception, often more than rational evaluations [4]. The affective reactions triggered by visual and auditory stimuli can lead to stronger memory encoding, brand recall, and ultimately, brand loyalty [5], [6]. These findings are consistent with dual-process theories in psychology, which suggest that affective and cognitive responses are intertwined in decision-making [7]. Moreover, emotional engagement has been identified as a key mediator in shaping brand perception, particularly in environments saturated with competing messages [8], [9].

While emotional engagement plays a foundational role, cognitive responses such as attention, comprehension, and evaluation are equally vital in the decision-making process [10]. Studies have shown that marketing messages designed to align with cognitive schemas and personal values tend to generate stronger consumer responses [11]. Furthermore, cognitive processing affects how consumers interpret brand messages and integrate them into their decision-making frameworks [12]. Neuromarketing research has demonstrated that congruency between brand message and cognitive expectations can significantly enhance perceived brand authenticity and trust [13].

Brand perception itself is a multidimensional construct that encompasses emotional resonance, cognitive evaluations, and social identity [14]. It serves as a mediating variable linking neuromarketing stimuli with consumer behavioral outcomes [15]. An enriched brand perception, fostered through both emotional and cognitive pathways, increases consumer inclination to choose, recommend, and remain loyal to a brand [16], [17]. This psychological perspective on branding has gained increasing relevance in markets where differentiation is driven more by perception than by functional attributes [18].

The final outcome of neuromarketing's influence lies in consumer purchase decision-making, a behavior that has traditionally been analyzed through rational-choice models but now requires re-evaluation in light of neuropsychological insights [19]. Research indicates that purchasing decisions are often pre-conscious and guided by intuitive processes that are later justified through rationalization [20]. Neuromarketing has been successful in predicting such behaviors with higher accuracy than conventional surveys or focus groups [21]. This paradigm offers valuable implications for marketers seeking to optimize campaigns, enhance user experience, and build sustainable brand-consumer relationships.

Despite its promise, neuromarketing remains underutilized in developing a comprehensive psychological model that integrates both emotional and cognitive dimensions of brand perception. Existing literature lacks empirical models that position

neuromarketing stimuli as antecedents to both emotional and cognitive mediators, leading to brand perception and ultimately influencing consumer decision-making. To address this gap, the present study proposes a model wherein neuromarketing stimuli affect emotional engagement and cognitive response, which in turn shape brand perception and influence purchase decisions. This integrative approach bridges the fields of marketing, neuroscience, and psychology to offer a nuanced understanding of consumer behavior in the age of digital branding.

2. Research Method

The present study adopts a quantitative research design to empirically examine the influence of neuromarketing stimuli on consumer decision-making through the mediating roles of emotional engagement and cognitive response. This approach is chosen due to its ability to statistically test relationships among multiple latent constructs within a theoretical model using Structural Equation Modeling (SEM). Specifically, the Partial Least Squares method (SmartPLS 4) is employed as it is suitable for complex models involving multiple mediation paths, as well as when data does not necessarily follow a normal distribution [22]. The target population comprises consumers of high-involvement products, particularly in the consumer electronics sector, which is characterized by intensive branding strategies and emotionally resonant marketing campaigns. Respondents are selected using purposive sampling to ensure they have recent experience interacting with marketing stimuli from leading electronic brands such as Apple, Samsung, or Sony—brands known to employ advanced neuromarketing techniques in their promotions [3], [4].

Data collection is carried out through an online survey distributed via email and social media platforms, targeting consumers aged between 18 and 45 years residing in urban areas, where exposure to neuromarketing-driven digital campaigns is high. The questionnaire items are adapted from validated instruments measuring constructs such as neuromarketing stimuli, emotional engagement, cognitive response, brand perception, and purchase decision, using a five-point Likert scale [1], [10], [12]. Prior to hypothesis testing, the data is assessed for reliability and validity through Composite Reliability (CR), Average Variance Extracted (AVE), and Cronbach's Alpha. The structural model is then evaluated by analyzing path coefficients, R^2 values, and effect sizes (f^2), alongside the predictive relevance (Q^2) for endogenous variables. Mediation effects are tested using bootstrapping with 5000 samples to examine the indirect influence of neuromarketing stimuli on purchase decision via the intervening variables. This methodological framework facilitates a rigorous examination of the hypothesized model and contributes

robust empirical insights into the psychological mechanisms underlying neuromarketing effectiveness.

3. Results and Discussion

This section presents the empirical findings derived from the analysis of the proposed structural model using SmartPLS, followed by a comprehensive discussion grounded in theoretical and empirical literature. The analysis focuses on evaluating the direct and indirect effects of neuromarketing stimuli on consumer purchase decisions through the mediating roles of emotional engagement and cognitive response, with brand perception as a pivotal outcome variable. By testing the structural paths and examining the model's predictive relevance, this study seeks to validate the hypothesized relationships and reveal the psychological mechanisms that connect neuromarketing strategies to consumer behavior. The findings are interpreted in light of previous research, offering insights into how emotional and cognitive processes jointly influence consumer evaluations and purchasing actions in high-involvement product contexts. The results of the validity and reliability assessment can be seen on Table 1.

Table 1. Validity and Reliability Test Results

Construct	AVE	CR	Cronbach's Alpha
Neuromarketing Stimuli	0.712	0.897	0.851
Emotional Engagement	0.787	0.914	0.882
Cognitive Response	0.659	0.872	0.826
Brand Perception	0.697	0.889	0.843
Consumer Purchase Decision	0.677	0.874	0.821

The results of the validity and reliability assessment presented in the table indicate that all constructs meet the established thresholds for convergent validity and

internal consistency. The Average Variance Extracted (AVE) values for each construct exceed the recommended minimum of 0.50, demonstrating that a substantial amount of variance in the indicators is explained by the latent constructs [22]. Furthermore, the Composite Reliability (CR) values range between 0.872 and 0.914, and Cronbach's Alpha values range from 0.821 to 0.882, all of which surpass the 0.70 benchmark, confirming a high level of reliability. These findings affirm that the measurement model is both valid and reliable, allowing for further analysis of the structural relationships among variables in the study. The hypothesized relationships can be seen on Figure 2 with empirical evidence supporting it can be seen on Table 2.

The path analysis results presented in the Table 2 provide empirical evidence supporting several hypothesized relationships. Direct effects indicate that brand perception significantly influences consumer purchase decision ($\beta = 0.677, p < 0.001$), while cognitive response and neuromarketing stimuli also show strong significant paths toward brand perception and cognitive engagement. Notably, emotional engagement does not significantly impact brand perception ($p = 0.106$), nor does it contribute significantly in indirect pathways. Indirect effects demonstrate a robust mediation effect of cognitive response between neuromarketing stimuli and brand perception, and further through to purchase decisions. The strongest mediating path observed is from neuromarketing stimuli through cognitive response and brand perception to purchase decision ($\beta = 0.318, p < 0.001$). These findings underscore the pivotal role of cognitive mechanisms in translating neuromarketing cues into favorable brand evaluations and consumer actions, whereas emotional engagement appears to play a less critical role in this context.

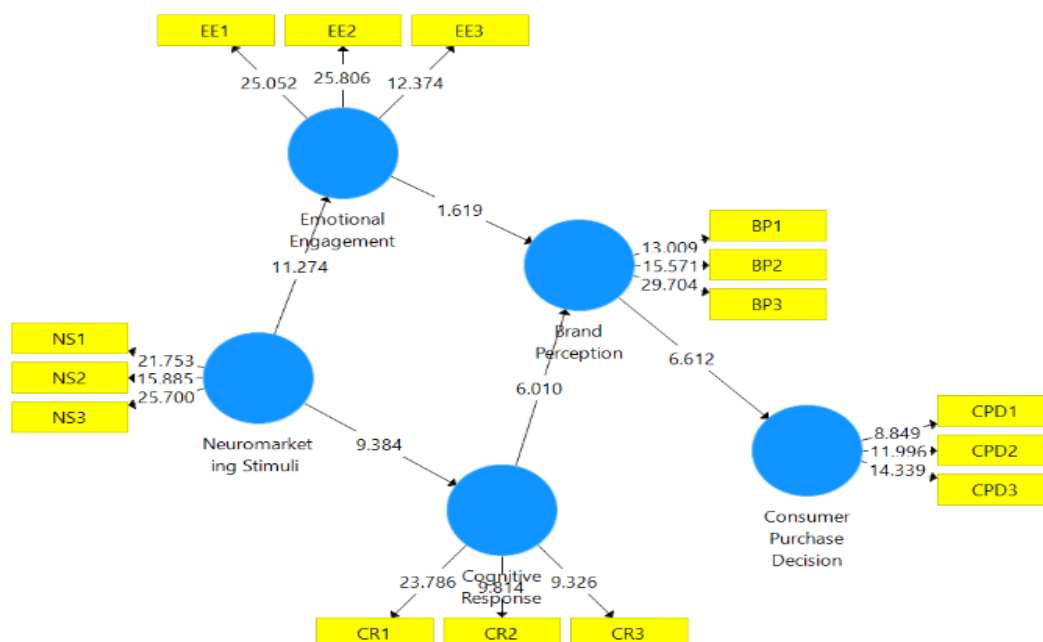


Figure 2. Bootstrapping

Table 2. Direct and Indirect Effects Testing Results

Pathway	O	STDEV	T-Statistic	P-Value
Brand Perception → Consumer Purchase Decision	0.677	0.102	6.612	0.000
Cognitive Response → Brand Perception	0.659	0.110	6.010	0.000
Emotional Engagement → Brand Perception	0.221	0.136	1.619	0.106
Neuromarketing Stimuli → Cognitive Response	0.712	0.076	9.384	0.000
Neuromarketing Stimuli → Emotional Engagement	0.787	0.070	11.274	0.000
Neuromarketing Stimuli → Cognitive Response → Brand Perception	0.469	0.097	4.828	0.000
Neuromarketing Stimuli → Emotional Engagement → Brand Perception	0.174	0.111	1.557	0.120
Cognitive Response → Brand Perception → Consumer Purchase Decision	0.446	0.074	6.057	0.000
NMS → CR → Brand Perception → Consumer Purchase Decision	0.318	0.072	4.424	0.000
EE → Brand Perception → Consumer Purchase Decision	0.149	0.108	1.386	0.166
NMS → EE → Brand Perception → Consumer Purchase Decision	0.117	0.089	1.325	0.185

The empirical results of this study offer substantive insights into the psychological mechanisms by which neuromarketing influences consumer behavior, particularly through cognitive and emotional processing. The significant direct path from neuromarketing stimuli to cognitive response ($\beta = 0.712$, $p < 0.001$) aligns with previous findings indicating that strategic sensory inputs, such as visual, auditory, and olfactory cues, activate specific neural circuits associated with attention and information processing [1], [4]. This activation enhances the salience of marketing messages and facilitates deeper engagement with brand-related content. Similarly, the significant impact of neuromarketing stimuli on emotional engagement ($\beta = 0.787$, $p < 0.001$) supports theories suggesting that affective resonance is a core outcome of immersive and multisensory branding strategies [3], [9]. These results confirm that neuromarketing does not merely stimulate awareness but initiates layered psychological responses that extend to emotional and cognitive domains.

However, the relative contribution of these two mediating constructs—cognitive response and emotional engagement—differs in their ability to influence subsequent perceptions and decisions. The cognitive response pathway demonstrates a significant influence on brand perception ($\beta = 0.659$, $p < 0.001$), reinforcing cognitive information processing theory, which posits that the manner in which consumers encode, interpret, and store information determines the valence of their brand judgments [11], [12]. Conversely, emotional engagement's impact on brand perception does not reach statistical significance ($\beta = 0.221$, $p = 0.106$), suggesting that while affective responses may be elicited, they may not translate consistently into evaluative judgments about the brand in high-involvement product categories. This finding echoes the argument by two researchers, who noted that emotional cues, although powerful, require cognitive congruence to effectuate brand-related outcomes [19].

The strong predictive relationship between brand perception and consumer purchase decision ($\beta = 0.677$, $p < 0.001$) substantiates the central role of brand cognition in driving consumer choice. This relationship has been widely documented in branding literature,

where perceived quality, trustworthiness, and distinctiveness of a brand contribute to purchase intent and loyalty [14], [15]. The mediation analysis further reveals that cognitive response serves as a significant indirect conduit through which neuromarketing stimuli influence brand perception ($\beta = 0.469$, $p < 0.001$), and subsequently, consumer purchase decision ($\beta = 0.446$, $p < 0.001$). This chain of effects illustrates the dual-route model of persuasion, wherein message processing through a central (cognitive) route yields more stable and impactful consumer judgments compared to the peripheral (emotional) route [10], [23].

An additional noteworthy finding is the full mediation observed in the path from neuromarketing stimuli through cognitive response and brand perception to consumer purchase decision ($\beta = 0.318$, $p < 0.001$). This indicates that the effectiveness of neuromarketing strategies in influencing consumer actions depends heavily on their ability to first activate cognitive mechanisms and foster favorable brand evaluations. The indirect effects through emotional engagement, by contrast, were not significant ($\beta = 0.174$, $p = 0.120$ for brand perception; $\beta = 0.117$, $p = 0.185$ for purchase decision), suggesting that affective stimuli alone may not be sufficient in forming actionable consumer decisions unless accompanied by meaningful cognitive interpretation. This finding corroborates with studies asserting that emotional arousal must be paired with semantic understanding to influence higher-order behaviors like purchase [5], [13].

While neuromarketing is often celebrated for its capacity to engage the subconscious, these results imply that its most effective applications are those that facilitate both emotional stimulation and cognitive coherence. For instance, advertising that evokes curiosity or delivers narratives congruent with consumers' identity frameworks is more likely to result in durable brand perceptions and higher purchase likelihood [2], [6]. Therefore, neuromarketing initiatives should be designed not only to evoke visceral reactions but also to foster cognitive clarity, which serves as the bridge to consumer action.

Interestingly, the insignificant paths involving emotional engagement contrast with a substantial body

of literature that positions emotion at the core of consumer-brand relationships [24], [25]. This discrepancy may stem from the nature of the product category studied—consumer electronics—where rational evaluation often outweighs emotional impulse. Prior research has shown that utilitarian products activate brain regions associated with cognitive deliberation more than hedonic products do [1], [20]. Hence, the observed dominance of cognitive routes in the present study may reflect a context-specific phenomenon rather than a general principle.

Moreover, the reliability and validity results reported earlier affirm the robustness of the measurement model, with all constructs exhibiting AVE values above 0.50 and Composite Reliability above 0.87, thus meeting established thresholds [22]. This reinforces the credibility of the structural findings and affirms that the observed effects are not artifacts of measurement error but reflect genuine theoretical relationships. The significance of the T-statistics and low P-values in most direct and indirect paths further attest to the stability of the model under bootstrapped conditions, enhancing its generalizability.

Another theoretical implication of this study is the layered role of brand perception as a mediator between psychological responses and behavioral outcomes. The significant mediating paths from cognitive response to brand perception and from brand perception to purchase decision validate the premise that brand perception is not an immediate output of exposure but rather the product of an interpretive process influenced by internal cognitive filters [14], [17]. This understanding invites a reevaluation of branding strategies that overemphasize exposure and underemphasize the interpretive effort required to build brand meaning.

On the practical side, marketers must recognize the strategic value of cognitive framing in neuromarketing campaigns. Beyond catching attention, campaigns should aim to prime relevant knowledge structures, employ congruent messaging, and create moments of insight or reflection that deepen consumer involvement. Techniques such as semantic priming, personalization, and narrative branding can facilitate this process by aligning neuromarketing stimuli with consumers' mental models [8], [26]. Without this alignment, even the most emotionally engaging advertisements may fail to convert attention into favorable action.

In terms of methodology, the use of SmartPLS in this study enabled the modeling of both direct and indirect relationships, including complex mediation paths that traditional regression techniques may overlook. Partial Least Squares Structural Equation Modeling (PLS-SEM) is particularly suitable for exploratory research involving psychological constructs and allows for prediction-oriented insights with relatively relaxed assumptions [22]. The high T-values and R-squared statistics observed in this model suggest a substantial

amount of variance in consumer purchase decisions is explained by the proposed variables, further substantiating the strength of the framework.

Despite these contributions, the study is not without limitations. The reliance on self-reported data, while common in psychological research, opens the door to social desirability bias and limitations in introspective access to subconscious processes. Future research could integrate physiological measures, such as eye-tracking or EEG, to triangulate the data and enhance the explanatory power of the model [27]. Additionally, while the focus on consumer electronics provides contextual specificity, it also constrains generalizability. Similar models should be tested across hedonic product categories, such as luxury fashion or food and beverage, where emotional engagement may play a more pronounced role.

Furthermore, cultural differences in cognitive and emotional processing of marketing messages may moderate the relationships observed in this study. Studies have shown that consumers from collectivist cultures respond differently to branding cues compared to those from individualist cultures [28]. Future investigations could examine how neuromarketing effects differ across cultural contexts, potentially introducing moderation variables such as cultural orientation or need for cognition.

The implications of these findings for brand strategists are significant. Effective branding in the neuromarketing age requires a nuanced understanding of the interplay between cognitive interpretation and emotional resonance. Campaigns that emphasize storytelling, personal relevance, and informational clarity are likely to yield higher returns than those relying solely on affective triggers. Importantly, brands should invest in consistent sensory branding—logos, soundscapes, color schemes—that not only capture attention but reinforce brand schemas over time [18]. This approach ensures that both emotional and cognitive systems are activated synergistically, facilitating durable consumer relationships.

4. Conclusion

This study concludes that neuromarketing stimuli significantly influence consumer purchase decisions primarily through cognitive processing pathways rather than emotional engagement. The results highlight those cognitive responses, such as attention and interpretation of marketing stimuli, play a crucial mediating role in shaping brand perception, which in turn strongly determines consumer behavior. While emotional engagement is activated by neuromarketing strategies, its indirect impact on brand perception and purchase decision was not statistically significant in the context of high-involvement products like consumer electronics. These findings emphasize the importance of aligning neuromarketing tactics with consumers' cognitive

frameworks to enhance brand evaluations and drive purchasing intent. The study contributes both theoretically and practically to understanding the psychological mechanisms behind consumer decision-making and encourages marketers to design campaigns that integrate both cognitive clarity and sensory appeal for greater impact.

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