

Neuromarketing and Consumer Decision-Making: Insights into Emotional, Cognitive, And Behavioural Responses

¹Aswini D, ²Dr. R Kathaia

¹Research Scholar, School Of Commerce, Vel Tech Rangarajan Dr. Sagunthala R&D Institute Of Science and Technology

²Associate Professor, School of Commerce, Vel Tech Rangarajan Dr.Sagunthala R&D Institute of Science and Technology

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ABSTRACT

Purpose: The aim of this research is to investigate the impact of neuromarketing on consumer decision-making, considering emotional, cognitive, and behavioral aspects. This study tests whether there is any correlation between neuromarketing-related emotional cues and brand perception, customer satisfaction, and purchase intention.

Design/Methodology/Approach: A quantitative approach with questionnaire design is recommended. The model consists of the Neuromarketing-Based Emotional Cues (NEC) as the independent variable, Brand Perception (BP) and Customer Satisfaction (CS) as mediating variables, and Purchase Intention (PI) as the dependent variable. For the demonstration of statistical procedures, an illustrative sample of 200 respondents is used. The numerical results are just illustrative for manuscript preparation and should be substituted by actual field data when submitting the paper empirically.

Findings: Based on the illustrative analysis, positive and statistically significant correlations between the variables were found. Emotional cues have positive correlations with brand perception and customer satisfaction, while brand perception and customer satisfaction are positively correlated with purchase intention. Regression and mediation results exemplify how emotional and cognitive processes could be studied in the context of consumer decision making.

Originality/Value: This study combines emotional, cognitive, and behavioral aspects into a simple neuromarketing-oriented framework. Moreover, this study explicitly considers questionnaire-based consumer response from one side and neurological or physiological measurements from the other side.

1 INTRODUCTION

Neuromarketing has been developing through the confluence of marketing, neuroscience, psychology, and behavioral science. The focal point of the area is the understanding of consumer responses to marketing stimuli and the processes behind attention, emotion, value assessment, memory, persuasion, and decision making. According to recent reviews, neuromarketing has evolved from the scope of neuroimaging applications to a broader range of methods, such as EEG, eye-tracking, pupillometry, fMRI, artificial intelligence, and multimethods. These advances increase the potential of neuromarketing to deliver deeper insights into consumer decision making (Hossain et al., 2024; Alsharif et al., 2024). The broadness of methodologies used in neuromarketing and consumer neuroscience is further addressed in the recent literature. For example, Alsharif et al. (2024) review the advances made in neuromarketing and discuss the growing number of studies that employ fMRI, eye-tracking, EEG, and computational methods to explore consumers' responses. In addition to that, Alsharif et al. (2024) review methodological weaknesses, ethical issues, and the need for the integration of neuroscientific tools with conventional marketing research. Such trends clearly demonstrate that neuromarketing is viewed increasingly as a complementary tool to explore consumers' behaviour rather than an alternative to traditional marketing research (Alsharif et al., 2024; Kansra et al., 2024).

Consumer decision making entails the utilization of affective and cognitive processes. In evaluating factors such as price, quality, utility, risk, and other product characteristics, consumers may experience affective responses like pleasure, trust, excitement, familiarity, or attraction. Therefore, contemporary studies in consumer neuroscience seek to complement traditional behavioral studies by exploring the processes of attention, arousal, cognitive processes, emotion, and subjective value. For instance, recent studies on pupillometry indicate that the pupil response can provide valuable insights on cognitive load, arousal, and emotional processing although care should be taken during interpretation of results (McInnes & Sung, 2025; Karmarkar & Plassmann, 2019). Recent work has also sought to relate neuromarketing with advertising effectiveness and consumer engagement. Through the use of EEG, it has been shown that neurophysiological measures have the potential of being used to examine consumers' response to advertisement stimuli and any variation in the level of attention and emotional engagement. Studies using neurophysiological measures have indicated that neurophysiological measures can provide information that cannot be gathered through conventional methods (Hossain et al., 2024; Neuro-signaling Techniques in Advertisement Endorsements, 2025).

On the other hand, the use of consumer neuroscience faces several challenges associated with methodology, practice, ethics, and interpretation. Issues related to sample size, ecological validity, reliability of the measure, data interpretation, cost, complexity, privacy, and consumer information usage have been highlighted in research works. A review conducted by Kansra et al. (2024) has revealed a number of constraints that limit the use of consumer neuroscience and stress the necessity for methodological robustness and responsible implementation of the tool. In other words, neuromarketing results should be taken into consideration cautiously since physiological or neurological responses can be used to justify actual consumer behaviour (Kansra et al., 2024). The current paper examines a parsimonious model of consumer decision making in which neuromarketing emotional stimuli are expected to influence brand perception and customer satisfaction that will, in turn, affect purchase intention. This model involves the emotional, cognitive, and behavioural aspects of consumer decision making and considers both direct and indirect relationships between constructs. Since the current study employs survey-based measures, emotional and cognitive responses are considered to be self-reported psychological responses that cannot be regarded as neural or physiological responses. It is important to mention the fact that neuromarketing requires using objective measures such as EEG, eye-tracking, fMRI, pupillometry, and other physiological measures (Plassmann et al., 2015; Hossain et al., 2024).

II REVIEW OF LITERATURE

2.1 Neuromarketing and Consumer Decision-Making

Neuromarketing focuses on the use of neuroscience and psychophysiological tools for the purpose of answering marketing questions. Recent literature reviews have shown that EEG, eye tracking, fMRI, pupillometry, machine learning, and multimethod approaches are being increasingly employed. These methods offer the capability to learn more about attention, arousal, valuation, memory, and decision-making processes that could be valuable alongside behavioral measures. This has enhanced the possibility of neuromarketing by virtue of the convergence between neuroscience and marketing in explaining consumer decision-making processes (Hossain et al., 2024; Alsharif et al., 2024).

2.2 Emotional Responses

Emotion is an essential aspect of consumer evaluations due to the ability of marketing stimuli to create emotions that could impact consumers' attention, memory, brand evaluation, engagement, and intention. Neuromarketing scholars have been giving attention to the emotional response not as an output but as part of the affective processing/consumer decision-making interaction process. Consumer neuroscience studies have identified affective processing, subjective value, persuasion, and attention as critical processes by which consumers react to marketing stimuli (Karmarkar & Plassmann, 2019; Gkintoni et al., 2024).

2.3 Cognitive Responses

Some examples of cognitive responses are attention, information processing, evaluation, memory, learning and perceived value. Recent research using EEG technique shows that consumer behavior may be explained in terms of interaction between marketing stimuli and consumers' psychological characteristics, such as cognitive and affective processes, as well as external environment. These results show that cognitive processing is very important in terms of interpretation of marketing information and formation of evaluations and decisions by consumers (Hossain et al., 2024).

2.4 Brand Perception

Brand perception is interpretation and evaluation of brand related information by consumers. Emotions and cognition related to advertisement, packaging, price, product, images and other marketing stimuli might help consumers to form positive or negative perceptions about the brands. The use of neuromarketing techniques in addition to consumer reported evaluations might allow researchers to study consumers' attention, emotions and physiology regarding brand related stimuli. Thus, understanding of both evaluations and responses would allow researchers to have a more complete picture of brand perception (Plassmann et al., 2015; Alsharif et al., 2024).

2.5 Consumer Satisfaction

Consumer satisfaction indicates how people perceive their experience with a particular brand, product, or service. Consumers' positive perception and experience could lead to consumer satisfaction and have an effect on consumers' behavioral intentions in the future. According to the suggested model, consumer satisfaction is seen as an intermediate variable that can serve as a mechanism to convert positive perceptions of brands into stronger purchase intentions. The discussed approach is aligned with the general approach in consumer behavior that views consumers' responses in terms of integrated psychological and behavioral processes (Karmarkar & Plassmann, 2019; Gkintoni et al., 2024).

2.6 Purchase Intention

Purchase intention stands for consumer willingness to purchase a product or brand. There has been a growing trend in neuromarketing studies to analyze attention, emotions, rewards, perceived value, and cognitive assessment as factors that can affect purchase decisions. Nonetheless, purchase intention is just a behavioral tendency, not actual purchase behavior or any neurobiological activity. Questionnaire-based measures of purchase intentions should be viewed as such and cannot be seen as direct evidence of consumer behavior or brain functioning (Plassmann et al., 2015; Hossain et al., 2024).

2.7 Recent Research Trends

Recent studies have been conducted on the use of EEG, fMRI, eye-tracking, pupillometry, and computational methods in neuromarketing. But there are still some methodological limitations, ethical issues, ecological validity, and the incorporation of neurological results with traditional consumer research to be overcome (Hossain et al., 2024; Alsharif et al., 2024; Kansra et al., 2024). Another recent trend is to consider emotions and cognition at various stages of consumer decision making process. But there is not much research done to combine emotional cues, brand perception, customer satisfaction, and purchase intentions (Gkintoni et al., 2024; McInnes & Sung, 2025). So the current paper intends to fill this gap by exploring the interconnection between neuromarketing emotional cues, brand perception, customer satisfaction, and purchase intention. The research also draws a line between psychological and neurological aspects (Hossain et al., 2024; Kansra et al., 2024).

III RESEARCH GAP

Limited integration: The current neuromarketing literature mostly tends to concentrate on one particular neuropsychological or physiological aspect without considering the overall consumer reaction.

Emotional component: Not much consideration is paid to the effects that neuromarketing-based emotional cues have on consumers' subsequent evaluations and decisions.

Brand perception: The role of brand perception in bridging emotional cues and consumer decision making deserves more study.

Customer satisfaction: There is not enough research that would integrate the concept of customer satisfaction with emotional cues and brand perception to predict purchase intention.

Purchase intention: Emotional cues, brand perception, customer satisfaction, and purchase intention are not often studied in relation to each other in consumer decision making process.

Methodological constraints: Methodological limitations of consumer neuroscience research remain in terms of measuring, interpreting and applying neurophysiological techniques.

Ethical constraints: There are ethical considerations associated with consumer neuroscience research, namely, consumer privacy, proper participation, and interpretation of neurological and physiological reactions.

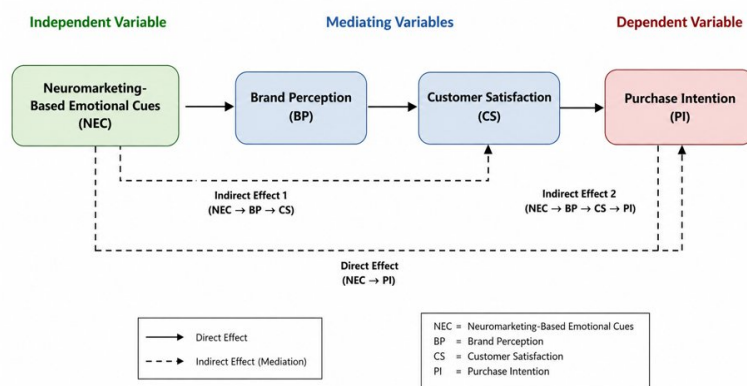
Integration of concepts: There is a need for the development of the concise model integrating neuromarketing-based emotional cues, brand perception, customer satisfaction, and purchase intention.

Validation of the model: Such a model can be tested with the help of questionnaires and later confirmed with the help of neuromarketing methods.

IV OBJECTIVES

- To determine the impact of the emotional cues through neuromarketing on brand perception.
- To determine the impact of brand perception on customer satisfaction and purchasing intention.
- To determine the impact of customer satisfaction on purchasing intention.
- To find out whether brand perception and customer satisfaction mediate the relationship between emotional cues and purchasing intention.

V CONCEPTUAL FRAMEWORK



This framework posits that the neuromarketing based emotional cues affect consumers' brand perception by affecting their emotional response to marketing stimuli, attention towards marketing messages and evaluating the marketing stimuli. Brand perception that is positive in nature could lead to higher customer satisfaction by setting up positive expectations and experiences that would then further help to increase the purchase intention of consumers. This model also allows for a direct effect of emotional cues on the purchase intention because sometimes emotional response could affect the decisions of consumers without going through the mediating variables. Moreover, this framework evaluates whether the brand perception and customer satisfaction mediate the effect of emotional cues on purchase intention.

VI HYPOTHESES

- H1: Neuromarketing-based emotions affect brand perception positively.
- H2: Brand perception affects customer satisfaction positively.

H3: Customer satisfaction affects purchase intention positively.

H4: Brand perception and customer satisfaction act as mediating variables in the relationship between neuromarketing-based emotions and purchase intention.

VII METHODOLOGY

7.1 Research Design

A quantitative cross-sectional research design has been used. It is suggested that a structured questionnaire be employed to measure the four constructs included in the conceptual model.

7.2 Population and Sample

In the illustrative analysis, a sample of 200 consumers is considered. The target population of the survey can be defined as consumers aged 18 and over having some exposure to marketing communications and experience in evaluating various products or brands. The number of respondents and the method of sampling should be substituted for an actual field methodology in the empirical version of the manuscript.

7.3 Measurement

All four variables were measured with the help of several items on the 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Emotional cues are related to emotional appeal, attraction, and affective involvement. In addition, brand perception is based on favourable brand evaluation and associations, trust in the brand and its image. Satisfaction reflects overall customer satisfaction and meeting of expectations whereas purchase intention shows willingness to make a purchase.

7.4 Statistical Techniques

It involves respondent profile, descriptive statistics, reliability, correlation analysis, multiple regression, and mediation. The level of significance was set at 5%. The following numerical analysis is given for illustrative purposes only.

VIII DATA ANALYSIS AND RESULTS

8.1 Respondent Profile

Illustrative sample: N = 200.

Table 1

Characteristic	Category	Frequency (%)
Gender	Male	92 (46.0%)
Gender	Female	104 (52.0%)
Gender	Other/Prefer not to say	4 (2.0%)
Age	18–25	64 (32.0%)
Age	26–35	78 (39.0%)
Age	36–45	38 (19.0%)
Age	46+	20 (10.0%)
Education	Undergraduate	78 (39.0%)
Education	Postgraduate	96 (48.0%)
Education	Other	26 (13.0%)

The profile provided is relatively evenly distributed between genders and the largest group falls in the age category of 26-35 years. The profile is only an example to show the reporting format.

8.2 Descriptive statistics

Table 2

Construct	Mean	SD	Min	Max
Emotional Cues (NEC)	3.72	0.71	1.60	5.00
Brand Perception (BP)	3.68	0.69	1.80	5.00
Customer Satisfaction (CS)	3.75	0.73	1.60	5.00
Purchase Intention (PI)	3.81	0.76	1.40	5.00

The illustrative measures are above the midpoint value on the scale of 3.00, indicating that the responses are mostly positive. The purchase intention measure is the highest (3.81), then customer satisfaction (3.75), emotional triggers (3.72), and brand perception (3.68).

8.3 Reliability Analysis

Table 3

Construct	No. of Items	Cronbach's Alpha
Emotional Cues	5	0.88
Brand Perception	5	0.86
Customer Satisfaction	4	0.89
Purchase Intention	4	0.91

All the calculated values of Cronbach's alpha coefficient are above 0.80. In a real-life situation, one must also consider item-total correlations and alpha if item deleted values.

8.4 Correlation Analysis

Table 4

Variable	NEC	BP	CS	PI
NEC	1.00	0.62**	0.58**	0.55**
BP	0.62**	1.00	0.66**	0.61**
CS	0.58**	0.66**	1.00	0.70**
PI	0.55**	0.61**	0.70**	1.00

$p < 0.01$. The above correlation matrix suggests positive relationships among all four constructs. The most significant relationship is observed between customer satisfaction and purchase intention ($r = 0.70$), followed by brand perception and customer satisfaction ($r = 0.66$).

8.5 Regression Analysis: Emotional Cues → Brand Perception

Table 5

Predictor	β	t	p	R ²
NEC → BP	0.62	10.99	<0.001	0.38

The example regression shows that emotional triggers have a positive effect on brand perception ($\beta = 0.62$, $p < 0.001$). The regression accounts for about 38% of the variance in brand perception. This is an indication of support for H1.

8.6 Regression Analysis: Brand Perception → Customer Satisfaction

Table 6

Predictor	β	t	p	R ²
BP → CS	0.66	12.29	<0.001	0.44

Brand perception is illustrated to be positively associated with customer satisfaction ($\beta = 0.66$, $p < 0.001$). This model accounts for 44% of the variance in customer satisfaction, which supports H2.

8.7 Multiple Regression

Table 7

Predictor	β	SE	t	p	R ²
NEC	0.16	0.06	2.72	0.007	0.54
BP	0.25	0.07	3.68	<0.001	0.54
CS	0.48	0.07	6.94	<0.001	0.54

The above example of multiple regression accounts for 54% of the total variance of purchase intention. The standardized coefficients are 0.48 for customer satisfaction, 0.25 for brand perception, and 0.16 for emotional cues. All three predictors are

significant. Thus, we can say that there is an influence of emotional cues on purchase intention through consumer's brand perception and satisfaction.

8.8 Mediation Analysis

Table 8

Indirect Path	Illustrative Effect	Bootstrapped 95% CI	Decision
NEC → BP → PI	0.15	0.08 to 0.23	Significant
NEC → CS → PI	0.28	0.19 to 0.37	Significant
NEC → BP → CS → PI	0.20	0.13 to 0.28	Significant

According to the illustrative mediation analyses, the indirect effects are positive since the bootstrap confidence intervals do not contain zero values. This implies that emotions might impact purchase intentions via the influence on brand perception and customer satisfaction. As the effect of emotions on purchasing intention is statistically significant, despite the inclusion of brand perception and customer satisfaction in the model, the mediation process would be classified as partial.

8.9 Hypothesis Summary

Table 9

Hypothesis	Illustrative Result	Decision
H1	NEC → BP: $\beta = 0.62$, $p < 0.001$	Supported
H2	BP → CS: $\beta = 0.66$, $p < 0.001$	Supported
H3	CS → PI: $\beta = 0.48$, $p < 0.001$	Supported
H4	Indirect effects significant	Supported

IX DISCUSSION

According to the illustrative findings, neuromarketing-based emotional cues have a positive impact on brand perception. It is assumed that emotional stimuli in the marketing communication might affect consumer's favorable attitude toward the brand. Emotional reactions can impact the process of attention, perception, and evaluation of marketing stimuli, which can contribute to the creation of positive brand perception. The illustrative findings also show that there is a positive relationship between brand perception and customer satisfaction. People with favorable perceptions of the brand can provide more positive reports of the brand experience and their satisfaction. There is also a high degree of relationship between customer satisfaction and purchase intention, indicating that the decision-making process of the consumers does not rely only on initial emotional reactions, but also on further evaluation of the brand experience.

Mediation analysis provides a more detailed understanding of the proposed relationships. According to the illustrative findings, emotional cues have an indirect effect on purchase intention via brand perception and customer satisfaction. That is, people's emotional reactions affect purchase intention by shaping brand perception and further influencing customers' satisfaction. The suggested model includes all three stages of the consumer decision-making process - emotional, cognitive, and behavioral. Nevertheless, the illustrative findings should be viewed cautiously, since the proposed research will use questionnaires as research measures. Consumers' perceptions, emotions, satisfaction, and purchase intentions are subjective measures, which cannot serve as evidence of actual neurological activity. Such research requires the use of objective techniques like EEG, eye tracking, fMRI, pupillometry, etc. Thus, future research can validate the suggested relationships with the help of objective neuromarketing techniques.

X THEORETICAL IMPLICATIONS

The study offers several theoretical implications related to neuromarketing and consumer decision-making. First, the findings contribute to the development of the consumer behaviour perspective by linking the emotional cues of neuromarketing with the perceptions of brands held by the consumers. It confirms the notion that consumer decisions are driven not only by their rational assessments but also by emotions that they experience when reacting to marketing stimuli. Second, the research advances the knowledge about the relationship between emotions, cognitions and behavior in consumer decision-making process. The suggested model links the emotional cues with the brand perception, customer satisfaction and purchase intention as key components of consumer decision-making process that can explain how emotions lead to cognition and behavior. Third, the study helps to theoretically position the brand perception and customer satisfaction as mediating factors. Instead of suggesting that the emotional cues have a direct impact on the purchase intention of the consumers, the study offers that these emotional responses may affect how customers perceive the brand and how they feel about it, and this can impact their purchase intention.

Fourth, the suggested research contributes to the consumer neuroscience perspective by differentiating between psychological responses and the neurological responses. The questionnaire-based framework provides an initial foundation to study the perceptions and intentions of the consumers and the future research may build on it by utilizing EEG, eye-tracking, fMRI, pupil

measurement, etc. Finally, the proposed framework provides a theoretical ground for future neuromarketing research because it integrates all three dimensions (emotional, cognitive and behavioral) into one model. This model can be further expanded through addition of such variables as attention, emotional arousal, perceived value, brand trust, consumer involvement and actual purchase.

XI LIMITATIONS

1. Questionnaire-based method captures self-reported psychological response rather than any physiological/neural activity.
2. Numerical values used in the paper are for illustration only, and need to be substituted with real-world data for empirical research.
3. Cross-sectional data cannot make any strong conclusions about time-related effects and causality.
4. Intention to buy does not necessarily imply purchase behavior.
5. Further research will validate the framework using objective measures.

XII FUTURE RESEARCH

Future research should use both self-report scales and EEG, eye-tracking, pupillometry, facial expression analysis, galvanic skin response, or another applicable measure. Multimethod designs would allow for comparisons between subjective and objective measures of response. In recent studies, there are opportunities to include the usage of AI and machine learning techniques in neuromarketing research along with methodological and ethical issues. Further research could look into consumer decision-making during pre-purchase, purchase, and post-purchase processes.

XIII CONCLUSION

The field of neuromarketing offers a great interdisciplinary approach to studying consumer behaviour. The suggested theoretical framework involves emotional stimuli, brand image, consumer satisfaction and purchasing intention in one compact model. The example of statistical analysis shows how one can employ reliability, correlation, regression and mediation in the analysis of suggested links. However, the main value of the framework is in combining emotional and cognitive processes and the issue of behavioural intention. However, there is a need to clearly distinguish between results of questionnaire research and neurological studies. Future research based on neurophysiological methods will provide more robust evidence on mechanisms of consumer behaviour.

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