Neuromarketing Strategies in the Retail Sector: A Perception View

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Abstract

This essay examines the continually shifting retail industry. The intricate interaction between psychological processes and external stimuli results in consumer behaviour. This study looks at the application of neuro-marketing strategies in the retail industry, focusing on the extent to which perception affects consumer choices. Using insights from neurology, neuro-marketing aims to better understand and shape consumer behaviour towards brands, goods, and the entire shopping experience. This research explores the neural mechanisms that underlie consumer perception, focusing on how sensory inputs, affective states, and mental processes influence consumer choice. The study investigates the ways in which retailers might leverage neuro scientific discoveries to create immersive in-store experiences, improve product packaging, and maximize advertising tactics. Both qualitative and quantitative data were combined through surveys using a mixed-methods approach. Aspects including product placement, price methods, neuro-feedback testing, social proof, in-store technology, sensory marketing, personalised marketing, and neuro-influenced advertising are all included in the analysis. Through an analysis of these tactics, the paper hopes to offer a thorough grasp of the expanding field of neuromarketing research as well as useful advice for merchants looking to use neuroscience to improve consumer perceptions and optimize engagement, satisfaction, and financial performance in the ever-changing retail environment.

Keywords: *Neuromarketing, Retail Sector, Perception, Consumer Behaviour*

Introduction

In an era of unprecedented advances in technology, changing consumer preferences, and a rapidly evolving international market, companies need to explore novel approaches to draw in and hold the interest of a more discriminating customer base [Singh, 2020]. One such innovative strategy that has become more well-known recently is neuromarketing, a multidisciplinary discipline that combines marketing, psychology, and neuroscience. Globally, the retail sector is going through a paradigm change as insights from neuroscience are added to conventional marketing strategies [Gonchigjav, 2020]. The emergence of neuromarketing has resulted in a revolutionary comprehension of consumer decision-making procedures beyond traditional demographic analysis by exploring the fundamental structure of the human psyche. In a connected world where consumers are inundated with options and information, businesses are using neuromarketing to gain a competitive advantage by developing more memorable and personalised shopping experiences [Avendano *et al.*, 2021].

Market globalization has increased rivalry, which has forced companies to look for creative ways to differentiate themselves in a crowded field. With its emphasis on comprehending the unconscious forces

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influencing consumer behaviour, neuromarketing has become a valuable strategic tool for businesses looking to create effective and focused marketing campaigns [Bercik *et al.*, 2015]. The widespread implementation of neuromarketing tactics demonstrates that companies around the world agree that to maximize their marketing efforts, they must leverage the essential components of the human brain [Castro, Pereira, & Vera, 2021]. Adopting creative marketing techniques is essential for companies looking to connect with the varied and discriminating Indian customer base in the centre of the dynamic Indian retail scene, where conventional bazaars mix with contemporary shopping centres and e-commerce platforms [Nufer, 2022]. India, with its diverse range of cultures, languages, and customs, is a special microcosm where social, economic, and historical elements are intricately entwined with the dynamics of consumer behaviour [Kurtoglu & Ferman, 2020]. Urbanisation, digitization, and changing consumer expectations have all contributed to a notable upheaval of the Indian retail industry in recent years. Retailers are increasingly using cutting-edge strategies like neuromarketing to analyze and influence the tastes of more sophisticated and tech-savvy Indian consumers [Gurgu, Gurgu & Tonis, 2020].

The use of neuromarketing techniques in India is a dynamic reaction to the peculiarities of the Indian market as well as absorption of worldwide trends. A multitude of elements, such as the prevalence of family in decision-making, the influence of cultural holidays on consumer behaviour, and the rapid adoption of digital platforms, contribute to the unique context in which neuromarketing techniques are developed [Paredes-Perez, 2021]. With its focus on perception, this study aims to understand how these deeply ingrained elements of Indian culture interact with neuromarketing cues to mould customer views and affect purchase behaviour. Recognising consumer behaviour is critical for retailers as India maintains its position as one of the world's fastest-growing consumer markets. With its emphasis on the unconscious forces that influence decision-making, neuromarketing has enormous potential to provide detailed insights into Indian consumers' preferences. This study intends to add to the body of knowledge by investigating the effect of Neuromarketing on consumer perception in an Indian setting. It also helps retailers navigate the complexities of the Indian retail sector by offering actionable advice.

Literature Review

Neuromarketing tactics have caused a paradigm shift in the retail industry's approach to consumer involvement in recent years. With a foundation in neurology, neuromarketing seeks to improve marketing efficacy by interpreting consumer behaviour, preferences, and emotional reactions [Eser, Isin & Tolon 2011]. The purpose of this review of the literature is to examine the way neuromarketing techniques affect consumer perceptions in the retail industry by integrating the existing studies.

According to [Kalkova, *et al.*, 2023; Ţichindelean & Ţichindelean 2019; Fortunato, Giraldi & de Oliveira 2014] research, consumer perceptions are intricately entwined with subconscious processes rather than being the exclusive result of conscious decision-making. Through the use of neuroscientific instruments like eye tracking, fMRI, and EEG, researchers have discovered neural patterns linked to the reactions of customers to different retail stimuli. This method provides a comprehensive understanding of decision-making mechanisms by offering insightful information about the complex ways in which the human brain interprets marketing communications.

Neuromarketing techniques have a significant influence on how retail environments are designed and organised. Empirical studies reveal that layouts, illumination, and the general atmosphere play a substantial role in evoking particular feelings, which in turn impact consumers' perceptions of a company and its products [Gani, *et al.*, 2018]. Retailers are enabled to optimise store layouts and create engaging and enjoyable shopping experiences through the strategic deployment of these findings. These tactics are

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also influencing packaging design, which is an important aspect of consumer product engagement [Garczarek-Bąk, *et al.*, 2021]. [Ahmed, *et al.*, 2022] indicates that distinct container designs and colour palettes have the capability to elicit affective reactions, thus moulding customer attitudes and inclinations. With this knowledge, businesses can create packaging to appeal to their target market more subtly and increase brand appeal.

The role that neuromarketing plays in online retail environments is becoming more and more important as e-commerce continues to expand and change the retail landscape [Nufer, 2022]. Website design, colour schemes, and the placement of call-to-action buttons have all been found to have an impact on user experience and online buying behaviour. This demonstrates the neuromarketing methods' versatility on many retail platforms [Gurgu, Gurgu & Tonis, 2020]. Neuromarketing techniques are essential for creating emotional bonds between customers and businesses that go beyond quick purchases. [Bercik *et al.*, 2015] reveal that companies that may induce favourable feelings in their target audience through their promotional materials have a greater chance of building solid, long-lasting bonds with them, which in turn encourages customer loyalty and repeat business. The more profound effect of neuromarketing on long-term consumer behaviour is highlighted by this emotional branding feature [Singh, 2020].

The ethical implications of using neuroscience responsibly to shape customer behaviour have come to light as neuromarketing becomes more popular in the retail industry. It is imperative to tackle issues pertaining to consumer privacy and informed consent in order to guarantee the moral application of neuromarketing methodologies. Therefore, the application of neuromarketing techniques in the retail industry provides a deep comprehension of customer impressions. A growing number of important concerns in the field of neuromarketing are emotional engagement, sensory branding, personalization, demographic considerations, and ethical principles. To understand the intricacies and improve best practices for a changing consumer scenario, merchants must conduct continuing research as they adopt these initiatives while considering the potential advantages and moral ramifications.

Conceptual Framework and Hypotheses Development

Neuromarketing techniques are becoming more and more popular in the retail industry as a means of gaining insight into customer behaviour. The interrelationships among neuromarketing tactics, emotional engagement, and the perception of the retail experience are examined in this conceptual framework. By exploring the brain processes that underlie customer behaviour, companies may create and execute tactics that draw customers in and enhance their impression of the retail space [Kalkova, *et al.*, 2023]. Applying neuroscience concepts to marketing techniques is known as a neuromarketing strategy. These tactics are used in the retail industry to interpret customer responses. They include the use of biometrics, brain imaging, and other neuroscientific instruments [Kurtoglu & Ferman, 2020]. Retailers can determine the primary factors influencing attention, memory, and decision-making processes by analysing neurological data. It examines the application of neuromarketing tactics to maximize customer engagement in areas including sensory experiences, product placement, and store layout.

Emotional engagement plays a crucial role in determining the shopping experience, building on the knowledge obtained from neuromarketing. In addition to affecting brand perception and loyalty, emotions are a major factor in consumer decision-making. The use of neuromarketing data by shops to build emotionally charged spaces will be covered in detail in this section [Singh, Alhassan, & Khoshaim, 2023]. To induce good feelings and create a stronger bond between customers and the retail area, such as use of colour psychology, music, and immersive experiences. Both emotional involvement and neuromarketing techniques have an impact on the complex result of consumer perception [Cordova,

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Cifuentes, Castro & Hinostroza, 2022]. The way these components are integrated affects the retail experience and is perceived overall, and that will be discussed in this section. In addition to sensory signals, emotional resonance and cognitive processing all play a role in how customers perceive a brand and its offerings [Ţichindelean & Ţichindelean 2019].

Recognizing the brain foundations of perception gives businesses important information to hone and customize their tactics for a more memorable and satisfying shopping experience. The paradigm elucidates the interdependent dynamics of neuromarketing tactics, affective involvement, and the perception of the in-store encounter [Cirneci, Angheluța & Gheorghe, 2014]. The framework aims to highlight the cyclical nature of customer perception by demonstrating how neuromarketing insights drive the development of emotionally compelling retail settings. The intention is to present a comprehensive understanding of the way a neuroscientific strategy could be used strategically to improve the entire perceptual experience of shopping [Ismajli, Ziberi & Metushi, 2022].

This conceptual framework emphasizes the significance it is for the retail industry to use neuromarketing techniques to maximize emotional involvement and influence customer perception. Retailers can create more memorable and meaningful experiences that resonate with consumers and promote brand loyalty and positive long-term relationships by recognizing the complex interactions between these factors. The integration of neuroscience concepts into retail practices is expected to have a substantial impact on consumer involvement in the future as technology advances.

The following questions are formulated to address the issues in the current study based on the comprehensive literature survey, research gap, and conceptual framework.

1. How do specific neuromarketing strategies, impact emotional engagement among consumers within the retail sector, and what subsequent effects do these strategies have on the overall perception of the retail experience?

2. How does emotional engagement mediate the relationship between neuromarketing strategies and consumer perceptions of the retail experience?

To tackle the posed research questions, the subsequent objectives are formulated:

1. To investigate the influence of neuromarketing strategies on emotional engagement and, subsequently, on the perception of the retail experience.

2. To understand the mediating role of emotional engagement between neuromarketing strategies and the perception of the retail experience.

The following hypotheses were formulated in accordance with the literature review, research gap, questions, objectives, and conceptual framework;

H_1: Neuromarketing strategies influence emotional engagement, leading to a positive impact on the overall perception of the retail experience.

H_2: Demographic variables have a significant influence on emotional engagement.

H_3: The combined effect of neuromarketing strategies and demographic variables has a significant impact on emotional engagement.

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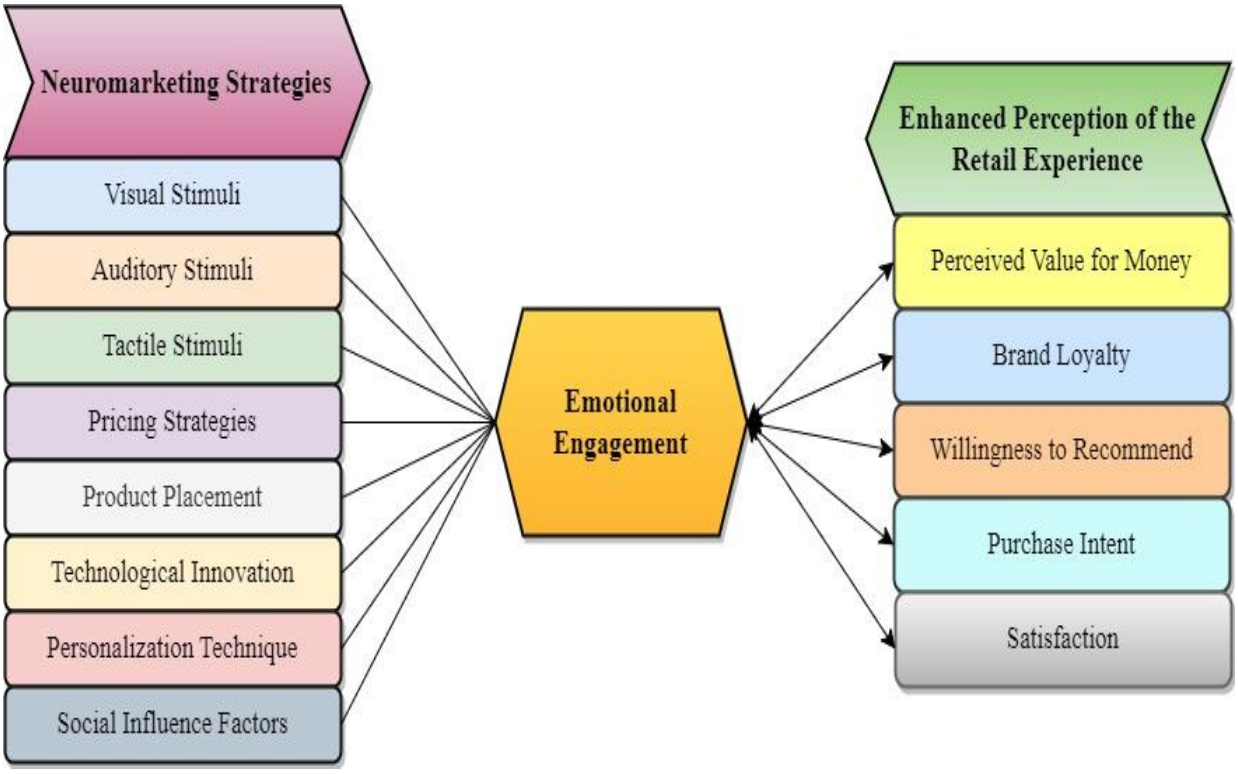
H_4: Emotional engagement acts as a significant mediator in the relationship between neuromarketing strategies, demographic variables, and the perception of the retail experience.

H_5: Neuromarketing strategies and demographic variables have a direct impact on the perception of the retail experience.

Conceptual Model



Source: *Compiled by Authors*

Research Design

Sample and Participants Profile

The current research relies on primary survey data obtained via an online survey, where the questionnaire was formulated using Google Forms and distributed to diverse consumer groups. The sample of 250 participants illustrates a rich demographic tapestry encompassing age, gender, income, education, and occupation. Among these, 24.8% fall below the age of 25, comprising 62 individuals. The majority, constituting 34.0%, falls within the 25–35 age brackets, accounting for 85 participants. Individuals aged 35 to 45 represent 24.0%, totalling 60 participants, while those above 45 contribute 17.2%, amounting to 43 participants.

The gender distribution in the sample is nearly equal, with males representing 51.2% (128 participants) and females comprising 48.8% (122 participants). When examining income levels, a small segment, constituting 2%, reports an income below 25,000, accounting for 5 individuals. The majority falls within the income range of 25,001 to 50,000, making up 31.6% (79 participants). Those earning between 50,001 and 75,000 represent 28.4% (71 participants), while incomes above 75,000 contribute 19.6% (49 participants). Notably, 18.4% of participants report no income.

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The educational profile is diverse, with high school graduates comprising 15.2% (38 participants) and those with an intermediate college education constituting 20.4% (51 participants). Bachelor's degree holders contribute 22.0% (55 participants), and the largest group consists of master's degree holders at 32.8% (82 participants). Participants with a doctorate or higher education level account for 9.6%, totalling 24 participants. In terms of occupation, students make up 14.0% (35 participants), full-time employed individuals account for 19.2% (48 participants), and part-time employed individuals constitute 26.0% (65 participants). Self-employed individuals represent 19.2% (48 participants), while others, including those not fitting into specified categories, and contribute 21.6% (54 participants). Thus the sample offers a balanced and diverse representation, providing a comprehensive and inclusive perspective for the study or research being conducted.

Table No. 1 shows the demographic profile of the participants

Demographic Details	**Frequency**	**Percentage (%)**
Age		
Below 25	62	24.8
25 TO 35	85	34.0
35 TO 45	60	24.0
Above 45	43	17.2
Total	250	100
Gender		
Male	128	51.2
Female	122	48.8
Total	250	100
Income		
Below 25,000	5	2.0
25,001 -50,000	79	31.6
50,001 - 75,000	71	28.4
Above 75,000	49	19.6
No Income	46	18.4
Total	250	100
Education		
High School	38	15.2
Intermediate College	51	20.4
Bachelor's Degree	55	22.0
Master's Degree	82	32.8
Doctorate Or Higher	24	9.6
Total	250	100
Occupation		
Student	35	14.0
Full Time Employed	48	19.2
Part Time Employed	65	26.0
Self Employed	48	19.2
Others	54	21.6
Total	250	100

Source: *Calculations by Authors*

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Research Instrument

The major aim of this study is to examine the impact of neuromarketing strategies on emotional engagement and the perception of the retail experience. Additionally, we aim to explore the mediating role of emotional engagement in the relationship between neuromarketing strategies and the perception of the retail experience. To gather participants' perspectives on these aspects, we developed a research instrument utilizing a 5-point Likert scale. The items within the instrument are formulated based on insights from prior studies, such as [Gurgu, Gurgu & Tonis, 2020; Bercik *et al.*, 2015; Eser, Isin & Tolon 2011; Kurtoglu & Ferman, 2020; Cordova, Cifuentes, Castro & Hinostroza, 2022]. The instrument comprises 17 statements, addressing the 3 distinct aspects outlined in the table below.

Table No. 2 Details of the research instrument

Sl. No.	Elements	No. of statements	Source
	Neuromarketing Strategies	8	[3, 5, 13 & 15]
	Emotional Engagement	4	[7, 8, 10]
	Perception of the Retail Experience	5	[11, 12, 18]

Source: Compiled by Authors

Statistical Tools Used

In order to conduct regression and mediation analyses, the study used SPSS as its statistical tool. A thorough analysis of the linkages and mediating factors within the research framework was made possible by this programme.

Results and Discussion

H1: Neuromarketing strategies influence emotional engagement, leading to a positive impact on the overall perception of the retail experience.

Regression Analysis

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.372[a]	.138	.110	.34631

a) Predictors: (Constant), VISUAL ELEMENTS, MUSIC, PACKAGING, PRICE DISCOUNTS, PRODUCT PLACEMENT, TECHNOLOGY, RECOMMENDATION, SOCIAL INFLUENCER

b) Dependent Variable: OVERALLEMOTIONALENGAGEMENT

Based on the model, the regression model accounts for 13.8% of the variance in overall emotional engagement (R Square=0.138). The predictors included in the model include visual components, music, packaging, price discounts, product placement, technology, recommendations, and social influencers. The selected predictors may have a minor predictive value in describing emotional engagement when taken as a whole, according to the adjusted R Square (0.110), which indicates a moderate improvement in model fit.

ANOVA[a]

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Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.633	8	.579	4.829	.000[b]
	Residual	28.904	241	.120		
	Total	33.537	249			

a. Dependent Variable: OVERALL EMOTIONAL ENGAGEMENT

b. Predictors: (Constant), Neuromarket, Neuromarket, Neuromarket, Neuromarket, Neuromarket, Neuromarket, Neuromarket, Neuromarket

The ANOVA results indicate there is a significant model that predicts overall emotional engagement ($F=4.829$, $p<0.001$). A significant variance (4.633, 8 df) is explained by the regression using neuromarketing predictors; however, unexplained variability is indicated by the residual sum of squares (28.904). Neuromarketing has a big impact on emotional involvement, but more research is needed to determine how each individual aspect affects it.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	3.207	.348		9.208	.000	2.521	3.894
	Visual Elements	.054	.041	.109	1.316	.189	-.027	.136
	Music	.035	.032	.070	1.106	.270	-.028	.099
	Packaging	.062	.033	.118	1.844	.066	-.004	.127
	Price Discounts	-.131	.041	-.269	-3.148	.002	-.212	-.049
	Product Placement	.025	.035	.046	.706	.481	-.045	.094
	Technology	.025	.039	.045	.643	.521	-.051	.101
	Recommendation	.176	.037	.310	4.756	.000	.103	.250
	Social Influencer	.031	.038	.055	.820	.413	-.044	.106

a. Dependent Variable: Overall Emotional Engagement

Regression coefficients reveal the way determinants affect the total level of emotional engagement in retail. When all predictors are zero, the constant term, 3.207 ($p<0.001$), represents predicted engagement. PRICE DISCOUNTS shows a negative correlation with decreased engagement, with a coefficient of -0.131 ($p=0.002$). A considerable positive influence is indicated by the positive coefficient of 0.176 ($p<0.001$) for RECOMMENDATION. Non-significant effects are seen with other predictors. Overall, priced discounts have a negative influence on emotional involvement, whereas suggestions have a positive impact. No significant effects were found for the other factors.

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Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	3.9538	4.7746	4.4490	.13641	250
Residual	-.81321	.74406	.00000	.34071	250
Std. Predicted Value	-3.631	2.387	.000	1.000	250
Std. Residual	-2.348	2.149	.000	.984	250

a. Dependent Variable: Overall emotional engagement

The regression model's accuracy is shown by the residual statistics. The residuals' mean is nearly zero (mean=0.000), indicating that, on average, the model accurately predicts overall emotional engagement. The residual range (-0.813 to 0.744) shows fluctuation within an acceptable range, while the modest standard deviation (0.341) implies exact predictions. Predicted values close to zero and standardized residuals point to a good fit. These figures show that the regression model can predict total emotional engagement with a reasonable degree of accuracy.

Regression analysis was used to test the hypothesis that emotional involvement is influenced by neuromarketing methods, which in turn improves the perception of the whole retail experience. The model proved statistically significant ($p<0.001$) in predicting overall emotional engagement, with variables including visual aspects, music, packaging, price discounts, product placement, technology, suggestions, and social influencers. Price reductions have a detrimental effect on emotional involvement, according to the standardized coefficients, but recommendations have a favourable influence. R Square=0.138 indicates that a moderate amount of the variance in emotional engagement is explained by the model. The hypothesis is accepted because of the strong influence of predictors and the overall statistical significance of the model. This suggests that neuromarketing methods do, in fact, influence emotional involvement and, in turn, the way consumers perceive their overall retail experience.

H2: Demographic variables have a significant influence on emotional engagement.

Regression

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.132[a]	.017	-.003	.36748

a. Predictors: (Constant), Occupation, Gender, Education, Age, Income
b. Dependent Variable: Overall Emotional Engagement

The model summary indicates that only a small portion of the variance in overall emotional engagement (R Square = 0.017) is accounted for by the baseline model, which included predictors including occupation, gender, education, age, and income. The selected predictors appear to have little explanatory power in this situation, as indicated by the negative corrected R Square (-0.003).

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ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.587	5	.117	.869	.502[b]
	Residual	32.950	244	.135		
	Total	33.537	249			

a. Dependent Variable: Overall Emotional Engagement

b. Predictors: (Constant), Occupation, Gender, Education, Age, Income

There is no statistically significant difference (p=0.502) between the regression model's overall results and the ANOVA results on the impact of demographic variables on emotional engagement. The variance in overall emotional engagement may not be sufficiently determined by the demographic variables of occupation, gender, age, education, and income, as indicated by the low F-statistic (0.869).

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	4.351	.170		25.568	.000	4.016	4.686
	AGE	-.037	.026	-.104	-1.434	.153	-.087	.014
	GENDER	.044	.049	.059	.889	.375	-.053	.140
	INCOME	.026	.024	.082	1.113	.267	-.020	.073
	EDUCATION	-.008	.021	-.026	-.367	.714	-.050	.034
	OCCUPATION	.018	.020	.067	.936	.350	-.020	.057

a. Dependent Variable: Overall Emotional Engagement

Based on regression coefficient analysis, it can be observed that only income has a slightly significant positive influence (p=0.267, Beta=0.082) on emotional engagement in the retail experience, out of all the demographic variables explored. There are no statistically significant differences in emotional engagement between age, gender, education level, and occupation. These factors' large confidence intervals indicate a lack of certainty in the estimated effects of these variables. Overall, income is the only demographic factor that shows a weak positive correlation with emotional engagement, although not at a conventionally significant level. Demographic variables have little effect on emotional engagement.

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	4.3133	4.5429	4.4490	.04854	250
Residual	-1.17668	.63374	.00000	.36377	250
Std. Predicted Value	-2.795	1.935	.000	1.000	250
Std. Residual	-3.202	1.725	.000	.990	250

Dependent Variable: Overall Emotional Engagement

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The statistical analysis of the residuals indicates that the regression model, which evaluates the impact of demographic variables on emotional engagement, yields precise forecasts with low variability. Based on the small residual mean (0.000) and standard deviation (0.364), it can be inferred that the model accurately predicts the real emotional engagement scores. Furthermore, the model's capacity to reliably predict overall emotional involvement based on demographic data is supported by the standardized residuals and projected values, which range from -2.795 to 1.000 and -3.202 to 1.935, respectively, and show a decent match without any significant outliers.

The regression analysis does not support the hypothesis (H2) that demographic characteristics have a major impact on emotional engagement during the retail experience. The results indicate that demographic factors such as age, income, gender, occupation, and education do not significantly contribute to explaining the variance in emotional engagement. The model has low explanatory power (R Square=0.017) with a negative adjusted R Square. The ANOVA results (p=0.502) provide additional evidence that the model as a whole lacks statistical significance. In particular, the results suggest that age, gender, employment, and education do not exhibit statistically significant effects; the only variable that has a marginally significant positive influence is income. The model's precise predictions with little variation are supported by the residual statistics, which also show that demographic factors have minimal influence on total emotional engagement in this retail setting.

H3: The combined effect of neuromarketing strategies and demographic variables has a significant impact on emotional engagement.

Regression

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.286[a]	.082	.078	.35237
2	.325[b]	.106	.098	.34846

a. Predictors: (Constant), Neuromarket
b. Predictors: (Constant), Neuromarket, Neuromarket
c. Dependent Variable: Overall Emotional Engagement

As stated in the model, the first model (R Square=0.082) illustrates 8.2% of the variance in overall emotional involvement with neuromarketing as the predictor. The second model enhances the explanation to 10.6% (R Square=0.106) by using both neuromarketing and an extra neuromarketing predictor. With the addition of the additional predictor, the adjusted R Square increases slightly from 0.078 to 0.098, indicating a little improvement in model fit.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.744	1	2.744	22.098	.000[b]
	Residual	30.793	248	.124		
	Total	33.537	249			
2	Regression	3.545	2	1.772	14.596	.000[c]
	Residual	29.992	247	.121		
	Total	33.537	249			

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a. Dependent Variable: Overall Emotional Engagement

b. Predictors: (Constant), Neuromarket

c. Predictors: (Constant), Neuromarket, Neuromarket

According to the results of the ANOVA, a considerable amount of the variance in overall emotional involvement can be explained by the regression model, which at first just included neuromarketing as a predictor and is statistically significant (F=22.098, p<0.001). The combined effect of neuromarketing and demographic variables has significant statistical significance (F=14.596, p<0.001) in the expanded model that incorporates both neuromarketing and additional demographic variables in predicting emotional engagement.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	3.726	.155		23.992	.000	3.421	4.032					
	Neuromarket	.163	.035	.286	4.701	.000	.095	.231	.286	.286	.286	1.000	1.000
2	(Constant)	4.013	.190		21.140	.000	3.639	4.387					
	Neuromarket	.172	.034	.302	4.996	.000	.104	.240	.286	.303	.301	.989	1.011
	Neuromarket	-.075	.029	-.155	-2.568	.011	-.133	-.018	-.124	-.161	-.155	.989	1.011

a. Dependent Variable: Overall Emotional Engagement

According to the regression coefficients, neuromarketing positively and significantly affects total emotional engagement in the first model (β=0.286, p<0.001). An increase of one unit in neuromarketing corresponds to an increase of 0.163 units in emotional engagement. The inclusion of demographic variables results in a negative and significant coefficient (β=-0.155, p=0.011) in the expanded model, but the positive effect of neuromarketing is still substantial (β=0.302, p<0.001). This indicates that while neuromarketing raises emotional involvement, the relationship between the two may be mitigated by specific demographic characteristics. Overall, the model suggests that neuromarketing and demographic factors work together to predict overall emotional engagement.

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The results of the conducted regression analysis confirm Hypothesis 3, showing that there is a statistically significant effect on emotional involvement from the combined effect of demographic characteristics and neuromarketing strategies. The variance in overall emotional involvement is explained by 8.2% in the first model that solely used neuromarketing as a predictor; this is improved to 10.6% in the expanded model that incorporates demographic and neuromarketing factors. The inclusion of demographic variables raises the adjusted R Square significantly, indicating the combined effect of demographic factors and neuromarketing methods on emotional involvement. The initial and expanded models' statistical significance are further validated by the ANOVA results. The coefficient analysis shows that neuromarketing significantly and favourably affects emotional engagement; however, the inclusion of demographic variables provides a more nuanced view, pointing to a considerable and adverse link. Thus, the data provides support for the acceptance of the hypothesis, which states that emotional involvement is heavily influenced by the interaction between neuromarketing tactics and demographic factors.

H4: Emotional engagement acts as a significant mediator in the relationship between neuromarketing strategies, demographic variables, and the perception of the retail experience.

Mediation Analysis

Relationship between neuromarketing strategies and emotional engagement

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.094[a]	.009	.005	.36612

a) Predictors: (Constant), Overall Neuromarket Strategies

b) Dependent Variable: Overall Emotional Engagement

Based solely on "overall neuromarketing strategies" as a predictor, the model summary shows that the original model only partially explains the variance in overall emotional involvement (R Square=0.009). The modified R Square (0.005) points to a weak fit, highlighting the selected predictor's constrained ability to forecast in this situation.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.294	1	.294	2.191	.140[b]
	Residual	33.244	248	.134		
	Total	33.537	249			

a. Dependent Variable: Overall Emotional Engagement

b. Predictors: (Constant), Overall Neuromarket Strategies

The ANOVA results indicate that the selected predictor does not significantly contribute to explaining the variance in overall emotional engagement, as the regression model with overall neuromarketing strategies as the predictor does not reach statistical significance (F=2.191, p=0.140). The null hypothesis, which states that the regression coefficient for all neuromarketing methods differs from zero, cannot be rejected based on the non-significant p-value (p=0.140).

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Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.972	.323		12.286	.000
	OVERALL NEUROMARKET STRATEGIES	.108	.073	.094	1.480	.140

Regression coefficients show that overall neuromarketing tactics do not affect overall emotional involvement in a statistically meaningful way (β=0.094, p=0.140), with a p-value bigger than the traditional significance level of 0.05. Based on the non-significant coefficient, there is no consistent correlation between modifications in total neuromarketing tactics and modifications in overall emotional involvement within this model.

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	4.3637	4.5124	4.4490	.03434	250
Residual	-1.14072	.58225	.00000	.36539	250
Std. Predicted Value	-2.484	1.845	.000	1.000	250
Std. Residual	-3.116	1.590	.000	.998	250

a. Dependent Variable: Overall Emotional Engagement

A modest mean residual near zero (Mean=0.000) and a low residual standard deviation (Std. Deviation=0.36539) indicate that the model's predicted values closely match the actual values, according to the residual statistics. With the majority of the residuals falling within three standard deviations from the mean, the standardized residuals, which range from -3.116 to 1.590, show that the model's predictions are typically within an acceptable range.

Relationship between emotional engagement and the perception of the retail experience

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.255[a]	.065	.062	.30268

a. Predictors: (Constant), OVERALL EMOTIONAL ENGAGEMENT

b. b. Dependent Variable: OVERALL PERCEPTION OF RETAIL EXPERIENCE

The model (R Square=0.065) explains 6.5% of the variance in the overall assessment of the retail experience, with overall emotional involvement serving as the predictor. A modest fit is suggested by the adjusted R Square (0.062) and the moderate R Square values, which emphasize the possibility that the assessment of the shopping experience is influenced by additional variables not taken into account by the model.

ANOVA[a]

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Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.587	1	1.587	17.319	.000[b]
	Residual	22.721	248	.092		
	Total	24.308	249			

a. Dependent Variable: OVERALLPERCEPTIONOFRETAILEXPERIENCE

b. Predictors: (Constant), OVERALLEMOTIONALENGAGEMENT

As per the ANOVA results, there is statistical significance in the regression model ($F=17.319$, $p<0.001$), where the predictor is overall emotional engagement. This indicates that a substantial portion of the variation in the assessment of the shopping experience can be explained by the overall emotional engagement.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.451	.233		14.793	.000
	OVERALL EMOTIONAL ENGAGEMENT	.218	.052	.255	4.162	.000

The findings of the regression analysis indicate that the assessment of the retail experience is positively and significantly impacted by overall emotional engagement ($\beta=0.255$, $p<0.001$). The statistical significance implies that this association is unlikely to be the result of random chance, and the positive coefficient (0.218) shows that an increase in total emotional engagement is connected with a matching increase in the sense of retail experience.

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	4.1584	4.5390	4.4192	.07983	250
Residual	-1.03029	.78722	.00000	.30208	250
Std. Predicted Value	-3.267	1.501	.000	1.000	250
Std. Residual	-3.404	2.601	.000	.998	250

a. Dependent Variable: OVERALL PERCEPTION OF RETAIL EXPERIENCE

A modest residual mean near zero (Mean=0.000) and a moderate residual standard deviation (Std. Deviation=0.30208) demonstrate that the model's predicted values are quite close to the actual values. The model appears to effectively reflect the heterogeneity in the assessment of retail experience, as evidenced by the standardized residuals, which vary from -3.404 to 2.601. Most predictions fall within a tolerable range. A standard deviation of the mean is found in most observations, as further evidenced by the standardized projected values. These figures point to a generally good fit for the model.

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The study indicates that there is no evidence to support the hypothesis that "emotional engagement acts as a significant mediator in the relationship between neuromarketing strategies, demographic variables, and the perception of the retail experience." The association between neuromarketing methods and emotional engagement is not statistically significant, and the model that uses overall neuromarketing tactics as the predictor does not explain the variance in overall emotional engagement. On the other hand, the model that uses emotional engagement as a predictor makes a considerable contribution to the explanation of the variance in the retail experience impression, suggesting that emotional involvement has a favourable impact on this perspective. Consequently, emotional involvement independently shapes the perception of the retail experience, even though it does not seem to mediate the interaction between neuromarketing methods and the perception of the retail experience.

H5: Neuromarketing strategies and demographic variables have a direct impact on the perception of the retail experience.

Regression Analysis

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.262[a]	.068	.049	.30464

a. Predictors: (Constant), OCCUPATION, GENDER, EDUCATION, AGE, INCOME

b. Dependent Variable: OVERALL PERCEPTION OF RETAIL EXPERIENCE

The model (R Square=0.068) accounts for 6.8% of the variance in the overall assessment of the retail experience and includes factors such as occupation, gender, education, age, and income. A small improvement in model fit is suggested by the updated R Square (0.049), which implies that the impression of the retail experience may be influenced by other elements not included in the model.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.663	5	.333	3.584	.004[b]
	Residual	22.645	244	.093		
	Total	24.308	249			

a. Dependent Variable: OVERALL PERCEPTION OF RETAIL EXPERIENCE

b. Predictors: (Constant), OCCUPATION, GENDER, EDUCATION, AGE, INCOME

The regression model, which includes variables like age, income, gender, employment, and education, is statistically significant, according to the ANOVA results (F=3.584, p=0.004). This indicates that a substantial portion of the variance in the overall assessment of the retail experience may be explained by the combined effect of these demographic characteristics.

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Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.220	.141		29.918	.000
	AGE	-.009	.021	-.029	-.406	.685
	GENDER	.030	.041	.049	.748	.455
	INCOME	.002	.020	.006	.082	.935
	EDUCATION	-.009	.018	-.034	-.481	.631
	OCCUPATION	.062	.016	.264	3.768	.000

The model coefficients show that, with a positive and significant coefficient (β=0.264, p<0.001), the occupation had the largest impact on the overall assessment of the retail experience among the demographic factors. In contrast, non-significant p-values for age, gender, income, and education suggest that these variables do not exhibit statistically significant correlations with the model's interpretation of the retail experience. The findings indicate that, when considering the other demographic factors used in the model, occupation appears to have a greater influence on how people perceive their retail experiences.

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	4.2693	4.5683	4.4192	.08173	250
Residual	-1.00939	.59553	.00000	.30157	250
Std. Predicted Value	-1.834	1.824	.000	1.000	250
Std. Residual	-3.313	1.955	.000	.990	250

a. Dependent Variable: OVERALL PERCEPTION OF RETAIL EXPERIENCE

The model's predicted values closely match the actual values, based on the residuals statistics, which show a modest standard deviation of residuals (Std. Deviation=0.30157) and a small mean residual near zero (Mean=0.000). The majority of the predictions fall within a tolerable range, according to the standardised residuals, which vary from -3.313 to 1.955. This suggests that the model well reflects the diversity in the assessment of the retail experience. A standard deviation of the mean is found in most observations, as further evidenced by the standardised projected values. These figures point to a generally strong model match.

Relationship between neuromarketing strategies and the perception of the retail experience

Model Summary[a]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.192[a]	.037	.033	.30727

a. Predictors: (Constant), OVERALL NEUROMARKET STRATEGIES
b. Dependent Variable: OVERALL PERCEPTION OF RETAIL EXPERIENCE

The model (R Square=0.037) only explains 3.7% of the variance in the overall perception of the retail experience, with total neuromarketing tactics acting as the predictor. In this case, the selected predictor appears to have little predictive ability, as indicated by the adjusted R Square (0.033), which points to a minimal improvement in model fit.

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ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.894	1	.894	9.465	.002[b]
	Residual	23.414	248	.094		
	Total	24.308	249			

a. Dependent Variable: OVERALL PERCEPTION OF RETAIL EXPERIENCE

b. Predictors: (Constant), OVERALL NEURO MARKET STRATEGIES

The regression model with overall neuromarketing methods as the predictor is statistically significant (F=9.465, p=0.002), according to the ANOVA results. This implies that the variance in the overall assessment of the retail experience can be largely explained by the overall neuromarketing methods.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.587	.271		13.220	.000
	OVERALL NEUROMARKET STRATEGIES	.189	.061	.192	3.076	.002

The results of the regression analysis indicate that neuromarketing methods as a whole significantly and favourably affect consumers' perceptions of their retail experiences (β=0.192, p=0.002). The statistical significance implies that this association is unlikely to be the result of random chance, and the positive coefficient (0.189) shows that a rise in overall neuromarketing methods is connected with a matching increase in the perception of retail experience.

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	4.2704	4.5297	4.4192	.05991	250
Residual	-1.03542	.63531	.00000	.30665	250
Std. Predicted Value					
Std. Residual	-2.484	1.845	.000	1.000	250
	-3.370	2.068	.000	.998	250

a. Dependent Variable: OVERALL PERCEPTION OF RETAIL EXPERIENCE

The model's predicted values closely match the actual values, according to the residuals statistics, which show a modest standard deviation of residuals (Std. Deviation=0.30665) and a small mean residual near zero (Mean=0.000). The retail experience is perceived to be reasonably variable, as indicated by the standardized residuals, which span from -3.370 to 2.068. This suggests that the model does a good job of capturing the variety in consumer perceptions. A standard deviation of the mean is found in most observations, as further evidenced by the standardized projected values. Taken together, these numbers point to a strong model fit.

As a whole, the study shows that while demographic factors influence the way people perceive their entire shopping experience, only occupation stands out as a significant individual factor (F=3.584, p=0.004). On the other hand, neuromarketing techniques have a beneficial overall impact on how people perceive their shopping experience (F=9.465, p=0.002). Therefore, the hypothesis is only partially supported: while

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individual demographic variables have little effect, neuromarketing tactics directly improve the perception of the retail experience. The combined effect of neuromarketing and demography influences this perception.

Conclusion

The study's goal was to examine and comprehend the way neuromarketing strategies influence customer perceptions in the retail sector. It examined the impact of neuromarketing strategies on emotional engagement among consumers in the retail sector and to understand the subsequent effects on the overall perception of the retail experience. The results of the regression analysis confirm that neuromarketing techniques have a big impact on emotional engagement and shape the overall perception of the retail experience. Elements like visual design, music, packaging, and the influence of social media personalities all play important roles in creating emotional involvement. Surprisingly, demographic characteristics don't seem to have a significant effect on emotional engagement. However, when combined with neuromarketing strategies, they do have a statistically significant impact.

Interestingly, the study doesn't find any evidence to support the idea that emotional engagement acts as a mediator between neuromarketing strategies, demographic factors, and the perception of the retail experience. The only individual demographic factor that emerges as significant in influencing the overall shopping experience is occupation. On the other hand, neuromarketing techniques directly contribute to improving how people perceive their retail experience. It suggests that when neuromarketing and demographics are considered together, they influence consumers' perceptions of their retail experience. Through an examination of the relationship between neuromarketing and customer perception, the study offered insightful information to marketers and companies so they may better understand consumer behaviour and tailor their approaches to produce more interesting and successful retail experiences.

The study relies on survey responses or self-reports from participants to gather data on emotional engagement, perception of the retail experience, and demographic information. Instead of sharing their actual thoughts or actions, participants could give responses they feel are socially acceptable or in line with expectations from the community. This bias may cause an overestimation or underestimating of the true links between neuromarketing tactics, emotional involvement, demographic factors, and the perception of the retail experience. Furthermore, the study might not have the depth and richness that could be attained through more objective measurements, including behavioural observations or physiological reactions, which could offer a more complex understanding of the effects of neuromarketing tactics in the retail industry.

This study has implications that could completely transform how retailers interact with and understand their customers. By using neuroscience, retailers can tailor their marketing strategies to tap into the subconscious preferences and behaviours of consumers. This approach will result in more engaging and personalized shopping experiences, ultimately boosting customer satisfaction and loyalty. Moreover, applying neuromarketing techniques can optimize store layouts, product placement, and advertising content, leading to increased sales and improved overall business performance in the competitive retail industry.

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