

# A Multimodal Neuromarketing Investigation Of Online Purchase Intention: An Empirical Study Among Online Shoppers In Chennai

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## Abstract

Consumer purchase decisions are largely driven by subconscious processes that are difficult to capture using traditional self-report methods. Neuromarketing, which integrates neuroscience tools such as electroencephalography (EEG) and eye-tracking, offers deeper insights into consumer attention, emotion, and decision-making. This study examines how a multimodal neuromarketing approach can predict online purchase decisions among consumers in Chennai. The rapid growth of digital commerce in India has significantly transformed consumer purchasing behavior, particularly among young online shoppers. Traditional research methods often fail to capture the subconscious influences that shape online buying decisions. This study adopts a neuromarketing-oriented approach to examine the factors influencing online purchase intention among consumers in Chennai. Using an experimental and descriptive research design, data were collected from 119 active online shoppers aged 18–45 through structured questionnaires. The study analyzes the impact of demographic variables, social proof, scarcity cues, and product-related attributes such as price, brand, and image quality. Statistical tools including descriptive analysis, correlation, and regression were applied to test the hypotheses. The findings reveal that online reviews, brand perception, product presentation, and scarcity cues significantly influence purchase intention. Although price shows a positive and significant relationship with buying behavior, its explanatory power remains limited. Rational drivers such as utility and value for money were found to exert stronger influence than emotional factors. The study highlights the importance of combining logical appeal with emotional engagement in digital marketing strategies. By focusing on consumers in Chennai, this research contributes empirical insights to the growing neuromarketing and online consumer behavior literature.

**Keywords:** Neuromarketing, Online Purchase Intention, Consumer Behavior, Social Proof, Scarcity Cues, E-Commerce,

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## Introduction

The rapid growth of digital commerce in India has transformed the way consumers evaluate and purchase products online. Among various consumer segments, Online Shoppers has emerged as the most digitally native, visually driven, and socially influenced cohort. Their purchase decisions are shaped not only by price and product utility but also by peer reviews, visual presentation, and emotional engagement.

Traditional marketing research tools such as surveys and interviews are limited in their ability to capture subconscious influences on decision-making. Prior research suggests that a significant proportion of consumer decisions occur at a non-conscious level. Neuromarketing addresses this limitation by employing neuroscientific tools to directly observe brain activity and visual attention patterns.

Despite growing interest in neuromarketing, existing studies remain largely Western-centric, single-tool oriented, and laboratory-based. There is limited empirical evidence from Indian consumers, particularly Online Shoppers, using **integrated EEG and eye-tracking methods** in realistic e-commerce settings. This study seeks to bridge these gaps.

## Review of Literature

### Review 1: Exploring consumers' perceptions of online purchase decision factors: electroencephalography and eye-tracking evidence

Consumer behavior on the Internet is influenced by factors that can affect consumers' perceptions and attention to products. Understanding these processes at the neurobiological level can help to understand consumers' implicit responses to marketing stimuli. The objective of this study is to use electroencephalography (EEG) to investigate the differential effects of selected

## **A Multimodal Neuromarketing Investigation of Online Purchase Intention: An Empirical Study among Online Shoppers in Chennai**

online purchase decision factors that are becoming increasingly important in online shopping. Using event-related potentials (ERPs) and simultaneous eye-tracking measurements, we identified differences in the perception of utilitarian and hedonic products when the products are exposed together with visual elements of the factors review, discount, and quantity discount.

The ERP analysis focused on the P200 and late positive potential components (LPP). By allowing free-viewing of stimuli during measurement, early automatic and later more complex attentional affective responses could be observed. The results suggest that the review and discount factors are processed faster than the product itself. However, the eye-tracking data indicate that the brain processes the factor without looking at it directly, i.e., from a peripheral view. The study also demonstrates the possibilities of using new objective methods based on neurobiology and how they can be applied, especially in areas where the use of neuroscience is still rare, yet so much needed to objectify consumers' knowledge of their need satisfaction behavior.

### **Review 2: Consumer Behavior in Online Retailing: Factors, Trends and Implications in India**

Online retailing has revolutionized the retail landscape, offering unparalleled convenience and accessibility to the consumers. Consumer behavior in online retailing is a rapidly evolving subject, shaped by technology advancement, shifting preferences, latest trends and the convenience of e-commerce platforms. This study explores the factors influencing consumer behavior in the digital marketplace, including trust, price sensitivity, convenience, social proof and personalized shopping experiences Vetrivel et al (2015). It also examines the latest trends and technologies such as artificial intelligence (AI), augmented reality (AR) and mobile commerce in transforming the online shopping landscape.

Furthermore, the research delves into different factors, such as impulse buying, cultural differences, and generational preferences, that affect buying decisions. By understanding these dynamics, online retailers can craft targeted strategies to improve customer engagement, retention, and satisfaction.

The findings emphasize the needs for businesses to embrace innovation and adapt to evolving consumer expectations, ultimately paving the way for a more personalized, secure and efficient online shopping experience. This study contributes to the growing

literature on e-commerce and provides actionable insights for practitioners and researchers

### **Review 3: The Factors Influencing A Customer's Purchase Intention on Online Shopping Website**

Nowadays, the advancement of the internet creates opportunities for product marketing and the introduction of new forms of retail transactions, and it has resulted in a remarkable increase in online shopping activities. Therefore, it is important for the industry to identify the main determining factors in consumer purchase intentions. The aims of this study are to reveal the influence of customer trust on perceived risks and purchase intentions as well as the effect of perceived benefits on purchase intentions. A survey approach was employed to collect data from 268 online shoppers, and quantitative analysis has been used to evaluate the hypotheses. The study discovered that customers' perceived benefit, perceived trust, and perceived risk all had a significant influence on their purchasing intentions. The implications of these findings go far beyond academia, providing useful information to online advertisers. Marketers with a detailed awareness of the elements influencing customers' purchasing intentions can proactively address these determinants, consequently improving the business's overall success and efficacy in fulfilling customer satisfaction. Fundamentally, this study contributes valuable insights to the body of knowledge necessary for managing the complexities of the contemporary digital marketplace.

### **Review 4: An Empirical Study on Factors Affecting Online Shopping Behavior and Intentions of Consumers**

Online shopping has become a recent phenomenon in the field of electronic business and has gained familiarity among consumers around the world. Most of the companies are now adopting online portals to sell their products/services online. Though in countries like India, the trend of online shopping took some time to develop, but now a days, there is a craze for online shopping both among the younger and elderly populations. Compared to traditional store shopping, online shopping has received much more attention. The purpose of this study is to determine the driving factors affecting the online buying behavior of consumers and to analyze the impact of these driving factors on online buying intentions. To meet the research objectives, multiple regression analysis has been applied. The results of the study revealed that in order of their impact size, the most significant predictors of online

# A Multimodal Neuromarketing Investigation of Online Purchase Intention: An Empirical Study among Online Shoppers in Chennai

buying behavior are convenience, impulse buying behavior, congruence, shopping enjoyment, browsing enjoyment, value consciousness, price consciousness and risk Vetrivel.et.al (2022). The research provides a novel finding of the strongest effect of impulse buying behavior, which has not previously been identified as a key antecedent to online shopping.

### 3. Research Objectives

1. To examine the influence of demographic factors, social proof, and scarcity cues on online purchase intention.
2. To analyze the impact of product-related factors such as price, brand, and image presentation on buying behavior.

### Hypotheses

- **H1:** Demographic factors, social proof, and scarcity cues significantly influence online purchase decisions of Online Shoppers consumers.
- **H2:** Product-related factors such as price, brand reputation, and image quality significantly affect buying behavior.

### Limitations and Future Research

The study is limited to urban Online Shoppers consumers and uses consumer-grade EEG devices. Future studies may include diverse age groups, rural populations, and advanced neuroimaging tools. Longitudinal research could explore brand loyalty and repeat purchase behavior

### Research Methodology

#### Research Design

The study adopted an **experimental and descriptive research design**

#### Sample

A total of 119 **consumers (18–45 years)** from chennai were selected using purposive sampling. All participants were active online shoppers.

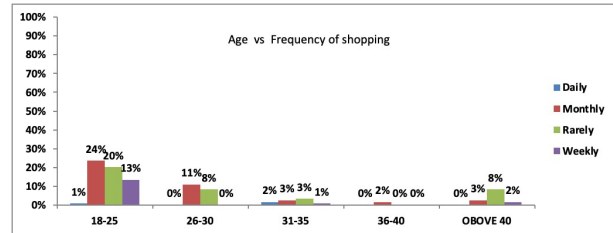
#### Instruments

- **Questionnaire:** Structured Likert-scale questionnaire measuring demographics, shopping behavior, emotional and rational drivers, and purchase intention.

#### Data Analysis Tools

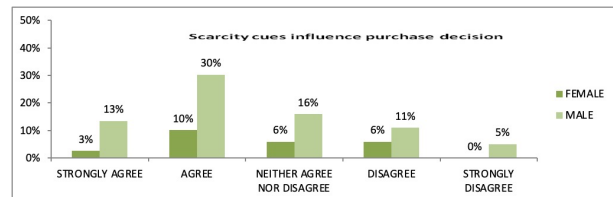
- Descriptive statistics
- Correlation analysis
- Regression analysis

#### Results and Analysis

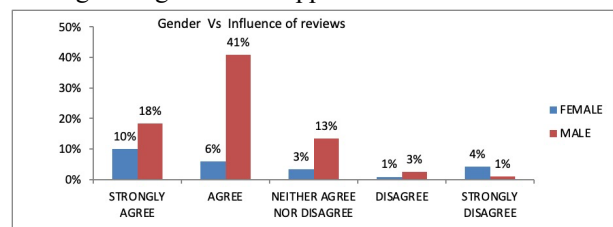


Younger consumers shop online more actively than older groups. As people age, their shopping frequency falls slowly. Over daily purchasing, most customers would rather shop rarely or plannedly. Middle-aged consumers purchase online at a modest rate. Generally speaking, age greatly affects the mode and frequency of online buys.

### Impact of Scarcity Cues



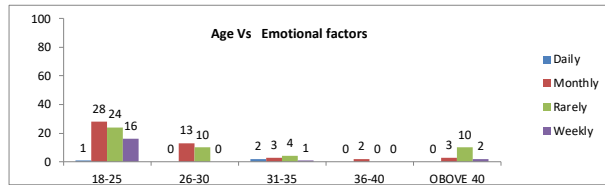
Male respondents appear more vulnerable to the influence of poverty signals on their buying decisions than do female responders. Men's purchasing behavior is influenced by limited availability more often than women's is. Men's responses to scarcity techniques are rather neutral and slightly amiable when set against women's reactions. Few respondents in either group strongly disagree with the influence of scarcity signals. Generally, buying choices seem to be much affected by scarcity-based marketing strategies, but that effect varies between men and women. The analysis showed that scarcity cues significantly influence purchase likelihood, supporting the presence of urgency-driven decision-making among Online Shoppers consumers.



Both male and female respondents' purchasing decisions are much influenced by internet reviews. Compared to female respondents, male respondents are more likely to concur that reviews affect their buying decisions. Women respondents value reviews as well, albeit their replies are slightly more varied. Most respondents don't doubt the influence of reviews,

# A Multimodal Neuromarketing Investigation of Online Purchase Intention: An Empirical Study among Online Shoppers in Chennai

independent of their gender. Generally speaking, client feedback much affects internet buying decisions regardless of gender.



The respondents in the 18–25 age group are most swayed by emotional factors while making purchases, especially on a monthly and regular basis. The 26–30 age range also has a great impact, even if somewhat lower than the youngest age group. Respondents in the 31–35 age group exhibit mild emotional effect, mostly at sporadic frequencies. People between the ages of 36 and 40 display hardly any emotional response. Though less important, emotional issues are nevertheless apparent in those above 40, especially in less regular events.

## Product-Related Regression Factors

### MODEL SUMMARY<sup>b</sup>

Model	R	R Square	Adjusted R Square	Std. Error
1	.279	.078	.070	.869

a. Predictors: (Constant), Product price influences purchase decision  
b. Dependent Variable: How likely are you to purchase this product online?

### ANOVA<sup>a</sup>

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	7.454	1	7.454	9.870	.002
Residual	88.406	117	0.756		
Total	95.860	118			

a. Dependent Variable: How likely are you to purchase this product online?  
b. Predictors: (Constant), Product price influences purchase decision

### COEFFICIENTS<sup>a</sup>

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	2.846	.276		10.312	.000
	Product price influences purchase	.273	.087	.279	3.142	.002

a. Dependent Variable: How likely are you to purchase this product online?

The probability of purchase and product price both have a slight positive link. Just 7.8% of the variability in purchase likelihood is explained by product price influence. Even taking sample size into account, the explanatory ability is still not great. Because other factors also influence buying decisions made online, the model only covers a minor part of purchasing behavior.

The regression analysis shows that product pricing has a statistically significant and positive impact on consumers' tendency to buy online ( $\beta = 0.273$ ,  $p < 0.05$ ). But with a low strength of the link ( $R^2 = 0.078$ ), it seems that price alone is not a very significant influence on consumer behavior. Other factors may thus more greatly affect customers' decisions—brand,

reviews, image quality, emotional and rational influences.

## Findings

- Online buying is done somewhat; most survey respondents purchase weekly or occasionally as opposed to every day.
- Young customers rule the sample since the great part of poll respondents fall in between 18 and 25.
- As seen by the great influence of product pricing on purchasing decisions ( $p = 0.002$ ), consumers are very price conscious.
- Although price is only responsible for 7.8% of the likelihood of a purchase ( $R^2 = 0.078$ ), this shows it is not the most significant consideration.
- Purchasing decisions depend greatly on the number of reviews and ratings; many participants agreed reviews are crucial.
- The clarity and quality of the product pictures seem to be quite important given their broad agreement.
- The brand has a somewhat great influence as many respondents agreed it impacts their decisions.
- Although not all respondents are treated equally, some customers are affected by scarcity cues (like few remaining).
- Because of stronger agreement levels, intelligent criteria (price, specifications, utility) become more significant than emotional ones.
- Generally speaking, consumers show a usually good likelihood of buying online, which points to broad acceptance of online venues.

## Suggestions

- Do not rely just on pricing tactics as they cannot fully explain a sizable share of purchasing behavior.
- Use several points of view and high-resolution images to help goods to be better visually. As purchase decisions are greatly influenced by client ratings and reviews, inspire them. Set a solid brand position because brand perception affects consumer trust and buying intent.

## A Multimodal Neuromarketing Investigation of Online Purchase Intention: An Empirical Study among Online Shoppers in Chennai

- Highlight the practical benefits—features, specs, use—straightforwardly in product descriptions.
- Strategically use scarcity techniques and time-limited discounts but avoid overuse in order to maintain credibility.
- To draw price-sensitive consumers, provide discounts and comparisons with straightforward pricing.
- Enhance customer confidence components including warranty, return policies, and secure payment methods.
- Because young customers (18–25 age group) comprise the majority of your clientele, focus your marketing efforts on them.
- Combine emotional appeal—design, excitement—with logical appeal—value for money—for a greater marketing influence.

### Conclusion

Although its overall effect is small, the study shows that consumers' internet purchasing decisions are significantly affected by the price of a product. Along with logical factors, brand reputation, picture quality, and product reviews are other variables influencing purchase intention. The results show that a number of variables affect internet buying behavior, not only cost. Companies should therefore use a balanced marketing approach that includes competitive pricing with great product presentation and customer trust-building activities.

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