

# Decoding Social Commerce: Neuromarketing Insights into the Consumer Purchase Behavior

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**Abstract:** Neuromarketing explores the varied consumer emotional and cognitive reactions to marketing strategies to understand the consumer decision. The Secondary research investigates the customer behaviour, especially in the context of social commerce. It highlights the relevance of emotional and cognitive responses to elements like influencer endorsement, branded content, and user-generated content in influencing purchasing behaviour. On reviewing the literature, the paper synthesis, the roles of emotional arousal, attention, and memory in the process of consumer engagement and decision-making. The tools of neuromarketing, eye-tracking, EEG, and facial coding tools helps analyse the patterns of consumer responses to the content of social commerce. It shows how appeals to emotions may help build trust in a brand, the cognitive role of social proof in a purchase decision, and ethical considerations in the use of neuromarketing techniques in digital commerce. The study provides a useful viewpoint on how marketers can improve consumer engagement, optimise methods, and improve content. It provides insightful information about how neuromarketing and social commerce interact, providing a foundation for future work.

**Keywords:** Neuromarketing, Consumer Behaviour, Emotional Responses, Cognitive Processes, Social Commerce

## 1 Introduction

The increasing growth of online markets in recent years has given new tactics to understand the impact on consumer buying behaviour (Zhang and Benyoucef, 2016). The integration of social commerce and neuromarketing becomes the crucial element to understand the use of social media platforms to improve and facilitate the purchasing and selling of goods and services (Yadav et al., 2013). Social commerce leverages networks to increase customer engagement and sales by fusing social interactions and user-generated content with e-commerce (Meilatinova, 2021). Because it can combine the ease of internet shopping with the persuasive power of social influence, this model has become more and more popular (Busalim et al., 2021).

### 1.1 Neuromarketing: Bridging Neuroscience and Marketing

The study talks about neuromarketing, which is the integration of neuroscience and marketing principles to gain a deeper understanding of how consumers make decisions (Ariely and Berns, 2010; Lee et al., 2007). Through the examination of the brain and body's reactions to marketing stimuli, neuromarketing offers important insights into how consumers view and interact emotionally with products, brands, and advertising (Morin, 2011). With the help of this technique, marketers may create more persuasive tactics that appeal to consumers' subconscious desires, enhancing brand loyalty and raising conversion rates (Plassmann et al., 2015).

The increasing significance of neuromarketing and social commerce is a reflection of broader developments in consumer behaviour and technology (Amiri et al., 2022). Businesses are using digital platforms more and more to gain a competitive advantage as they

get more sophisticated. Brands looking to connect and engage with consumers in meaningful and personalised ways are finding that social commerce is increasingly indispensable (Liu et al., 2021). In a similar vein, neuromarketing is becoming more popular since it provides a better comprehension of customer preferences and motives, enabling more focused and effective marketing campaigns (Boksem and Smidts, 2015).

## **1.2 Evolution and Current Status**

Examining the definitions, development, and relevance of social commerce and neuromarketing in the contemporary digital economy, this study tries to assess their current status. Neuromarketing has gained prominence as a research domain since the early 2000s, marked notably by Montague et al.'s (2004) influential study on the "Neural Correlates of Behavioral Preference for Culturally Familiar Drinks," popularly known as the "Pepsi vs. Coke" experiment. The evaluation aims to demonstrate the potential of these sectors to revolutionise marketing strategies and improve consumer experiences by examining current advancements and trends. Moreover, the study will delineate significant obstacles and prospects linked to the amalgamation of neuromarketing and social commerce, furnishing discernments for enterprises and investigators seeking to optimise their capabilities.

## **1.3 Social Commerce: A Dynamic Fusion**

Social commerce has emerged as a dynamic fusion of e-commerce and social media, revolutionizing how consumers discover, evaluate, and purchase products (Zhang and Benyoucef, 2016). Platforms such as Instagram and Facebook have become hubs for social commerce, utilizing features like shoppable posts, live-streamed product demonstrations, and influencer-driven marketing campaigns (Koay et al., 2021; Ma et al., 2024). These advancements blur the boundaries between social connection and transactional intent, making it imperative for businesses to develop innovative strategies to better understand factors that influence consumer behaviour (Mou and Benyoucef, 2021).

## **1.4 Neuromarketing Techniques and Applications**

Neuromarketing has arrived as the cutting-edge approach that leverages neuroscience to explore how marketing stimuli impact consumer emotions, cognition, and decision-making processes (Ariely and Berns, 2010; Fugate, 2007). Unlike traditional methods like surveys or focus groups, neuromarketing taps into the subconscious mind, providing valuable insights into the unarticulated factors that influence purchase intentions (Fisher et al., 2010; Kahneman, 2011).

## **1.5 Emotional and Cognitive Responses**

Emotions play a critical role in consumer behavior, especially in social commerce, where purchases are often impulsive, influenced by visually appealing content or endorsements from trusted sources like influencers and peers (Koay et al., 2021; Chen et al., 2021). Emotional responses, such as excitement, joy, or trust, can significantly enhance consumer engagement, fostering stronger connections with brands and increasing the likelihood of purchase (Rúa-Hidalgo et al., 2021). On the other hand, cognitive responses—such as processing social proof mechanisms (e.g., reviews, likes, and shares) and evaluating product information—help consumers rationalize their decisions, bridging the gap between emotional appeal and logical assessment (Aspara et al., 2021). Understanding the interplay between these emotional and cognitive responses is key to crafting effective social commerce strategies that resonate with consumers on a deeper level (Meilatinova, 2021).

## 1.6 Neuromarketing Tools and Technologies

Neuromarketing techniques like eye-tracking can reveal which elements of a product page or advertisement capture a consumer's attention (Zurawicki, 2010; Chae and Lee, 2013). EEG (electroencephalography) can uncover the brain's emotional reactions to specific content, measuring attention, cognitive load, and emotional intensity (Boksem and Smidts, 2015; Thomas et al., 2022). Facial coding and sentiment analysis can gauge immediate emotional responses, providing marketers with actionable data on how consumers perceive their brand or product (Hill, 2011; Harrell, 2019).

Eye-tracking technology has become one of the most important tools in determining consumer attention and preferences (Gheorghe et al., 2023). When combined with facial coding, the results generated show the accurate volume of visual activity (the exact point the person is looking at), linking specific emotional responses to different stimulated elements (Hill, 2011). The integration of EEG, eye-tracking, and virtual reality (VR) allows for a completely new approach to retail and shelf research, offering both high realism and a high degree of experimental control (NMSBA, 2021).

Facial expression analysis software uses computer vision to decode microexpressions and emotional responses during content exposure, allowing marketers to assess viewer reactions—joy, surprise, confusion, or frustration—as they interact with content (Neurons Inc., 2024). Frontal alpha asymmetry (FAA) and the late positive potential (LPP) were found to be the most consistent markers of emotional responses to marketing stimuli, consumer preference, and purchase intention (Thomas et al., 2022). The predictive accuracy of FAA and LPP was greatly improved through the use of machine-learning prediction, especially when combined with eye-tracking or facial expression analyses (Thomas et al., 2022).

## 1.7 Applications in Social Commerce

By applying these tools to social commerce, marketers can optimize content delivery, enhance consumer experiences, and ultimately drive higher conversion rates (Ariely and Berns, 2010). Neuromarketing techniques are particularly valuable in analyzing how users emotionally and cognitively engage with content on platforms such as Instagram, Facebook, TikTok, and LinkedIn (Muñoz-Leiva et al., 2019; Meshi et al., 2015). Studies have shown that travel advertising on social networks is more effective when inserted in media with little editorial content such as Facebook or specialized blogs (Muñoz-Leiva et al., 2019).

The use of neuromarketing for social media analysis enables companies to look past big data and go beyond socially desired responses, as it brings to light real reactions (Constantinescu et al., 2019; Turel et al., 2018). Eye-tracking has been used to optimize ad placement, website layout, and call-to-action visibility, ensuring that digital elements are seen and processed effectively (De Matos et al., 2012; Sung, 2004).

## 1.8 Influencer Marketing and Impulse Buying

Influencer marketing has become a dominant force in social commerce, with social media influencers serving as trusted information sources from which consumers obtain information about products or services (De Veirman et al., 2017; Djafarova and Rushworth, 2017). Studies reveal that effective social media marketing activities by Instagram influencers are critical in driving online impulse buying through the mediating effects of attractiveness and trustworthiness (Koay et al., 2021).

Research indicates that online impulse buying accounts for more than 50% of online purchases, with consumers spending approximately \$5,400 per annum on impulse purchases (Zheng et al., 2019; O'Brien, 2018). Instagram has been identified as the most preferred platform as a social channel for influencer marketing because it is the most effective platform for influencers to connect with their followers (InfluencerMarketingHub, 2020; Jackson, 2019).

The credibility of communication factors plays an essential role in developing trust in influencers' posts, which ultimately induces the urge to buy impulsively (Shamim and Islam, 2022). Product affection mediates the relationship between trust and the urge to buy impulsively, and people with low levels of persuasion knowledge were found to have more chances of developing impulse buying behavior (Chen et al., 2019; Matthes and Naderer, 2016).

Macro-influencers' posts characteristics, including authenticity and visual appeal, positively impact followers' perceived informativeness and flow state, leading to the urge to buy impulsively (Masuda et al., 2022; Pöyry et al., 2019). The authenticity of influencers plays a critical role in followers' purchase behaviour, particularly through mechanisms such as parasocial interaction, which allows consumers to form emotional connections with influencers (Agnihotri et al., 2023).

### **1.9 Limitations of Neuromarketing Integration**

The study of neuromarketing integration provides valuable insights into consumer behaviour, but it does carry limitations on three aspects (Lee et al., 2007):

1. **Ethical Concerns:** It brings issues on privacy, consent, and data transparency, as consumers may not be fully aware of its outcomes (Fisher et al., 2010; Ariely and Berns, 2010). While many of the studies conducted by neuromarketers are commercial and do not go through the standards nor the review process imposed by academics, enough evidence has been published to highlight some neurocognitive principles at play when consumers perceive advertising messages (Morin, 2011).
2. **Cost and Accessibility:** Neuromarketing tools such as fMRI, EEG, and eye-tracking equipment are expensive, limiting their use to well-funded organisations and restricting research work (Breiter et al., 2015). However, emerging solutions combining AI-powered analytics with decades of behavioral research are making these insights more accessible and cost-effective (Neurons Inc., 2024).
3. **Methodological and Practical Limitations:** Studies have shown the use of small samples, which eventually reduces the generalizability (Plassmann et al., 2015). Additionally, neuromarketing as a technique for accessing what consumers 'really' feel might be more properly understood as the development of techniques for making probabilistic predictions about the behaviour of populations (Hubert and Kenning, 2008).

### **1.10 Research Objectives and Methodology**

This study explores the underexplored integration of neuroscience tools in the context of social media platforms by analysing the emotional and cognitive responses that influence purchase intention. The research deploys secondary databases including Scopus, PubMed, Elsevier, Springer, Science Direct, and Emerald to understand the integration of under-explored drivers and their interplay in driving decision-making in social commerce environments (Gheorghe et al., 2023).

The systematic literature review approach examines research contexts, theories, and research methods to propose an integrative framework for understanding consumer behavior in social commerce (Zhang and Benyoucef, 2016). The study draws upon the stimulus-organism-response (SOR) model and the five-stage consumer decision-making process to elucidate factors in consumers' decision-making process (Meilatinova, 2021; Huang, 2016).

This research highlights the need for studies that bridge the gap using secondary data to understand how neuromarketing techniques can be effectively integrated with social commerce platforms. The convergence of social commerce and neuromarketing represents a significant paradigm shift in understanding and influencing consumer behavior (Amiri et al., 2022; Sengur and Goncalves, 2023). As digital marketing continues to evolve, the integration of neuroscientific insights with social media platforms offers unprecedented opportunities for brands to connect with consumers at deeper psychological and emotional levels (Leung et al., 2022).

## 2 Literature Review

### 2.1 The Origins and Evolution of Neuromarketing

Neuromarketing emerged at the intersection of neuroscience and marketing, with the term gaining prominence in the early 2000s. Researchers sought to apply neuroscience tools, such as functional magnetic resonance imaging (fMRI) and electroencephalography (EEG), to understand consumer behavior in ways traditional methods could not. Pioneering works like those of Hubert and Kenning (2008) explored how neuroimaging could bridge gaps in understanding unconscious consumer preferences, providing a foundation for the field.

One of the foundational ideas behind neuromarketing stemmed from Damasio's (1994) somatic marker hypothesis, which emphasized the critical role of emotions in decision-making. Damasio argued that emotional reactions provide essential cues that help individuals navigate complex choices, a principle directly relevant to understanding consumer purchasing behavior. The hypothesis challenged the traditional economic notion of consumers as purely rational agents, prompting marketing researchers to explore emotional responses more deeply.

Early practical applications of neuromarketing gained attention through studies like the "Pepsi Challenge," where researchers used fMRI to demonstrate how branding influenced consumers' perception of taste (McClure et al., 2004). This groundbreaking study revealed that brand associations activated the brain's reward centers, even when the actual sensory experience (taste) was identical. Such findings underscored the power of subconscious processes in shaping consumer preferences and inspired further research in the field.

### 2.2 Theoretical Foundations of Neuromarketing

Neuromarketing is rooted in several theoretical frameworks that link neural processes to consumer behavior:

**Dual-Process Theory:** Kahneman (2011) proposed that Neuromarketing primarily focuses on System 1, as it governs the impulsive, automatic decisions that often drive consumer behavior in real-world contexts. Human thought operates on two systems—System 1 (fast, intuitive, and emotional) and System 2 (slow, deliberate, and logical).

**Emotion-Cognition Interaction:** This study by LeDoux (1996) demonstrated that emotional and cognitive processes are deeply intertwined, with emotions playing a significant

role in guiding decisions. Neuromarketing leverages this interplay by designing stimuli that simultaneously engage emotional arousal (e.g., visual storytelling) and cognitive reasoning (e.g., product information).

**Attention and Memory Theories:** Attention and memory are crucial in marketing, as they determine which messages resonate with consumers. Treisman’s (1988) Feature Integration Theory highlighted the importance of salient visual cues in capturing attention, while Baddeley and Hitch (1974) explored working memory, emphasizing how emotionally engaging content enhances recall and recognition.

### 2.3 Neuromarketing Tools and Techniques

The following tools of neuromarketing have enable the measurement of emotional and cognitive responses more precisely:

**Neuroimaging Techniques:**fMRI: fMRI has been instrumental in identifying neural correlates of consumer preferences and emotional responses Used to measure changes in blood flow in the brain(Plassmann et al., 2007).EEG: EEG has been used to measure emotional engagement, attention, and cognitive workload during marketing interactions A non-invasive method to track brain activity in real time, (Vecchiato et al., 2011).Biometric Tools:Eye-Tracking: eye-tracking can optimize ad layouts and visual content.Tracks gaze patterns to identify which elements of an advertisement or webpage capture attention. Studies by Wedel and Pieters (2008) Facial Coding: Analyzes facial expressions to detect emotional responses. Ekman (1997) Other Techniques: Galvanic Skin Response (GSR): Measures physiological arousal by detecting changes in skin conductivity, as explored in studies by Critchley (2002).Heart Rate Variability (HRV): Assesses emotional engagement and stress levels, providing insights into the emotional intensity of consumer experiences (Boucsein, 2012).

Table 1 summarizes key neuromarketing studies, outlining their objectives, tools used, and major findings across different years. It highlights the growing adoption of neuroimaging and biometric techniques to uncover subconscious consumer responses beyond traditional self-report methods.

Author(s)	Year	Objective	Neuromarketing tools/ techniques	Key findings
Lee et al.	2007	To introduce neuromarketing and discuss its potential applications.	Functional magnetic resonance imaging (fmri), electroencephalography (eeg)	Fmri provides deep insights into brain activity for understanding consumer preferences; eeg is effective for real-time emotion tracking.
Morin	2011	To evaluate the potential of neuromarketing in understanding consumer behavior.	Eye tracking, eeg	Neuromarketing provides more accurate insights into consumer preferences than traditional methods.
Plassmann et al.	2012	To explore the neural mechanisms underlying decision-making.	Fmri, eeg	Identified brain areas responsible for brand preference and price perception.
Ariely and Berns	2010	To assess the effectiveness of neuroimaging in marketing research.	Fmri, eeg	Neuroimaging tools reveal subconscious consumer preferences that surveys cannot capture.
Kühn et al.	2016	To examine the role of the brain in advertising effectiveness.	Fmri, eye tracking	Successful ads activate reward centers in the brain. Eye tracking shows which elements capture attention.
Hubert and Kenning	2008	To outline the scope of neuromarketing in marketing strategies.	Eeg, facial expression analysis	Eeg effectively identifies emotional engagement; facial expression analysis complements this data.
Vecchiato et al.	2011	To investigate emotional responses to	Eeg, galvanic skin response (gsr)	Eeg and gsr are effective in identifying subconscious emotional reactions to ads.

		advertising.		
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Table 2 Applications of Neuromarketing in Consumer Behaviour, provides a concise overview of how neuromarketing insights are applied across different marketing domains to influence consumer decision-making. It demonstrates how emotional and cognitive responses guide advertising effectiveness, packaging design, retail experiences, and digital/social commerce engagement.

Application area	Description
Advertising and branding	Emotional appeals in advertisements influence brand perception; emotionally charged ads activate the brain's reward system, enhancing memorability and persuasion (ariely & berns, 2010).
Product design and packaging	Eye-tracking studies reveal that visual elements like color and layout in packaging affect consumer preferences and purchase intentions (reimann et al., 2010).
Retail environments	Multisensory retail environments—through music, lighting, and scent—enhance emotional engagement and stimulate impulse buying (spence et al., 2014).
Digital and social commerce	Emotional and cognitive responses to influencer content, user-generated content, and interactive campaigns boost engagement and purchase intent in social commerce (huang & rust, 2021).

### 3 Research Gap

This study explores the underexplored integration of Neuroscience tools in context to social media platforms by analysing the emotional and cognitive response that influence the purchase intention by deploying the Secondary databases that will help to understand the integration the under explored drivers and its interplay to drive decision making in social commerce environment, it highlights the need for research that brides the gap using secondary data.

### 4 Need and importance of the Study

1. The rising research on Social commerce demands a exploration into the very novel integration with neuromarketing to draw the understudying into the emotional and cognitive factors driving purchase decisions. The tools of Neuromarketing helps to understand disclose the subconscious influences and helps the business to tailor various marketing strategies.

2. This study maps the neuroscience with digital marketing and provides the practical insights to enhance the consumer engagement, trust and purchase intent. The Outcome provide a actionable guidance for optimising the content and strategies in competitive on-line marketing place and research.

### 5 Objectives of the Study

1. To explore how emotional and cognitive responses influence consumer purchase intentions in social commerce, utilizing insights from secondary data on neuromarketing applications.

2. To determine the role of neuromarketing tools in shaping consumer behaviour on social commerce platforms and its influence on purchase decisions.

## 6 Research Methodology, Data Collection and Analysis

This study employs a secondary research by taking consideration of existing data from the Academic journals, government database, published books and industry reports. Varied sources include Scopus, Web of Science, Statista, Forbes and reports from organisations like Deloitte and Nielsen. The integrations provide valuable insights from diverse credible sources this methodology ensures a comprehensive understating of how neuromarketing influences purchase intention in social commerce platforms.

Table 3. Provides a structured overview of the secondary data utilized in this study, detailing the origin, type, volume, variables extracted, and analytical methods applied. It demonstrates how diverse and credible data sources collectively support a comprehensive investigation into how neuromarketing influences purchase intention within social commerce platforms.

Data source	Category	Number of documents reviewed	Key data/variables collected	Analysis type
Academic journals (e.g., scopus, web of science)	Secondary data (scholarly)	218	Neuromarketing applications, emotional & cognitive responses in social commerce, purchase intention factors	Descriptive analysis, content analysis
Industry reports (e.g., nielsen, statista)	Secondary data (market research)	20	Social commerce trends, consumer behavior on social media platforms, neuromarketing insights	Descriptive statistics, trend analysis
Government data (e.g., indian ministry of commerce, state government portals)	Secondary data (government/business stats)	18	Number of businesses operating online, growth of social commerce in punjab, consumer demographics	Descriptive statistics, trend analysis
Neuromarketing data (e.g., eeg, fmri studies)	Experimental data	5	Emotional responses, attention levels, decision-making processes in social commerce	Statistical analysis, behavioral analysis
Social media analytics (facebook insights, instagram analytics)	Secondary data (digital metrics)	15	User engagement (likes, comments, shares), click-through rates, conversion rates	Descriptive statistics, correlation analysis
Case studies & company reports	Secondary data (case studies)	8	Neuromarketing tool implementation, consumer behavior, impact on sales	Case study analysis, descriptive analysis
Data source	Category	Number of documents reviewed	Key data/variables collected	Analysis type

Table 4 .Offers a detailed framework explaining how neuromarketing tools are used to measure emotional, cognitive, attentional, memory-based, and behavioral responses within social commerce environments. It highlights how different neuroscientific methods, analytical techniques, and data variables help predict consumer engagement, decision-making, and purchase intentions.

Theme	Relationship with neuromarketing	Neuromarketing tools/techniques	Key data/variables collected	Analysis type	Analysis tools/methods	Expected insights
Emotional responses in social commerce	Neuromarketing identifies and measures emotional reactions to social commerce stimuli such as ads, product features, influencer endorsements, and user-generated content. Positive emotions (e.g., excitement) can lead to stronger purchase intentions.	Facial expression analysis (via facial coding), eeg (emotional arousal tracking), fmri (brain activation linked to emotions), eye tracking (emotional engagement)	Emotions elicited by social commerce ads/content (e.g., joy, trust, surprise, anxiety), emotional intensity, consumer engagement	Descriptive statistics (mean, mode), sentiment analysis, qualitative coding	Spss, nvivo (qualitative coding), emotional response scales, r studio	Emotional responses influencing consumer attitudes, their purchase readiness, and engagement with content

		through gaze)	metrics (e.g., clicks, likes)			
Cognitive responses to social commerce	Cognitive responses describe how consumers process social commerce content (e.g., understanding, evaluating, and remembering ads). Neuromarketing tools measure attention and cognitive load during interactions with ads and social commerce content.	Eeg (attention levels, mental effort), fmri (cognitive processing related to decision-making), eye tracking (cognitive focus on product details)	Cognitive load, product evaluation, memory retention, attention to specific content (e.g., price, benefits), recall of ad or brand	Statistical analysis (anova, regression analysis), correlation analysis	Spss, matlab, psychological analysis tools, r	Cognitive ease or overload, brand recall, and decision-making pathways leading to purchase intentions
Attention and focus in social commerce	Attention and focus are vital for consumers to notice and interact with social commerce content. Neuromarketing tracks how attention is allocated to different aspects of social commerce ads (e.g., visuals, text, or influencer).	Eye tracking (gaze patterns and fixation duration), eeg (attention-related brainwave patterns), fmri (brain areas activated by attention and focus)	Focus on key product elements, areas of interest in social media posts or ads, time spent on product information vs. Promotional content, impact of visual cues	Descriptive statistics (fixation duration, gaze patterns), regression analysis (focus and attention's influence on purchase decision)	Eye tracking software (tobii), spss, matlab	Insights into which product features or content types attract the most attention, guiding content optimization for higher engagement
Memory and recall in social commerce	Cognitive memory and recall influence whether a consumer remembers a product or brand after interacting with social commerce content. Neuromarketing tracks how content is stored and retrieved in consumers' minds, impacting their purchase decisions.	Fmri (memory-related brain activation), eeg (memory encoding), eye tracking (memory retention through visual cues)	Recall of product features, brand memory, recognition of ads or promotions, how memory of an ad influences subsequent decisions	Correlation analysis (memory retention and brand recall), regression analysis (memory vs. Purchase decision)	Spss, matlab, neuroscience tools (eeg, fmri)	Insights into how content and emotional/cognitive engagement lead to stronger brand recall and influence purchase behavior
Purchase intentions and emotional-cognitive link	Neuromarketing integrates emotional and cognitive responses to predict and explain purchase intentions. Consumers with higher emotional and cognitive engagement are more likely to make a purchase.	Eeg (emotional and cognitive integration), fmri (neural circuits for decision-making), behavioral data (clicks, conversion rates, purchase tracking)	Emotional arousal and cognitive processing factors related to product choice, decision-making time, purchase intent based on emotional engagement and cognitive focus	Regression analysis (emotions + cognition = purchase intention), path analysis (link between emotional/cognitive responses and purchase behavior)	Structural equation modeling (sem), spss, r	Understanding the key emotional and cognitive factors that drive consumer purchase intentions in social commerce contexts
Social influence and trust in social commerce	Social influence, peer behavior, and trust in social commerce platforms are critical to shaping emotional and cognitive responses. Neuromarketing examines how consumer trust affects emotional responses and subsequent cognitive evaluations of content.	Social media analytics (sentiment analysis of peer reviews and influencer endorsements), fmri (tracking trust-related brain activity), eeg (measuring emotional trust)	Trustworthiness of influencers, emotional reactions to peer reviews, perceived authenticity of content, trust in online shopping platforms	Sentiment analysis (trust sentiment), correlation analysis (social influence vs. Purchase intention)	Google analytics, sentiment analysis tools (e.g., textblob), r studio	Insights into how social proof and trust impact emotional and cognitive evaluations, guiding marketers on influencer strategies
Psychological engagement and behavior	Neuromarketing links psychological engagement (e.g., curiosity, excitement) with purchase behavior. These emotional and cognitive states	Eeg (curiosity, arousal), fmri (activation in areas linked to	Levels of curiosity, desire, or anticipation related to	Statistical analysis (correlation between engagement	Spss, nvivo, physiological tools	Revealing the role of psychological engagement in shaping

	influence consumer decisions in social commerce platforms.	curiosity or interest), behavioral data (user engagement such as likes, shares, and comments)	product posts, interaction patterns such as likes, shares, comments, and conversions	and purchases), regression analysis (psychological engagement vs. Purchase intention)	(eeg)	decision-making pathways, assisting brands in creating more engaging content
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Table 5 presents a detailed overview of neuromarketing tools used within social commerce, outlining their purpose, collected data, key variables, analytical methods, and expected insights. It demonstrates how each tool contributes to understanding emotional, cognitive, physiological, and behavioral responses, enabling deeper analysis of consumer engagement and purchase intention.

Neuromarketing Tool	Purpose and Relationship with Neuromarketing	Data Collected	Key Variables	Analysis Techniques	Analysis Tools/Methods	Expected Insights
Facial Expression Analysis (Facial Coding)	Measures emotional responses based on facial expressions. Neuromarketing uses facial coding to detect micro-expressions indicative of emotions (e.g., happiness, surprise, fear).	Facial expressions (e.g., smile, frown, raised eyebrows), emotional intensity, facial muscle movement patterns, emotional arousal (positive/negative)	Emotional responses: happiness, trust, excitement, surprise, frustration, and negative emotions, emotional engagement levels	Descriptive Statistics (frequency, intensity), Sentiment Analysis, Content Analysis	SPSS, Affectiva, FaceReader, Noldus	Understanding emotional engagement, consumer preferences, and emotional drivers for purchase decisions
EEG (Electroencephalography)	Measures electrical activity in the brain. Neuromarketing uses EEG to analyze emotional engagement, cognitive load, attention, and decision-making processes during social commerce interactions.	Brainwave patterns, emotional arousal (positive/negative), attention and focus levels, cognitive load, engagement levels, decision-making processes	Emotional engagement (alpha, beta, theta waves), cognitive load, attention levels (frontal and occipital regions), decision-making-related brain patterns (frontal cortex)	Regression Analysis, Cluster Analysis, Correlation Analysis	NeuroSky, Emotiv, Biosemi, Brain Vision Analyzer	Insights into brainwave patterns linked to emotional reactions, cognitive load, and attention in decision-making
fMRI (Functional Magnetic Resonance Imaging)	Detects brain activity associated with emotional and cognitive responses. fMRI is used to observe how brain regions are activated during interactions with social commerce content.	Brain activation data (neural pathways), emotional processing regions (e.g., amygdala, prefrontal cortex), decision-making areas, attention-related areas	Brain activation patterns: emotional engagement, reward circuits (dopamine), cognitive processing (decision-making, risk-taking), trust, social influence processing areas	Statistical Analysis (ANOVA, regression), Network Analysis (brain activation regions), Correlation Analysis	fMRI Software (Brain Voyager, SPM), SPSS	Understanding neural regions involved in emotional/cognitive responses, revealing insights on trust and decision-making pathways
Eye Tracking	Tracks eye movement to identify which areas of social commerce content (ads, product images, text) attract attention. Neuromarketing uses eye tracking to assess visual engagement.	Gaze duration, fixation points, visual attention (areas of interest), time spent on key elements (product features, price, brand logo), eye movement patterns	Visual attention allocation, time spent on images/text, focus on product vs. promotional content, visual appeal (logo, product details)	Heatmap Analysis, Gaze Plot Analysis, Fixation Duration Analysis	Tobii Studio, EyeLink, Smart Eye	Insights into what attracts consumer attention, which features increase emotional engagement, and visual cues that drive purchase behavior
Biometric Feedback (GSR, Heart Rate, Skin Conductance)	Measures physiological responses to emotional and cognitive stimuli, providing insights into emotional arousal and engagement levels during interactions with social commerce content.	Heart rate variability, skin conductance response, electrodermal activity (EDA), emotional arousal levels (stress, excitement, calmness)	Emotional arousal: excitement, stress, engagement, excitement, frustration, emotional arousal intensity (high/low)	Statistical Analysis (mean differences), Correlation Analysis (bio-response and purchase intention)	Biopac, Thought Technology, Mind Media	Insights into the physiological responses that indicate emotional arousal, stress, or excitement, influencing purchase decisions

Behavioral Data Analytics	Analyzes user behavior (clicks, scrolls, time spent on content) on social commerce platforms. This data reflects the effectiveness of content in engaging consumers and influencing purchase decisions.	Click-through rates, time spent on product pages, likes, shares, comments, bounce rates, conversion rates, interaction intensity	Interaction frequency, time spent on pages, conversion rate (from engagement to purchase), user behavior patterns (engagement to purchase)	Clickstream Analysis, Engagement Analysis, Conversion Funnel Analysis	Google Analytics, Hotjar, Adobe Analytics	Insights into how users interact with social commerce content, factors that influence purchase conversion, and engagement metrics
Social Media Sentiment Analysis	Examines user-generated content (e.g., reviews, comments) on social media platforms to measure sentiment (positive, negative, neutral). Neuromarketing applies sentiment analysis to gauge emotional reactions to content.	Sentiment polarity (positive, negative, neutral), keyword frequency, emotional tone of posts, brand mentions, social sentiment trends	Emotional tone of reviews (positive/negative), frequency of brand mentions, social engagement (comments, likes, shares), sentiment over time	Sentiment Analysis (quantitative), Text Mining (keyword analysis)	R Studio, Lexalytics, MonkeyLearn	Understanding public perception of brands, product preferences, emotional responses to ads or promotions, and their effects on purchase behavior
Social Listening and Engagement Analysis	Uses social listening tools to monitor consumer conversations and interactions on social media. Neuromarketing analyzes how social interactions and engagement affect emotional and cognitive responses.	Volume of mentions, engagement level (likes, shares, comments), context of conversations, emotional tone in conversations, influencer engagement	Social influence metrics (e.g., influencer impact), brand sentiment, frequency of engagement, emotional reactions to content	Network Analysis, Sentiment Analysis, Topic Modeling	Brandwatch, Sprout Social, Hootsuite	Insights into social dynamics, influencer effectiveness, consumer emotional responses to social media interactions, and the role of social proof in shaping purchase intention
Virtual Reality (VR) and Augmented Reality (AR)	Used to simulate immersive environments where consumers can interact with products in social commerce. Neuromarketing explores how immersive experiences affect emotional engagement and decision-making.	Interaction patterns, emotional reactions to virtual product experiences, cognitive load, decision-making in a simulated environment	Emotional engagement with virtual/augmented products, ease of interaction, cognitive processing in decision-making scenarios	Engagement Analysis, Immersive Experience Analysis, Emotional Response Measurement	Oculus, Vive, Unity, Eye-tracking	Insights into how immersive experiences influence consumer emotions, increase engagement, and enhance purchase intention in social commerce
Psychophysiological Measurement (Heart Rate Variability, Respiration)	Measures physiological stress, relaxation, or excitement during consumer interactions with social commerce content. Provides insight into the emotional impact of product ads, social media posts, or influencer endorsements.	Heart rate variability, breathing patterns, emotional arousal (stress, calm), emotional regulation during content exposure, physiological engagement levels	Emotional intensity (calm vs. arousal), physiological stress, emotional control (relaxation, excitement)	Correlation Analysis (physiological response vs. emotional reaction), Regression Analysis (emotion and purchase behavior)	Biopac, Thought Technology, iMotions	Insights into emotional regulation, consumer physiological responses to content, and how they influence engagement and purchasing behavior

Table 6.outlines key social commerce performance metrics and explains how each relates to neuromarketing by linking emotional, cognitive, and behavioral responses to consumer actions. It provides insight into how analytical methods and digital tools transform behavioral data into predictors of engagement, conversion, and long-term loyalty.

Social Commerce Metric	Purpose and Relationship with Neuromarketing	Data Collected	Key Variables	Analysis Techniques	Analysis Tools/Methods	Authorial Citations	Expected Insights
Engagement Rate	Measures user interaction with content (likes, shares, comments). Neuromarketing analyzes this metric to understand emotional responses to	Number of likes, shares, comments, reactions, user interactions	Emotional engagement, social influence, engagement intensity (high/	Descriptive Statistics, Time Series	Google Analytics, Hootsuite, Sprout Social	Li, L., & Lee, C. (2020). "Neuromarketing in Social Commerce:	Insights into the emotional connection consumers have with content and

	social commerce content.	with social commerce posts	low)	Analysis		Measuring Engagement and Emotional Responses". Journal of Interactive Marketing, 55, 43-56.	their likelihood of engaging in purchase behavior.
Conversion Rate	Measures the percentage of users who make a purchase after interacting with social commerce content. Neuromarketing uses this to assess the relationship between emotional engagement and purchase decision.	Total purchases, purchase frequency, user actions after interacting with ads (click, buy, add to cart)	Purchase intent, emotional connection to brand/products, cognitive evaluation of purchase decision (impulse vs. rational decision)	Regression Analysis, Logistic Regression	Google Analytics, Adobe Analytics, Shopify Analytics	Kumar, A., & Raj, M. (2021). "Impact of Emotional Engagement on Conversion in Social Commerce". Journal of Consumer Research, 49(5), 1073-1087.	Understanding how emotional responses influence conversion rates and purchase intentions.
Click-Through Rate (CTR)	Measures the percentage of users who click on an ad or link in social commerce content. Neuromarketing analyzes this to understand attention and cognitive response to visual and textual stimuli.	Number of clicks, number of impressions, CTR calculation (clicks/impressions * 100)	Attention, visual interest, cognitive processing of ad content, decision-making prompt (e.g., perceived value of content)	ANOVA, Chi-square Test	Google Analytics, Hotjar, Optimizely	Park, S., & Lee, H. (2020). "Neuromarketing Applications in Social Media Advertising". Journal of Marketing, 84(3), 94-111.	Insights into how cognitive processing of content affects purchase decisions and how to optimize content for higher CTR.
Social Sentiment Analysis	Measures emotional tone in social media conversations (positive, negative, neutral). Neuromarketing uses sentiment data to assess consumer emotions and attitudes toward products or brands.	Positive, negative, and neutral sentiment data, keyword frequency, consumer opinions, emotional tone in user-generated content (e.g., reviews, comments)	Sentiment polarity, emotional responses, brand perception, product attitudes, emotional engagement	Sentiment Analysis, Text Mining	Lexalytics, R Studio, IBM Watson, Brandwatch	Tang, Q., & Zhang, Y. (2022). "Social Media Sentiment and its Impact on Consumer Behavior". International Journal of Business, 38(2), 210-225.	Insights into how positive or negative sentiments influence consumer trust and purchase behavior in social commerce.
Influencer Impact (Reach and Engagement)	Measures the effectiveness of influencer marketing campaigns. Neuromarketing examines how influencers evoke emotional responses and affect cognitive processing in social commerce.	Influencer's reach, engagement rate, follower interactions, sentiment analysis on influencer-related content	Social influence, trust in influencer, emotional connection through influencer endorsements, cognitive evaluation of influencer credibility	Multivariate Analysis, Regression Models	Hootsuite, Sprout Social, SocialBakers, Traackr	Acar, A., & Balta, M. (2019). "The Role of Influencer Marketing in Social Commerce". Journal of Marketing Research, 57(6), 412-428.	Insights into how influencers evoke emotional responses and shape consumer perceptions and purchase behavior.
User-generated Content (UGC) Volume	Measures the volume of content created by consumers (e.g., reviews, posts). Neuromarketing explores how UGC affects emotional engagement, trust, and the cognitive decision-making process.	Number of posts, user-generated reviews, photos, and videos, frequency of mentions, engagement with UGC	Emotional trust, social influence, consumer advocacy, engagement, perceived authenticity, emotional connection with content	Content Analysis, Correlation Analysis	Brandwatch, Google Analytics, Hootsuite	Zhang, Y., & Luo, X. (2021). "Exploring the Role of User-Generated Content in Social Commerce". Journal of Interactive Marketing, 57, 122-135.	Insights into how UGC builds trust, emotional engagement, and influences purchase decisions in social commerce.
Shareability and Virality Metrics	Measures how often content is shared by users. Neuromarketing applies this metric to evaluate emotional triggers and cognitive evaluations that make	Number of shares, number of viral posts, content amplification rates,	Emotional engagement, social influence, peer-driven	Social Network Analysis, Content Diffusion	Hootsuite, BuzzSumo, ViralWoot	Choi, J., & Kim, Y. (2020). "Viral Content and Consumer Behavior: A	Insights into the emotional triggers and social dynamics that lead to

	content viral.	engagement with viral content	behavior, perceived social value (content shareability as social proof)	Modeling		Neuromarketing Approach". Journal of Business Research, 66(10), 1814-1823.	content virality, which can influence purchase intention.
Customer Satisfaction and Loyalty Metrics	Measures customer satisfaction through ratings and feedback. Neuromarketing uses these metrics to explore emotional responses that contribute to long-term consumer loyalty in social commerce.	Customer satisfaction scores, Net Promoter Score (NPS), customer feedback, loyalty program participation, repurchase intentions	Customer satisfaction, brand loyalty, emotional attachment, perceived product value, trust in brand	Factor Analysis, Path Analysis	Qual- tics, SurveyMon- key, NPS Tools	Kim, J., & Lee, H. (2019). "Customer Satisfaction and Loyalty in Social Commerce". Journal of Consumer Psychology, 29(4), 567-584.	Insights into how emotional satisfaction and trust contribute to customer loyalty and repeated purchase behavior.
Time-on-Site and Interaction Duration	Measures how long consumers engage with social commerce content. Neuromarketing analyzes this metric to gauge emotional and cognitive engagement, which can influence decision-making.	Time spent on site, page interaction time, session duration, time spent on key product pages or check-out pages	Emotional engagement, cognitive processing (deciding to purchase), attention level, decision-making intensity (impulse vs. planned)	Time Series Analysis, ANOVA	Google Analytics, Hotjar, Kissmetrics	Jones, R., & Ng, M. (2020). "The Role of Engagement Duration in Social Commerce: A Neuromarketing Perspective". Journal of Marketing Research, 58(2), 231-245.	Insights into how emotional and cognitive engagement time on a platform impacts the likelihood of making a purchase.
Purchase Frequency and Retention Metrics	Measures how often customers purchase after interacting with social commerce content. Neuromarketing assesses emotional attachment and cognitive evaluation that leads to repeated purchase behavior.	Number of purchases per user, repurchase rate, retention rate, average order value	Emotional attachment to brand/products, trust in brand, perceived value, cognitive decision-making (considering past experiences and emotional satisfaction)	Co-hort Analysis, Survival Analysis	Google Analytics, Kissmetrics, Adobe Analytics	Lee, M., & Han, J. (2021). "Retention and Repurchase Behavior in Social Commerce". Journal of Interactive Marketing, 56, 145-158.	Insights into emotional and cognitive factors influencing customer loyalty and repeat purchase behavior in social commerce.

Table 7 presents a structured link between neuromarketing dimensions and consumer behavioural outcomes within social commerce environments. It illustrates how emotional, cognitive, and social responses—captured through advanced neuromarketing tools—shape trust, decision-making, engagement, and purchase intentions.\*\*

Neuromarketing Aspect	Purpose and Relationship with Consumer Behavior	Data Collected	Key Variables	Analysis Techniques	Analysis Tools/Methods	Authorial Citations	Expected Insights
Emotional Response to Ads	Neuromarketing examines emotional reactions to advertisements in social commerce. These emotions influence consumer perceptions, attitudes, and purchase intentions.	Emotional tone in consumer reactions (e.g., happiness, surprise, anger), facial expressions, physiological responses (e.g., heart rate, skin conductance)	Emotional engagement, decision-making, brand perception, immediate response to stimuli	Facial Expression Analysis, Emotion Mapping	iMotions, FaceReader, Affdex	Lee, S., & Kim, Y. (2020). "Emotional Responses and Consumer Engagement in Social Commerce". Journal of Consumer Research, 46(7), 1124-1137.	Emotional responses to advertisements drive brand perception and purchase intent by creating a positive emotional connection.
Cognitive Response to Marketing Stimuli	Neuromarketing measures how cognitive processes like attention, memory, and	Attention span, memory recall, cognitive load, implicit associations	Cognitive effort, brand recognition, decision-making process,	Cognitive Load Analysis, Implicit	EEG, Eye-tracking, Implicit Association Test	Berger, J., & Milkman, K. (2019). "The Cognitive Load	Insights into how cognitive responses influence the consumer's understanding of the product

	learning affect decision-making in social commerce. This impacts consumer behavior by shaping their understanding of products.	with products or brands	attention, information processing	Association Tests	(IAT), fMRI	of Social Commerce Ads and its Impact on Consumer Behavior". Journal of Marketing Science, 44(2), 98-112.	and their purchasing decision-making process.
Trust and Perceived Risk	Neuromarketing evaluates how consumers' perceptions of risk and trust affect purchase intentions. Emotional responses to trust cues (e.g., reviews, testimonials) also play a role in shaping behavior.	Perceived trust levels, consumer perceptions of risk, review ratings, trust cues (e.g., logos, certifications)	Trust in the platform/brand, perceived risk, emotional reassurance, cognitive evaluation of product credibility, security concerns	Regression Analysis, Factor Analysis	Qualtrics, SurveyMonkey, IBM Watson	Zhang, Y., & Zhao, L. (2021). "The Role of Trust and Risk in Social Commerce". Journal of Business Research, 72(8), 2503-2514.	Understanding the balance between perceived trust and risk can enhance consumer confidence and increase purchase intentions.
Neuromarketing Tools (EEG, Eye-Tracking)	Tools like EEG and eye-tracking help measure real-time emotional and cognitive responses to social commerce content. These tools provide insights into consumer engagement and attention levels.	Eye movement patterns, neural activity (EEG), areas of the brain activated by stimuli, attention span	Attention, focus, emotional engagement, decision-making, visual processing	Eye-Tracking, Neuroimaging (EEG, fMRI)	Eye-tracking systems (Tobii, SMI), EEG systems (Emotiv, NeuroSky)	Chang, W., & Choi, J. (2018). "Exploring Neuromarketing Tools in Social Commerce". Journal of Marketing Psychology, 21(4), 115-130.	Insights into how attention and emotional engagement are triggered by specific marketing stimuli, shaping purchase intentions.
Consumer Purchase Intentions	Neuromarketing studies purchase intentions by analyzing how emotional and cognitive responses influence the decision to buy. It assesses how these responses guide the decision-making process.	Consumer purchase intent data, willingness to buy after exposure to social commerce ads, emotions experienced during ad exposure	Emotional attachment, cognitive evaluation of product value, intention to purchase, time-to-purchase, impulsivity	Conjoint Analysis, Logistic Regression	RStudio, SPSS, IBM SPSS Statistics	Kim, S., & Lee, M. (2020). "Understanding Purchase Intentions in Social Commerce Through Neuromarketing". Journal of Interactive Marketing, 45(3), 234-247.	Neuromarketing insights reveal how specific emotional and cognitive triggers influence the likelihood of consumers making a purchase.
Social Influence (Peer Reviews, Testimonials)	Neuromarketing investigates how social influence through peer reviews and testimonials can evoke emotional responses, shaping consumer decisions. These influence the cognitive evaluation of products.	User reviews, ratings, social proof data (e.g., influencer endorsements, testimonials), customer feedback, comments on posts	Trust, social proof, emotional reassurance, validation, cognitive evaluation of product/service quality	Sentiment Analysis, Social Network Analysis	Brandwatch, SocialBakers, Hootsuite	Lee, J., & Kim, H. (2021). "Social Influence and Trust in Social Commerce: A Neuromarketing Perspective". Journal of Marketing Science, 49(6), 245-257.	Social influence through peer reviews and testimonials affects trust and purchase intent, creating a validation loop that boosts consumer confidence.
Visual Appeal and Product Presentation	Neuromarketing examines the emotional and cognitive impact of visual elements (e.g., images, colors) on social commerce platforms, which can trigger emotional reactions that influence purchase intentions.	Visual engagement data, user interaction with images/videos, color preferences, visual focus points, time spent on product pages	Visual appeal, emotional engagement, visual attention, product desirability, perceived product quality, purchase desire	Eye-Tracking, Visual Content Analysis	Hotjar, EyeQuant, Visual Website Optimizer	Davis, F., & Wang, X. (2019). "The Emotional Power of Visual Marketing in Social Commerce". Journal of Advertising Research, 59(3), 346-360.	Insights into how visual stimuli such as product images and design influence consumer emotions, leading to higher engagement and purchase likelihood.
Personalization and Targeted Content	Neuromarketing studies how personalized content (e.g., product recommendations) affects emotional responses and	Data on personalized ads, click-through behavior, frequency of interactions	Personalization, emotional connection, cognitive relevance, product fit,	Cluster Analysis, Segmentation Analysis	Google Analytics, Facebook Insights, Amazon	Batra, R., & Wang, T. (2021). "Personalization and Consumer Engagement in	Personalization increases emotional engagement and cognitive processing, leading to stronger purchase intentions

	cognitive decision-making, making content more relevant and appealing to consumers.	with personalized content, recommendation click rates	perceived value		Personalization Tools	Social Commerce". Journal of Interactive Marketing, 52, 75-90.	through targeted content.
Customer Journey and Path-to-Purchase	Neuromarketing maps the consumer's journey across different social commerce touchpoints to analyze how emotional and cognitive responses evolve, affecting purchase decisions.	Data on consumer interactions with social commerce platforms (e.g., browsing history, checkout behavior, abandonment rates)	Emotional touchpoints (e.g., excitement, doubt), cognitive processing (e.g., decision-making, evaluation), stage in the purchase funnel	Path Analysis, Funnel Analysis	Google Analytics, Mixpanel, Kissmetrics	Sweeney, J., & Griffiths, M. (2021). "Mapping the Consumer Journey in Social Commerce". Journal of Business Research, 61(4), 82-95.	Insights into how emotional and cognitive responses change throughout the consumer's journey, shaping their final purchase decision.

## 7 Findings

1. Emotional engagement significantly influences brand perception and increases the likelihood of purchase on social commerce platforms.
2. Cognitive responses determine evaluation and decision-making, affecting perceived product value and risk.
3. Neuromarketing tools such as EEG, eye-tracking, and facial expression analysis offer deeper behavioural insights compared to traditional methods.
4. Social commerce outcomes improve when marketing content strategically targets both emotional and cognitive triggers.
5. Neuromarketing-based strategies can help businesses enhance consumer engagement, trust, satisfaction, and conversion performance online.

## 8 Conclusion

The study concludes that neuromarketing plays a significant role in understanding consumer behaviour within social commerce platforms by analysing both emotional and cognitive responses. Unlike traditional marketing approaches that depend largely on self-reported perceptions, neuromarketing tools capture real-time subconscious reactions to digital stimuli. Emotional states such as trust, excitement, and curiosity were found to strongly influence purchase intention, while cognitive processes like attention, memory, and perceived value guided product evaluation and decision-making. Therefore, integrating neuromarketing insights into social commerce strategies enables businesses to create more persuasive, personalised, and engaging marketing content that enhances consumer satisfaction, loyalty, and conversion rates.

## 9 Future Scope

The study on literature brings out a wider scope for future work that requires examination of cross cultural variations in emotional and cognitive responses to social commerce, marketing to inform global strategies. The integration with AI can enhance neuromarketing analysis by detecting behavioural patterns at scale. It also brings the need for longitudinal studies that can reveal how responses evolve with the repeated exposure. On the exposure to advanced technology this may yield more affordability and access to neuromarketing

research. There is need to explore more into real-time personalization and addressing ethical concerns—such as privacy, consent, and transparency as the research on neuromarketing is increasing and it is relevant to studies such spheres because it is emdeddedly increasing in digital marketing.

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