



THE INFLUENCE OF UNCONSCIOUS DECISION MAKING IN ONLINE CONSUMER BUYING BEHAVIOUR: A CRITICAL REVIEW

PHD THESIS



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Abstract

This doctoral research explores online consumer buying behaviour with a particular focus on unconscious decision-making processes in digital contexts. The overarching aim of the study is to examine neurological and emotional factors associated with online purchasing and to investigate how such factors may be consciously and subconsciously engaged within consumer decision-making processes. Three research questions guide the study: (a) What neurological factors impact online purchasing choices? (b) In what ways, if any, can these factors be consciously manipulated? and (c) In what ways, if any, can these factors be subconsciously manipulated?

A sequential exploratory mixed-methods methodology was employed. The study commenced with qualitative semi-structured interviews to capture participants' subjective experiences of online shopping and their perceptions of conscious and unconscious influences on buying behaviour. Themes emerging from the qualitative phase informed the design of a subsequent quantitative Electroencephalogram (EEG) experiment using a Dot Probe Task to explore attentional responses to emotional stimuli. The EEG component was exploratory in nature and was not intended to establish causal relationships.

The qualitative findings indicate that participants perceive emotions, ease of online transactions, disposable income, algorithmic prompts, and product presentation as influential factors in their online purchasing behaviour. Additional influences, including the COVID-19 context, brand familiarity, detailed product descriptions, and customer reviews, were also discussed. While the EEG analysis revealed descriptive trends in attentional responses to emotional stimuli, no statistically significant effects were identified.

This research contributes to academic discussion by offering an interpretive account of how conscious and unconscious influences may be involved in online consumer decision-making. It also raises ethical and practical considerations relevant to marketers, designers, and policymakers, particularly in relation to emotionally oriented engagement strategies in digital environments. The study advances understanding of online consumer behaviour while explicitly recognising the methodological and evidential limits associated with exploring unconscious processes.

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1 Introduction.

In this present era, digital technology, mainly information and communication technologies (ICT), plays a central role in human life. The widespread use of digital devices, the internet, and other technologies has transformed how information is created, shared, and accessed. Consequently, consumer behaviour in online shopping has undergone a profound transformation. For businesses navigating this evolving terrain, the imperative lies in identifying and comprehending the fundamental factors shaping consumer behaviour. A strategic grasp of these factors not only aids businesses in effectively targeting their intended audience but also enhances their ability to engage with consumers meaningfully.

Traditionally, marketers have deployed strategies that appeal to the rational minds of consumers, emphasising the features and benefits of their products. Dieckmann, Dippold, and Dietrich (2009) state that consumer choices are often rational and deliberate. Theories such as the consumer buying theory process also suggest that consumers go through a rational decision-making process. This theory also means that the process before deciding to buy is a conscious one. However, an alternative perspective to consumers being rational in their buying decisions emerges from studies such as Jiang et al. (2013), challenging the assumption of perfect rationality. According to Jiang et al. (2013), assuming consumers to be perfectly rational is unrealistic due to the influence of psychological biases and cognitive constraints on consumer behaviour. More recently, Dibb et al. (2021) also argue that other factors such as emotions, play significant role in consumer decision making, although the study specifically focussed on the area of financial decision making. While extensive research has delved into conscious decision-making processes, a recent surge of interest focuses on unconscious decision-making's impact on consumer buying behaviour. A pivotal revelation from prior research underscores that many consumer decisions may involve processes that operate with limited conscious awareness (Halkiopoulos et al., 2022). This notion implies that, despite emphasising rational considerations, a significant portion of consumers undergo decision-making processes that elude conscious thought. As explained by Halkiopoulos et al., (2022) Neuromarketing research indicates that a significant portion of consumer decisions, particularly in contexts such as tourism destination selection, occurs beyond conscious

awareness. This is supported by findings that subconscious cognitive and emotional processes, identified through techniques like eye tracking, influence consumer behaviour without the individual being fully aware of these underlying factors (Halkiopoulos et al., 2022). This underscores the crucial role of subconscious mechanisms in shaping consumer choices, affirming the broader notion that many consumer decisions are made without conscious deliberation. Building on these insights, earlier research by Ulman, Cakar, and Yildiz (2014) explored how marketers can leverage neuromarketing techniques to engage with consumers' emotional and cognitive processes, further highlighting the potential of these methods in influencing consumer desires. This explanation supports the above suggestion that marketers are exploring techniques that can influence consumers' minds, which can affect how consumers buy things, i.e., without prior planning. This is known as impulse buying or, sometimes, unconscious buying. According to Iyer et al. (2020) Impulse buying happens when a consumer feels a sudden, powerful, and persistent urge to buy something immediately. The marketers accomplish this using neuromarketing techniques, which Hsu and Chen (2020) describe as a combined aspect of neuroscience, economics, marketing, psychology, and decision theory. This can be significant as Kacen and Lee (2002) highlight the prevalence of impulse buying, attributing up to 80% of purchases in specific product categories to impulsive decisions. However, contrasting findings from Koc and Boz (2014) propose an even higher figure, stating that 95% of all purchases are impulse driven. This raises a fundamental question about the effectiveness of marketing strategies that solely target the conscious mind.

Considering the substantial impact of unconscious decision-making, the effectiveness of marketing geared towards appeasing the conscious mind comes into question. Kumar and Singh (2015) argue that a deeper understanding of the underlying brain mechanisms offered by neuromarketing has been proposed as a way to better understand consumer responses. Consequently, this study explores the influence of unconscious decision-making in online consumer buying behaviour, as this would help to understand the consumers better and to ensure that marketers develop strategies that are both effective and address the needs of the consumers.

1.1 Aim and objectives:

Research Aim:

This research aims to explore the role of perceived unconscious decision-making in shaping online consumer behaviour, with a focus on understanding the interplay between conscious and unconscious factors that drive online purchasing decisions. This research seeks to provide insights that can enhance marketing strategies by incorporating both conscious and unconscious elements of consumer decision-making, thereby contributing to more effective and ethically grounded neuromarketing practices.

Research Objectives:

1. To identify and analyse the conscious and unconscious factors that influence online buying decisions.
2. To examine the dynamic process of online consumer behaviour, emphasising the interaction between conscious and unconscious decision-making.
3. To investigate the internal psychological mechanisms that drive impulsive online shopping behaviour, particularly those that operate unconsciously.

1.2 Research questions:

1. What are the key conscious and unconscious factors that influence online consumer buying decisions?
2. How do conscious and unconscious factors interact to shape the online consumer decision-making process?
3. What unconscious psychological mechanisms contribute to impulsive online shopping, and how do they operate within the broader consumer behaviour process?

1.3 Rationale for this study.

The motivation for conducting this research stems from a profound interest in understanding the complexities of human behaviour, particularly in the context of online consumer activities. As the digital age continues to reshape how consumers interact with markets, the intersection of psychology, marketing, and technology has become increasingly significant. The evolution of online shopping platforms has not only altered traditional buying behaviours but has also introduced new dimensions to consumer decision-making processes. In this transformed landscape, it is essential to explore not just the conscious decisions made by consumers, but also the unconscious influences that drive their behaviours.

The rationale for this thesis is rooted in the need to address a gap in the existing literature regarding the role of unconscious decision-making in online consumer behaviour. While substantial research has been conducted on conscious decision-making processes, the unconscious aspects which are those decisions made without active awareness, remain less understood, particularly in online environments. This gap is critical because unconscious processes often significantly influence consumer choices, from product selection to the timing of purchases. Understanding these processes can offer valuable insights into consumer behaviour, which is essential for developing more effective and ethically sound marketing strategies.

The digital marketplace, characterised by its vast array of choices, personalised content, and the ease of transaction, is fertile ground for unconscious decision-making. The rapidity and convenience of online shopping can lead to impulsive buying, often driven by unconscious triggers such as emotional responses, habitual patterns, and subtle cues in the online environment. By investigating these unconscious factors, this research aims to uncover the internal psychological mechanisms that underpin impulsive online shopping behaviour. This understanding is crucial not only for academics seeking to advance knowledge in consumer psychology but also for practitioners looking to refine marketing strategies in a way that resonates more deeply with consumers.

Moreover, this research is justified by its potential contributions to both academic discourse and practical applications. From an academic perspective, this study seeks to bridge the gap between psychological theories of decision-making and their application in online consumer contexts. It aims to enhance the theoretical understanding of how conscious and unconscious

factors interact to shape online purchasing decisions. This contribution is particularly valuable in the field of consumer behaviour, where the integration of psychological insights with marketing strategies remains an ongoing challenge.

On the practical side, the findings of this research have the potential to inform the development of marketing strategies that are not only more effective but also ethically responsible. In recent years, the rise of neuromarketing has raised important ethical questions about the manipulation of unconscious processes for commercial gain. By providing a detailed examination of these processes, this thesis aims to promote ethical considerations in the application of neuromarketing techniques. The goal is to ensure that marketing strategies account for the well-being of consumers, avoiding exploitative practices while still achieving business objectives.

Therefore, the rationale for this thesis is grounded in the need to explore the unconscious dimensions of online consumer behaviour, a topic of growing importance in the digital age. By investigating the interplay between conscious and unconscious decision-making processes, this research aims to contribute to both theoretical knowledge and practical marketing strategies. Ultimately, the study aspires to enhance the understanding of online consumer behaviour and promote ethical practices in the marketing field, aligning commercial success with consumer well-being.

1.4 Value of the Study

This research offers substantial value to marketing professionals, businesses, and regulatory bodies by providing a nuanced understanding of online consumer behaviour through the integration of both conscious and unconscious decision-making processes. By delving into these often-overlooked aspects, the study equips marketers with the tools needed to develop more targeted and effective strategies that resonate with consumers on a deeper psychological level.

One of the key contributions of this study is its emphasis on the ethical application of neuromarketing techniques. In an era where data-driven marketing is increasingly pervasive, understanding the ethical boundaries of these practices is crucial. This research highlights the importance of respecting consumer autonomy and well-being, particularly when marketing to vulnerable populations. For instance, individuals who are more susceptible to impulsive

buying due to conditions like depression or anxiety are at greater risk of being manipulated by aggressive marketing tactics. The study's findings aim to prevent such exploitation by advocating for ethical standards in neuromarketing, ensuring that consumer protection is prioritised alongside business objectives.

Furthermore, this research holds practical implications for businesses seeking to enhance their marketing effectiveness. By uncovering the unconscious drivers of consumer behaviour, companies can refine their strategies to align more closely with consumer needs and preferences, thereby increasing customer satisfaction and brand loyalty. This alignment is not only beneficial for business success but also for fostering long-term consumer trust.

For regulatory bodies, the study provides valuable insights into the necessity of safeguarding consumers in the increasingly complex digital marketplace. The findings can inform policy decisions aimed at protecting consumers from unethical marketing practices, ensuring a fair and transparent online shopping environment. By addressing the potential risks associated with unconscious decision-making and impulsive buying, this research supports the development of regulations that promote consumer well-being.

As a result, this study adds value by bridging the gap between psychological theory and marketing practice, offering actionable insights that can enhance marketing strategies while upholding ethical standards. It serves as a guide for businesses and regulators alike, advocating for responsible marketing practices that prioritise the protection and well-being of consumers in the digital age.

1.5 Target Audience

The primary audience for this research includes marketers, companies, and organisations seeking to enhance their understanding of consumer behaviour to develop more effective marketing strategies. Business owners aiming to better comprehend their target audience and create marketing campaigns that resonate with consumers will also benefit. Academics and researchers interested in the psychological aspects of consumer behaviour and neuromarketing will find this study valuable. Ultimately, this research aims to assist businesses in making informed decisions about their marketing strategies, leading to successful campaigns and products that meet consumer needs.

1.6 Research Approach

This study employs a sequential exploratory mixed methodology, integrating qualitative and quantitative methods to investigate online consumer buying behaviour. A sequential exploratory mixed methodology is appropriate where an initial qualitative phase is used to explore a phenomenon and inform the focus of a subsequent quantitative phase (Tashakkori, Johnson and Teddlie, 2020). In this study, the qualitative phase was conducted first because the research sought to understand how participants perceived the conscious and unconscious influences affecting their online purchasing decisions.

The qualitative phase used semi-structured interviews to explore participants' experiences of online buying, with particular attention to emotional responses, impulsive tendencies, product presentation, algorithmic prompts, ease of purchase, and other perceived influences on decision-making. This phase was inductive because it allowed key themes to emerge from participants' accounts rather than imposing predetermined categories at the outset. Such inductive development is consistent with exploratory mixed methodological designs, where qualitative findings help identify relevant constructs for later investigation (Schoonenboom and Johnson, 2017).

The purpose of the qualitative phase was not to produce generalisable findings, but to generate interpretive insight into participants' subjective experiences. These insights were then used to inform the conceptual focus of the subsequent EEG experiment. In particular, the prominence of emotion within participants' accounts informed the decision to focus the experimental phase on emotional attentional processing. Similarly, participants' references to product appearance, visual presentation, and algorithmic prompts supported the use of a visual attentional task, as these themes suggested that online consumer behaviour may be influenced by visual and affective cues.

The quantitative phase therefore employed an exploratory EEG experiment using a dot-probe task to examine neural attentional responses to emotionally valenced stimuli. The dot-probe task is widely used to examine attentional responses to emotional stimuli, making it appropriate for exploring emotional attentional processing in this study (van Rooijen, Ploeger and Kret, 2017). EEG measurement was used because it enables the observation of neural

activity associated with attentional and cognitive processing (Luck, 2022). The EEG phase was not designed to establish causal relationships or generalisable effects. Rather, it provided a second source of evidence through physiological observation, allowing the study to compare participants' reported experiences with exploratory neural indicators of attentional processing.

The relationship between the two phases is therefore sequential and complementary. The interviews provided the interpretive foundation for identifying emotion and visual attention as relevant areas for further exploration, while the EEG experiment provided an exploratory physiological perspective on attentional responses to emotional stimuli. This form of integration is consistent with mixed methodological research, where qualitative and quantitative sources may be combined to provide complementary perspectives on complex phenomena rather than to produce direct confirmation (Fetters and Molina-Azorin, 2020). Together, the two phases support triangulation by source in a limited and non-confirmatory sense: the qualitative and quantitative data offer different forms of insight into the same broad phenomenon, without implying that one phase validates or proves the other. This integrated approach supports a more methodologically transparent understanding of unconscious and emotional influences in online consumer decision-making.

2 Literature Review

2.1 Introduction to the Literature Review:

This chapter on literature review explores existing literature to understand the intricacies of the human psyche in the context of digital marketplaces. The review takes a constructivist approach and seeks to dialogue with diverse perspectives and theories. This chapter aims to construct a nuanced understanding of the complex influences shaping contemporary consumer choices in the digital age. It explores selected literature, with the aim of going beyond mere enumeration but delving into the underlying philosophical foundations that guide the pursuit of knowledge and insight in this ever-evolving field. In navigating the digital marketplace, consumers are confronted with countless choices, prompting an exploration of the underlying psychological and neurological processes that shape their purchasing decisions. This review seeks to uncover the rich tapestry of literature addressing the neurological foundations of online consumer behaviour, offering insights into the factors that guide individuals' digital shopping journeys.

The themes identified in the literature are presented in a way that creates a logical flow that builds upon the research topic. The sequence of presenting the themes has been chosen to help lead the reader from general marketing dynamics to specific aspects like communication, information exchange, competition, and cooperation before delving into more specialised topics like emotions, neuromarketing and ethical considerations in neuromarketing.

The following themes explored in this literature review include:

The dynamics of modern marketing and customer engagement, the role of communication in the market, information exchange in the market, cooperation and competition in the market, the role of price in the market, neuromarketing and decision-making, subliminal persuasion and buying decisions, marketing and impulse purchase, social networking sites and impulse buying behaviour, the prevalence of impulse buying behaviour, stimuli and influencing factors driving impulse buying, culture and impulse buying, colour and impulse buying, perception of product packaging and impulse buying, online reviews and impulse buying, emotion and decision-making, positive emotion and thoughts, the International Affective Picture System (IAPS), the role of emotion in online buying decisions, ethical implications of neuromarketing, neuromarketing and mind control, neuromarketing and invasion of privacy, and the role of f-

commerce in buying behaviour. Understanding these factors is crucial for academic discourse, businesses, and marketers striving to comprehend the intricate interplay between conscious and unconscious elements that drive online consumer choices.

The review explores the neurological underpinnings of online consumer behaviour, examining seminal works that lay the groundwork for understanding the cognitive processes involved in digital decision-making. It delves into contemporary research, critically evaluating studies that have investigated the conscious and perceived unconscious influences that may influence consumer choices in the online realm.

This literature review section seeks to enhance the academic stance surrounding online consumer buying behaviour. It does this by offering a nuanced understanding that can inform future research endeavours and practical implications for businesses operating within the dynamic landscape of e-commerce. This is achieved by exploring the factors influencing online consumer buying behaviour, focusing on conscious and unconscious influences rather than concentrating solely on conscious factors. By considering these dual dimensions, marketers can optimise their marketing strategies to appeal effectively to the consumers' conscious and unconscious minds.

2.2 Criteria for selecting literature:

The online consumer landscape has undergone profound transformations in recent years, driven by technological advancements and changing market dynamics (Zaki, 2019). Therefore, as individuals increasingly engage in e-commerce, the intricacies of their decision-making processes have become a focal point of scholarly inquiry.

When identifying extant literature to address the research questions and objectives of this study, the following criteria were taken into consideration:

Relevance: Only literature relevant to the research questions and objectives was selected. The following keywords were used in this study: Neuromarketing, Unconscious buying decisions, Impulse buying, Online buying behaviour, Online purchase, Impulse purchase, Consumer buying behaviour, Emotions, Market, Marketing, Marketing research, Electronic commerce, Social commerce, Unconscious thought theory, Electroencephalogram (EEG).

Currency: This selection of literature for this study was guided by a clear objective to ensure conceptual depth, relevance, and scholarly rigour. Given the evolving nature of online consumer behaviour and the increasing attention on purchase influences in the digital environments, the review prioritised literature published within the last ten years. This was done to ensure that the research remained relevant to contemporary developments, including but not limited to shifts in consumer behaviour as a result of the COVID-19 pandemic (Koch, Frommeyer, & Schewe, 2020).

However, this study does not focus exclusively on the effects of the pandemic. For this reason, the literature review was not restricted to sources published post-2020. Earlier works were included, to offer theoretical frameworks, essential definitions, or foundational insights into core concepts such as emotional drivers, consumer decision-making processes, and unconscious psychological mechanisms. These seminal contributions were instrumental in establishing a robust conceptual framework upon which more recent findings could be critically evaluated.

The selection process also involved using relevant keywords identified through scoping reviews and refined throughout the search process. Reference lists from key articles were reviewed to identify additional, thematically aligned sources.

Methodology: The methodology used in the selected literature was a selection criterion; only those that had employed similar research methods to those utilised in this study, for example, Interviews, Questionnaires, Experiments such as Electroencephalogram, Eye-Tracking, Neuroimaging and more, were considered. Peer-reviewed academic literatures were selected for this research.

2.3 Foundational Knowledge: Understanding the Meaning of Market and Marketing.

Before examining consumers and their buying behaviour, it is essential to first understand the concepts of 'market' and 'marketing.' Gaining clarity on these foundational terms will help to contextualise the research by establishing a clear framework for analysing consumer behaviour. This approach provides a basis for identifying and understanding the dynamics of the online marketplace which is a specific type of market, and the various factors influencing buying decisions within this context. By defining and exploring these key concepts, the study

ensures a precise and well-grounded analysis, enabling a deeper understanding of how marketing principles apply specifically to online consumer buying behaviour. Looking into the meaning of market, Armstrong et al. (2014) identify how markets involve exchange and relationships with actual and potential product buyers. Their study suggests buyers share a particular need or want mainly satisfied through exchange relationships. This highlights the importance of understanding the target audience for products and services, including the target audience that marketers could reach through marketing efforts. This definition focuses on the customers, defining the market as the set of actual and potential buyers of products, emphasises the importance of understanding consumer needs, preferences, and behaviours. This understanding is critical to developing effective marketing strategies to meet the target audience's needs and expand the market to attract new customers. However, this definition has a potential limitation because it must consider the market's supply side. Unarguably, it is important to understand consumers' needs and preferences. Additionally, it is important to take into consideration factors such as competition and the availability of similar or substitute products and services, as these significantly influence consumer choice and market positioning (Arens and Hamilton (2016). Without a clear understanding of these factors, businesses may struggle to develop effective marketing strategies that highlight unique value propositions or differentiate their products and services from competitors. This differentiation is essential for achieving a competitive advantage, as it enables businesses to better meet consumer needs, create stronger brand loyalty, and ultimately capture greater market share (Farida and Setiawan, 2022). Furthermore, the definition needs to account for the broader economic context within which the market functions. Consequently, it omits essential factors that significantly impact the market, including social, economic, and political influences, which can affect demand, supply, pricing, and other market outcomes. Understanding these broader contextual factors is vital for developing effective marketing strategies that marketers can use to respond to changes in the market environment. In summary, while the definition "market is the set of actual and potential buyers of a product" highlights the importance of understanding customer needs and preferences, it does not give a comprehensive understanding of the market. A more complete definition would consider various factors, including the competitive landscape and broader market context.

Another definition of a market to consider is provided by Mankiw (2010), who defines market as an arrangement where buyers and sellers interact to determine the quantity and price of

goods and services exchanged. This definition highlights the fundamental role of demand and supply in shaping market dynamics, as the interaction between buyers and sellers ultimately determines equilibrium prices and the quantities of goods and services traded. This understanding is critical for analysing the efficiency of resource allocation within a market-based economy. However, while the definition provided by Mankiw (2010) captures the essential elements of market interactions, it has the following limitations: Not all exchanges of goods and services occur within traditional market structures. For example, transactions such as the giving of gifts or charitable donations fall outside the parameters of a typical market exchange since they are not motivated by price or voluntary negotiation between buyers and sellers. Furthermore, the broad nature of the definition could imply that transactions in command economies where exchanges may be obligatory or regulated by central authorities might also be included, even though these do lack the voluntary nature of typical market interactions. In contrast, Perloff (2014) provides a more refined definition, describing a market as a mechanism wherein buyers and sellers come together, communicate by sharing information about their preferences and capabilities, and engage in mutually beneficial exchanges. This definition emphasises the importance of information exchange and mutual benefit as integral aspects of market operations, suggesting a more structured and cooperative process than the broader arrangement in the definition provided by Mankiw (2010). By incorporating the communication and informational dimensions, Perloff's definition provides deeper insights into the mechanisms that facilitate market transactions, such as negotiation, signalling, and the role of trust in fostering effective exchanges. Mankiw's definition needs to include the importance of communication in markets. However, Perloff's definition is comprehensive, highlighting communication and mutual benefit. Together, these definitions provide complementary perspectives on what constitutes a market, offering a foundation for analysing its complexities and variations across different economic systems. Although these definitions provide a valid starting point for understanding markets but, they need to be more comprehensive. It is worth noting that a more complete understanding of market requires considering a range of factors, including communication, information exchange, prices, mutual benefit, and competition.

2.4 Exploring the role of communication in the market.

Pakura et al. (2020) state that clear communication is fundamental to market dynamics and significantly affects brand image, buying choices and consumer behaviour. Understanding the complex role of communication is crucial when considering the unconscious processes involved in consumer purchasing. Another study by Shen et al. (2022) explores how conscious and unconscious processing contributes to memory effectiveness in advertising. The study focuses on both standard and creative advertisements. A dual-process, signal-detection technique to separate the effects of conscious recollection and unconscious discrimination was utilised. Shen et al. (2022) reveal that creative advertisements enhance conscious and unconscious memory recognition compared to standard advertisements. When consumers experience a sudden clarity or understanding from an advertisement, it strengthens their unconscious retention of the brand's message. In addition, Shen et al. (2022) state that by crafting messages that facilitate moments of insight, marketers can enhance the unconscious retention of their content, thereby influencing consumer buying decisions. Both Pakura et al. (2020) and Shen et al. (2022) agree that clear communication can influence consumer purchasing behaviour.

An earlier study by Dvir and Gafni (2018) challenges the notion that providing more information through clear communication can positively influence consumer purchasing decisions. Dvir and Gafni (2018) explain that an increased volume of content on a website's landing pages can negatively affect user engagement and decision-making. More specifically, they reveal that the higher the amount of information on a webpage, the fewer users are willing to provide their email addresses, which means that conversion may also decrease. This suggests that overly detailed or abundant information may overwhelm consumers, leading to reduced engagement and lower conversion rates. Therefore, in specific contexts, streamlined communication with less emphasis on detailed information may be more effective in influencing consumer buying behaviour. More recently, Majaliwa et al. (2024) examined the effect of marketing communication strategies on consumer preferences and purchasing decisions. However, this was explicitly the case in the Huye Complex Market in Rwanda. Majaliwa et al. (2024) suggest that businesses should use emotions such as desire, happiness, aspiration, or empathy to strengthen brand loyalty and influence purchasing decisions. Their study highlights the need for advertising messages to be clear, concise, and targeted, focusing

on unique features, benefits, and value propositions to capture consumer attention and interest.

Consequently, all the studies mentioned support the notion that clear, insightful and effective communication in advertising plays a vital role in shaping consumer buying decisions. However, Dvir and Gafni (2018) highlight the importance of not overwhelming the consumers with too much information, as this may have a negative impact. However, by delivering well-crafted messages that resonate emotionally and convey distinct value, marketers can ensure that their advertisement resonates more deeply with the consumers, making the brand more memorable and significantly impacting consumer preferences and driving purchasing behaviour.

2.5 Exploring the role of Information exchange in the market.

Investigating the influence of unconscious decision-making in online consumer buying behaviour requires an understanding of the mechanisms of information exchange in the market. This is supported by Bellur and Sundar (2014), who show that customer knowledge, information exchange and relationship processes can shape market performance and consumer understanding. This is important because information exchange facilitates consumer awareness (Rosario and Raimundo, 2021) and influences perceptions, preferences, and choices through direct and indirect cognitive processing (Son, Nam and Diddi, 2022). In modern buyer-seller relationships, buyers have taken on an increasingly important role as value co-creators (Baumann and Le Meunier-FitzHugh, 2015). This shift is primarily due to information technology and digitisation advances, which have enabled industrial buyers to conduct extensive market research, gather crucial market data, and gain a deeper understanding of competitive products and services. As a result, buyers now play a vital role in shaping market knowledge and providing valuable market intelligence (Rapp et al., 2015). Buyers make a significant contribution to the pool of knowledge within their industry. They are well-positioned to offer insights into products and services relevant to their field and information regarding competitive offerings and their unique advantages (Soltani and Navimipour, 2016). As such, buyers have become an increasingly invaluable source of information, both for salespeople and the selling organisation as a whole. Salespeople can

use buyers' information to enrich their firm's knowledge base. By incorporating buyer-generated knowledge, they can enable their organisation to develop more valuable market offerings, ultimately creating a competitive advantage in the marketplace (Sukrat, Mahatanankoon and Papasratorn, 2018). This exchange of knowledge, facilitated by the buyer's insights and the sales team's expertise, strengthens the buyer-seller relationship and can lead to the development of innovative solutions that better cater to the needs and preferences of the market. In addition, as the buyer's role evolves, their contribution to market knowledge and intelligence becomes increasingly significant. This collaboration between buyers and sales teams is a mutually beneficial exchange of expertise, creating more competitive and appealing market offerings.

The role of information exchange in the market is crucial, mainly in helping to shape competitive advantages and driving innovation. However, beyond its strategic importance, this process is deeply linked with the unconscious decision-making mechanisms that influence consumer buying behaviour. The continuous flow of buyer-generated knowledge into the selling organisation refines product offerings and slowly influences consumer perceptions and preferences, often beyond their conscious awareness. As buyers contribute insights regarding market trends and competitive positioning, they unintentionally shape the information environment that guides consumer choices. This strengthens the argument that consumer decisions are not made in isolation but influenced by a network of information exchanges that operate at both the conscious and unconscious levels. Consequently, understanding how this information exchange affects consumer psychology is vital in comprehending the broader influence of unconscious decision-making within the consumer buying process.

2.6 Exploring the role of price in the market.

Price is crucial in influencing consumer purchasing decisions, although other significant factors, such as brand loyalty and product quality, contribute. This notion is supported by Duralia (2022) and Auf et al. (2018), who argues that financial circumstances, pricing or economic constraints influences consumer choice and purchasing behaviour. When focusing on price, its impact goes beyond logical cost-benefit assessments to involve deeply ingrained unconscious cognitive processes that drive consumer behaviour. Bryan et al. (2018) point out that prices influence market dynamics. The scarcity effect is a fundamental economic

principle reflected in supply and demand. When a resource's availability decreases, its value increases, leading to higher prices and, in turn, can influence consumer behaviour.

Saccardo et al. (2020) suggest that consumers frequently depend on heuristics and emotional reactions when assessing prices, resulting in decisions that are not entirely rational. For example, the anchoring effect demonstrates how the initial presentation of a specific price can subconsciously affect consumers' willingness to pay, regardless of whether the anchor is relevant. An experimental study on anchoring effects (Zong and Guo, 2022) revealed that consumers' price evaluations are considerably swayed by initial anchor prices, which, in turn, influences their subsequent purchasing choices (Zhu et al., 2022). The anchoring effect in consumer behaviour focuses on how initial price exposures influence subsequent purchasing decisions. Furthermore, psychological pricing techniques, like setting a price just below a whole number (for instance, £9.99 instead of £10.00), take advantage of consumers' predisposition to perceive these prices as substantially lower, thereby impacting their buying decisions. It is important to note that economic factors, including income levels and unemployment rates, may diminish the psychological effects of pricing on consumer choices (Balabanis and Stathopoulou, 2021). Wu, Ran, and Zhu (2021) suggest that these pricing strategies boost sales by fostering a perception of more excellent value among consumers. Given these insights, examining the role of price in the marketplace is vital to understanding how unconscious decision-making influences the consumer buying process. By analysing the psychological mechanisms through which price conveys exclusivity, quality, or affordability, often without consumers' conscious realisation, this section highlights the importance of pricing strategies and their subtle ability to manipulate consumer behaviour and market dynamics.

2.7 The relationship between Cooperation and Competition in market Dynamics.

There is a relationship between cooperation and competition in the market, and this relationship is a critical determinant of consumer decision-making, and often operates unconsciously through economic, social, and psychological mechanisms (Katz, Finestone and Paskevich, 2021). At the same time, competition promotes innovation, differentiation, and strategic positioning; cooperation, on the other hand, enhances market efficiency and collective value creation through partnerships, supply chain synergies, and industry alliances.

Consumers, however, are often unaware of how these dual forces affect and change product availability, pricing structures, and quality perceptions. As a result, exploring this dynamic is essential to understanding the unconscious mechanisms that guide consumer choices. This section analyses how the balance between competitive pressures and cooperative strategies influences consumer behaviour and market evolution.

The Competitive Perspective: Differentiation as a Driver of Consumer Decision-Making

Traditional economic theories emphasise competition as a mechanism for market efficiency, suggesting that businesses adopt similar competitive actions to achieve comparable market positions (Moon, 2022). However, marketing theory presents a contrasting view, stressing the role of differentiation in securing favourable consumer perceptions. For example, Duralia (2022) explores this interplay, claiming that unique marketing strategies increase consumer engagement by creating distinct brand identities. This differentiation is essential in consumer decision-making, as individuals tend to gravitate toward brands that resonate with their values, preferences, and perceived needs. The study highlights how consumer reactions to organisational strategies are key to refining effective market positioning. It also reinforces that competition compels businesses to tailor their offerings in response to evolving consumer behaviours.

Contrary to this, while differentiation and competitive positioning are fundamental, a growing body of research argues that business cooperative strategies equally shape market dynamics and consumer behaviour. Gnyawali and Charleton (2018) introduce the concept of coopetition, wherein businesses simultaneously compete and collaborate. Their findings suggest that coopetitive strategies drive joint value creation, benefiting all participating businesses while enhancing overall market offerings. This collaborative approach fosters improved products and services, appealing to consumers who prioritise integrated and seamless solutions over purely distinct brand differentiation.

Mina and Dagnino (2023) expand on this by exploring how businesses leverage coopetition for strategic advantage. Their research highlights that coopetition fosters innovation through knowledge sharing, resource pooling, and inter-organisational learning, ultimately enhancing consumer choices by delivering more diverse, high-quality offerings. They suggest that in industries characterised by rapid technological advancement and shifting consumer preferences, collaborative efforts can sometimes outweigh the benefits of strict competition as businesses collectively accelerate innovation and market responsiveness.

Moreover, the assumption that competition through differentiation permanently secures a competitive advantage may not hold in all market contexts. In specific industries, price sensitivity and habitual purchasing behaviours override brand differentiation. For example, consumers often prioritise affordability over brand uniqueness in markets such as generic pharmaceuticals or utility services. In these cases, cost leadership strategies and price wars may prove more effective than differentiation-driven marketing efforts (Surono, Suryanto and Anggraini, 2020). Additionally, Klein et al. (2019) provide a nuanced perspective on coopetition by examining its influence on market entry decisions. Their research demonstrates that businesses in shared markets balance cooperation and competition to optimise strategic outcomes. They argue that coopetition is not merely an alternative to competition but a complementary approach that allows businesses to pool resources, mitigate risks, and strengthen market positioning while maintaining a competitive edge. Their findings suggest that businesses engaging in coopetitive behaviours can navigate market complexities, access new consumer segments, and develop sustainable competitive advantages. However, coopetition has potential drawbacks, such as the risk of collusion or the adverse effects on smaller businesses that may struggle to compete against larger cooperatives.

Having said that, the interplay between competition and cooperation is not a zero-sum game, these forces interact in complex ways to shape consumer behaviour and market structures. While competition promotes innovation and differentiation, cooperation does facilitate efficiency, resource optimisation, and collective value creation. The above points suggest that businesses must strategically balance these dynamics, as market conditions, consumer preferences, and industry-specific factors determine the relative effectiveness of competitive and cooperative strategies. Therefore, understanding how these mechanisms operate at both conscious and unconscious levels is crucial to comprehending the broader influence of consumer decision-making processes.

2.8 Exploring the role of f-commerce in buying behaviour.

F-commerce has become a significant subset of online commerce by leveraging social media platforms to facilitate transactions and engage consumers (Wang *et al.*, 2022; Chen *et al.*, 2017). Given the central focus of this thesis, which explores the influence of unconscious decision-making in online consumer buying behaviour, investigating the role of f-commerce

is both relevant and timely. F-commerce platforms create unique digital environments where visual stimuli, social interactions, and personalised content can trigger unconscious responses that ultimately shape consumer choices. Integrating an examination of f-commerce into this study enhances the understanding of how digital design and social elements can influence buyer behaviour and offers valuable insights for developing effective marketing strategies that account for both conscious and unconscious consumer processes. As a result, including f-commerce in this research provides a critical lens through which the delicate interplay of psychological factors and digital commerce practices can be comprehensively understood. Social media is an interactive platform that significantly influences online consumer behaviour, with Facebook emerging as one of the most prominent examples. Leong et al. (2018) conceptualise the practice of conducting commerce on Facebook as “f-commerce,” a distinct subset of social commerce (s-commerce). F-commerce leverages Facebook’s unique features, including user-generated content, social interactions, and integrated commercial functionalities to facilitate the online sale and purchase of goods and services (Menon et al., 2016). While this study emphasises the potential of social media to enhance consumer engagement and streamline transactions, it does not fully address how underlying algorithms and design elements may unconsciously influence purchasing behaviour.

Leong et al. (2018) explain that f-commerce is enabled by Facebook’s application programming interfaces (APIs), allowing retailers to display product deals and pertinent information directly on the platform, enabling seamless transactions. However, this focus on commercialising social media platforms does not comprehensively examine the algorithmic mechanisms that may trigger unconscious buying impulses. For instance, Facebook’s referral and recommendation systems integrated via ‘Like’ and ‘Share’ buttons are designed to stimulate impulse buying by gently influencing user behaviour (Leong et al., 2017). Such mechanisms suggest that subconscious triggers are crucial in shaping online purchase decisions beyond deliberate consumer choices.

Research on impulse buying within social commerce indicates that hedonic and utilitarian shopping values influence consumer buying behaviour. Chung et al. (2017) demonstrate that impulsiveness is driven by emotional (hedonic) factors, such as enjoyment and social status, as well as by practical (utilitarian) considerations, like convenience and efficiency. For example, a consumer may impulsively purchase a luxury wristwatch for its prestige value (hedonic motivation). In contrast, a practical purchase might be driven by the need for a

reliable and cost-effective car (utilitarian motivation). Nevertheless, a counterargument arises from Chung et al.'s (2017) focus on restaurant products, which may not fully capture the complexity of impulse buying across diverse product categories. This limitation suggests that the generalisability of their findings could be constrained, and additional product-specific studies are warranted. Furthermore, situational factors such as scarcity and uncertainty have been identified as pivotal in linking impulsiveness with shopping values. For example, scarcity can intensify the urge to purchase by creating a sense of urgency, while uncertainty introduces elements of chance that might either amplify or dampen impulsive behaviour (Chung et al., 2017). Critics such as Leong et al. (2018) argue that restricting the analysis to only scarcity and uncertainty may oversimplify the multifaceted nature of impulse buying, thereby compromising the validity and reliability of such findings. They recommend that future research should also consider other variables such as convenience, brand recognition, and visual presentation to develop a more refined understanding of consumer impulse behaviour in social commerce. In addition to these factors, Chen et al. (2016) investigate the impact of online advertising on consumers' urge to buy impulsively by examining information quality, inherent impulsiveness traits, and the influence of the number of "likes" on a post. Their study draws on several theoretical frameworks, including heuristic information processing, latent-state trait theory, observational learning, and the herding effect. Bellur and Sundar (2019) describe heuristic information processing as the use of mental shortcuts to simplify decision-making, while Steyer et al. (2022) (as cited in Zandi et al., 2022) employ latent-state trait theory to elucidate the interplay between enduring personality traits and transient emotional states. Observational learning, where individuals adopt behaviours by observing others (Smith et al., 2021) and the herding effect, which involves following the actions of others without critical analysis (Coker, 2020), further highlight how external social cues can drive unconscious consumer decisions.

Leong et al. (2017) utilise quantitative methods to analyse the impact of Facebook browsing intensity on impulse buying in f-commerce. Although their structured data collection and statistical analyses provide valuable insights, such approaches may not fully capture the spontaneous and emotional aspects of impulse buying in real-world contexts. For example, relying on proxies such as the "urge to buy" (UBI) rather than directly measuring actual purchase behaviour and the use of dummy Facebook accounts to track "likes" raises concerns about the ecological validity of the findings. These methodological limitations suggest that a

mixed-methods approach, integrating qualitative and quantitative analyses, could offer a more comprehensive view of the interplay between conscious and unconscious processes in online consumer behaviour. Additional studies have examined various Facebook attributes that influence purchase intentions. Suraworachet et al. (2020) reveal that attitudes toward f-commerce, belief in the effectiveness of Facebook features, and perceived ease of use significantly affect purchase intentions. However, because their study was based on simulated scenarios rather than actual f-commerce transactions, its real-world applicability may be limited. Similarly, Sukrat et al. (2015) explore the use of Facebook as a trading platform for organic rice in Thailand. They found that perceived kindness and information quality enhanced trust but did not necessarily translate into increased purchase intentions. Leong et al. (2018) criticise such studies for their small sample sizes and reliance on convenience sampling, which further limits the generalisability of their conclusions.

Kang and Johnson (2015) investigate the determinants of apparel online shopping on Facebook using purposive sampling and incorporating personality traits from the Meta-Theoretic Model of Motivation and Personality (3M model; Johnson et al., 2019). Their findings indicate that information-seeking and socialising gratifications positively influence shopping intentions, with market mavenism and social browsing playing significant roles. However, the study's focus exclusively on active Facebook users aged 18 to 44 neglects non-social shoppers, potentially skewing the results and limiting their generalisability.

A comprehensive review of the literature reveals that, while many studies have focused on the conscious aspects of purchase intention in social commerce, there is a noticeable gap in examining unconscious or impulsive buying behaviour. Although research has examined variables such as Facebook browsing (Lin & Utz, 2015; Qiu, Lin & Leung, 2018) and usage intensity (Moore & McElroy, 2015; Peoyry, Parvinen & Malmivaara, 2019), these studies have not explicitly addressed how these factors relate to the unconscious processes underlying impulse buying. While some researchers (e.g., Iram & Chacharkar, 2017; Cakanlar & Nguyen, 2019) explore the determinants of unconscious buying, many, such as Adelaar et al. (2017) and Mittal, Sondhi & Chawla (2017), focus primarily on stimulus-response frameworks rather than on the internal cognitive processes involved.

Given the increasing use of algorithm-driven marketing, which may further promote impulsive or unconscious buying, the need to understand these internal mechanisms is more critical than ever. This thesis addresses this gap by illuminating the cognitive and affective

processes underpinning impulse purchases in online environments, thereby advancing our understanding of how conscious and unconscious factors drive consumer buying behaviour (Lerner et al., 2015; Chang et al., 2020).

2.9 The Dynamics of Modern Marketing and Customer Engagement.

This study focuses on the influence of unconscious decision-making in online consumer buying behaviour, necessitating a critical examination of marketers' processes and activities to influence consumer buying decisions. Understanding these dynamics is essential, as modern marketing seeks to establish profitable customer relationships and subtly shape the unconscious processes that drive consumer behaviour.

According to Payne, Frow and Eggert (2017), marketing encompasses the processes and activities involved in managing markets to create profitable customer relationships. This definition underscores the centrality of relationship-building in achieving sustainable market performance. In the digital era, however, the interplay between marketers and consumers has grown increasingly complex, as deliberate and unconscious factors often influence online interactions.

Recent literature reveals divergent patterns in consumer engagement within digital environments. Dessart et al. (2015) examine online brand communities and demonstrate that although literature widely promotes active engagement, a substantial segment of consumers adopts a more passive role called "lurking." These consumers predominantly absorb content without engaging in reciprocal interactions, challenging the conventional wisdom that active, customer-managed relationships are universally necessary for effective marketing. This passive consumption suggests that not all consumers require or even desire the intensive, interactive engagement traditionally emphasised by marketers.

In contrast, Chen (2019) provide evidence that, in social commerce contexts, price promotions exert a significant influence on consumer purchase intentions, particularly among those with high price sensitivity. Their findings indicate that while relationship-building strategies are important, tactical pricing interventions may deliver a more immediate impact on consumer behaviour. This view raises a counterargument: if price promotions can effectively drive purchase decisions, particularly among price-sensitive segments, the

resource-intensive pursuit of long-term relationship building may not always be the optimal strategy for every market segment.

Further complicating the marketing landscape, Lee et al. (2018) highlight the phenomenon of consumer fatigue, which arises from the overwhelming amount of online marketing information. Their research suggests that when consumers are overwhelmed with digital marketing content, their responsiveness diminishes, undermining the effectiveness of relationship-building strategies. In such scenarios, passive exposure to succinct promotional messages may prove more influential than efforts to cultivate interactive, long-term relationships. These insights challenge the assumption that only meaningful, long-term relationships marketers foster can effectively drive consumer engagement. Instead, they suggest that passive exposure to marketing stimuli and tactical pricing strategies may greatly influence unconscious decision-making processes in online consumer behaviour. In other words, while interactive, customer-managed relationships are a valued goal, they are not universally preferred or adequate for all consumer segments, particularly in contexts where price sensitivity and information overload are prevalent.

Nonetheless, creating meaningful customer relationships remains a foundational objective in modern marketing. This context is also reflected in Ariely and Berns (2010), who discuss how marketing systems, customer value and market practices shape consumer behaviour. Marketers must engage in various activities, including consumer research, product development, communication, pricing, distribution, and pre-and post-sales service (Payne, Frow, and Eggert, 2017). Importantly, marketing is not a unidirectional process; the active participation of consumers also shapes it. Consumers engage in product searches, information acquisition, brand interactions, and decision-making processes, all of which contribute to the overall marketing ecosystem.

Technological advancements such as websites, online social networks, tablets, and smartphones have further empowered consumers, making the marketing landscape increasingly interactive. This digital transformation necessitates that contemporary marketers adeptly manage customer relationships and the emerging dynamics of customer-managed interactions. Consequently, several critical questions arise: How can marketers effectively reach consumers in an era of digital saturation? How should consumers navigate and interpret the plethora of marketing messages they encounter? And, crucially, how do

these interactions, whether active or passive, influence the unconscious decision-making processes that underpin online consumer buying behaviour?

Addressing these questions is essential for advancing our understanding of modern marketing and customer engagement dynamics. By critically examining both the strategies employed by marketers and the varied responses of consumers, this aims to make clear the complex interplay between conscious marketing efforts and the unconscious processes that ultimately drive online purchasing decisions.

2.10 Neuromarketing and Decision Making.

Modern marketing encompasses two primary objectives: attracting new customers through the provision of superior value and retaining them, as well as expanding the existing customer base by ensuring customer satisfaction (Kumar and Reinartz, 2016; Payne, Frow and Eggert, 2017). This duality not only supports traditional marketing theory but also forms the foundation for understanding how unconscious processes may influence consumer buying behaviour in online environments, a central theme of this thesis.

On the one hand, the rapid evolution of marketing strategies has led some practitioners to rely on traditional methods such as direct mail and surveys (Agarwal and Dutta, 2015). On the other hand, a growing contingent of marketers is exploring contemporary approaches like neuromarketing, which integrates insights from neuroscience, economics, psychology, and decision theory to improve understanding of consumer behaviour (Hsu and Chen, 2020; Nilashi et al., 2020). Supporters argue that neuromarketing offers a promising avenue for uncovering the subconscious drivers of buying decisions by employing brain imaging technologies and other advanced methods to capture consumers' neural responses to marketing stimuli (Venkatraman et al., 2015). However, the application of neuromarketing is not without its challenges and controversies. Critics contend that current neuromarketing techniques may only partially predict consumers' decision-making processes due to the inherent complexity of unconscious factors. For instance, recent research indicates that while specific neural responses can be linked to consumer behaviour, the assumption that all purchasing decisions follow a rational, step-by-step process is flawed (Jiang et al., 2017). In reality, many consumers exhibit impulsive buying patterns or make decisions without extensive cognitive deliberation. This observation raises the question of how neuromarketing

can reliably forecast decision outcomes across diverse consumer segments. Moreover, the debate extends further to the broader implications of using neuromarketing to influence behaviour. Some scholars have raised ethical concerns regarding manipulating consumers through techniques that target subconscious processes (Cosc, 2016). While several studies (e.g., Plassmann et al., 2015; Venkatraman et al., 2015) advocate for the potential of neuromarketing to enhance marketing effectiveness by providing deeper insights than traditional methods, others caution that its predictive power may vary depending on the methods employed and the characteristics of the subject population. This division highlights the need for a multidisciplinary approach that not only refines neuromarketing methodologies but also addresses ethical considerations and validates the practical application of these techniques in real-world settings (Lim, 2018).

A critical examination of consumer decision-making models further emphasises these challenges. As stated by Kumar and Reinartz (2016), traditional models involve sequential stages such as need recognition, information search, evaluation of alternatives, purchase and post-purchase behaviour. However, emerging evidence suggests that these models may underestimate the role of unconscious influences at each stage. For example, the increasing integration of mobile computing and digital tracking technologies enabled by cookies and sophisticated algorithms has blurred the lines between digital and physical consumer experiences (Lane, 2014). Such technologies facilitate the collection of vast amounts of user behaviour data, often done without explicit consumer awareness. Thereby, they potentially impact the subconscious elements of the decision-making process.

Integrating digital tracking and neuromarketing raises critical questions about privacy and consumer autonomy. Studies by Kroger and Raschke (2019) illustrate how data gathered from mobile devices can deliver highly targeted advertising that may trigger impulse buying. However, Narayanan and Vitaly (2018) argue that large-scale audio-based data collection is unlikely due to the vast amount of data required. However, the trend toward increasingly intrusive data collection methods cannot be ignored. These practices have significant implications for consumer autonomy and the ethics of influencing unconscious decision-making, directly challenging the traditional view that customer engagement must be rooted in long-term, reciprocal relationships.

In addressing these issues, several scholars have proposed that neuromarketing should not be seen as a replacement for conventional marketing techniques but rather as a

complementary tool. Recent studies suggest that combining neuromarketing with traditional approaches can yield a more comprehensive understanding of consumer behaviour, ultimately leading to more effective marketing strategies (Boksem and Smidts, 2015; Venkatraman et al., 2015). Such an integrative approach acknowledges the complexity of the decision-making process and encompasses conscious deliberation and subconscious influences. This discussion is significant because it is directly relevant to the central thesis of this study: the influence of unconscious decision-making in online consumer buying behaviour. This research aims to clarify how unconscious factors interplay with conscious decision-making stages by critically analysing the evolving role of neuromarketing alongside traditional marketing strategies. The insights from this analysis are expected to refine existing consumer decision-making models and enable marketers to design more effective, ethically sound strategies that harness both conscious and subconscious drivers of online buying behaviour.

2.11 Subliminal Persuasion and Buying Decisions.

In subliminal persuasion, messages are embedded below the threshold of conscious awareness, thereby influencing consumer attitudes and behaviours without explicit recognition (Morris et al., 2019). This notion is supported by Huang et al. (2019), who examine how subliminal, affective or facial cues can influence perception and behavioural response. This form of persuasion is predicated on the notion that individuals can be subtly guided to alter their beliefs, adopt new information as correct, and even propagate these ideas further, all without deliberate, conscious evaluation (Lakhani, 2008). In practical applications, subliminal persuasion has been employed across various domains, including advertising, public relations, and even political communication, where it is argued to facilitate organic message diffusion among target audiences (Sofi et al., 2018).

Empirical research supports the existence of subliminal influences in marketing. For instance, studies have shown that visual stimuli such as fleeting images or subtle cues embedded within advertisements can significantly impact consumer preferences. Hsu and Chen (2020) describe an experiment in which subliminal cues, such as the messages “Eat Popcorn” and “Drink Coca-Cola,” led to increased sales of these products, suggesting that consumers’ neural responses can be triggered by stimuli that bypass conscious scrutiny. Moreover, subliminal messages do

not need to be confined to verbal content; non-verbal cues such as facial expressions also play a pivotal role. Andrews et al. (2017) demonstrate that facial expressions, which are processed more rapidly than other forms of stimuli (Vuilleumier, 2018), influence social decision-making and consumer behaviour, even when these expressions are not consciously acknowledged.

Despite the evidence supporting the effectiveness of subliminal persuasion, its application in marketing has remained contentious. One counterargument is that, in online environments, the overt elements of interactive engagement, such as user reviews and social media interactions, may overshadow the subtle influence of subliminal cues. Heerey and Gilder (2019) argue that while a smile or other positive non-verbal cues can enhance brand perception, their impact in digital contexts is less direct than face-to-face interactions. Nevertheless, there is a convincing scenario where positive interactions with digital images of smiling staff become associated with a brand, influencing future consumer buying decisions without any direct personal interaction. Further complicating the discussion are the ethical concerns regarding subliminal persuasion. Such techniques have historically been controversial, with regulatory bans implemented in several countries since the mid-20th century (Samuel, 2016). While some contemporary scholars argue that neuromarketing, which often employs similar techniques, offers a more transparent and scientifically grounded method to understand consumer behaviour (Lim, 2018), others caution that utilising these methods risks crossing ethical boundaries by manipulating consumers' unconscious processes without their informed consent (Coscic, 2016). The debate is intensified by recent findings which suggest that modern digital tracking and algorithmic targeting further blur the line between overt marketing and covert influence on consumers. For example, targeted advertising based on data collected from social media interactions and smart devices may exploit consumers' unconscious vulnerabilities to drive impulsive purchases (Dobbs, 2015; Hartmann, 2010).

Critically, the question arises: so, what? This thesis investigates the influence of unconscious decision-making in online consumer buying behaviour; therefore, understanding subliminal persuasion is crucial. Traditional consumer decision-making models may be incomplete if subliminal cues, whether through visual, auditory, or algorithmically mediated channels, can significantly influence consumer decisions without their conscious awareness. Evidence that subliminal stimuli influence consumers suggests that both conscious and unconscious

processes interact to shape consumer buying behaviour (Shen et al., 2021). Consequently, this thesis examines whether current consumer decision-making models underestimate the role of the unconscious mind, particularly in digital contexts where subliminal influences are prevalent. Moreover, the ethical implications of such influences cannot be overlooked. As marketers increasingly adopt neuromarketing techniques to leverage subliminal cues, the need arises to balance commercial objectives with consumer privacy protection and autonomy. Addressing these issues not only advances theoretical understanding but also informs regulatory frameworks and best practices in digital marketing.

While subliminal persuasion demonstrates the capacity to influence consumer behaviour subtly but significantly, its integration into modern marketing strategies raises both practical and ethical challenges. The need to examine these dynamics is central to this thesis, which seeks to clarify the interplay between conscious and unconscious processes in online consumer decision-making, thereby contributing to a more comprehensive understanding of how modern marketing shapes buying behaviour.

2.12 Marketing and Impulse Purchase.

Research into marketing techniques continues to evolve as organisations invest significant resources in refining strategies to influence consumer behaviour (Agarwal and Dutta, 2015). Traditionally, marketing has been conceptualised around rational decision-making, emphasising product features and benefits to attract new customers and sustain long-term relationships (Keller, 2017). In this view, consumers must evaluate product attributes and make informed choices deliberately and consciously. However, evidence indicates that a substantial portion of consumer purchases, particularly in specific product categories, are made impulsively, challenging the assumption that all buying decisions follow a rational, deliberative process.

Recent studies suggest that impulse purchases can account for a significant share of transactions. This is consistent with Adelaar et al. (2003) and Hausman (2000), who identify impulsive purchasing as a behaviour shaped by situational cues, affective responses and limited deliberation. For example, research by Kacen and Lee (2012) and Koc and Boz (2014) indicates that impulsive buying may dominate in specific product categories, even reaching rates as high as 95% in some contexts. Notably, the propensity for impulse buying appears to

vary with product type. While high-value products like real estate typically involve extensive comparison and evaluation, low-value items like everyday consumer goods are often purchased impulsively. This distinction calls into question the universality of traditional consumer decision-making models, which assume a sequential, conscious process from need recognition through post-purchase evaluation (Kotler et al., 2012).

Kacen and Lee (2012) explore the multifaceted nature of impulse buying and explain that while impulse buying is often characterised as unplanned and driven by unconscious urges, there is evidence that some consumers may consciously choose to engage in impulsive buying as a strategic decision. They explain that in certain situations, consumers evaluate the context and decide that an impulsive purchase will satisfy an immediate need or desire more effectively than a planned purchase. This suggestion indicates that impulse buying exists on a continuum, where strategic, conscious decisions can also occur with more automatic, unconscious processes. This perspective challenges the traditional view that impulsivity is solely an uncontrollable, spontaneous reaction, highlighting that consumers may deliberately adopt impulsive behaviours to optimise their satisfaction in some contexts.

Counterarguments to the purely rational consumer decision-making model have emerged from research on bounded rationality. Zhao, Hu, and Chen (2018) argue that heuristics, psychological biases, and cognitive constraints often influence consumer behaviour, particularly when individuals are faced with information overload or complex choices. Indeed, Fitzsimons et al. (2002) have demonstrated that many consumer decisions occur outside of conscious awareness, thereby highlighting the role of unconscious processes in impulse buying. Neuromarketing offers a promising approach to elucidate these unconscious drivers. Kumar and Singh (2015) contend that understanding the underlying brain mechanisms associated with impulse buying can enable marketers to design more effective pricing and promotional strategies. For instance, Kim and Kim (2019) show that pricing tactics can significantly trigger impulsive purchases in online retail environments, often more so than in the physical or atmospheric context of the shopping experience. Such findings underscore the potential for neuromarketing to complement traditional approaches by addressing the subconscious factors that traditional models may overlook. Nonetheless, the reliance on rational decision-making frameworks persists in much marketing practice. Conventional models typically assume that consumers deliberately search for information, evaluate alternatives, and make purchase decisions based on a clear set of criteria (Cao and Li, 2019).

However, the reality of consumer behaviour is more complex. As Williams and Tan (2018) explain, the modern consumer is bombarded with several advertisements, often leading to decision fatigue and reliance on quick, impulsive choices (Shen and Su, 2018). Moreover, Robinson and Lee (2018) argue that the transient nature of consumer emotions means that many decisions are made based on fleeting, unconscious reactions rather than sustained rational analysis.

The implications for this PhD thesis are significant. If the traditional consumer buying process overlooks the roles of unconscious and impulsive decision-making, marketers might be missing key opportunities to connect with consumers more effectively. By integrating insights from neuromarketing, it is possible to develop a more holistic understanding of consumer behaviour that bridges the gap between conscious deliberation and subconscious influences. Such an approach could lead to more effective, cost-efficient marketing strategies that better target impulse purchases, ultimately enhancing competitive advantage in the digital marketplace. Therefore, while conventional marketing strategies have long been premised on rational consumer decision-making, recent evidence challenges this view by highlighting the significance of impulsive and unconscious processes. This research aims to clarify these dynamics further, thereby refining consumer decision-making models and offering actionable insights for modern marketing practice.

2.13 Social Networking Sites and Impulse Buying Behaviour.

Social networking sites are not merely platforms for social interaction but have evolved into complex environments where marketing stimuli are omnipresent and multifaceted (Li, Larimo and Leonidou, 2022). Huang (2016) explains that extensive exposure to these platforms intensifies the influence of marketing messages, as users encounter a continuous stream of content ranging from overt advertisements to subtle cues embedded in posts by friends and influencers. This continuous barrage can trigger impulse buying behaviours before consumers consciously visit a retail website. For example, carefully selected feeds laden with visually appealing product images, user-generated content, and algorithmically targeted advertisements create a setting where consumers are bombarded with explicit and implicit purchase prompts. In addition to the large volume of stimuli, the social dimension inherent in these platforms plays a critical role in shaping consumer behaviour. Li, Liu, and Tukkinen

(2017) explain that the drivers of online purchases extend beyond functional needs to include social gratification and hedonic pleasure. Consumers may be influenced by the desire for social validation or the enjoyment derived from engaging with trendy brands, which predisposes them to act impulsively. The interplay between social identity and consumer behaviour suggests that users are influenced by the content itself and the social context in which it is presented. For example, influencers' endorsements or peers may activate, thereby conforming to consumers' unconscious desire for social norms and triggering impulse buying.

Furthermore, recent studies indicate that these stimuli are processed on multiple levels. For example, Wang et al. (2019) explain that while some cues are consciously noticed, a substantial portion is absorbed subconsciously, and this is a result of the fast pace and massive volume of information available on social media. Information overload can overwhelm cognitive resources, leading to quicker, less deliberative decision-making processes. This phenomenon challenges the traditional models of consumer behaviour that assume a clear demarcation between conscious deliberation and impulsive actions. Instead, it suggests that passive consumption, even without active engagement, is sufficient to trigger impulse buying. Critically, while some researchers argue that active user engagement is necessary for effective marketing, evidence suggests that even passive "lurkers" are not immune to the effects of persistent marketing stimuli (Huang, 2016). The fact that consumers can be influenced without direct interaction highlights the potency of these platforms in shaping behaviour. However, there are counterarguments to this. For instance, Park et al. (2018) state that individual differences in cognitive processing and media literacy can moderate these effects, suggesting that some users respond differently to different stimuli. This variability emphasises the importance of separating the target audience and ensuring the content strategies are tailored accordingly.

For this PhD thesis, the insights derived from studying social networking sites are crucial. Suppose unconscious exposure to diverse, rapid-fire marketing messages can significantly influence consumer decision-making; in that case, traditional consumer behaviour models, which often assume a straightforward, rational decision-making process, are likely incomplete. By integrating these nuanced dynamics into a comprehensive framework, this research aims to advance the understanding of how both active and passive digital interactions contribute to impulse buying. This refined understanding will inform more

effective and ethically sound marketing strategies that leverage conscious and subconscious consumer responses.

2.14 Impulse Buying Is Becoming More Prevalent

The digital revolution has transformed consumer shopping behaviours, leading to a marked increase in impulse buying across online channels. Liu, Li, and Hu (2019) explain that the advent of e-commerce platforms with one-click purchasing, personalised recommendations, and frictionless checkout systems has drastically lowered the barriers to spontaneous purchases. These technological advancements create environments where consumers can quickly transition from browsing to buying, often bypassing the deliberative processes typically associated with traditional retail environments.

Modern marketing techniques have further increased this trend. Liang and Turban (2017) argue that promotional strategies like flash sales, limited time offers, and dynamic pricing effectively evoke immediate consumer responses. The sense of urgency these strategies create is heightened by digital channels' ease of access and convenience, leading to higher unplanned purchases. Dawson and Kim (2010) explain that economic factors such as increased disposable income and the availability of credit, particularly in developed markets, further contribute to this phenomenon. Park (2018) also shares a similar view that when consumers have more disposable income, this tends to increase their subjectivity to making impulse purchases. Although the factors mentioned above collectively drive the prevalence of impulse buying in the online marketplace. However, the rising incidence of impulse purchases does not imply uniformity across all product categories or consumer segments. Gerbing et al. (2015) highlight that impulse buying is more noticeable for low-cost and frequently purchased items, whereas items that have high value would generally involve more extensive evaluation. Furthermore, cultural and demographic factors influence the degree to which consumers engage in impulsive buying behaviour. For example, Dhar and Simonson (2003) state that younger consumers and those with higher media engagement are more susceptible to impulsive triggers.

Critically, while the increase in impulse buying suggests that modern marketing techniques are highly effective, concerns should be raised about consumer welfare and decision quality. The ease of making unplanned purchases may lead to buyer's remorse or financial strain for

some consumers, thereby challenging the ethical implications of aggressive marketing practices. Moreover, the traditional rational decision-making model appears increasingly inadequate in capturing the complexity of these behaviours. If impulse buying is becoming more prevalent, revisiting and possibly revising consumer decision models to incorporate both conscious deliberation and unconscious, spontaneous influences are imperative.

This trend has significant implications for this PhD thesis. A comprehensive understanding of the factors driving impulse buying is essential for developing more accurate consumer decision-making models that account for deliberate and spontaneous actions. By exploring how digital environments foster impulse buying, this research offers actionable insights for marketers seeking to design more effective and responsible marketing strategies. Furthermore, a clearer understanding of these dynamics could also inform policy discussions around consumer protection in the digital age, ensuring that marketing innovations do not come at the expense of consumer well-being.

2.15 Stimuli and influencing factors – What drives impulse buying?

At the heart of impulse buying lies a complex interplay of stimuli that trigger both conscious and unconscious responses. Shen and Khalifa (2018) utilise the Stimulus-Organism-Response (SOR) framework to illustrate how website design elements, such as colour schemes, layout, and interactive features, can evoke immediate emotional reactions that predispose consumers to impulse purchases. Peng and Kim (2018) further elaborate that the harmony between visual imagery, animated content, and persuasive promotional cues can significantly increase decision-making, rapidly leading to unplanned purchases.

Beyond the digital interface, situational factors play a critical role in regulating the impact of these stimuli. Lejoyeux and Weinstein (2019) indicate that time pressure, mood fluctuations, and situational stress can influence the likelihood of impulsive buying, and this can be achieved by reducing the capacity for rational evaluation. For instance, a hurried or emotionally charged consumer may be more vulnerable to a compelling limited-time offer, as their cognitive resources are diverted toward immediate gratification. Similarly, Robinson and Lee (2018) reveal that the pervasive fear of missing out (FOMO) is a potent driver of

impulse buying, particularly in social media environments where consumers are constantly reminded of trending products and peer behaviours.

Cultural influences further complicate this dynamic. Cakanlar and Nguyen (2019) argue that cultural norms and social expectations create consumers' susceptibility to marketing stimuli. In cultures that prioritise collectivism and social conformity, for example, the influence of peer endorsements and social validation can intensify impulsive reactions to marketing cues. Conversely, consumers in a more individualistic society might show more excellent resistance to such external pressures, demonstrating different responses to the same stimuli. In addition, negative affect and emotional distress have been linked to heightened impulsivity. Shemeis, Asad, and Attia (2021) provide empirical evidence that negative emotions can trigger compensatory buying behaviours, as consumers look for immediate relief through unplanned acquisitions. This finding highlights the importance of considering affective states as critical internal factors that interact with external marketing stimuli. Notably, Peng and Kim (2018) argue that these affective responses often occur below the level of conscious awareness, reinforcing the need to incorporate unconscious processes into buying behaviour models. Critically, while these insights underscore the multifaceted nature of impulse buying, they also challenge traditional marketing models that assume a rational, step-by-step decision-making process. The interaction of environmental cues, emotional states, and cultural factors suggests that impulse buying is not merely a spontaneous reaction, but a complex phenomenon driven by internal and external factors.

For this PhD thesis, a deep understanding of the specific stimuli and influencing factors that drive impulse or unconscious buying is essential for refining contemporary consumer decision-making models. This research aims to provide a more holistic view of consumer behaviour in digital environments by clarifying the mechanisms through which both conscious and unconscious factors interact. Such an understanding is important for developing innovative marketing strategies that are more effective and ethically grounded, ensuring that businesses can engage consumers in ways that promote profitability and consumer welfare.

2.15.1 Pandemic and Buying Behaviour.

The COVID-19 pandemic has radically reshaped consumer behaviour on a global scale. Recent research by Donthu and Gustafsson (2020) confirms that the crisis has disrupted business practices and fundamentally altered how consumers approach buying decisions. Pantano et al. (2020) observe that the pandemic has shifted consumers' buying behaviour regarding quantity, timing, and product types. For example, lockdowns and health concerns have accelerated the adoption of online shopping, while economic uncertainty has prompted consumers to adjust their spending habits and reconfigure their shopping baskets.

Recent empirical work by Kim and Park (2021) reveals that changes in household routines, such as working from home and the increased time consumers spend online, significantly affect their buying motivations. Consumers now prioritise convenience and safety over traditional shopping experiences. This shift is further compounded by political and economic uncertainties. As noted by Kim and Park (2021), these uncertainties have fostered a climate of caution that affects spending behaviours, with consumers becoming more selective in their purchases due to concerns about their financial futures. However, many studies attribute these changes primarily to the external shock of COVID-19. However, there are counterarguments to this. For instance, Kirk and Rifkin (2020) argue that the pandemic may have triggered enduring societal transformations rather than temporary shifts. They suggest that the crisis could instigate long-term changes in consumer behaviour, where digital channels and self-service models will become deeply entrenched even after the pandemic subsides. This view is supported by observations of do-it-yourself (DIY) behaviours and increased self-reliance in shopping practices, which hint at an adaptive, rather than purely reactive, transformation. Critically, the pandemic's impact on consumer behaviour highlights a complex interplay between external events and internal decision-making processes. While the immediate effects, such as panic buying or hoarding, appear to be driven by external uncertainty, more profound changes in routines and priorities suggest that the pandemic may have also altered the underlying and possibly unconscious dynamics of consumer decision-making. This nuance is particularly significant for the present thesis, which explores the influence of unconscious processes on online consumer buying behaviour. If external shocks like the pandemic can reshape conscious and unconscious buying impulses, traditional models that assume stable, rational decision-making may be incomplete.

As a result, understanding the pandemic's multifaceted impact is crucial for refining consumer decision-making models. Suppose the COVID-19 crisis has led to persistent shifts in how

consumers approach buying, altering the visible behaviours and the underlying unconscious drivers. In that case, marketers and researchers must reconsider existing theories. Incorporating these insights could enable businesses to design strategies better aligned with the new normal, thereby boosting consumer engagement and competitive advantage in the digital marketplace.

2.15.2 Culture and Impulse Buying.

Cultural factors profoundly influence impulse buying behaviour, shaping how consumers respond to marketing stimuli and the extent to which they engage in spontaneous purchases. Nguyen and Simkin (2018) provide compelling evidence that cultural orientations, precisely the dichotomy between collectivism and individualism, affect consumers' impulse control and responsiveness to external cues. In collectivist cultures, where group harmony and social conformity are prioritised, individuals are often socialised to suppress impulsive tendencies to maintain group cohesion. Conversely, in individualistic cultures, the emphasis on personal freedom and self-expression can lead to a higher propensity for impulse buying, as consumers are more likely to act on personal desires without extensive deliberation.

Recent studies by Li et al. (2021) further emphasise that these cultural influences are deeply embedded in early socialisation processes. For example, in many East Asian contexts where collectivist values dominate, there is a strong expectation to consider the needs and expectations of the group, which may mitigate impulsive actions. In contrast, Western consumers, socialised in more individualistic environments, often prioritise personal satisfaction and may be more susceptible to immediate, emotionally driven purchases. However, Nguyen and Simkin (2018) argue that the relationship between culture and impulse buying is not unidirectional. They also explain that in collectivist cultures, consumers might buy on impulse when the purchase decision aligns with group norms or enhances social status. This notion suggests that cultural influences can be context-specific and interact with other factors, such as product type and marketing context. For instance, online retail environments that tailor their messages to reflect culturally specific values might dampen or amplify impulsive behaviours depending on how well they resonate with local norms.

Moreover, the digital transformation of commerce has introduced new dynamics that further complicate this cultural interplay. Li et al. (2021) note that digital marketing platforms often

employ sophisticated targeting techniques that can either exploit or mitigate cultural predispositions toward impulsive buying. For example, promotional strategies that emphasise communal benefits may be more effective in collectivist settings. In contrast, those that highlight personal gains and immediacy might better capture the attention of individualistic consumers. These cultural dimensions are critical to understanding the full spectrum of impulse buying behaviour, especially when considering unconscious influences. The traditional view that impulse buying is a spontaneous, irrational act is challenged by evidence that cultural context significantly modulates these behaviours. In individualistic cultures, the unconscious drive to act quickly may be more pronounced, while in collectivist settings, the unconscious influence might be channelled through social conformity and group-related cues. In this PhD thesis, recognising the cultural underpinnings of impulse buying is vital. If cultural factors shape how consumers unconsciously process marketing stimuli and make impulsive decisions, then any comprehensive consumer decision-making model must account for these variations. This insight is not only theoretically significant, but it also has practical implications for global marketing strategies. By understanding how cultural contexts influence impulse buying, marketers can tailor their approaches to better align with the values and behaviours of diverse consumer segments. Such culturally sensitive strategies could improve engagement, reduce consumer resistance, and foster more effective and ethical marketing practices in an increasingly interconnected digital marketplace.

2.15.3 Colour and Impulse Buying.

Colour is among the most potent visual stimuli influencing consumer mood, cognition, and online purchase behaviour (Zebal and Jackson, 2019). This notion is supported by an earlier study Coursaris et al. (2008), who state that visual design features such as colour, contrast or graphical presentation can influence consumer perception and online response. Wang, Qian and Li (2019) establish that colour enhances aesthetic appeal and affects information processing, memory retention, and emotional responses in ways that often operate beneath conscious awareness. Their study further explains that visual attributes such as colour saturation contribute to the aesthetic appeal of products and subtly modulate cognitive and emotional response processes that typically occur at an unconscious level. Their study shows that colour is critical in shaping consumer perception and decision-making. Lin and Liu (2019)

demonstrate that web page colour displays can influence consumers' emotional responses and subsequent online impulse purchasing intention. Using a laboratory experiment based on the Stimulus–Organism–Response framework, their study found that chromatic web page displays generated stronger feelings of pleasure and arousal than achromatic displays, and that these emotional responses influenced consumers' intention to purchase impulsively online. This suggests that the deliberate use of colour in e-commerce interfaces may affect consumers' emotional engagement and increase the likelihood of impulsive buying behaviour. The three principal components of colour hue, saturation, and brightness play distinct roles in shaping consumer perception. Kumar and Chaudhary (2018) offer an updated framework by defining hue as the basic colour tone (e.g., red, blue, or green), saturation as the intensity or purity of that colour, and brightness as the perceived lightness or darkness. Their study in the *Journal of Business Research* found that the interplay between these elements can significantly influence online consumer behaviour. For instance, the authors report that a website featuring high-saturation colours with moderate brightness fosters an energetic mood conducive to impulse buying. In contrast, excessive brightness and high saturation may lead to sensory overload, diminishing the desired effect. Madden, Hewett and Roth (2000) extend this discussion by investigating colour meanings and preferences across different national and cultural contexts. Their cross-national study shows that colours can shape brand and corporate image, but that colour meanings and preferences vary across cultures. This suggests that the effectiveness of colour as a marketing tool is context dependent, particularly where brands operate across culturally diverse markets. As a result, marketers must carefully consider the aesthetic qualities of their colour choices as well as the cultural background of their target audience. For example, an online retailer aiming at a global market might need to tailor its colour strategy to local preferences to maximise the impulsive impact on consumers. However, counterarguments exist regarding the universality of colour effects on impulse buying. Singh and Kaur (2021) argue that while colour can trigger strong emotional responses, its influence on impulse purchasing is moderated by individual differences in colour sensitivity and cognitive load. Their study shows that in conditions where users are probably undergoing high information overload, which is typical for many forms of digital shopping, the impact of colour erodes. Additionally, the researchers argue that the excessive use of intense colours can cause visual fatigue that lowers overall interest and sometimes even makes consumers defer or ignore their buying decisions. This points to the

fact that colour is a double-edged sword. Intentionally, it is a powerful unconscious cue that increases impulse buying, but when misapplied, it worsens the user experience.

The implications for this PhD thesis are significant. The research posits that unconscious cues are critical in online consumer decision-making. Colour, as an omnipresent and easily manipulated aspect of digital design, exemplifies a factor that can trigger spontaneous purchase behaviour without the consumer's full awareness. By integrating recent findings on colour psychology into consumer decision models, this study aims to refine our understanding of how subtle environmental cues contribute to impulse buying. In turn, these insights can guide the design of e-commerce interfaces that leverage colour strategically to balance visual appeal with cognitive load, thereby enhancing consumer engagement and conversion rates.

2.15.4 Perception of Product Packaging and Impulse Buying.

Product packaging serves as a tangible manifestation of a brand's identity and plays an influential role in shaping impulse buying behaviour. This is consistent with Bettels et al. (2020), who demonstrate that packaging and sensory product cues can influence consumer evaluation and behavioural response. Recent advancements in neuroimaging have allowed researchers to probe the neural mechanisms underlying consumer responses to packaging design. Liu et al. (2018) used functional magnetic resonance imaging (fMRI) to investigate how attractive packaging influences neural activity in regions associated with reward processing and impulsivity. Their results indicate that when consumers view aesthetically appealing packages, there is heightened activation in the ventral striatum, a brain region linked to immediate reward. This finding suggests that attractive packaging can trigger unconscious, emotion-driven responses that lead to impulse purchases even when the consumer has not previously intended to buy the product.

In contrast, packaging that is perceived as plain or unattractive tends to elicit less activation in reward-related brain regions while increasing activity in areas associated with reflective and deliberative processing (Kim and Choi, 2018). This inverse relationship implies that the visual attractiveness of packaging may bypass the more rational evaluation systems, thereby fostering a state of impulsivity. However, it is important to note that not all consumers are equally influenced by packaging aesthetics. Li and Huang (2019) provide evidence that the impact of packaging on impulse buying is moderated by factors such as product involvement

and prior brand familiarity. Consumers with high product involvement may engage in more deliberate evaluation, even when presented with attractive packaging, suggesting that the unconscious influence of packaging is more pronounced in low-involvement contexts.

Further complicating this relationship is the role of multisensory packaging cues. Wang and Li (2019) argue that tactile elements such as texture and weight, when combined with visual attributes like colour and form, can synergistically enhance the perceived quality of a product. Their study, published in the *Journal of Business Research*, shows that packaging design that integrates visual and tactile stimuli can more effectively trigger impulsive buying by creating a holistic sensory experience. However, counterarguments by Garcia and Patel (2017) caution that the efficacy of such multisensory cues may vary across product categories. For instance, while sensory-rich packaging may enhance impulse buying for food products, it might have less impact on electronics or utilitarian items where functionality is a primary concern.

The relevance of product packaging to this thesis lies in its potential to serve as an unconscious influencer in consumer decision-making. The evidence suggests that packaging aesthetics can activate neural pathways related to reward and impulsivity, thus prompting unplanned purchases. By critically examining how variations in packaging design, such as layout, colour, and multisensory cues, affect neural responses and subsequent buying behaviour, this research aims to bridge the gap between conscious decision-making models and the subtler, unconscious influences at play. Ultimately, a refined understanding of these dynamics can inform marketing strategies that optimise packaging design to stimulate impulse purchases while ensuring that such approaches are ethically sound and contextually appropriate.

2.15.5 Website design and Impulse Buying

The design of an e-commerce website plays a pivotal role in shaping consumer behaviour, particularly in facilitating impulse purchases (Gulfranz et al., 2022).

C-S and Yen (2008) along with Garcia et al. (2013) indicate that website characteristics such as usability, trust, atmospheric cues and interface design can shape online consumer behaviour. Website design encompasses various elements, including visual appeal, ease of navigation, perceived security, and overall usability. Recent empirical studies have shown that these factors collectively create an online environment that can trigger conscious and

unconscious buying decisions. Wu, Chen, and Chiu (2016) demonstrate that aesthetically pleasing websites with intuitive interfaces evoke positive emotional responses, increasing consumers' propensity to make spontaneous purchases.

Luo and Zhang (2019) extend these findings by linking website design to perceived usefulness, a critical post-adoption cognition in online shopping. Their research indicates that when consumers perceive a website as visually attractive and functionally efficient, their confidence in the platform increases. This confidence, combined with positive affect, can lead to higher levels of impulse buying. However, counterarguments such as Floh and Madlberger (2013) argue that high-quality website design does not uniformly result in impulsive behaviour but that its influence is moderated by consumers' digital literacy and ability to evaluate online content critically. In environments where users are proficient in navigating digital interfaces, the effect of aesthetics on impulse buying may lessen as these consumers engage in more deliberate decision-making processes.

Trust also plays an indispensable role in the context of website design, as Liu, Zhang, and Wang (2018) found that trust comprising elements of competence, benevolence, and integrity is significantly enhanced by high-quality website design. This trust, in turn, facilitates impulsive purchasing by lowering the perceived risk associated with online transactions. However, Gefen et al. (2003) emphasise that overemphasising aesthetics without adequate informational content may lead to a superficial trust that does not necessarily translate into sustainable consumer loyalty. Moreover, McCloskey and Zhao (2019) argue that the interplay between website design and trust is complex, suggesting that while a visually appealing website can foster initial engagement and impulse purchases, the absence of robust security features or clear product information may eventually undermine consumer confidence.

For this thesis, the investigation of website design is critical because it directly relates to the unconscious factors that drive online consumer behaviour. This research will attempt to illuminate how digital environments are engineered to trigger impulsive actions by dissecting the interrelationships between visual aesthetics, perceived usefulness, and trust. Such insights are essential for developing a comprehensive consumer decision-making model that accounts for deliberate cognitive evaluations and the more subtle, automatic responses induced by website design. This dual perspective advances theoretical understanding and provides actionable guidelines for practitioners seeking to optimise e-commerce platforms in a competitive digital marketplace.

2.15.6 Online Reviews and Impulse Buying.

Online reviews have emerged as crucial in shaping consumer behaviour, particularly by influencing impulse buying decisions (Zhang *et al.*, 2018). In their study, they establish that online reviews serve dual functions. They provide both utilitarian information and hedonic pleasure that can trigger spontaneous purchases. Zhang, Li, and Zhao (2018) have shown that positive online reviews enhance product credibility and elevate consumers' emotional arousal, increasing the likelihood of impulsive purchases. Their research indicates that highly impulsive consumers tend to focus on the hedonic aspects of reviews, such as personal anecdotes and emotional endorsements. In contrast, more deliberate consumers place greater emphasis on the utilitarian information provided.

However, the influence of online reviews is multifaceted and context dependent. Nguyen, Simkin, and Canh (2019) argue that the credibility of online reviews is paramount. When reviews are perceived as genuine and coming from verified purchasers, they can amplify the impulse to buy. Conversely, if reviews are suspected to be manipulated or biased, their effect on impulsive behaviour is markedly reduced. This perspective is supported by Lee and Choi (2021), who found that verified reviews are more effective in evoking impulse buying decisions than anonymous ones. Moreover, Kim, Lee, and Lee (2021) report that while a surge of positive reviews can boost impulsive buying, the cumulative effect of an overload of reviews may lead to decision fatigue, which dampens impulsivity.

An additional counterargument is that online reviews, while influential, might interact with other factors, such as website design and individual predispositions. For example, positive reviews may easily influence consumers with high impulsivity. However, this effect can be moderated by factors such as previous shopping experience and personal scepticism (Nguyen & Simkin, 2020). Thus, the relationship between online reviews and impulse buying is not linear but contingent upon various moderating variables.

For this thesis, understanding the role of online reviews is pivotal as it highlights how external social cues contribute to the unconscious dimensions of consumer decision-making. The interplay between informational content and emotional arousal generated by online reviews offers critical insights into the mechanisms that drive impulsive purchases in digital contexts.

By integrating these findings with other dimensions of the consumer decision process, this research aims to construct a holistic model that bridges the gap between conscious evaluation and subconscious influence. Such a model will enable marketers to design strategies that leverage the persuasive power of online reviews while addressing potential drawbacks like information overload and credibility issues.

2.15.7 Economic Factor and Impulse Buying.

Economic factors are fundamental determinants of consumer behaviour, particularly in impulse buying. Avdeenko et al. (2019) supports this notion by showing that financial circumstances, pricing or economic constraints can influence consumer choice and purchasing behaviour. Contemporary research indicates that various dimensions of an individual's economic status, including disposable income, discretionary income, family income, and access to consumer credit, can either facilitate or constrain impulsive purchasing behaviour. Ramya and Ali (2017) provide empirical evidence that higher disposable and discretionary income levels correlate with an increased impulse buying propensity. Their findings suggest that when consumers possess more significant financial resources, the perceived risks associated with unplanned purchases are reduced, lowering cognitive barriers to spontaneous buying. Omar, Leach, and March (2018) extend this discussion by demonstrating that the availability of liquid assets and consumer credit, such as credit cards and instalment purchase options, further amplifies impulsive behaviour. Their study in the *Journal of Financial Counselling and Planning* shows that consumers with ready access to credit are more likely to engage in impulsive buying, as the financial cushion provided by these resources fosters a sense of security. However, counterarguments exist. Li, Liu, and Tukkinen (2020) argue that higher income can lead to increased impulse buying, but it may also encourage more deliberate spending habits among financially literate consumers. They suggest that individuals with robust savings and strong financial management skills may moderate their impulsive tendencies, even with abundant economic resources. Furthermore, economic expectations play a critical role in shaping consumer behaviour. When individuals anticipate an increase in income, their confidence in spending tends to rise, which can lead to more impulsive purchases (Ramya & Ali, 2017). Conversely, during periods of economic uncertainty, such as recessions or inflationary cycles, consumers typically adopt more

conservative spending behaviours, reducing the frequency of impulse buys (Omar et al., 2018). This dynamic highlights that the relationship between economic factors and impulse buying is not static but fluctuates in response to broader macroeconomic conditions.

Another important aspect is the influence of pricing strategies on impulse buying. Tirmizi et al. (2009) have shown that promotional pricing, including discounts and limited time offers, can trigger impulsive purchasing behaviour across various consumer segments. Their research indicates that price reductions are external cues interacting with internal financial conditions to prompt unplanned purchases. However, Tinne (2011) cautions that the effectiveness of discounted pricing as an impulse trigger may depend on the consumer's income level and the product's perceived value. For example, while consumers with high disposable income might be more responsive to luxury discounts, those with lower incomes might reserve such spending for essential products. The economic dimension is directly relevant to this PhD thesis because it highlights the interplay between conscious financial considerations and unconscious impulsive triggers. The research posits that while economic prosperity lowers the barriers to impulse buying, it simultaneously interacts with psychological factors such as risk tolerance, cognitive load, and the need for immediate gratification. By incorporating economic variables into consumer decision-making models, this study aims to provide a more integrated view of impulse buying that accounts for rational financial constraints and the automatic, unconscious responses that drive unplanned purchases. Such an approach is critical for developing effective marketing strategies that drive sales and are ethically responsible, ensuring that consumers are not exploited during periods of economic vulnerability. The sections above collectively illustrate the multifaceted influences on impulse buying in online environments, ranging from sensory cues such as colour and packaging to digital interface design, online reviews, and economic factors. Each factor contributes to the broader understanding of how unconscious processes intersect with conscious decision-making in shaping consumer behaviour. This PhD thesis seeks to refine traditional consumer decision-making models by integrating insights from neuromarketing and behavioural economics that reveal the underlying, often unconscious, dynamics at play. By critically examining the roles of colour, packaging, website design, online reviews, and economic conditions, this research addresses the central thesis question: How do unconscious influences drive online consumer buying behaviour? The evidence reviewed demonstrates

that these factors often operate below the level of conscious awareness, triggering immediate emotional and neural responses that lead to impulsive purchases. Moreover, counterarguments from recent studies already mentioned highlight that these influences are not uniform across all consumer segments and are moderated by factors such as cultural context, individual financial literacy, and digital proficiency. This integrative approach advances theoretical understanding by challenging the notion that consumer decisions are solely the product of deliberate, rational processes and offers practical insights for marketers. Understanding the subtle interplay between conscious and unconscious processes is essential for designing effective, ethically sound marketing strategies in a digital marketplace where consumers are bombarded with various stimuli. Marketers who leverage these insights can optimise e-commerce interfaces, tailor promotional campaigns, and implement pricing strategies that resonate with the complex realities of consumer behaviour.

This chapter demonstrates that modern impulse buying results from an intricate interplay between environmental cues and internal cognitive processes. By updating and synthesising recent academic literature, this research contributes to a more nuanced model of consumer decision-making that bridges the gap between rational deliberation and automatic, unconscious responses. Such a model is indispensable for academic scholarship and practical marketing, as it offers a framework for understanding and influencing consumer behaviour in the rapidly evolving digital landscape.

2.16 Emotion and Decision-Making.

Korteling and Toet (2020) define cognitive bias as deviations from rational judgment arising from mental shortcuts and heuristics, which can lead to incomplete or inaccurate decisions. In the context of consumer behaviour, such biases can distort information processing and influence decision outcomes in ways that consumers may not fully recognise. At the heart of this discussion is the concept of affect, an umbrella term that comprises of both emotion and mood. Affect is crucial for understanding consumer behaviour because it reflects the overall experiential state that influences how information is processed, stored, and retrieved.

Lerner et al. (2015) provide a contemporary framework for understanding emotion in decision-making. Achar et al. (2016) and Dave (2016) support this notion as both studies

explain that affective states can shape judgement, information processing and consumer decision-making. According to Scarantino and De Sousa (2018), emotion is a state of mental readiness that arises from cognitive appraisals of events or thoughts. They further explain that the state can be either positive or negative and is characterised by a physiological and behavioural changes, such as changes in facial expressions, posture, and vocal tone, that further influence cognitive processing. Kim et al. (2020) argue that these emotional responses often operate below the level of conscious awareness, thereby shaping attitudes, preferences, and decision outcomes without the consumer's realising this.

Consumer behaviour research further highlights the impact of emotion on decision-making. For example, studies such as Kim et al. (2020) have shown that emotional states can significantly affect product evaluations and purchasing behaviour, even when consumers are unaware of these influences. Therefore, emotion can serve as a powerful yet covert driver of consumer decisions. This notion is particularly relevant to this thesis investigating how unconscious processes shape online consumer buying behaviour.

However, not all scholars agree on the primacy of emotion in decision-making. Counterarguments in the literature suggest that cognitive processes such as attention, memory, and categorisation exert a stronger influence than emotion in specific contexts. Forgas (2017) argues that while affective influences are undeniable, integrating cognitive evaluations often dominates decision-making, particularly in high-stakes or information-rich environments. Moreover, research by Hsee and Rottenstreich (2019) indicates that rational cognitive assessments can sometimes override emotional impulses, especially when consumers are motivated by long-term goals rather than immediate gratification.

These differing perspectives underscore an ongoing debate, 'to what extent do unconscious emotional responses versus conscious cognitive processes drive consumer behaviour?' For instance, while Lerner et al. (2015) explain that emotions can trigger spontaneous decision-making, especially in impulse purchase scenarios, Forgas (2017) suggests that consumers rely more heavily on analytical processing in complex decision contexts. Such debates are not merely academic because they have practical implications for how marketers design their strategies. If emotional cues operate largely at an unconscious level, then marketing campaigns might benefit from leveraging affective imagery and messaging to trigger immediate responses. Conversely, providing detailed product information and clear comparisons might be more effective if cognitive processes are more influential.

This thesis is positioned at the intersection of these debates. By integrating recent insights from neuroscience and behavioural economics, it aims to develop a refined model of consumer decision-making that accounts for both the rapid, unconscious influence of emotion and the slower, more deliberate cognitive processes. Understanding the interplay between these factors is essential for understanding how online consumer behaviour is shaped. In digital environments, where consumers are bombarded with stimuli that can evoke both affective and cognitive responses, it is crucial to determine which processes predominate under various conditions. The implications for marketing are profound. Supposing unconscious emotional influences play a dominant role in shaping online buying behaviour. In that case, marketers can optimise digital interfaces to evoke the desired emotional responses, enhancing engagement and driving impulse purchases. On the other hand, if cognitive processing is seen to override emotional impulses in specific contexts, then strategies need to be adjusted to provide more comprehensive product information and decision-support tools. Ultimately, this research contributes to a more nuanced understanding of consumer decision-making by elucidating the relative contributions of emotion and cognition, and how these processes interact in the online marketplace. By advancing this integrative perspective, the present thesis enriches the theoretical debate on emotion and decision-making and offers practical insights for designing more effective marketing strategies. In an era where digital interactions are increasingly prevalent, a model that bridges the gap between unconscious emotional responses and conscious cognitive evaluations is truly important for both academic inquiry and commercial practice.

2.17 The International Affective Picture System (IAPS)

The International Affective Picture System (IAPS) was used for this research. Lang, Bradley, and Cuthbert (2008; cited in Constantinescu et al., 2016) describe IAPS as a stimulus database investigating various aspects of emotional processing. IAPS is a standardised set of images that have been confirmed to be capable of eliciting emotional responses. These images are primarily utilised in research concerning emotions to highlight specific emotions and are sometimes used to calculate the magnitude of emotional reactions. In addition, they are used in various fields, including neuroscience, psychology, marketing, and consumer behaviour research. Scientific researchers utilise IAPS images to explore attentional biases, emotion

regulation, and how emotional bias can impact decision-making (Lang, Bradley, & Cuthbert, 2008). In a study to investigate the cross-regional consistency in the emotional valence and arousal of IAPS images across different cultures, Miskovic and Schmidt (2012) found that the ratings of the pictures were generally consistent across regions. This confirms that IAPS images can be relied on and used to induce emotional responses across different cultural groups. Similarly, Gruhn, Scheibe, and Baltes (2015) utilised IAPS images when investigating age differences in the negativity bias of memory for emotional pictures. They concluded that older adults demonstrated reduced negative bias in their memory for emotional pictures compared to younger adults. This also confirms that IAPS images can be accurately used for adults and younger adults. Lastly, Kim and Kwon (2019) investigate how the valence and arousal of IAPS images can impact consumers' responses to restaurant menu items. Their study revealed that consumers were likelier to select menu items with higher valence images. The study also identified that the effect was more substantial for high-arousal images. These studies demonstrate using IAPS images to evoke emotional responses and study emotions' effects in various contexts.

This PhD thesis examines whether participants are influenced by emotional bias, causing them to engage in online buying behaviour. The study seeks to determine whether positive or negative biases drive such purchases. This investigation aligns with existing literature on cognitive bias (Cooper & Meterko, 2019), thereby highlighting the psychological mechanisms that underlie consumer decision-making. Understanding these biases is crucial, as it sheds light on how marketers and advertisers utilise brand recognition strategies which often incorporates the use of subliminal techniques to embed their products within consumers' consciousness (Agarwal & Dutta, 2015). Therefore, resulting in the formation of a positive bias toward specific products, and ultimately affecting the consumer behaviour and the decision to make purchase.

2.18 The Role of Emotion in Online Buying Decisions.

Online shopping has revolutionised how consumers make purchases, but its complexity goes beyond just the virtual shopping cart. As consumers navigate the digital marketplace, emotions emerge as influential factors guiding their decisions (Wacker, 2018). Much like in traditional retail settings, where a smile from a salesperson can impact one's choices, positive

emotions can significantly affect one's online buying behaviours. Understanding this link between emotions, cognition, and consumer behaviour is essential for businesses and consumers.

Wacker (2018) states that positive emotions influence consumers' cognitive processes, steering them toward stability or flexibility. Just as emotions can guide one in real-world purchases, they extend their reach into the digital realm. Interestingly, the intensity of these effects hinges on the strength of one's emotional experiences. Moreover, a neurochemical player, dopamine, comes into play, potentially altering digital shopping behaviours. This dopamine is known for its role in reward and motivation, which can reshape consumers' brains beyond the screen boundaries (Gillio, 2019).

Diener, Thapa and Tay (2020) also explains that individuals who frequently experience positive emotions exhibit more outgoing personalities than those who experience negative emotions. Therefore, researchers sought to explore the intricate connection between diverse levels of positive emotions and dopamine. This knowledge will aid in understanding the complex relationship between consumers' thoughts, emotions, and the brain's responses in online shopping. Wacker (2018) investigate the effects of positive emotion, extraversion, and dopamine on cognitive stability-flexibility and frontal EEG asymmetry. It claimed that positive emotions affect how the conscious mind, making one think more steadily or flexibly. The study adds that these effects might change depending on how strongly one feels a positive emotion and whether a chemical in the brain called dopamine is involved (Wacker, 2018). The study further explains that using brain activity, like brain waves, can help to measure these effects. People who enjoy positive emotions are often more outgoing than those who do not. The study also examines how the different levels of positive emotion (i.e., wanting and expecting good things compared to feeling warm and liking something) and dopamine (i.e., a chemical in the brain) can change how people think and how their brain activity looks.

Based on their findings, when people feel a positive emotion, their thinking becomes less steady compared to when they are feeling it more gently. This effect was reversed when the dopamine was blocked, but how their brain activity changed did not depend on the intensity of the positive emotion. Instead, it was more about whether they tended to feel positive emotions related to wanting or liking things. Baixauli (2017) explain that people who enjoy positive feelings and are more outgoing tend to have specific patterns of brain activity. However, it was noted that this pattern changed in the participants when the dopamine was

blocked. The study explains how positive emotions, the chemical dopamine, and personality traits are connected to people's thinking. It also adds to what is already known about how different people think differently. Consequently, it also raises the question of whether negative emotions would have a similar effect on an individual's thinking and the impact of these emotions on the individual's decision-making process when buying online.

Wang, Liu and Qi (2014) suggest that emotions such as wanting and anticipating good things compared to the warm feeling and liking of something carry distinctive implications for brain waves. They likened this to how different shoppers are attracted towards diverse products, each triggering unique emotional responses. The patterns of brain activity reflect these emotional leanings. Outgoing individuals who enjoy and frequently experience positive emotions surfaced as protagonists. Their personalities, closely tied to positive emotions, turned out to be entwined with brain activity. Under the influence of dopamine, extraversion appeared to produce a distinct brain wave pattern during online shopping, similar to a unique choreography of neural connections, but this changed when dopamine was blocked.

The study increases understanding of the fusion between emotions, brain chemistry, and individual traits in decision-making. Purchasing decisions go beyond button clicks and become a symphony of internal factors guided by emotional orchestrations. As businesses design their online marketing strategies, they do this with an understanding of their customers. It is no longer just about user interfaces but more about choreographing experiences that resonate with different emotional tones.

2.19 Ethical Implication of Neuromarketing.

Hsu (2017a) states that neuromarketing research is based on the idea that most brain activity is focused on unconsciously processing information, which is deeply embedded in the mind and not easily accessible through traditional research methods. This means limitations exist in direct investigative techniques, such as direct interviews, surveys, and focus groups, which primarily tap into the conscious reactions of consumers (Cherubino et al., 2019). Neuromarketing aims to understand consumer behaviour at a deeper level by studying the unconscious processes in the brain, which traditional research methods cannot directly access. This provides insights into consumer decision-making (Cherubino et al., 2019). However, Bakardjieva and Kimmel (2016) state that critics of neuromarketing techniques are

alarmed at marketers' attempts to explore the unconscious, suggesting that neuromarketing techniques are used to probe the consumers' unconscious minds for marketing research purposes. Manipulating consumer buying behaviour, including 'Mind control' and 'Privacy intrusion', can be unethical. According to Khaneja and Arora (2024), traditional marketing techniques could also harvest marketing information in the same way as neuromarketing techniques, although the latter may be more effective. However, it is worth mentioning that their study also considers newly developed AI-based software in business practice rather than just a straightforward comparison between traditional marketing and neuromarketing techniques.

2.20 Neuromarketing and Mind Control.

Concerning mind control, Bakardjieva and Kimmel (2016) suggest that research on the unconscious effects of exposing individuals to triggers that are intended to encourage specific buying behaviours has increased concerns about mind control. Bakardjieva and Kimmel (2016) suggest that clever marketers use various tactics to influence buying behaviour and highlight two common scenarios. Firstly, placing the bakery section of a supermarket close to the entrance to entice the shoppers, which they explained may cause customers to be drawn to the bakery section because of freshly baked pastries and bread aroma. Secondly, larger shopping trolleys should be provided in supermarkets to encourage consumers to purchase more items. They also add that some marketers use logos, brand names, and other marketing stimuli, which can be powerful primes to activate strategies. Studies suggest that this can impact the expectation of a product's attributes, influencing behaviour (Chartrand et al., 2008; Fitzsimons, Chartrand & Fitzsimons, 2008). It is worth mentioning that the success of the techniques that marketers may use to entice consumers to make purchases will depend on consumers' spending power. Both examples are simplistic and assume that consumers always have unlimited money. In addition, the examples above assume that all consumers are flexible with the choice of items and the quantity of items they choose to purchase. There are concerns about new technologies such as Google Glass and other SmartWear and greater insight into the brain's response to marketing stimuli. The ethical problem is that this might enable marketers to trigger behaviours more aligned with corporate interests than those in the consumer's interests (Goncalves et al., 2024). While this concern could apply to any form

of marketing, it becomes more significant for neuromarketing as it can influence consumers' unconscious minds.

2.21 Neuromarketing and Invasion of Privacy.

Apart from concerns about neuromarketing having the potential for mind control, another ethical question mark relates to the invasion of consumers' privacy and the associated threats to the confidentiality of data (Tan & Lee, 2024). Kindt (2016) raises concerns about the methodological techniques employed by marketing researchers, particularly regarding privacy issues, such as the use of evolving biometric technologies like facial recognition. Hayes et al. (2021) suggest that ethical issues are more problematic in neuromarketing due to the possibility of personal data being utilised by various third parties (such as advertising agencies and corporate clients) to influence consumer buying decisions. In addition, Surmiak (2019) explains that the confidentiality of data will be breached when there is a failure to protect the privacy of personal data disclosed during a professional relationship with a researcher.

To support the points raised above, Ulman et al. (2014) state that risks to privacy within the context of neuroimaging research would enable the quantification of complex thought processes through technology and could lead to discrimination, stigmatisation, and coercion of individuals or groups. However, Pluta-Olearnik and Szulga (2022) comment that some researchers defend the ethics of neuromarketing, claiming that neuromarketing is not dangerous. Instead, neuromarketing furnishes marketers with an increased understanding of consumer needs and desires and gives consumers some power to influence marketing decisions (Pluta-Olearnik & Szulga, 2022). Although their study focuses on the importance of emotion on consumer purchase decisions, they argue that putting a stop to neuroscience research and its applications because of the possibility that the personal privacy of consumers will be invaded or that consumers' buying decisions might be unjustifiably manipulated could result in significant setbacks for the advancement of neuroscience. Agreeably, Cherubino et al. (2019) explain that ignoring the use of neuroscience research in marketplace applications because of the fear that it might cause potential harm to consumers will be morally problematic and explain that it may result in the possible loss of knowledge and benefits.

3 Theoretical Framework: Consumer Buying Decision Process Model and Unconscious Thought Theory

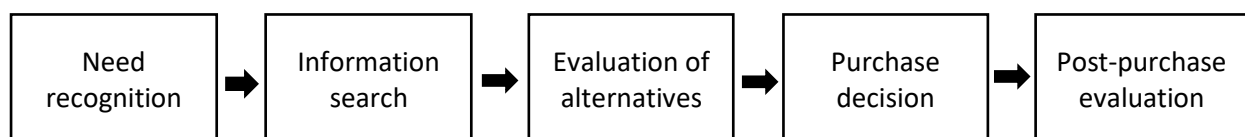
Understanding how consumers make decisions is central to this PhD thesis, which explores the dynamics of online consumer behaviour, particularly in the context of impulse buying. Two theoretical frameworks underpin this PhD thesis analysis: the Consumer Buying Decision Process Model and the Unconscious Thought Theory (UTT). Both models provide a comprehensive lens for examining conscious and unconscious consumer decision-making elements in digital environments.

3.1 Consumer Buying Decision Process Model

The consumer buying decision process Model is well-established in consumer behaviour research that outlines a linear, rational, five-stage process through which consumers make purchasing decisions: need recognition, information search, evaluation of alternatives, purchase decision, and post-purchase behaviour (Panwar et al., 2019). This structured model in *Figure 1* assumes that consumers consciously and sequentially evaluate options, ultimately leading to a purchase decision.

The strength of this model lies in its systematic breakdown of the purchasing process, therefore making it an important tool for marketers seeking to understand “what consumers buy, where they buy, how they buy, how much they buy, when they buy, and why they buy” (Hall, Towers & Shaw, 2017).

Figure. 1: Consumers' decision process model.



Source: (Panwar et al., 2019)

For example, *Figure 1* (Panwar et al., 2019) graphically illustrates the step-by-step process of the consumer buying process model and shows that the purchase decision is made at the fourth stage, with post-purchase evaluation potentially influencing future buying behaviour. However, the model has notable limitations. One critical assumption is that consumers follow the same five-stage process for repeat purchases without recognising that prior experience and emotional associations may bypass or reshape earlier steps. Moreover, Panwar et al. (2019) acknowledge that some stages are likely to be skipped or rearranged in routine or low-involvement purchases, such as when buying toothpaste.

Limitations of the Consumer Buying Process Model: The Role of Unconscious Influences.

The Consumer buying process model assumes that all decision stages are driven by conscious deliberation, but there are challenges to this assumption. For example, Mileti, Guido and Prete (2016) argue that neuromarketing techniques can unconsciously influence consumers' need recognition, inducing desires that were not initially present. Similarly, Stanton, Sinnott-Armstrong and Huettel (2016) find that marketers can use sensory and emotional cues to affect product perception and preference formation without the consumer's awareness. Cosic (2016) reinforces this by suggesting that marketers often capitalise on these unconscious triggers to promote unnecessary purchases.

These findings highlight a significant gap in the consumer buying process model as it underestimates the role of unconscious processes, particularly in impulse and emotionally driven decisions. The model also appears too simplistic in e-commerce contexts, where consumer journeys are often fragmented and subject to persuasive design techniques. As Misra, Baranwal and Jha (2017) note, online platforms present numerous unsolicited product recommendations to consumers. Unlike the guided, conscious experience typical in physical retail environments, this can shape behaviour through subtle and often unconscious suggestions.

3.1.1 Impulse Buying and the Inadequacy of Rational Models

An obvious limitation of the consumer buying process model is that it fails to account for impulse buying. Chan, Cheung, and Lee (2017) define online impulse buying as a sudden and immediate purchase without pre-shopping intentions. This behaviour contradicts the sequential and rational assumptions of the consumer buying process model and suggests a

need for a theoretical model that incorporates spontaneous, affective, and unconscious drivers. The consumer buying process model also assumes stability in post-purchase evaluations and that these evaluations will inform future behaviour in a similarly rational manner. However, implicit memories and emotional experiences from previous purchases often shape subsequent choices without conscious recall or reflection, suggesting that the model lacks explanatory strength for such behaviours.

3.2 Synthesising CBDPM and UTT: A Holistic Model for Online Consumer Behaviour

Given their contrasting strengths, this thesis proposes an integrative approach that combines the structured, conscious stages of the consumer buying process model with the dynamic, affective, and heuristic processes described by UTT. This hybrid model is essential for understanding how online shoppers make decisions in an environment that constantly blurs the line between rational planning and emotional impulse.

Unconscious Thought Theory and Its Relevance to Consumer Buying Behaviour.

In recent years, Unconscious Thought Theory has emerged as a valuable framework for understanding complex decision-making, especially when traditional rational models fall short. Developed initially to distinguish between conscious and unconscious cognitive processes in decision-making, UTT posits that unconscious thought has a relatively higher capacity for processing complex information, particularly when individuals are confronted with multifaceted choices (Strick et al., 2011; Dijksterhuis & Nordgren, 2006).

Although the consumer buying decision process model provides a structured and conscious framework to understand purchasing behaviour, it fails to fully incorporate the unconscious cognitive mechanisms that often guide actual consumer decisions. This PhD thesis integrates UTT as a complementary framework to address this critical gap, particularly in digital environments where consumers are continuously exposed to stimuli that can trigger unconscious responses. Combining these models provides a more nuanced, dual-process understanding of consumer behaviour, incorporating deliberate and unconscious influences.

3.2.1 Unconscious Thought and Decision Making.

According to UTT, conscious and unconscious thoughts are governed by different cognitive systems. While conscious thoughts are suitable for rule-based decisions requiring logical analysis, they have limited processing capacity and often oversimplify complex judgments. In contrast, unconscious thought allows for the parallel processing of large volumes of information, effectively integrating multiple decision attributes (Strick et al., 2011; Usher et al., 2011). In a key experiment, Huizenga et al. (2012) demonstrated that participants who engaged in unconscious thought were significantly more accurate in selecting optimal options than those who relied on conscious deliberation. In complex decisions, such as evaluating apartments with numerous attributes, participants in the unconscious thought condition performed better, suggesting that unconscious cognitive processes can support high-quality decision-making under complexity. This discussion is reinforced by Acker (2008) and Dijksterhuis et al. (2005), who focus on how unconscious or non-conscious processes may shape preferences and decision outcomes. This notion is particularly relevant for online consumer behaviour, where digital environments often present consumers with overwhelming information, pop-up recommendations, time-limited offers, and emotionally charged imagery. In such contexts, conscious evaluation becomes challenging, and unconscious processes may predominate, leading to rapid, emotionally driven decisions (Abdelsalam et al., 2020).

3.3 Counterarguments and Critique of UTT

Not all scholars accept the UTT model, which has also been criticised. For example, Nieuwenstein and van Rijn (2012) report experiments attempting to replicate the unconscious thought advantage (UTA). However, evidence supporting the UTA was insufficient, contributing to the ongoing debate about the validity of UTT. Similarly, Nieuwenstein, Wierenga, and Morey (2015) conducted a large-scale replication study and reported inconsistent evidence for the superiority of unconscious thought in decision-making contexts.

Critics also argue that experimental conditions in UTT studies often lack ecological validity. For instance, Waldron (2019) questioned whether linguistic, cultural, and contextual variables

were adequately controlled in early UTT experiments, potentially affecting participants' performance. Moreover, purchasing a car involves a mix of planning, conscious steps, real-time consideration, and emotion-driven deviations, highlighting the complexity of consumer choices that cannot be fully explained by either system in isolation. Nonetheless, even among critics, there is a growing consensus that unconscious processes influence consumer decisions, albeit context-dependent (Dijksterhuis et al., 2006). The article by Bargh (2011) reviews Unconscious Thought Theory (UTT) and its empirical support and subsequent methodological critiques. It concludes that many published "failures to replicate" articles demonstrate at least the equivalent quality of unconsciously made decisions compared to consciously made ones. Therefore, rather than dismissing UTT, this thesis argues that its insights are best used when integrated with more established models, such as the consumer buying decision process model, especially in digital contexts where cognitive and affective processing co-occur.

3.4 Relevance of UTT to Online Consumer Behaviour

Impulse buying offers a compelling application of UTT within consumer research. Defined as a sudden, immediate purchase without pre-shopping intention (Chan, Cheung & Lee, 2017), impulse buying contradicts the structured, rational stages proposed in the consumer buying decision process model. Empirical studies have consistently demonstrated that emotions, situational cues, and environmental triggers can divert consumers from their initial goals, prompting unplanned purchases (Liu, Li & Hu, 2013; Amos, Holmes & Keneson, 2014). Furthermore, neuromarketing research has shown that visual stimuli, emotional priming, and affective cues on digital platforms can activate neural responses that bypass deliberate cognition and influence purchasing decisions unconsciously (Plassmann, Venkatraman, Huettel & Yoon, 2015). This notion supports the argument that many online buying decisions are not entirely rational but shaped by emotional heuristics and unconscious motivations.

3.5 Integrating UTT with the Consumer Buying Decision Process Model

Integrating UTT with the Consumer Buying Decision Process Model allows this thesis to better account for the hybrid nature of consumer decision-making in online environments. While the latter provides a structured understanding of goal-directed behaviour, UTT explains how spontaneous, heuristic, and affective processes intervene at various stages, particularly during problem recognition, evaluation of alternatives, and purchase decisions.

For example, consumers may consciously search for a product online but purchase an entirely different item after being exposed to emotionally persuasive advertisements or visual cues that activate implicit desires (Chen et al., 2020). Therefore, this suggests that unconscious thought is not a separate or opposing system but one that often operates alongside conscious reasoning to influence outcomes.

3.6 Contribution of UTT to this Thesis

This PhD thesis adopts the Unconscious Thought Theory (UTT) as a complementary model. UTT posits that unconscious processes are especially effective in processing large amounts of complex information and may yield better decisions than conscious deliberation in certain situations (Dijksterhuis & Strick, 2016). This view aligns with Vieira, Araujo, and Sampaio (2017), who suggest that unconscious thoughts can produce more accurate and satisfactory decisions in complicated scenarios.

UTT becomes particularly relevant in online consumer behaviour, where consumers are regularly exposed to stimuli such as personalised ads, urgency cues, and sensory-rich media that trigger automatic emotional responses. For instance, Lo et al. (2022) explore how a digital marketing tactic in social commerce, called live streaming, triggers impulse buying. It identifies factors such as parasocial interaction, scarcity persuasion, and price perception that drive consumers' cognitive and affective reactions, leading to immediate purchasing decisions.

This PhD thesis is not concerned with establishing whether consumers make decisions consciously or unconsciously but rather with exploring how unconscious processes contribute to consumer behaviour, especially in digital commerce environments where rapid, low-effort decisions are prevalent. Understanding the influence of UTT helps marketers and researchers design more effective interventions that resonate at both cognitive and emotional levels.

By adopting an integrated theoretical framework, the thesis contributes to a more holistic understanding of consumer buying behaviour, particularly in online impulse buying. It bridges a critical gap in the existing literature by accounting for rational evaluation and unconscious influences, ultimately offering more accurate and applicable insights for marketing strategy, digital platform design, and consumer psychology.

As shown in Figure 2 (Panwar et al., 2019), consumer decision-making can vary widely from complex, deliberate behaviours to habitual and impulsive ones. By incorporating UTT, the PhD thesis acknowledges that emotions and unconscious cues are not merely peripheral, but central to understanding why consumers deviate from the structured consumer buying process model in many real-world scenarios, particularly online.

3.7 Statement of the Conceptual Territory

This section synthesises the literature review and clearly articulates the research gap that this thesis addresses and serves as a bridge between the literature review and the methodology chapter.

The literature reviewed in this thesis provides a detailed exploration of the psychological, emotional, and behavioural dimensions of consumer decision-making, particularly in an online shopping environment. Foundational models of consumer behaviour, such as the widely cited Consumer Buying Decision Process Model, conceptualise purchasing as a sequential and deliberate process, typically comprising five rational steps: need recognition, information search, evaluation of alternatives, purchase decision, and post-purchase evaluation. This model assumes consumers make decisions through conscious, linear reasoning guided by identifiable needs, cost-benefit analyses, and cognitive evaluations.

However, the literature examined throughout this thesis challenges this view. Multiple scholars cited within the review (e.g., Wacker, 2018; Verhagen & Van Dolen, 2011; Kacen & Lee, 2002) provide compelling evidence that emotions play a pivotal role in shaping consumer decisions, often operating below the threshold of conscious awareness. Emotions such as happiness, excitement, or stress not only influence the outcome of the purchase decision but also shape cognitive and behavioural engagement at every stage of the process, from the initial recognition of a need to post-purchase satisfaction or regret. Research by Bagozzi, Gopinath, and Nyer (1999; cited in Bigne et al. (2023) further confirms that emotional

responses are not just fleeting reactions but are connected to physiological, behavioural, and cognitive systems that influence consumer action.

Additionally, the studies reviewed on neuromarketing, and consumer psychology demonstrate that emotional stimuli such as advertising visuals, discounts, packaging, or colour schemes can trigger automatic and unconscious responses (e.g., Becker et al., 2011; Pelet & Papadopoulou, 2012). This means that unconscious mechanisms can bypass or override deliberate reasoning. Therefore, the consumer's decision-making process is not solely rational or consciously controlled.

The literature challenges the prevailing assumption in traditional consumer behaviour models that each step in the buying decision process is consciously navigated. Instead, it highlights a more integrated and seamless interaction between emotion and cognition, where unconscious emotional processing is linked with all stages of the buying journey. This perspective highlights a critical conceptual gap. While established models acknowledge emotion as an external or peripheral factor, they fail to incorporate emotion as a central, underlying force that connects and influences each stage of the buying decision process.

As a result, the conceptual territory of this research is situated at the intersection of consumer behaviour theory, emotional psychology, and unconscious cognitive processes. Thereby recognising that consumer decisions, especially in online contexts, are not only the product of rational deliberation but are subtly and continuously shaped by emotional implications that operate both consciously and unconsciously. This thesis addresses the unresolved tension between rational consumer models and emotion-driven behaviour by exploring how emotions, particularly those acting unconsciously, influence each phase of the online consumer decision-making process.

This research contributes to discussions of consumer behaviour in e-commerce contexts by proposing emotion as a potential connective element across stages of the decision-making process. It is positioned in response to an identified gap in the literature concerning the limited integration of unconscious emotional mechanisms within established consumer decision-making models. Based on the review, the diagram below *Figure 2*. further simplifies the consumer buying decision process model, considering emotion's critical role in the process.

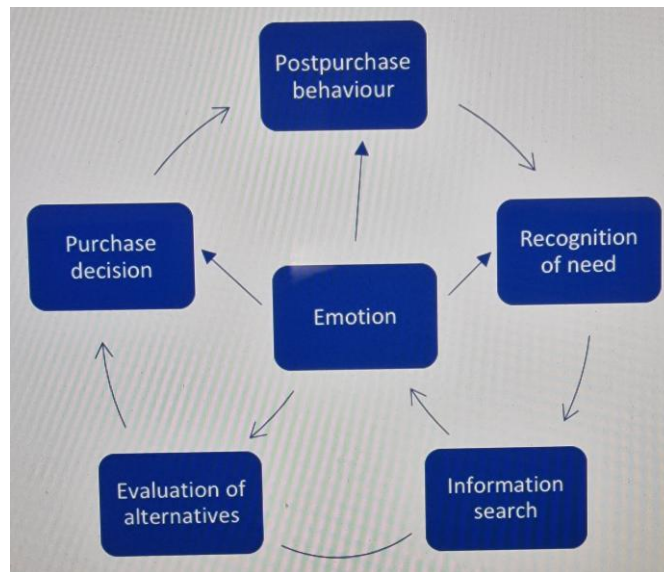


Figure 2: Conceptual synthesis of the Consumer Buying Decision Process Model and Unconscious Thought Theory, used as an interpretive framework rather than a validated causal model.

Implications for Marketing and PhD Research Focus

This conceptual framework is presented as a heuristic device to support theoretical integration and interpretive analysis. It does not claim empirical validation within the scope of this study, nor does it propose a causal explanation of consumer behaviour. Instead, the framework provides a structured lens through which the interaction between conscious and unconscious processes may be examined in relation to the qualitative and quantitative findings.

4 Methodology Methods and Design Chapter.

Methodology and Methods.

This study investigates the influence of unconscious decision-making in the context of online consumers' buying behaviour. This chapter presents an overview of the research paradigms underpinning the study and provides a rationale for adopting a mixed-methods research design. It details the development and positioning of the study's hypotheses, describes the sampling strategy employed, and outlines the design and procedures for both the qualitative and quantitative components. Additionally, the chapter defines mixed methods research, discussing its advantages and limitations. Finally, it highlights the characteristics of the mixed methods approach as applied in this PhD thesis.

4.1 Philosophical Positioning and Mixed Methodological Framework

This research adopts a pragmatic mixed methodological framework to investigate the influence of unconscious decision-making in online consumer buying behaviour. Pragmatism provides a philosophically coherent basis for integrating multiple methodological approaches, recognising that complex behavioural phenomena may require both subjective interpretive understanding and objective empirical investigation. Rather than adhering exclusively to a single epistemological tradition, pragmatism prioritises the research question and supports the use of methods that best address the phenomenon under investigation (Creswell & Plano Clark, 2018). The qualitative phase of this research is grounded in a constructivist epistemological position. Constructivism recognises that individuals construct meaning based on their experiences, perceptions, and social contexts. This perspective is particularly appropriate for exploring participants' subjective interpretations of their online consumer behaviour and their perceived emotional and unconscious influences. Through semi-structured interviews, the qualitative phase seeks to understand how participants interpret their own buying decisions and how they make sense of emotional and behavioural influences within digital environments (Charmaz, 2017).

In contrast, the quantitative experimental phase draws upon a post-positivist epistemological orientation. Post-positivism recognises the existence of measurable phenomena while acknowledging that empirical observations are inherently probabilistic rather than certain. The use of electroencephalogram (EEG) methodology in this study aligns with this position, as neural activity can be objectively measured to examine attentional responses to emotional stimuli. However, the experimental phase is explicitly exploratory in nature and does not seek to establish causal relationships or definitive, generalisable conclusions (Park, Konge and Artino, 2020).

The integration of constructivist and post-positivist perspectives is facilitated by a pragmatic methodological framework that enables the researcher to combine interpretive and empirical approaches to gain a more comprehensive understanding of unconscious decision-making processes. This pragmatic stance recognises that subjective experiential data and objective physiological observations provide complementary insights rather than mutually exclusive forms of knowledge (Kelly and Cordeiro, 2020; Tashakkori et al., 2020). This philosophical positioning ensures methodological coherence by aligning the interpretive qualitative exploration of subjective experience with the exploratory quantitative investigation of neural attentional responses. The mixed methodological approach is therefore justified by the multidimensional nature of unconscious decision-making, which involves both subjective cognitive interpretation and measurable physiological processes.

4.2 Research Paradigms used in this thesis.

The qualitative and quantitative phases are positioned sequentially and epistemologically distinct yet, analytically connected.

The qualitative phase adopts a constructivist interpretivist paradigm, enabling exploration of participants' lived experiences of online impulse buying and unconscious influences. This phase employs inductive reasoning, allowing patterns and themes to emerge from participant narratives without imposing pre-existing hypotheses.

4.2.1 Constructivist Approach to Semi-Structured Interviews.

The quantitative EEG phase adopts a positivist paradigm, employing deductive logic to test hypotheses derived from both prior literature and qualitative insights. This phase seeks measurable neural correlates of attentional and emotional processing but does not assume deterministic causality between neural signals and behaviour.

The qualitative phase employed a constructivist paradigm to explore unconscious decision-making. Constructivism, which holds that individuals construct meaning through social interaction, aligns with the aim of this study to uncover deep insights into consumer experiences (Fodouop Kouam, 2024).

Three justifications support this choice:

The first is that it enables the exploration of complex behaviours within online consumer contexts. The second is that it values participants' voices and interpretations. Lastly, it allows for flexible, iterative analysis that captures emergent themes. This aligns with Schwandt (2001), who emphasises the value of understanding behaviour in its context, and Denzin and Lincoln (2011), who support interpretative methods for studying lived experiences.

Choosing a positivist approach for experimental research and a constructivist approach for semi-structured interviews reflects a thoughtful alignment between the research paradigms and each research phase's specific goals and methodologies. This mixed methods approach harnesses the strengths of both paradigms to provide a comprehensive understanding of the research questions, enriching the overall research endeavour.

4.2.2 Positivist Approach to Experimental Research.

The second, quantitative phase followed a positivist paradigm. It sought to test hypotheses derived from qualitative findings by employing EEG (Electroencephalogram) experiments to measure neural responses to marketing stimuli. Positivism underpins the experimental design by enabling systematic measurement and hypothesis testing (Creswell & Clark, 2017).

This approach is suitable because it provides quantifiable and replicable data. In addition, it enables hypothesis testing and enhances validity through objective methods.

The experimental phase was positioned within a positivist empirical orientation because it involved the measurement of neural attentional responses using EEG. EEG is appropriate for

examining neural activity associated with attentional and cognitive processing because it provides time-sensitive physiological data about brain responses to stimuli (Luck, 2022). However, the experimental phase was exploratory rather than confirmatory. It was not intended to prove causal relationships between emotional stimuli and consumer buying behaviour, nor was it intended to produce generalisable claims. Instead, it was designed to provide physiological observations that could be interpreted alongside the qualitative findings.

The link between the qualitative phase and the EEG phase was established through the themes generated from the semi-structured interviews. Participants repeatedly described emotion as an important influence on their online buying behaviour. Emotional engagement, impulse, mood, attraction to visual presentation, product appearance, and algorithmic prompts were identified as factors that shaped participants' experiences of online purchasing. In sequential exploratory mixed methodology, qualitative findings can be used to identify relevant constructs and guide the focus of a subsequent quantitative phase (Tashakkori, Johnson and Teddlie, 2020). In this study, the interview findings indicated that emotional and visual attentional processes were relevant to the investigation of unconscious decision-making.

The EEG experiment therefore focused specifically on emotional attentional processing. The dot-probe task was selected because it allows attentional responses to visual and emotionally salient stimuli to be examined experimentally (van Rooijen, Ploeger and Kret, 2017). Emotion was operationalised through emotionally valenced visual stimuli, while attentional processing was explored using EEG measures. In this way, the experiment did not attempt to test all qualitative themes directly. Rather, it translated the most methodologically suitable qualitative insight, namely the salience of emotion and visual attention in online buying experiences, into an exploratory experimental task.

The hypotheses were therefore refined from the qualitative findings and from the wider literature on emotional attention and consumer decision-making. They were not generated in isolation from the interviews, but they were also not treated as being confirmed by the interview data. This distinction is important because mixed methodological integration allows qualitative findings to inform quantitative development without requiring the quantitative phase to validate or confirm the qualitative phase (Schoonenboom and Johnson, 2017;

Fetters and Molina-Azorin, 2020). The qualitative findings identified emotion as a salient experiential factor, while the EEG phase examined whether emotional valence was associated with measurable differences in neural attentional responses.

For clarity, the hypotheses guiding the EEG phase were:

Null Hypothesis (H1): Emotional valence of visual stimuli is not associated with statistically significant differences in neural attentional responses during the dot-probe task.

Alternative Hypothesis (H2): Emotional valence of visual stimuli is associated with statistically significant differences in neural attentional responses during the dot-probe task.

This formulation reflects the sequential exploratory mixed methodological design of the study. The qualitative phase identified emotion and visual attentional engagement as relevant constructs, and the quantitative phase explored these constructs through EEG measurement. This represents integration by development, where one phase informs the focus of the next, and triangulation by source, where both phases are interpreted together as complementary sources of evidence rather than as confirmatory proof (Tashakkori, Johnson and Teddlie, 2020; Schoonenboom and Johnson, 2017; Fetters and Molina-Azorin, 2020).

Sampling Strategy

The qualitative phase of the study adopts a convenience sampling (Novielli et al., 2023; Speak et al., 2018) based on students and staff of the University of Suffolk who had online shopping experience.

The recruitment was achieved by advertising on the UOS Student Unions' Social media pages, distributing recruitment flyers around the campus and posting on the UOS Psychology students' intranet page. Although data collection did not reach full thematic saturation (Guest, Bunce & Johnson, 2006) due to the limited number of participants, this was a methodological compromise necessitated by the practical constraints of the EEG study. Specifically, the extensive time required to fit the EEG cap and prepare each participant made a larger sample size impractical. Importantly, the same participants from the qualitative phase

were invited to participate in the quantitative EEG experiment. This continuity supported methodological coherence across the research phases because the physiological observations were interpreted in relation to the same broad participant group whose interview accounts had informed the experimental focus. In mixed methodological research, integration may occur by connecting phases, comparing different forms of evidence, and interpreting findings in relation to the same research problem (Schoonenboom and Johnson, 2017). This does not mean that the EEG results validated or confirmed the qualitative findings. Rather, it allowed for triangulation by source in a complementary sense, where interview accounts and EEG observations provided different forms of evidence relating to the same research problem. This approach supports integrated interpretation while avoiding claims of causal confirmation or statistical generalisability (Fetters and Molina-Azorin, 2020; McCrudden, Marchand and Schutz, 2021). This research employs a sequential exploratory mixed methodological approach, i.e., combining both qualitative and quantitative methods. This approach allows decisions to be made based on the complexities of the research topic without being limited to the restrictions of only using qualitative or quantitative methods. Subsequently, it clarifies the rationale behind selecting this approach and outlines the attributes of the design. The section concludes by presenting the final version of the research design. Some adjustments have been made to the design process. The adjustments include starting with the qualitative study rather than the quantitative one. This was done to gain the research participants' understanding of what they believe drives their buying decisions, and then the information was used to design the quantitative study. The section below clarifies the concept of mixed methodology and explains the reason for choosing this methodology.

4.3 Defining Mixed Methodology and Mixed Methods.

Creswell and Plano Clark (2011) state that in recent times, research has become more interdisciplinary, leading to a need for diverse and adaptable methodologies. This trend emerged in the late 1980s when researchers began recognising the benefits of merging quantitative and qualitative approaches. The shift was because of the growing complexity of research issues, the validation of qualitative investigation, and the requirement for more significant evidence in real-world applications.

Over time, this development has progressively paved the way for expanding the mixed methods approach into a broader range of disciplines than previously observed. This shift has also established a methodological connection between the traditions of qualitative and quantitative research (Elgeddawy & Abouraia, 2024). Although it is being extensively used in various scientific domains, the mixed methods approach remains a topic of debate and disagreement primarily due to two key factors. The first factor is the lack of compatibility between different paradigms, and the second is the integration of qualitative and quantitative techniques. Embracing mixed methods involves researchers acknowledging the possibility of multiple valid viewpoints in both paradigms and methodologies. This can prove challenging for researchers deeply rooted in the qualitative or quantitative approach. However, Creswell and Plano Clark (2011) explain that the mixed approach is gaining more and more ground. The complexity of the research questions and objectives demands solutions beyond mere numerical quantification or verbal description. Combining both types of data offers the most comprehensive analysis of these issues.

Tashakkori and Teddlie (2020) state that researchers contextualise numeric data with participant perspectives and contextualise participant narratives with numerical data, patterns, and statistical findings. Both types of data are essential in contemporary research. Mixed methods research involves collecting or analysing qualitative and quantitative data in a single study (Creswell et al., 2003). The data can be collected simultaneously or sequentially, with deliberate prioritisation. Data integration occurs at one or more stages in the research process (Creswell et al., 2003).

While this definition provides a foundational understanding of mixed methods research, it needs more specificity and guidance in certain areas, potentially leading to varied interpretations and implementations. Although it covers critical aspects of data integration, sequential data collection, and equal priority, it needs more clarity in guiding the depth of integration, philosophical alignment, and specific stages of integration, thus risking inconsistent application and superficial synthesis of data.

Years later, several definitions of mixed methods research have been developed. Johnson et al. (2007) utilised five themes common to mixed methods research definitions to establish a definition for mixed methods research. Johnson et al. (2007, p. 123) define mixed methods research as the type of research in which the researcher combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints,

data collection, analysis, inference techniques) for the broad purpose of breadth and depth of understanding and corroboration. The latter definition considers analysis and the advantage of conducting mixed methods research instead of focusing mainly on the mechanics of the data collection processes.

Creswell and Plano Clark (2007) updated the definition of mixed methods research as a research design characterised by philosophical assumptions and inquiry methods. This methodology entails guiding philosophical beliefs that steer data collection and analysis and incorporating qualitative and quantitative approaches in different stages of the research process. They elaborate further, describing the strategy as centred around the collection, analysis, and integration of both qualitative and quantitative data in the research. The essence of mixed methods lies in recognising that combining qualitative and quantitative approaches provides a more comprehensive understanding of research issues than employing either approach in isolation.

This thesis adopts a mixed methods approach. Johnson, Onwuegbuzie and Turner (2007) describe the mixed method approach as research in which the researcher combines qualitative and quantitative research approaches for breadth and depth of understanding and corroboration. This research consists of two phases: qualitative and quantitative (Creswell & Plano Clark, 2011). The reason for selecting this method is that a mixed methods approach provides more comprehensive evidence base when investigating research problems that would not be fully addressed by using either qualitative or quantitative research alone. (Creswell & Plano Clark, 2011).

In the 1980s, the convergence of various publications led to the emergence of what is now recognised as mixed methods. Creswell and Plano Clark (2011) explain that mixed methods originated because of the complexity of research problems where the answers are beyond simple numbers in a quantitative sense or words in a qualitative sense. Plano Clark and Ivankova (2016) explain that combining both forms of data provides the most complete analysis of problems. Mixed methods can be time-consuming and resource-intensive, involving qualitative and quantitative data collection and analysis. To address the risk in this thesis, a careful plan was made to prioritise the research objectives, focusing on the most critical questions that require qualitative and quantitative data. This study adopts a sequential exploratory mixed methods design, where the qualitative method was conducted first, and the findings informed the quantitative method, thus reducing the duplication of effort and

resources. Creswell (2014) explains sequential mixed methods design to mean first collecting and analysing quantitative data, followed by qualitative data. However, this order had been slightly altered for this study by first collecting and analysing the qualitative data followed by quantitative data. The decision to start with a semi-structured interview was favoured because the findings from the qualitative study will inform the design of the quantitative research. This approach enables findings from each method to be interpreted in relation to one another, supporting a more comprehensive understanding of the research phenomenon without assuming triangulation or validation across methods.

4.4 Advantages and Disadvantages of Mixed Methodological Research.

Promoters of mixed methods research, such as Creswell & Plano Clark (2011) and Johnson & Onwuegbuzie (2004), acknowledge that mixed methods research has challenges while offering numerous benefits.

4.4.1 Advantages of Using Mixed Methods Research.

Creswell & Plano Clark (2011) and Johnson & Onwuegbuzie (2004) explain that mixed methods research offers several benefits. It allows for the fusion of words, pictures, and narratives with numerical data to enhance contextual understanding, addressing a limitation of quantitative research, which often needs more context comprehension. Additionally, numbers can add precision to the interpretations derived from words, images, and narratives, compensating for the generalisation challenges inherent in qualitative research. By integrating the strengths of both quantitative and qualitative research, mixed methods research provides a comprehensive approach. Mixed methods research serves the dual purpose of theory generation and theory testing, capitalising on the complementary strengths of qualitative and quantitative approaches. By leveraging the strengths of one method to offset the limitations of the other, mixed methods research enables more balanced and robust investigation. This integrative approach enhances the comprehensiveness of findings and strengthens conclusions through the convergence and corroboration of evidence (Fetters and Molina-Azorin, 2017).

4.4.2 Disadvantages of Using Mixed Methods Research.

However, Creswell & Plano Clark (2011) and Johnson & Onwuegbuzie (2004) also add that employing mixed methods research presents several drawbacks. It can pose challenges for individual researchers, particularly when parallel designs are involved. This approach incorporates the limitations inherent in both qualitative and quantitative research methods. It demands significant time and financial resources, often resulting in elevated costs. Moreover, acquiring proficiency in multiple methods is arduous, and the learning curve can be steep. Collaborative efforts become essential, as mixed methods often require team-based research endeavours. The complexities of blending paradigms and methods can lead to confusion and challenges. This is further complicated by the presence of methodological purists who advocate strictly adhering to either qualitative or quantitative paradigms. Convincing others of the validity of the approach can also prove to be a formidable task. The disadvantages highlighted show many challenges of working with mixed methods designs. However, they are mainly concerned with time issues. For instance, it is time-consuming to do mixed methods research, to learn multiple methods, to anticipate and address paradigm issues, etc., which means that the challenges can be overcome. Accordingly, the complementary, synergistic effects of mixed methods, as well as the potential for providing more robust conclusions through convergence and corroboration of findings, outweigh the disadvantages. In these designs, the nature of the problem carries more weight than paradigmatic preferences. Thus, from a mixed methods research point of view, the nature of the phenomenon being explored must be considered before deciding upon a methodological approach to a problem. The discussion about what is seen as a very problematic aspect of mixed methods, the incompatibility thesis as described by Hathcoat and Meixner (2015) and Johnson and Onwuegbuzie (2004), is still present in some environments. As Bergman (2010) illustrates, the discussion is relevant because when faced with two competing paradigms, combining qualitative and quantitative elements within one research question would not be possible simply because competing paradigms are incommensurable. The clear separation between research paradigms, as outlined by Liu (2022), now seems to be less distinct (Bergman, 2010). Upon closer examination, it becomes challenging to maintain these distinctions since qualitative and quantitative analysis methods do not inherently require a

specific understanding of reality, prioritise a particular research topic or its investigation approach, or decide the truth of data.

Bergman (2010) further argues that instead of discussing paradigms, the term 'worldview' can be applied in the sense of approach, which he describes as the weaker, more flexible and less purist form of the term paradigm (Bergman, 2010). However, this makes the reconciliation between the two paradigms less problematic. Other scholars (Hathcoat and Meixner, 2015; Johnson & Onwuegbuzie, 2004; Elgeddawy & Abouraia, 2024) also argue that the similarities are more significant than the differences, therefore considering pragmatic worldview and the use of mixed methods acceptable and referring to Reichardt and Rallis' (1994) four beliefs about the similarities between quantitative and qualitative research inquiry, connecting theory with facts, understanding reality as constructed and diverse, and recognising theory's flexibility based on facts. Elgeddawy and Abouraia (2024) assert a shared set of beliefs among many social and behavioural scientists that form a paradigm different from positivism, postpositivism, or constructivism, also called pragmatism. This paradigm welcomes the utilisation of mixed methods in social and behavioural research. The mixed methods approach was therefore considered best suited to this project.

4.5 Characteristics of the Sequential Exploratory Mixed Methodology in This Thesis.

This research employs a sequential exploratory mixed methodology. In this thesis, the term mixed methodology refers to the overall logic, rationale, and structure guiding the integration of qualitative and quantitative methods. The qualitative and quantitative components are the methods used within this broader methodological framework. This distinction is important because methodology concerns the rationale and design of the research, whereas methods refer to the specific techniques used to collect and analyse data (Tashakkori, Johnson and Teddlie, 2020).

The design is sequential because the qualitative phase was conducted first and informed the conceptual focus of the subsequent quantitative phase. It is exploratory because the study first sought to understand participants' subjective experiences of online buying behaviour before examining emotional attentional processes through EEG. Exploratory sequential mixed methodological designs are appropriate where qualitative findings are used to identify

relevant constructs, refine research focus, and guide the development of a later quantitative phase (Tashakkori, Johnson and Teddlie, 2020; Schoonenboom and Johnson, 2017).

In this study, the qualitative findings informed the quantitative phase in three specific ways. First, participants repeatedly identified emotion as an influence on online buying behaviour, which supported the decision to focus the EEG experiment on emotional attentional processing. Second, participants discussed visual product presentation and appearance, which supported the use of a visual attentional task. Third, participants described algorithmic prompts and reminders as influences on their online behaviour, which reinforced the relevance of examining attentional capture by digital and visual stimuli.

The quantitative EEG phase did not test all qualitative themes directly. Rather, it operationalised the most experimentally suitable construct emerging from the interviews: emotional attentional processing. The use of EEG was appropriate because it allows neural activity associated with attentional processing to be observed physiologically (Luck, 2022). The use of a dot-probe task was also appropriate because this task is commonly used to examine attentional responses to emotional visual stimuli (van Rooijen, Ploeger and Kret, 2017). This distinction is important because the EEG experiment was not designed to confirm the qualitative findings. Instead, it provided a complementary physiological source of evidence that could be interpreted alongside the interview findings.

The mixed methodological design therefore supports triangulation by source, not confirmatory convergence. The qualitative phase provides interpretive insight into participants' reported experiences, while the quantitative phase provides exploratory physiological observations. Mixed methodological integration can be used to compare and interpret different sources of evidence while recognising that they do not necessarily validate one another (Fetters and Molina-Azorin, 2020). Together, these data sources allow for a broader understanding of the research problem, while recognising that the EEG findings cannot establish causal relationships or generalisable effects.

4.6 Inductive–Deductive Reasoning in the Sequential Exploratory Mixed Methodology

This thesis incorporates both inductive and deductive reasoning within a sequential exploratory mixed methodology. Sequential exploratory mixed methodology commonly begins with an inductive qualitative phase, which may then inform the focus or development of a later quantitative phase (Tashakkori, Johnson and Teddlie, 2020). In this thesis, the qualitative phase used inductive reasoning because it allowed themes to emerge from participants' accounts of online consumer behaviour. Rather than beginning with fixed assumptions about what drives unconscious buying decisions, the interviews enabled participants to describe their own experiences of emotion, impulse, visual presentation, algorithmic influence, ease of purchase, and other factors associated with online shopping.

The inductive qualitative phase therefore identified the key experiential constructs that shaped the subsequent quantitative phase. The most prominent and experimentally suitable construct was emotion, particularly participants' repeated references to emotional engagement, mood, impulse, attraction, and affective responses during online buying. In exploratory sequential designs, this movement from qualitative insight to quantitative focus is a recognised form of development between phases (Schoonenboom and Johnson, 2017). These findings provided the conceptual basis for focusing the EEG experiment on emotional attentional processing.

The quantitative phase then employed deductive exploratory reasoning. This phase translated the qualitative insight about emotional influence into a measurable experimental focus by examining whether emotionally valenced visual stimuli were associated with differences in neural attentional responses. EEG measurement was used because it allows researchers to observe neural activity associated with attentional and cognitive processing (Luck, 2022). The dot-probe task was used because it provides an experimental way of examining attentional responses to emotionally salient visual stimuli (van Rooijen, Ploeger and Kret, 2017).

The inductive–deductive relationship in this study should therefore be understood as developmental rather than confirmatory. The qualitative phase informed what was explored experimentally, while the quantitative phase examined the selected construct through

physiological measurement. The EEG phase did not validate or prove the qualitative findings; instead, it provided a complementary source of evidence. This use of sequential development and triangulation by source is consistent with mixed methodological research, where different data sources may be integrated to provide a fuller understanding of complex phenomena without implying causal confirmation (Fetters and Molina-Azorin, 2020; McCrudden, Marchand and Schutz, 2021).

5 Research Design.

Sequential exploratory design involves a staged research process in which qualitative exploration precedes quantitative investigation, allowing inductive insights to inform subsequent deductive testing within a philosophically integrated mixed methodology. The initial phase delves deeply into an issue through qualitative exploration, followed by a shift to the positivist approach in the second phase to identify variables and assess statistical trends (Creswell & Plano Clark, 2018). This approach initiates with qualitative data collection and analysis, paving the way for subsequent quantitative data gathering and testing (Schoonenboom & Johnson, 2017; Shorten & Smith, 2017). The mixed methods research starts with qualitative findings, quantitative measures are developed (Terrell, 2012; Wisdom & Creswell, 2013), and ultimately, the identified variables are examined quantitatively, interpreting how quantitative findings are examined alongside qualitative insights, without assuming confirmatory or causal integration. (Creswell & Plano Clark, 2018).

Creswell and Plano Clark (2011) define research designs as data collection, analysis, interpretation, and reporting procedures in research studies. These designs guide methodological decisions and interpretations at the end of the study. The main reason for selecting mixed methods in this research is to explore unconscious factors in consumers' online buying process. Qualitative and quantitative methods are employed for complementary purposes within a sequential exploratory mixed methodology, with qualitative findings informing the design and focus of the quantitative phase. (Plano Clark & Ivankova, 2016). To identify unconscious influences in online buying decisions, a quantitative study will be conducted depending on the findings from the qualitative study. The protocol will consider the identified influential factor from the qualitative research. The results from both phases are interpreted in relation to one another to provide a more comprehensive understanding of the research phenomenon, without assuming validation or confirmation across methods.

5.1 Positioning of the EEG Experiment in the Sequential Exploratory Mixed Methodology

The EEG experiment was positioned as the second phase of the sequential exploratory mixed methodology. In exploratory sequential mixed methodological designs, an initial qualitative phase may be used to identify relevant constructs and guide the focus of a later quantitative phase (Tashakkori, Johnson and Teddlie, 2020). In this study, the first phase consisted of semi-structured interviews, which explored participants' subjective experiences of online buying behaviour. The second phase consisted of an exploratory EEG experiment, which examined neural attentional responses to emotionally valenced visual stimuli.

The relationship between the two phases was developmental. The interviews were conducted first because the study aimed to identify which conscious and perceived unconscious influences participants associated with online buying behaviour. The qualitative findings showed that participants repeatedly referred to emotion, impulse, mood, visual product presentation, algorithmic prompts, and ease of purchase as influences on their decisions. In mixed methodological research, this form of development allows qualitative findings to shape the focus and design of a later quantitative phase (Schoonenboom and Johnson, 2017). These findings indicated that emotional and visual attentional processes were relevant to the research problem.

The EEG experiment was therefore designed to explore one specific construct emerging from the qualitative phase: emotional attentional processing. Emotion was selected because it appeared strongly across the interview data and was suitable for operationalisation through emotionally valenced visual stimuli. Visual attention was selected because online buying environments rely heavily on visual cues, product presentation, images, and prompts. The dot-probe task was therefore used to examine whether emotional stimuli were associated with differences in attentional response, as dot-probe paradigms are used to examine attentional allocation toward emotionally salient stimuli (van Rooijen, Ploeger and Kret, 2017). EEG was used because it provides a physiological measure of neural activity associated with attentional processing (Luck, 2022).

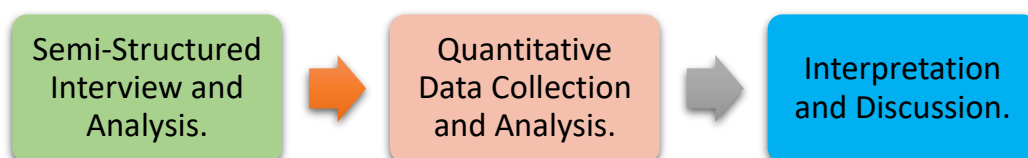
This means that the EEG phase did not attempt to test all qualitative themes directly. Algorithmic influence, ease of purchase, financial resources, and customer reviews were important qualitative findings, but they were not all directly operationalised in the EEG task. Instead, these themes helped contextualise the broader digital environment in which

emotional and attentional influences may operate. The experimental phase focused specifically on the emotional and visual-attentional dimension because this was the most appropriate element to examine using EEG.

The EEG phase was exploratory and non-confirmatory. It was not designed to establish causal relationships, validate the interview findings, or produce generalisable conclusions. Instead, it provided a second source of evidence that could be interpreted alongside the qualitative findings. In this sense, the study uses triangulation by source: the interview data and EEG observations provide different but complementary perspectives on the broader research problem. Mixed methodological integration may involve comparing and interpreting different sources of evidence without requiring confirmatory convergence between them (Fetters and Molina-Azorin, 2020). This approach is consistent with sequential exploratory mixed methodological design, where qualitative findings can inform the development and focus of a later quantitative phase (Tashakkori, Johnson and Teddlie, 2020; Schoonenboom and Johnson, 2017).

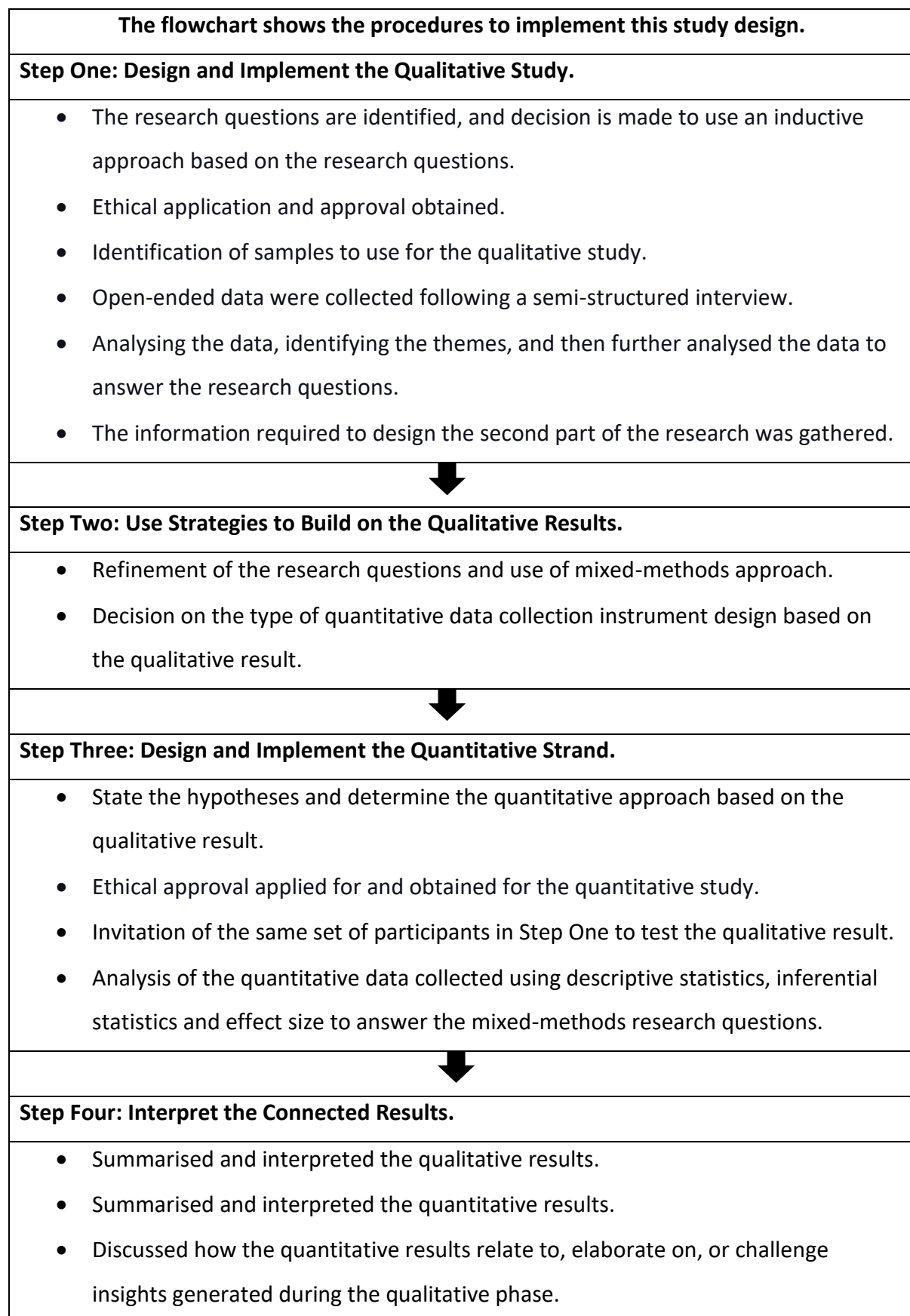
For the above reason, this research will follow the exploratory mixed methodological design as shown in the diagram below:

Figure 3. The Exploratory Design.



Source: Adapted from (Creswell and Plano Clark, 2011, p. 69-70).

Figure 4. Implementing Study Design.



Source: adapted from (Creswell and Plano Clark, 2011 p.88)

The steps in Figure 4. above and their implementation in this thesis are described below.

Figure 4: Sequential Procedures for Mixed-Methods Study Implementation

This flowchart shows the systematic phases of this PhD thesis, starting with the inductive qualitative strand and culminating in the deductive quantitative strand, using the same participant cohort across phases to support sequential methodological coherence and conceptual continuity across research phases.

6 Qualitative study

This section of the mixed methods research focuses on the intricacies of human experiences and perspectives. Through qualitative inquiry, the aim is to uncover the "how" and "why" behind the research phenomenon, exploring the subjective aspects that quantitative data alone cannot fully capture. This qualitative component, characterised by open-ended semi-structured interviews and deep analysis, adds depth and context to this study, enriching the understanding of the research questions.

6.1 Participants and Recruitment

To conduct the study, participants were invited to take part in the research voluntarily. Permission was first requested as an approval letter from the University of Suffolk's Ethical Committee Board on the 5th of August 2020 (See Appendix 1 for the approval letter). The participants were provided with a participant information sheet and an informed consent form. Participants' consent was recorded in writing before the participants were allowed to begin the study. Each participant was asked to create an ID (memorable word) developed using 3-8 letters, allowing them to remain anonymous and only correspond with their data from the responses during the semi-structured interview. Therefore, the participants will remain anonymous and cannot be identified within the data set. All data are stored in a password-protected file and on a password-encrypted USB. The University systems are password-protected, which means the data will remain secure. Participants were asked the following questions in a semi-structured interview: (See Appendix 2 for Interview questions). The interviewer interviewed the participants who could attend in a quiet room. In contrast, those who could not be present physically were interviewed online using the Microsoft Teams platform. The interview was conducted in an informal way that seemed like a friendly chat to let the participants feel relaxed. This relaxed approach increases the possibility of participants providing more natural responses, aligning with the Social Exchange theory. Cropanzano and Mitchell (2005) explain that individuals interact with others based on the expectation of gaining rewards and avoiding adverse outcomes. Therefore, by creating an informal and friendly atmosphere during the interview, with the aim of creating a positive exchange with the participants, fostering comfort and relaxation. A relaxed atmosphere may

encourage the participants to respond more openly and honestly. An open and honest response enriches the data and insights for the study.

The criteria for choosing participants for both the qualitative and quantitative studies include those who have made purchases online, gender (males and females), ages (18 years and above), language (those who can speak and understand English language), location: students and staff of the University of Suffolk and members of the public. Recruiting English-speaking participants was essential for conducting the research and interviews in the same language. As a result, it would be easier for the participants to understand the questions asked and provide easily understandable responses without translating. The decision was made to select ages 18 years and above to ensure that only adults can participate in the research. This is because it was easier to gain ethical approval using adults rather than minors. In addition, the study was conducted using a convenience sampling (Novielli et al., 2023; Speak et al., 2018) method with the University staff and students; therefore, the demographic of those that fall within this group does not include minors.

In addition, the decision to include both males and females in the study will better represent society. This study focuses mainly on consumers who undertake shopping online. Eroglu, Machleit, and Davis (2001; cited in Chan, Cheung & Lee, 2017) state that online shopping is now more conducive to impulse buying than offline. This is because the online environment is accessible from the constraints consumers might experience while shopping offline. The constraints may include limited operating hours, inconvenient store locations and social pressure from staff and other consumers (Chan, Cheung & Lee, 2017).

For this reason, it was more relevant to focus on online shopping. Degrees and qualifications held were not considered as part of the criteria for this research because the study mainly seeks to answer the research questions unrelated to qualifications or degrees.

In this research, G* power (Faul et al., 2009) was utilised in calculating how many participants were required for this study. The participants were selected voluntarily. Wilson and MacLean (2011) explain that a basic rule of research is that participants cannot be forced, coerced, or unduly induced into participating. The study will not rely only on voluntary participants because a sample of volunteers may be biased (volunteer bias) and may not represent the general population (Wilson & MacLean, 2011). Consequently, Psychology students who needed to participate in research as part of the requirement to complete their study were also invited. Flyers were created (See *Appendix 3* for the Sample of the Research flyer) and

posted them all over the University of Suffolk campus, inviting potential research participants to get in touch. Additionally, the study was promoted among Psychology department students, allowing those seeking research participation to fulfil their study requirements.

6.2 Data Collection: Qualitative Phase.

For the qualitative phase of this study, data were collected through semi-structured interviews, a well-established and widely endorsed method in qualitative research. This approach enabled an interactive exchange between the interviewer and participants, in which the interviewer posed open-ended questions directly aligned with the study's central research objectives. As noted by Doody and Noonan (2013), this method allows for flexibility in responses while maintaining a focused structure around key areas of inquiry. Supporting this methodological choice, Kronrod (2022) argues that spoken language naturally expresses underlying thoughts, emotions, and hidden mental states more spontaneously than carefully constructed written text, making conversational interviews ideal for unearthing deep consumer meanings. In line with current literature on data collection flexibility (Irvine, Drew & Sainsbury, 2012), the interviews were conducted both in-person and virtually. Physically present participants attended face-to-face sessions, while those unable to be present were interviewed via Microsoft Teams, allowing for inclusivity without compromising the quality of interaction. The semi-structured approach followed a protocol-driven format, with a consistent framework of questions used across interviews to ensure neutrality and enhance validity (Diefenbach, 2009; Doody & Noonan, 2013). Where necessary, prompting techniques were used to encourage elaboration or redirect focus, ensuring clarity and depth of response without leading the participants.

Each interview was conducted as a dialogue, by adapting follow-up prompts based on participant responses, in line with Flick's (2000, p. 82) recommendation for responsive and dynamic interviewing. This strategy enabled the collection of rich, qualitative data essential for behavioural assessment. The interview schedule was designed by breaking the overarching research questions into thematic modules. A complete list of the interview questions, including the specific prompts employed, is provided in Appendix 2.

Participant recruitment was carried out by distributing flyers across the University of Suffolk campus and through direct invitations to undergraduate psychology students, who were expected to engage in research participation as part of their academic requirements. Once interested individuals responded interview dates and times were assigned. Those unable to attend in person due to scheduling conflicts opted for online interviews. A confirmation email was sent to each participant, expressing appreciation for their involvement and providing relevant documentation, including an Information Sheet detailing the purpose and structure of the research (see Appendix 4) and a Participant Consent Form (see Appendix 5). Participants were required to complete and return the signed consent form via email or in person before the interview session. Failure to do so would render them ineligible to participate. The consent forms were verified on the interview day to ensure ethical compliance. Participants were again thanked for their participation and reminded that the study comprised two phases, and their involvement would extend to the second stage. They were also reassured of their anonymity and their right to withdraw at any time without consequence.

All 21 participants attended their scheduled interviews and completed them without interruption. Each session was conducted in a quiet, private room at the university, reserved exclusively for the interview. A “Do Not Disturb – Interview in Progress” sign was displayed on the door to maintain a focused and relaxed environment. At the beginning of each session, the purpose of the study was reiterated to the participants, emphasising that there were no right or wrong answers, and clarified that the goal was to explore how participants make decisions during online purchases. Participants were encouraged to seek clarification at any point and informed that they were free to discontinue the interview at their discretion. Upon ensuring that participants fully understood the nature and expectations of the interview, verbal permission to commence the recording was requested. The audio was recorded using a digital device for in-person interviews, and the built-in recording function was used on Microsoft Teams for online sessions. Where necessary, questions were repeated, clarified, or rephrased using prompts to facilitate accurate understanding and maintain alignment with the original research questions. Following the conclusion of each interview, participants were thanked for their time and contributions. They were reminded about the forthcoming quantitative phase of the study, in which they would also be invited to participate. They were

then provided with a Debrief Sheet (see Appendix 6) to ensure transparency and closure. This structured and ethically rigorous approach to qualitative data collection ensured the richness and reliability of the data gathered, forming a solid foundation for the subsequent development of hypotheses and the design of the quantitative EEG-based experiment.

6.3 Data Analysis: Qualitative Phase.

Thematic Analysis

Thematic analysis provides a systematic element to data analysis, which allows linking the analysis of the frequency of a theme to the whole content. This will ensure accuracy and enhance the quality and validity of the research. Marks and Yardley (2004) state that understanding the different aspects of data collection and analysis is important in qualitative research. Thematic analysis allows understanding the potential of any issue more widely. Namey et al. (2008) add that Thematic Analysis is not just counting precise words or phrases but attempting to identify and describe implicit and explicit concepts. The codes or themes developed for the concept or ideas are linked to the raw data as summary markers that would be later used for analysis. Looking for code co-occurrence, comparing the relative frequencies of themes or patterns within the data set, or graphically displaying code relationships may be included in the analysis. Alhojailan (2012) mentions that thematic analysis allows the researcher to determine the relationships between concepts and make comparisons between data that have been replicated. Using thematic analysis, it is possible to link the various ideas and opinions of the participants and compare them to the data gathered from all the interviewees throughout the study.

Thematic analysis was adopted to analyse the qualitative data in this PhD thesis, this is due to its suitability for identifying, analysing, and interpreting patterns across textual datasets (Alhojailan, 2012). This analysis provides a systematic method for extracting meaningful insights regarding participants' unconscious buying decisions online. Creswell et al. (2003) state that thematic analysis is appropriate for revealing underlying factors that influence thoughts, actions, and behaviours. The participants' subjective interpretations were critical in developing refined explanations for their decision-making processes, aligning with thematic analysis's foundational principles (Hatch, 2002). Thematic analysis also allows for

comparative investigation across different stages of the study. It enables the exploration of both similarities and divergences between participants' self-reported behaviours and what happens in reality as demonstrated by their neural functions (Creswell, 2009). In addition, it facilitates the conversion of coded data into well-defined themes, this process is essential in establishing meaningful relationships between factors (Braun & Clarke, 2006). This approach contributes to a richer understanding of consumer behaviour by presenting data that reflects the participants' lived experiences (Creswell, 2009). In line with research by Braun and Clarke (2006) and Crawford et al. (2008), thematic analysis also supports theory development and data interpretation, particularly when identifying recurring concepts among multiple participants. Narratives developed from participant interviews provide clarity in representing their perspectives and experiences. As Namey et al. (2008) argue that thematic analysis involves more than merely calculating the frequency of words or phrases and that it facilitates the identification of co-occurring codes and enables visual representation of relationships between codes, enhancing interpretive depth. It is important to add that thematic analysis enables data analysis without reliance on pre-existing themes thereby, making it highly applicable to exploratory research that is focused on participants' unique perspectives. Each statement within the dataset was considered relevant to building a deeper understanding of individual and shared beliefs and actions (Alhojailan, 2012). The process of constructing ideas from coded statements supported the development of a comprehensive view of participant behaviour and thought processes. Presenting both convergence and divergence in participants' views offered readers a broader insight into consumer behaviour (Joffe & Yardley, 2004; Blacker et al., 2009). Braun and Clarke's (2019) model guided the analytical process, which includes three key stages: data reduction, data display, and conclusion drawing. These key stages facilitated the use of narrative summaries, direct quotations, and figures to help visualise the complexity and relationships which are embedded in the data (Braun & Clarke, 2019). Such multi-modal display techniques also assisted in clarifying comparisons and minimising cognitive overload (Halldorson, 2009). During the data reduction phase, the audio-recorded interviews were manually transcribed and cross-verified using speech-to-text software (Google Docs). The transcripts were meticulously reviewed to ensure accuracy and to correct instances where the software had misinterpreted speech. Each participant's responses were saved in individual documents before being compiled into a comprehensive file to facilitate the coding process. This organisation enabled more efficient

coding and facilitated the identification of overarching themes. Texts were read repeatedly to gain an in-depth understanding of participant responses and to avoid premature analytical conclusions. Relevant excerpts were highlighted and colour-coded to align with the overarching research questions (Halldorson, 2009). Coded data were then sorted into preliminary themes. Comparisons were made across all responses to identify thematic patterns, inconsistencies, and missing data (Ryan & Bernard, 2003). Emerging themes were refined and organised into categories, which were subsequently saved in a separate document for clarity and relevance to the study objectives. The information was organised into thematic clusters for the data display stage, facilitating comparative analysis. This approach enabled a clearer examination of differences and similarities among participants, with data displayed in various formats, including charts, figures, narrative texts, and quotations (Yin, 2010). Visually displaying the data enhances the validity of interpretations and supports the analytic process by reducing data overload (Hignett & McDermott, 2015; Braun & Clarke, 2019; Gibbs, 2002). Another benefit of displaying the data includes viewing and improving it and avoiding data overload while conducting analysis (Halldorson, 2009). All data relating to the research questions were organised and presented in order, allowing an easier exploration of the differences and similarities by entering the data into conceptual clusters for analysis. The data was displayed in different ways to simplify the analysis. This was done using graphs, charts, figures, narrative texts, and quotations (Yin, 2010). The software QDA Miner Lite was used to support the coding and display of the data. This free qualitative analysis tool effectively processed textual data such as interview transcripts. It enabled the identification of thematic frequencies, code co-occurrences, and visual patterns, thereby deepening the interpretive rigour of the analysis (Gibbs, 2002). The use of direct quotations also contributed to the validation of emerging interpretations and supporting statements with evidence (Patton, 2002).

In the conclusion-drawing phase, themes and codes were synthesised into meaningful interpretations aligned with the research questions. Insights were drawn from the narrative patterns and thematic frequencies to offer a coherent understanding of the data. This synthesis provided explanations grounded in the participants' perspectives. It served as a foundation for developing hypotheses and designing the EEG-based experimental phase of the study. Thematic analysis proved to be a robust analytical method for examining participant narratives and extracting insight into the emotional and cognitive underpinnings

of consumer decision-making. The structured, multi-stage process ensured rigour, clarity, and depth in understanding the psychological processes involved in online buying behaviour.

6.4 Qualitative Results and Analysis.

The digital era has radically changed how consumers make purchases, particularly online shopping (Wang, 2021). In this context, understanding the underlying factors that drive consumer behaviour is essential for businesses seeking to effectively reach and engage their target audience. While conscious decision-making processes have been extensively studied, the influence of unconscious decision-making on online consumer buying behaviour has gained increasing attention in recent years. This research examines the intricate relationship between unconscious processes and online buying decisions. By utilising a mixed-method research approach encompassing qualitative and quantitative studies, this study explores the impact of the unconscious mind on the buying decision process.

The primary objective of this research is in three folds:

The first is to identify and analyse the conscious and unconscious factors influencing online buying decisions.

Secondly, to examine the dynamic process of online consumer behaviour, emphasising the interaction between conscious and unconscious decision-making.

Thirdly, to investigate the internal psychological mechanisms that drive impulsive online shopping behaviour, particularly those that operate unconsciously.

This section provides a basis for the subsequent chapters of this research, which includes the presentation of the findings and a discussion of the implications for both academia and industry. By exploring unconscious decision-making in online consumer buying behaviour, this study aims to contribute to the existing body of knowledge while offering practical insights for marketers seeking to optimise their strategies in the digital marketplace.

This chapter presents the findings from the qualitative phase of this PhD study, which explores factors influencing online consumer buying behaviour. The study attempts to

understand participants' lived experiences, attitudes, and motivations as they navigated digital environments. The data were gathered from semi-structured interviews with 21 participants, whose responses were analysed thematically using Braun and Clarke's (2006) six-phase framework. The emergent themes were aligned with the research questions and theoretical frameworks, the Consumer Buying Decision Process Model and Unconscious Thought Theory (UTT). In this chapter, quotations from participants are used not merely to illustrate themes but to develop analytical insights into the relationship between emotion, cognition, and consumer behaviour.

Figure 5. Distribution of Keywords used by participants.

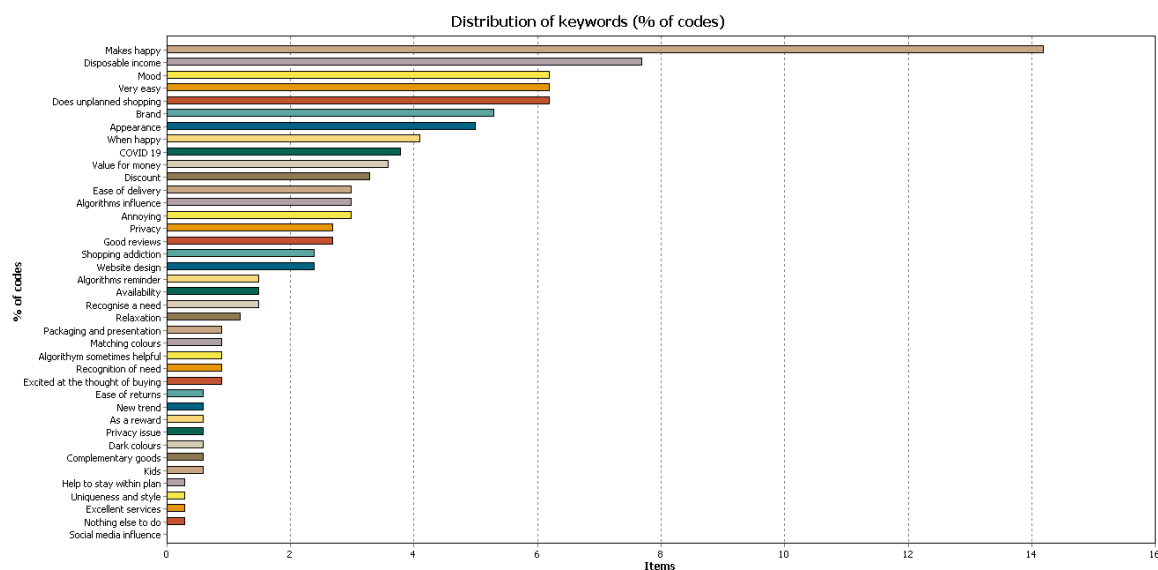
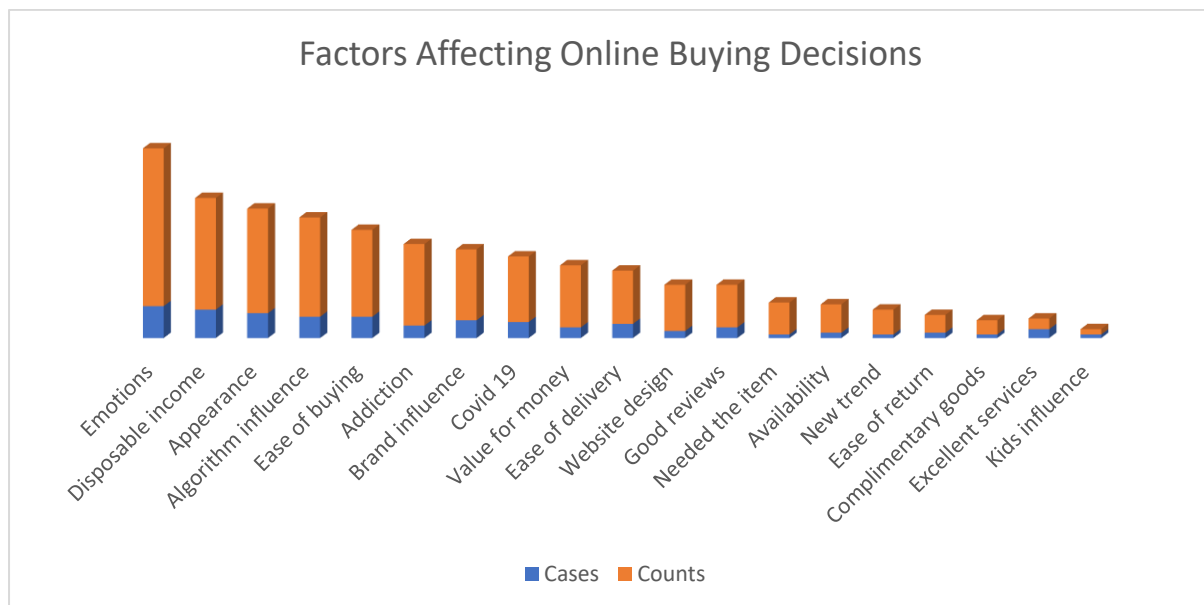


Figure 5 illustrates the various factors that influence the participants' buying decisions, considering both their frequency and level of importance, as indicated by the participants.

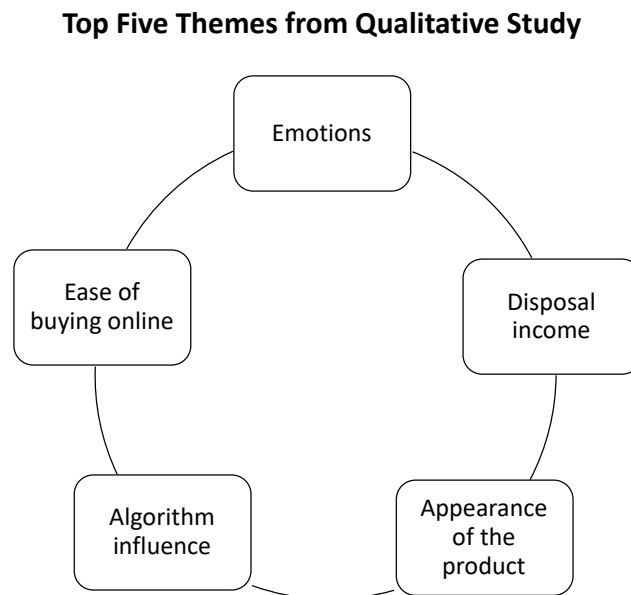
Figure 6. Factors Affecting Online Buying Decisions.



The distribution of keywords, as illustrated in *Figure 5*, revealed several similar or related terms. Consequently, these keywords were categorised and organised into thematic groups, which are presented in tabular form in *Appendix 1* to show the number of participants (cases) that mentioned them and the number of times (count) they were mentioned. A visual representation of the outcome is displayed in *Figure 6*.

The findings have been systematically organised and presented based on the five primary themes from the thematic analysis for a more in-depth analysis. These themes are arranged considering both their frequency and level of importance and include the following: emotions, ease of buying online disposable income, algorithm influence, and appearance of the product.

Figure 7. Top Five Themes from Qualitative Study.



6.4.1 Theme 1: Emotional Drivers in online Buying Behaviour

One of the most dominant themes that emerged from the data was emotion. Eighteen out of twenty-one participants described emotional states such as happiness, sadness, stress, or excitement as core influences in their online shopping behaviour. This study's qualitative data strongly suggests that emotion plays a pivotal role in shaping online buying behaviour. Participants' narratives revealed that purchasing decisions are not merely based on logic, utility, or necessity but are significantly intertwined with emotional states. This theme encapsulates five key subthemes that illustrate emotions' multifaceted role in online consumer decision-making.

This finding aligns with prior literature highlighting the covert power of affective responses in consumer decisions (Lerner et al., 2015). The chart below shows the components of the emotion theme.

Figure 8. Emotional Factors Behind Buying Decisions.



'Having a positive mood' and 'feeling happy' together due to their similar meanings. However, the 'being in a bad mood' category was left separate as participants did not want to make assumptions.

Emotion theme, as represented in *Figure. 8*, participants expressed various emotional experiences and motivations for engaging in online purchases. The sub-themes and their descriptions are presented below:

Shopping to feel happy.

Many participants described shopping as a mood-regulation strategy. Participant 11 remarked, "Shopping has got me through some difficult times in my personal life," suggesting that purchasing decisions were not always cognitively driven but used as a coping mechanism during personal difficulties. This notion aligns with the concept of hedonic consumption, where purchases are made not out of necessity but to fulfil emotional needs (Chung et al., 2017).

Participant 13 similarly acknowledged the therapeutic aspect of online shopping for mood elevation, stating, "If I am not feeling great or when I am tired, it seems like a good idea to just do it." Additionally, they mentioned, "When I am having low down or feeling tired or something, then I am probably more encouraged to shop online." Both respondents believed that browsing and making purchases online provides a sense of excitement and enjoyment, thereby contributing to a positive emotional state. Participant 19 echoed this, stating, "When I am happy, I want to buy something to treat myself, and if I am unhappy, I want to buy something to lift my mood." Here, the act of consumption is positioned as both a reward and a remedy, illustrating how dual emotional valences can serve as triggers for impulsive behaviour, precisely the kind that bypasses conscious deliberation, as suggested by UTT. Participant 3 described the act of simply being on a shopping website as uplifting: "Just being on the website makes me happy because I feel like I can treat myself if I want to, which is good." They elaborated, "You can also say it gives you a rush that makes you happy; you feel like you are worth something, and that makes you happy." These reflections illustrate how emotional gratification is not solely linked to the purchase but begins with the browsing experience. The participant's account also speaks to deeper psychological needs of self-worth and affirmation, which are fulfilled through the aesthetics and interactivity of digital retail platforms. These findings align with studies that identify digital shopping as both a hedonic and affective experience (Verhagen & Van Dolen, 2011). Similarly, Participant 9 highlighted the emotional peak experienced at the point of the transaction: "I do have the sort of happiness rush when buying an item online." They added, "Well, happiness, of course, if I am happy, then I will be in the mood to buy something for myself or others." This suggests that happiness amplifies not only self-directed purchases but also those made for others, thereby reflecting a social dimension in mood-driven consumer behaviour. These accounts collectively reinforce the proposition that emotional states, both positive and negative, are critical triggers in the online buying process. Such behaviours often bypass rational deliberation, aligning with Unconscious Thought Theory, which suggests that affective processing frequently operates outside of conscious awareness (Dijksterhuis & Nordgren, 2006). Furthermore, these patterns challenge the rational-sequential logic of the traditional Consumer Buying Decision Process Model, highlighting the need to integrate emotion as a core dimension in understanding online consumer behaviour.

Shopping to Make Someone Else Happy.

One emergent emotional driver in participants' online purchasing behaviour was the desire to bring happiness to others. For many, this motivation extended beyond simple gift-giving and reflected a deeper sense of emotional reciprocity and relational satisfaction. Online shopping served as a conduit for expressing care, love, and generosity, especially toward family and friends. Participant 7 captured this sentiment, explaining, *"I think it depends on my feelings, whether I am feeling it or not, laugh. You know the feeling you get and want to treat yourself or someone to something nice. You feel happy and want to make others happy, too."* This response suggests that shopping for others was not simply a rational decision, but an emotionally charged activity tied to the participant's own affective state. The act of gifting offered emotional gratification, enhancing both self-perception and relational bonds. In this context, online platforms were praised for their accessibility and ability to suggest thoughtful gifts, making the process more intuitive and emotionally satisfying.

Shopping when in a bad mood.

Participants acknowledged that their emotional state influenced their online buying behaviour. Some participants disclosed that they resorted to online shopping during negative emotions or when feeling down. They believed that shopping online provided a temporary escape or distraction from their negative mood and offered a sense of solace. Participant 8 stated, *"The happiness you feel being able to buy what you like is a good feeling, and I buy in the spur of the moment. I shop because I can, and that makes me happy."* They added, *"If I am sad, I feel like buying might bring me a little happiness. Then, I love it when the postman is coming, and when he comes, that cheers me up, like when he has a little parcel for me. Laugh."* The respondent explained that online shopping created a sense of happiness derived from the freedom to acquire desired items. They also disclosed that during periods of sadness, they tended to engage in excessive online shopping to alter their emotional state. Participant 17 stated, *"For example, I am in the office and having a bit of a bad day. I might buy something for everyone in the office to try to lift the mood even though it is my mood that I want to lift."* The respondent expressed a willingness to engage in online purchases to uplift the moods of others, resulting in a reciprocated sense of happiness. This behaviour supports assertions by

Cosic (2016), who argues that neuromarketing strategies often exploit emotional vulnerability to trigger purchase decisions, and by Stanton, Sinnott-Armstrong, and Huettel (2016), who highlight the role of emotional stimuli in the absence of conscious deliberation.

Shopping when in a good mood.

Conversely, participants also reported a heightened inclination to engage in online shopping when in a positive emotional state. They associated positive moods with increased desire and motivation to make purchases and a sense of optimism and enthusiasm towards the online shopping experience. For example, Participant 4 explained, *"If I want to be happy or to feel good about myself, then I go online to shop."* Therefore, it demonstrates the significance of feeling good about oneself as a driving force behind their online shopping endeavours. They added, *"When I am happy and content with myself, life, and the money I have or whatever, then, I tend to buy everything."* This suggests that when they are experiencing contentment and happiness, they tend to disregard caution and embrace impulsive buying tendencies. This supports Dijksterhuis and Strick's (2016) assertion that unconscious thought processes and emotional responses often underpin consumer decisions, even when cognition appears to dominate. Participant 5 corroborated Participant 4's views, affirming a higher inclination to make purchases in a positive emotional state than when feeling unhappy by stating, *"When I am happy, I tend to buy more than when I am not in a happy mood."* He also added, *"When I am not in a happy mood, I do not just buy anything, or I may buy the minimum requirement compared to when you are happy because when you are in a good mood, you are more likely to buy stuff than when you are sad."* However, they also acknowledged that their happiness during shopping was primarily influenced by the availability of savings and discounts by stating, *"I was happy obviously because it is £100 elsewhere, but I bought it for £80, which means that I saved £20 when buying toys for my daughter meaning, it saves me money."* Participant 10 explained, *"It depends on my mood and feelings. If I am in a good mood, I will buy it. Still, I will not buy if in a bad mood,"* thereby observing a correlation between their mood and purchasing decisions, with a heightened inclination to buy while in a positive mood but refraining from purchasing during negative emotional states. This participant revealed that a positive mood fuelled their desire to make purchases that would bring happiness to others, consequently enhancing their sense of well-being. Therefore, demonstrating the

influence of mood on their online buying habits, engaging in more purchases when in a positive emotional state but abstaining from buying during periods of negative emotions. However, the participant also explained that this happiness can quickly turn into unhappiness by adding, *"I tend to do a lot of research before buying, but when I find out that I could have bought an expensive item for a far cheaper amount, this will make me unhappy."* Similarly, Participant 21 characterised online shopping as a therapeutic activity that instilled happiness. The participant stated, *"One day, I was feeling a bit sad, and I had some Christmas money left over, and there was a power tool. Then, I told my wife I wanted it and kept an eye on it. A better one with the lowest price came up, and I bought it. This made me happy, so I do find it therapeutic. It helps me out and makes me happy."* These reflections support the position of Chan, Cheung, and Lee (2017), who argue that impulse buying, though often emotional but is not devoid of rational consideration, especially in online contexts.

Enjoying the Excitement of Shopping.

The participants expressed a shared sentiment of experiencing excitement and thrill during online shopping. They found joy in exploring various products, comparing options, and anticipating the arrival of their purchases. Participant 2 commented, *"I am feeling excited and inquisitive to see the price and the variety of items that I am going to buy even while making the purchase."* Therefore, this participant identified that their buying behaviour was influenced by the excitement associated with the prospect of making a purchase. This excitement was linked to their curiosity regarding pricing and the extensive range of available products. The excitement added an extra layer of emotional satisfaction to their online buying experience. This aligns with the work of Dijksterhuis & Nordgren (2006), whose Unconscious Thought Theory posits that emotions and unconscious processing often generate favourable outcomes in complex decision-making environments such as online shopping.

Enjoying the Anticipation of Receiving a Package.

The process of waiting for an item post-purchase emerged as a unique source of emotional pleasure. Participants also explained that the anticipation of receiving a package after an online purchase, contributed to their emotional satisfaction. The period of waiting for the package to arrive was seen as an exciting and gratifying experience, which added to the overall enjoyment of online shopping. Participant 7 noted, *"I do have those moments; for example, when ordering a camera, you get happy and feel excited and cannot wait to receive the item via post, you start tracking the post. I get that excitement, particularly items I have been seeking and desired."* The participant, therefore, argued that the satisfaction derived from anticipating the arrival of the purchased items and being able to track their delivery further augmented the participant's happiness. This further complicates the binary of planned versus impulsive buying by adding a temporal dimension to emotional fulfilment. The participants' responses unveiled shared and divergent perspectives concerning the interplay between emotions and online shopping behaviour. These findings illustrate a dynamic relationship between emotion and consumer behaviour in digital spaces. Participants described using online shopping as both an emotional balm and a celebratory act, influenced by mood, social gratification, and the anticipation of future enjoyment. These insights underscore the limitations of purely rational models such as the consumer buying decision process model (Panwar et al., 2019) and reinforce the relevance of incorporating Unconscious Thought Theory (Dijksterhuis & Nordgren, 2006) into consumer behaviour research to account for affective influences.

6.4.2 Theme 2: Financial Resources and Budget Constraints

Disposable income emerged as a pivotal factor influencing participants' online shopping decisions. Eleven out of the 21 participants explicitly linked their purchasing behaviour to the availability of surplus funds, often stating that they would only make discretionary purchases after fulfilling essential financial obligations such as rent, bills, and groceries. This finding builds on behavioural economics, which suggests that consumer rationality is bounded by available resources (Hamilton et al., 2018). It also reflects the practical importance of affordability and financial responsibility in consumer decision-making, aligning with

established behavioural models that consider financial capability a critical driver in the purchasing process (Tinne, 2011). Participants consistently indicated that price sensitivity and perceived value were central to their purchasing decisions. For example, Participant 2 stated, *"Price is a huge factor for me; even if I want to buy it at that moment, if I look at the price and I see that it is not worth it, then I might not buy."* Similarly, Participant 3 noted, *"Of course, the price, I would first consider how much the item costs."* These accounts underscore the primacy of cost considerations in online consumer contexts, mainly when choice is abundant, and decision-making is rapid. Tirmizi et al. (2009) emphasised that discounted pricing and promotional offers significantly affect impulse buying behaviour, which is echoed in several participants' responses who admitted to delaying purchases when funds were low and buying more impulsively when disposable income increased. This is illustrated by Participant 4, who described adding items to their online watchlist after payday and adjusting behaviour based on current financial status: *"If I just got paid, I go online and add stuff to my watch list, but if I have not been paid, I am a bit more like, okay, my money is going down, so I better not go on eBay."* This statement reinforces price sensitivity and reflects the dynamic relationship between income availability and online shopping engagement.

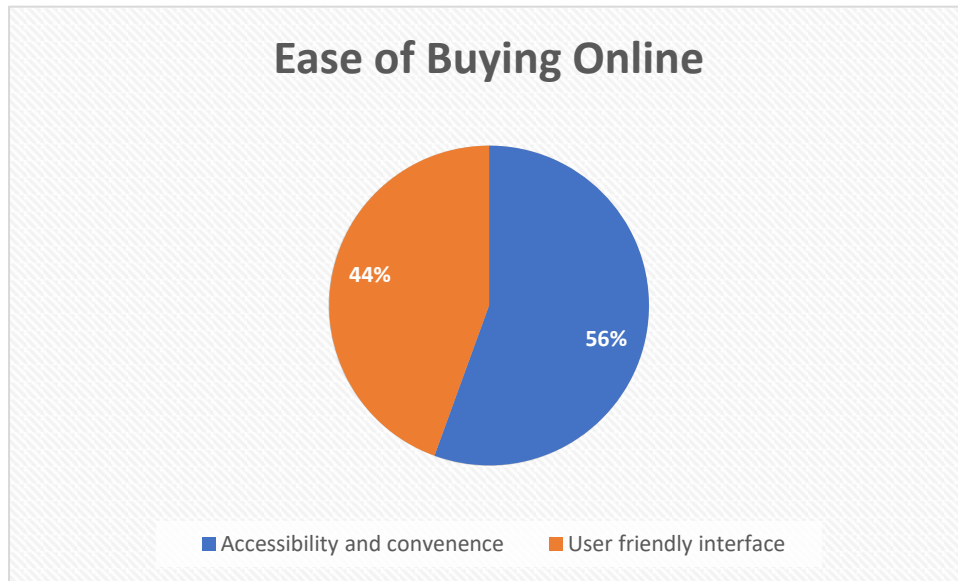
This finding aligns with the notion that online consumer behaviour is situationally influenced and contingent on external factors, including income. Kim and Park (2021) argue that such situational factors can override long-term behavioural intentions, particularly in impulsive or emotionally driven purchases. Participants' disclosures illustrate this duality. For instance, Participant 5 explained: *"When I have spare money that does not necessarily need to go anywhere, for example, my bills are all paid, shopping paid and all other expenses paid, then it is spare money, I can afford to buy then, I can go ahead to treat myself."* This reflects the tension between rational budgeting and the emotional gratification associated with discretionary online purchases. Moreover, a recurring theme in the narratives was the psychological negotiation between desire and affordability. Participant 11 reflected on changes in shopping habits linked to employment status: *"When working full time in a very good job, I would browse, and if things took my fancy, I would perhaps buy them, whereas now if things take my fancy, I look at them and dream and question myself if I do need them."* This aligns with Tinne's (2011) assertion that as consumers' disposable income fluctuates, so does their readiness to engage in non-essential purchases.

Several participants also demonstrated strategic decision-making, such as waiting for discounts or comparing prices across platforms. For example, Participant 21 noted, “Being able to find the item for the price that I want will influence my decision to buy.” This strategic orientation reflects a rational, goal-oriented aspect of consumer behaviour where financial optimisation plays a central role. Despite the rational underpinnings of price sensitivity, emotional and cognitive factors still intertwine. As Kacen and Lee (2012) point out, consumer decision-making often involves a dynamic interaction between affect and cognition. This was observed in Participant 9’s response: “If I have more money and my budget allows it, I will look for something more expensive.” Here, higher disposable income not only affects purchasing power but also expands the scope of product exploration and perceived value. The participants’ reflections reinforce the centrality of disposable income and financial self-regulation in shaping online consumer behaviour. Their accounts reflect a pragmatic approach to spending, wherein affordability, budgeting, and situational financial status critically inform buying decisions. These findings resonate with the broader consumer behaviour literature that recognises the influence of economic variables alongside psychological and emotional drivers in online retail environments (Tinne, 2011; Kacen & Lee, 2002). This theme contributes to a nuanced understanding of how consumers engage in self-monitoring and financial boundary-setting when navigating the affordances and temptations of online shopping.

6.4.3 Theme 3: Ease of Buying Online.

The third prominent theme emerging from the qualitative data is the ease of buying online, with nine participants explicitly identifying it as a major influence on their buying behaviour. This theme encompasses both accessibility and convenience, as well as the user-friendliness of online interfaces. Participants consistently highlighted how digital shopping environments remove spatial and temporal barriers and simplify the purchase process, making it appealing for a wide range of consumers. These findings reflect earlier literature suggesting that ease of use and accessibility are critical enablers of online purchasing behaviour (Floh & Madlberger, 2013).

Figure. 9 Ease of Buying Online Influencing Buying Decision.



6.4.4 Accessibility and Convenience.

The accessibility of online shopping was repeatedly cited as an influential factor, particularly regarding the ability to shop from any location, at any time, and often with expedited delivery. This sense of effortlessness was strongly expressed across responses. Participant 2 reflected this by stating: *"Shopping online besides clothes and gifts is easier and more efficient. Doing it online is just a click away; you can do it in bed by searching for things online. Regardless of the time of the day, you might end up receiving the item the next day."* This perception aligns with findings from Floh and Madlberger (2013), who argue that convenience and time-savings significantly affect consumer attitudes toward e-commerce. Similarly, Participant 5 noted: *"I prefer shopping online to going into the shop because I can find better deals and track my parcels."* This highlights another key element that, online shopping is not only perceived as more convenient, but also seen as more efficient and transparent, supporting a sense of control and autonomy. Participant 8 contributed to this view by commenting: *"You don't have to fire up a computer or laptop; you have your mobile phone in your hand most of the time, so you just buy it; it is that easy."* This notion reinforces the growing importance of mobile commerce and the seamlessness of modern digital interfaces, which has increased purchasing frequency and accessibility. Some participants also situated their responses within the

context of the COVID-19 pandemic. Participant 9 observed: *"The Internet makes things easily accessible to everyone, especially during lockdown and the quarantine period. People started buying more online because the shops were closed. Therefore, it gives people the perception that if they order something online, they can get it immediately by using the tracking information. This makes people feel as though they deserve everything immediately."* These insights reinforce that environmental factor such as lockdowns catalysed digital consumer behaviour, and this is in line with Chan, Cheung, and Lee (2017)'s theory of situational influences on impulse buying.

6.4.5 User-friendly Interface.

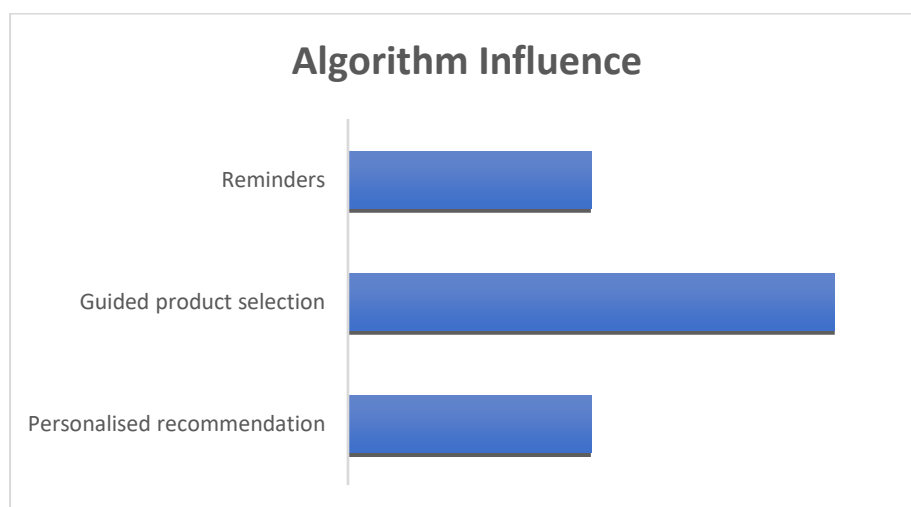
A key sub-theme of this broader category is the role of user-friendly design, which further simplifies the shopping process and increases consumers' likelihood to buy. Participants described intuitive navigation, minimal clicks, and simple payment methods as contributors to their positive experiences. Participant 3 articulated this clearly: *"It may be because of how easy it got, whenever you click, and it just pops up like okay pay now, or like how websites do not even require a confirmation from the card providers."* According to Wells, Parboteeah, and Valacich (2011), such design choices reduce friction, increasing the perceived usefulness of a website, one of the strongest predictors of online impulse buying. Similarly, Participant 6 noted: *"It is how the website presents the items that influence one to buy it. When you see a good website with what you want and is easy to navigate, it makes you happy and wants to buy."* This reflects the broader literature on how web aesthetics and usability (Benbasat & Wang, 2005) impact consumer trust and engagement. From an inclusivity standpoint, Participant 7 added an important dimension: *"As a person in a wheelchair, shopping online is easier, being able to get stuff sent home instead of going out for it."* This underscores how ease of access goes beyond convenience and into practical necessity for some consumers, enhancing their participation in the digital economy. Participant 18 reaffirmed the overall sentiment: *"I buy online because it is easy to buy online; it is a simple and convenient process."* This repeated emphasis on simplicity supports Floh and Madlberger's (2013) findings that the ease of use directly correlates with purchasing intentions. Altogether, the participants' narratives under this theme illustrate that ease of buying online is multidimensional,

encompassing availability, efficiency, mobile accessibility, and user-centred website design. These attributes collectively remove traditional barriers to consumption and amplify the likelihood of purchase. The findings do not only corroborate previous empirical work (Wells et al., 2011; Benbasat & Wang, 2005) but also contextualise how convenience, amplified during situational contexts such as the pandemic, can shift consumer expectations and habits permanently. Therefore, this theme contributes to answering the research question regarding the factors influencing online consumer buying behaviour and supports the thesis' broader aim to explore the unconscious and emotional dimensions of online decision-making, particularly in environments that simplify effort and increase immediacy.

6.4.6 Theme 4: Algorithm Influence.

The influence of algorithms and cookies on online buying behaviour emerged as a prominent theme in this study, with eight participants recognising their significance in shaping online shopping decisions. The findings revealed that algorithmic mechanisms such as personalised product suggestions, behavioural tracking, and reminder prompts served both as enablers and, at times, sources of discomfort in the participants' digital consumer journey. These insights resonate with the wider discourse on digital marketing, which positions algorithmic targeting as both persuasive and problematic.

Figure 10. Algorithm Influencing Buying Decision.



6.4.7 Personalised Recommendations.

Participants frequently described encountering algorithmically generated personalised product recommendations based on their prior search history and purchasing patterns. These recommendations, often in the form of pop-ups or reminder emails, were reported to significantly influence buying behaviour. Participant 4 remarked, *"Marketing is not just random, they do not just put things there, they know well enough that I shop for bags and purses a lot so, they give me a little pop-up banner with prompts like 'this is back'."* This comment illustrates how algorithmic predictions and triggers, informed by user behaviour, foster targeted marketing that feels relevant and persuasive to the consumer. In line with Tinne's (2011) assertion that marketers strategically influence impulse buying by appealing to emotions and psychological cues, these targeted prompts create an urgency to act. Participant 8 described this pressure, noting, *"This always happens to be, when I look at something to buy online, I start thinking of buying it again because I can see the items repeatedly being advertised on different websites as pop-ups, and there are usually price reductions, this again is my cracks, laugh, it makes me buy."* This demonstrates the repetitive visibility of algorithmic prompts acting as a behavioural nudge, often coupled with price reductions, amplifying the compulsion to purchase. However, participants also reflected critically on these interactions. Participant 8 acknowledged, *"When this comes up again, I feel pressured into looking at it again and reconsidering my options, including the fact that you are being monitored online."* drawing attention to concerns about digital surveillance and perceived invasiveness. This sentiment aligns with broader consumer anxieties in the literature regarding privacy erosion and data commodification in algorithmically driven commerce (Tinne, 2011).

6.4.8 Guided Product Selection.

Another benefit acknowledged by participants was the ability of algorithmic systems to guide them toward desired or relevant items, thereby reducing the time and cognitive effort required in decision-making. Participant 6 shared, *"The positive side is it directs you to what you need and want, and it is easier when you see it and know where to find it for a start."* Such remarks illustrate the practical efficiency and user satisfaction attributed to recommendation systems.

These findings reflect Wells et al. (2011), who identify ease of navigation and system usefulness as key predictors of consumer engagement and impulse buying. However, the study also uncovered drawbacks. Participant 7 recounted, *"I go online to get something, then something else shows up on the screen like oh these are related items, or someone looked at this, and you end up looking at it as well, this is a bit diverting from your original purpose of getting online."* This highlights how algorithms can distract consumers from their initial intentions, prompting unplanned purchases, an observation highlighted in prior studies on digital persuasion tactics (Wells et al., 2011). Participant 13 reinforced this tension between convenience and manipulation by stating, *"Algorithms and cookies inform me about possible offers, which makes me buy,"* though they also noted the occasional disappointment in the relevance or quality of these suggestions. Participant 21 referred to prompts like, *"The ten people who bought this item also bought this; we just wondered if you might want to consider this as well."* they added, *"this is something that has made me buy before."* This form of social validation illustrates the power of peer-influenced recommendation strategies, a known driver of trust in digital environments (Benbasat & Wang, 2005).

6.4.9 Algorithm Reminder

Some participants described algorithm-driven reminders as helpful in re-locating previously viewed products or aiding recall. Participant 1 explained, *"They helped me find a previously viewed item I had lost the link to,"* indicating the utility of algorithms in enhancing the user experience through convenience and continuity. However, the participant also voiced concern, stating, *"In terms of privacy, I do not really feel good, they control your ads and can influence you to buy things,"* suggesting an ambivalent perception of digital tracking technologies. This dual perspective on algorithms as both helpful and intrusive is consistent with observations made in Floh and Madlberger's (2013) study, which explored the emotional ambivalence experienced by online consumers. Participant 19 shared, *"Sometimes it is a good thing; it helps me to save time, and it also offers products,"* reflecting a utilitarian appreciation for algorithmic convenience. Nonetheless, they also noted, *"It can sometimes be annoying,"* underscoring consumer comfort's fluctuating nature with persistent digital engagement.

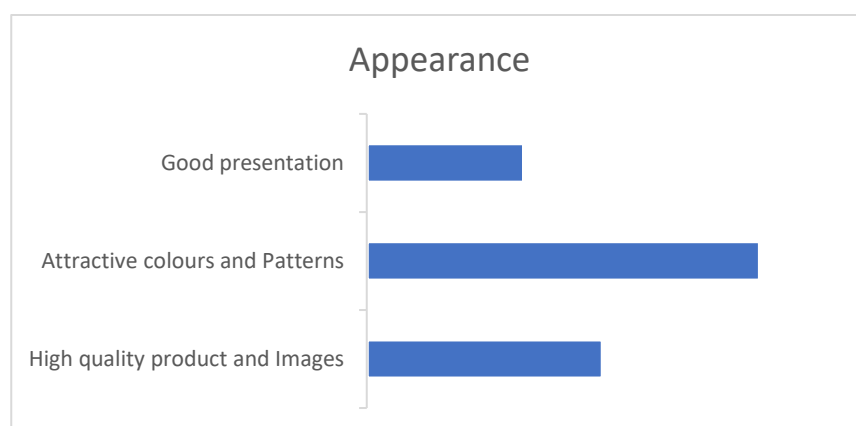
Taken together, the data reveal a nuanced picture. While algorithms enhance efficiency and personalisation in online shopping, they also raise ethical questions around manipulation, autonomy, and data privacy. Participants described these systems as capable of positively shaping their buying journeys through convenience but also acknowledged their capacity to overstep boundaries and create discomfort. In line with the theoretical frameworks of persuasive technology discussed in the literature, these findings illustrate the powerful yet complex role that algorithmic systems now play in shaping consumer behaviour in digital marketplaces. These responses and interpretations are situated within the broader aim of this study, which seeks to explore the unconscious and emotional dimensions of online consumer behaviour. Examining participants' nuanced reactions to algorithmic influence, the findings suggest that while such systems may facilitate decision-making and encourage purchases, they also invite reflection and concern, challenging assumptions about rational and autonomous consumption in the digital age.

6.4.10 Theme 5: Appearance of the Product.

The appearance of products emerged as one of the major themes influencing online consumer behaviour. Of the 21 participants, 10 explicitly cited the visual presentation of a product as a significant factor in their decision to purchase. These findings suggest that the aesthetics of an item, encompassing image quality, colour, layout, and packaging, may induce emotional responses and perceived product value, thereby shaping behavioural outcomes.

The following aspects were identified:

Figure. 11. Appearance Influencing Buying Decision.



High-quality Products and Images.

A prominent sub-theme within participants' responses was the role of high-quality imagery in facilitating product evaluations. Participants noted that clear, aesthetically pleasing photos increased their confidence in the product's quality and desirability. As Becker et al. (2011) argue, product imagery directly contributes to consumers' perception of quality, particularly in online environments where physical evaluation is absent. Participant 1 illustrated this by stating, *"For example, when buying clothes, I look at the item and imagine how it would look on me, and that would influence whether I buy or not."* This observation reflects the immersive cognitive process consumers undergo, relying heavily on visual representation to simulate ownership and fit. Similarly, Participant 3 emphasised, *"I would go with the thing that looks better, I won't say luxurious, but something that pleases the eyes."* pointing to the central role of visual pleasure in forming initial judgments. Participant 16 reinforced this, stating, *"The item must look good to influence my buying decision,"* adding that aesthetically pleasing products reduced post-purchase regret (Becker et al., 2011). This supports the findings of Pelet and Papadopoulou (2012), who posit that visual merchandising and quality representation influence immediate purchase decisions, trust, and long-term loyalty in e-commerce platforms.

Attractive Colours and Patterns.

Beyond resolution and clarity, participants frequently highlighted the importance of colour and pattern in influencing product desirability. According to Zebal and Jackson (2019), colour perception in digital shopping environments can evoke psychological responses and contribute to product differentiation. Participant 6 stated, *"The colour attracts me, and if it is something cute, I tell myself why not, I need to have it. So, I go ahead and order the item."* This response suggests an impulsive emotional response driven by the perceived attractiveness of colours. Participant 8 also noted this sentiment, stating, *"I usually buy items with bright colours. I like things with bright patterns, and I suppose they catch my eye more than something like black."* These statements align with existing literature asserting that bright, warm colours are more visually arresting and associated with excitement and stimulation (Lin & Liu, 2019).

Participant 9 reinforced the idea that *“colours do play a part, especially when it comes to clothing items,”* indicating that this visual dimension remains influential across product categories. Participant 10 noted that their decision was guided not only by colour but also by how the product *“appears to fit the model, in the photograph”* which shows how visual presentation reinforces trust in the product’s utility. Participant 19 also provided a reflective interpretation, stating, *“I do like pastel colours, so there might be some influence there. Yeah, I just decided to have more colourful things around me. I don't know, but it is a stage in life.”* alluding to how aesthetic preferences evolve and become associated with personal identity or life stages. This emphasises the individualised nature of online consumer behaviour, shaped not only by visual appeal but by subjective experience and emotion. This reflects the constructivist epistemological position underpinning the qualitative phase of this study, which assumes that meaning and reality are constructed through individuals’ interpretations of their lived experiences (Charmaz, 2017).

6.4.11 Good Presentation and Packaging.

Another dimension of appearance that participants found influential was the overall presentation and packaging of the product. As Becker et al. (2011) note, product presentation through layout, packaging, or contextual imagery can function as a heuristic cue for product value and quality. Participant 12 encapsulated this idea, stating, *“An item must look appealing, and that might be in terms of presentation, colour, and packaging.”* Participant 20 echoed this sentiment, also highlighting how a well-presented product positively influenced their decision-making process. These observations lend support to the broader theme that online consumer behaviour is shaped not only by rational evaluations such as price or utility but also by symbolic and sensory cues embedded in visual design. The emphasis placed on aesthetics in participant narratives reflects the critical role of emotional and perceptual responses in online shopping contexts. The findings suggest that product appearance significantly shapes online consumer behaviour through multiple intersecting channels, including image quality, colour, aesthetic alignment with personal identity, and overall presentation. Participants consistently reported that attractive, clear, and well-presented visuals fostered feelings of trust, excitement, and satisfaction, which are emotional states that strongly influenced their purchase decisions. These findings are consistent with previous

literature (Becker et al., 2011; Pelet & Papadopoulou, 2012), affirming that visual cues function as vital components in the digital consumer experience. Importantly, these results reinforce the broader argument within this study: that unconscious and emotionally driven factors, particularly those triggered by design and aesthetics, play a vital role in shaping online buying behaviours. This further substantiates the rationale for integrating neuroscientific measures (as pursued in the EEG phase of this study) to explore these implicit cognitive-affective mechanisms more deeply.

6.4.12 Additional Themes Influencing Online Buying Decisions:

Although not ranked among the top five major themes, participants identified several additional factors as contributing to their online shopping behaviours. These themes include: COVID-19, brand perception, detailed reviews, and unplanned purchases. They offer intricate insights into situational and contextual drivers of consumer choice in the digital space.

COVID-19 and Pandemic-induced Shopping Behaviour

The COVID-19 lockdown functioned as a significant external catalyst for online shopping, as reflected in several participants' accounts. Although the pandemic was not a psychological factor, its structural constraints, such as retail closures and physical distancing rules, changed shopping behaviours and habits across different demographics.

Participant 1 remarked, *"I think COVID-19 is changing online shopping significantly. People are seeing the products more than before in online shopping,"* highlighting increased exposure to online marketplaces as a function of enforced domesticity. This reflects the findings of Luo, Ba, and Zhang (2012), who argue that online accessibility and immediacy intensify consumer engagement, particularly during periods of restricted movement. Participant 13 supported this notion, stating, *"The obvious reason is the COVID-19 lockdown. I would say that I have been shopping online a lot more as a result."* Participant 16 added, *"People need something to look forward to,"* associating the arrival of parcels with emotional fulfilment as an emotional displacement mirrored in earlier findings under the theme of mood regulation.

The pandemic thus served as a contextual amplifier for behaviours already underpinned by emotional, cognitive, and situational triggers. Floh and Madlberger (2013) support this

contextual fluidity by asserting that external events shape online platforms' perceived value and utility.

Brand Recognition and Trust.

Brand emerged as a secondary but noteworthy influence on consumer decisions. While not a primary motivator, it functioned as a heuristic for quality and trust, particularly in contexts of uncertainty.

Participant 10 stated, *"I believe it depends on whether it is a good brand,"* suggesting that brand familiarity offered reassurance. Participant 17 echoed this sentiment: *"The reputation of the brand does influence my decision whether to buy or not to buy."* These reflections are consistent with Becker et al. (2011), who suggest that branding can indirectly shape emotional responses and consumer perceptions through associative mechanisms. Participant 18 described brand loyalty through a familial lens, stating, *"My younger sister likes nail varnish, but she likes three brands so that you can buy whatever ones, but they have to be one of those brands."* Such responses point to the embeddedness of brand preference within personal and social identity. However, while branding contributed to decision-making, it lacked the motivational immediacy of emotional or economic factors like discounts or product aesthetics.

Detailed Descriptions and Positive Reviews.

Several participants highlighted the importance of detailed product descriptions, and user reviews in mitigating uncertainty and also improving consumer trust. These elements offered practical insight into product functionality, reliability, and alignment with personal expectations.

Participant 1 noted, *"I look for the reviews to see what other people have said about the products, and if the reviews are positive, then I tend to buy."* Reviews function here as a form of social proof which is an evaluative shortcut supporting more confident decision-making. According to Palvia (2009), ease of trust formation via transparent communication, including customer reviews, is critical in converting intent into purchase. Participant 10 referred to the

influence of platforms like Pinterest, stating, *"I think applications like Pinterest can influence your taste,"* suggesting that visual and narrative feedback influences product desirability even when it doesn't directly modify purchasing habits.

Unplanned Shopping and Impulse Buying Behaviour.

All participants identified unplanned purchases, often driven by emotional states or algorithmic triggers, to varying degrees. For some, this behaviour was accompanied by post-purchase regret, while others framed it as self-indulgence or escapism.

Participant 12 admitted, *"I might be a shopaholic when it comes to buying useless stuff, and I think this is the biggest flaw."* Similarly, Participant 16 expressed concern: *"I realise that it is a hard time for everyone, and I need to save money as much as possible, but I cannot help myself. I scroll on websites for clothes; it is just a habit, and I am sad about this."* The findings from Wells, Parboteeah, and Valacich (2011) supports this stating that, impulsive shopping can be heightened by factors such as website design and the site's perceived ease of use. Additionally, integrating personalised marketing algorithms, as discussed in earlier themes, introduces ethical concerns when unplanned buying leads to regret or financial strain.

Participant 17 exemplified this by reflecting on discount cues: *"When I see the discounts and yellow labels, I am like, yes, definitely I am going to have that even if we do not need them."*

Participant 19 extended this observation to the role of habit and self-awareness, stating, *"I realised I was spending too much money and had to talk about it to a friend, and through our conversation, I realised that I am a bit addicted."* This realisation that consumer may be exposed to factors that can make them act against their will raises important implications for online platform design, particularly around ethical marketing practices and psychological manipulation. These findings echo concerns raised by Tinne (2011), who linked marketing stimuli to impulsive consumer actions and questioned their sustainability.

These additional themes demonstrate that while emotions, income, and digital convenience dominate consumer behaviour, situational factors such as a global pandemic, brand cues, peer reviews, and impulse buying remain significant. These findings demonstrate the exploratory depth of the qualitative study and illustrate how participant narratives can be situated within broader psychological and contextual frameworks to inform subsequent stages of inquiry, without implying validation or triangulation.

7 Qualitative Study Discussion

This chapter critically examines how the qualitative findings of this PhD research align with, expand on, or challenge existing literature, thereby addressing the study's overarching research questions:

RQ1. What are the key conscious and unconscious factors that influence online consumer buying decisions?

RQ2. How do conscious and unconscious factors interact to shape the online consumer decision-making process?

RQ3. What unconscious psychological mechanisms contribute to impulsive online shopping, and how do they operate within the broader consumer behaviour process?

The qualitative study, involving in-depth interviews with 21 participants, sought to unravel the intricate web of factors influencing online consumer buying decisions. This discussion section delves into these findings, synthesising them with the literature to provide an intricate understanding of the interplay between conscious and unconscious decision-making processes.

7.1 Integration of Emerging Themes

Although not central to the top five themes, additional factors such as COVID-19, brand loyalty, and customer reviews had noteworthy impacts.

The COVID-19 pandemic fundamentally changed how consumers shop. Participants 1, 13, 16, and 17 described shopping online more frequently during lockdowns, not only due to necessity but also to boost their mood during difficult times. As Laato et al. (2020) and Pantano et al. (2020) highlight, these shifts were driven by emotion and external constraints. Brand recognition was a trust factor and perceived quality. Participants associated established brands with reliability, which often justified higher spending. This is consistent with Bakardjieva and Kimmel (2016) and Chartrand et al. (2008), who link brand identity with emotional reassurance.

Detailed product descriptions and customer reviews gave participants confidence, aligning with findings from Pakura et al. (2020) and Zhang et al. (2018). Positive reviews, in particular, enhance trust and mitigate risk where there is no opportunity for physical evaluation.

The qualitative findings did not only answer but also elaborated upon the research questions posed, offering interpretive insight into how participants describe the relationship between conscious and unconscious influences in their online buying behaviour. Consumers rationally assess affordability, quality, and usability while simultaneously describing the influence of emotions, visual cues, and algorithmic nudges.

This PhD thesis supports existing literature while offering new insights into how emotions, especially positive ones, function as pivotal forces in the online buying journey. It also highlights areas where unconscious processes may exert influence beyond conscious control, raising ethical questions for marketers and platform designers. Ultimately, this thesis contributes to a richer understanding of consumer behaviour in digital contexts, revealing how internal states and external systems combine to shape consumers' daily shopping decisions.

These qualitative themes also clarify the developmental role of the interview phase within the sequential exploratory mixed methodology. The interviews identified emotion as a recurring influence on online buying behaviour and also highlighted the importance of visual presentation and algorithmic prompts. In exploratory sequential mixed methodological designs, qualitative findings may be used to identify constructs that inform the focus of a later quantitative phase (Tashakkori, Johnson and Teddlie, 2020). In this study, the qualitative findings did not confirm hypotheses or establish causal relationships. Rather, they informed the conceptual focus of the subsequent EEG phase by identifying emotional attentional processing as a relevant construct for exploratory physiological investigation. This form of integration by development is consistent with mixed methodological research, where one phase may inform the design or focus of another (Schoonenboom and Johnson, 2017). The qualitative findings therefore contributed to the mixed methodology by shaping the focus of the quantitative phase and by providing one source of evidence for later integrated interpretation. This supports triangulation by source in a complementary sense, where qualitative accounts and EEG observations are used to illuminate different dimensions of the same research problem without implying confirmatory convergence (Fetters and Molina-Azorin, 2020; McCrudden, Marchand and Schutz, 2021).

7.2 Addressing the Research Questions Through Qualitative Findings

7.2.1 Key Conscious and Unconscious Factors

RQ1: What are the key conscious and unconscious factors that influence online consumer buying decisions?

The qualitative findings suggest a complex interaction between rational (conscious) and emotionally rooted (unconscious) factors that influence online buying. Conscious considerations such as price, disposable income, product presentation, and brand trust were identified. Participants frequently described financial capability as a determining factor for whether a purchase occurred, corroborating the findings of Ramya and Ali (2016) and Tinne (2011) that affordability shapes consumer buying decisions. However, the qualitative data also highlight the decisive role of emotions, particularly the influential role of positive emotions in buying decisions. Participants reported shopping as a way to enhance their mood, self-soothe, or to reward themselves. This explanation aligns with Wacker (2018), who suggests that positive emotions are closely linked to consumer behaviour through neurological pathways such as dopamine release. However, this link requires further scientific validation. The narratives of participants 2, 3, 4, 7, and 21 support the hypothesis that emotional uplift is an unconscious and sometimes conscious trigger to buy.

Participant 11's reflection on shopping during a difficult period illustrates the therapeutic potential of online shopping. This is in agreement with Verhagen and Van Dolen (2011), who observed similar emotional gratification from digital retail experiences.

The study also suggest that negative emotions contributed to buying decisions but were less influential than positive emotions. Participants acknowledged that they were less likely to purchase when sad or stressed, although some noted using shopping to reverse these moods. This corresponds with Pelet and Papadopoulou's (2012) view that while negative emotions enhance memorability, they may not always result in a purchase. Instead, most participants identified happiness or contentment as their primary shopping motivator. In addition, high-quality product images, intuitive website layouts, and algorithm-generated suggestions surfaced as unconscious cues that triggered positive responses, often without the participant's immediate awareness. These elements align with the literature emphasising the visual and experiential dimensions of online retail (Becker et al., 2011; Pelet & Papadopoulou, 2012).

7.2.2 Interaction Between Conscious and Unconscious Processes

RQ2: How do conscious and unconscious factors interact to shape the online consumer decision-making process?

The findings highlight a dynamic interplay between rational planning and emotional response. Consumers often began with a specific intention (e.g., buying a gift) but were diverted or encouraged to make additional purchases due to emotional states, personalised suggestions, or visually attractive interfaces. This dual influence shows how rationality and emotion coexist in online buying. The participants described a shift in their mindsets when experiencing happiness or financial freedom. For example, Participant 4 noted how good moods, and sufficient funds led them to spend impulsively, while they were more cautious when they were emotionally or financially strained. This suggests that conscious financial awareness moderates unconscious emotional impulses.

The role of algorithms and cookies further illustrates this interaction. Kroger and Raschke (2019) highlight that algorithmic systems tailor experiences to consumer preferences, subtly nudging behaviour. Participants described how reminders of previously viewed items, promotional offers, or social cues (e.g., “others also bought this”) influenced their buying decisions. These features operate on the hem of conscious attention, providing familiarity, trust, and urgency.

Ease of navigation and fast checkout processes also contributed to consumer buying decisions. As Participant 3 stated, seamless payment mechanisms reduced the cognitive load, enabling quicker and often less rational decision-making. This view supports Wells et al. (2011) and Floh and Madlberger’s (2013) argument that usability increases perceived usefulness and promotes spontaneous purchases.

7.2.3 Unconscious Mechanisms and Impulsive Buying

RQ3: What unconscious psychological mechanisms contribute to impulsive online shopping, and how do they operate within the broader consumer behaviour process?

The findings highlight multiple unconscious psychological mechanisms at work in impulsive buying:

Mood Regulation: Several participants described using online shopping as a mood regulator to manage emotional lows. Tukkinen (2014) supports this finding, which is implied by Verhagen and Van Dolen (2011). Shopping was framed as a therapeutic activity, especially during times of stress or sadness.

Anticipatory Gratification: Participants explained the excitement they get when waiting for their packages, thereby linking anticipation to emotional satisfaction. This forward-looking pleasure mirrors dopamine-driven behaviour described by Wacker (2018).

Visual and Aesthetic Cues: The participants repeated the impact of colours, packaging, and product imagery. Bright colours and attractive models made items seem more appealing, often leading to impulsive purchases. This notion resonates with the findings of Pelet and Papadopoulou (2012) and Becker et al. (2011).

Algorithmic Nudges: Participants also reported that repeated exposure to items via pop-ups, reminders, or suggestions increased their likelihood of buying. While this creates convenience, participants 1 and 19 raised concerns about privacy and behavioural manipulation, highlighting the need for ethical considerations in personalised marketing (Kroger & Raschke, 2019).

The study also reveals instances where participants expressed feeling out of control or potentially addicted to online shopping. Participant 12 confessed to regretting purchases and feeling like a “shopaholic,” suggesting that these unconscious mechanisms can be overwhelming in digital contexts.

8 Quantitative study.

8.1 Introduction

The EEG (Electroencephalography) experiment is invaluable in the broader research framework, allowing an exploration into the intricacies of the human brain's response to stimuli. The objective is to understand the neural underpinnings that drive cognitive processes and decision-making. As a non-invasive method, EEG provides real-time insight into brain activity, offering a unique window into the physiological responses accompanying human behaviour. By measuring electrical activity across the scalp, the aim is to reveal the neural signatures associated with various stimuli, including emotional and cognitive triggers. This EEG experiment is designed to identify whether the participants have an emotional bias. The intention is to draw a comprehensive picture of how the participants' brain's electrical signals respond to the variables under investigation through precise methodologies, data collection procedures, and rigorous analysis. In the following sections, we will explore the intricacies of the EEG experiment. Doing this will help to create an understanding of the neurobiological pathways contributing to the overarching research questions and ultimately enriching the knowledge of online buying decision-making processes.

8.2 Ethical Considerations.

Before the research was conducted, the University of Suffolk's Ethical Committee approved the study on March 21, 2022. See Appendix 7 for Copies of the Ethical Approval. All participants were provided with a participant information sheet and an informed consent form.

Consent was recorded in writing before the participants carried out the study. Each participant was asked to create an ID (memorable word) developed using 3-8 letters, which allowed them to remain anonymous and was only used to correspond their data from the response they provided during the interview to the EEG data. Informed consent was documented through a tick box option. Participants could only start the study if they had given their consent. They were informed of their rights to withdraw at any point and that any

data concerning them would be destroyed according to the British Psychological Society Code of Ethics and Conduct guidelines (2021). Therefore, participants would remain anonymous and cannot be identified within the dataset. The research data generated by the study was stored in a password-protected file on a password-encrypted USB. Data will be kept until August 31, 2025, so that it can be accessed at any time during this PhD study and for a short time afterwards to cover publication possibilities. The participants were informed about this at the beginning before giving their consent. If they were uncomfortable with this, they could withdraw from the research. The experiment posed no risk to the participants; the only discomfort was the application of gel onto the scalp via the electrodes on the EEG cap worn on the head to collect EEG data. However, the gel was removed immediately after the experiment using tissue paper and water, as it was aqueous-based. The EEG experiment lasted approximately 60 to 90 minutes per participant, depending on the time required to place the EEG cap symmetrically on the participant's head, filling each electrode with gel and ensuring proper electrode signal reception by providing impedance below 10k Ω . The duration also depended on the participants' reaction times. However, participants were informed about the experiment's expected length and willingly proceeded.

8.3 EEG Experiment.

In this second part of the study, findings from the semi-structured interviews in step one was used to inform the design of the EEG experiment.

The qualitative study unveiled several themes: emotions, online buying convenience, disposable income, algorithmic influence, and product appearance. These themes offered significant insights into participants' motivations, preferences, and decision-making processes as described in relation to their online purchasing behaviour. Participants frequently described emotional experiences as closely intertwined with their online buying decisions, indicating that emotions were perceived as an influential factor across different stages of the purchasing process. These accounts provide interpretive insight into how participants experience the emotional dimensions of online shopping, without implying causal or confirmatory relationships. This led to exploring whether these emotional states might create participant bias.

At this stage, the Dot Probe task would effectively ascertain whether the participants in study one had an emotional bias. This is because there were indications from the codes and themes suggesting that emotions play a significant role in whether the participants decide to buy.

The same set of participants who took part in the interview were invited to take part in the electroencephalography (EEG) experiment.

It is commonly held that emotionally significant stimuli possess a distinct capacity to attract attention. This strong attentional bias towards emotional stimuli has been observed in various behavioural investigations, such as studies on the attentional blink (Thigpen et al., 2018) or dot probe detection (Bullock & Bonanno, 2013). Additional support for the notion of attention capture by emotionally charged stimuli comes from visual search experiments. These experiments indicate that fear-inducing stimuli can capture attention effectively. For example, studies have revealed that when angry faces are interspersed among happy faces, they are detected more quickly than in the reverse scenario (Ceccarini et al., 2024; Nummenmaa & Calvo, 2015) present agrees with these findings by stating that the detection of angry facial expressions is fast and efficient). Moreover, this attentional capture extends beyond faces; even schematic angry faces (Ohman et al., 2001a, corroborated by Eastwood et al., 2001) and fear-related non-face stimuli such as snakes and spiders placed among fear-irrelevant stimuli demonstrate similar results (Ohman et al., 2001b). These findings collectively suggest that the emotional significance of a stimulus can be processed beyond the focal point of attention and can actively steer attention toward its location.

In their study, Eimer and Kiss (2007) utilised event-related brain potential (ERP) measurements to explore the hypothesis that fear-inducing stimuli can provoke attentional capture, even under circumstances where they can be entirely disregarded, and attention is actively allocated to other tasks. To examine this phenomenon, they presented arrays of stimuli to the participants consisting of fearful and neutral faces. The individuals were simultaneously actively monitoring a fixation cross, their primary task being to detect a minor change in the cross's luminance. This luminance change occurred concurrently with the introduction of the face array on select trials. Eimer and Kiss (2007) state that the variety of faces contained either a singular fearful face amidst neutral faces or a single neutral face among fearful ones. The individual faces, termed singletons, were positioned close to the fixation point on either the left or right side (as depicted in Fig. 1). Notably, they were unrelated to the ongoing task, which involves identifying any instances of attentional capture

stemming from these irrelevant face singletons, the study utilised the N2pc component as an electrophysiological marker of attentional selection. The N2pc component typically emerges at posterior electrodes within 180 to 300 ms after stimulus onset, appearing contralateral to the side of the attended visual event. It serves as an indicator of spatially selective attentional processing, as previously established by researchers such as (Henare et al., 2024; Doro et al., 2019; Woodman et al., 2009).

The N2pc-posterior-contralateral Component, as elucidated by a comprehensive review of studies, embodies an event-related potential (ERP) closely associated with attention, specifically at the perceptual level. This component manifests before object recognition or deeper cognitive processing stages (Rodríguez Holguín et al., 2009). The N2pc is prominently observed during visual searches (Couperus & Quirk, 2015; Rodriguez Holguin et al., 2009) or more intricate assignments such as discriminating colours and orientations (Rodríguez Holguín et al., 2009). Its existence indicates ongoing attentional selection, manifesting as a continuous measure. A vital aspect of the N2pc's behaviour is its contralateral shift corresponding to the hemispheric side of the attended visual event, as established through research like the modified visual search paradigm conducted by Dell'Acqua et al. (2022). This phenomenon can be understood by considering its emergence in the aftermath of a target's onset (approximately 200-300ms), recorded primarily at posterior scalp sites (Hyun et al., 2009; Rodriguez Holguin et al., 2009). Notably, the N2pc registers as more negative on electrodes contralateral to the target's location, thereby showing a negativity bias in the left hemisphere for stimuli presented in the right visual field and the right hemisphere for stimuli presented in the left visual field (Rodriguez Holguin et al., 2009). The measurements are usually focused on electrodes PO7 and PO8, located at the posterior region of the scalp, where visual brain activity is most discernible (Fox et al., 2008). The calculation of the N2pc measurement involves subtracting the signal recorded from the electrode ipsilateral to the target from the signal recorded from the electrode contralateral to the target. This process offers insight into the N2pc's engagement in attentional selection, aiding in distinguishing between target-related and non-target-related neural responses (Rodriguez Holguin et al., 2009). The N2pc's ability to be isolated from other ERP activity and its consistent localisation within specific neural areas help validate its suitability for measurement (Rodriguez Holguin et al., 2009). Empirical evidence highlights the N2pc's presence across various stimuli, encompassing dots, words, letters, digits, shapes, lines, and faces. Notably, it surfaces in tasks

requiring focused attention to differentiate targets from distractors, indicating its role in selective attention (Couperus & Quirk, 2015). The N2pc's absence in cases where rapid attentional shifts are sufficient for detecting prominent features underscores its link to focused attention (Couperus & Quirk, 2015).

Furthermore, the N2pc appears sensitive to sensory factors such as target position and distractor number, suggesting its role in perceptual-level attention. Its responsiveness increases in more complex tasks, like distinguishing conjunction targets from feature targets or monitoring for change. This indicates the N2pc's adaptability to varying attentional requirements (Henare et al., 2024; Schankin & Wascher, 2008; Hopf et al., 2006). Despite discrepancies in timing definitions, the N2pc consistently demonstrates its relevance in the initiation and execution of attention shifts during visual tasks (Henare et al., 2024). Attempts to curtail attention shifts corroborate its role, as seen in visual search tasks where participants focus on a central fixation cross and are asked to detect specific features. When attention shifting is prevented, the N2pc's presence persists, underscoring its significance in feature detection (Rodríguez Holguín et al., 2009). In summary, the N2pc-posterior-contralateral Component, a distinct ERP, reflects attentional selection at a perceptual level. Its contralateral negativity bias, responsiveness to attentional demands, and consistent presence across varied tasks substantiate its role in focused attention.

8.4 Behavioural Measurement of Attentional Bias.

Gupta, Kujawa, and Vago (2019) outline that behavioural studies have employed various methodologies to investigate attentional bias. They elaborate that researchers have explored emotional, threatening, and non-threatening stimuli, including words (Bar-Haim et al., 2007), scenes (Gibb et al., 2017), and faces (Blauth & Iffland, 2024; Duque & Vazquez, 2015). Moreover, Gupta, Kujawa, and Vago (2019) explain that the dot-probe task was introduced by MacLeod et al. (1986) and is utilised to assess attentional bias through a spatial orientation towards threatening cues (Mogg and Bradley, 2016). This task involves briefly and simultaneously presenting two visual stimuli (cues) above and below or to the left and right of a central fixation cross. One of these cues is emotionally charged or threatening, while the other remains neutral.

Additionally, stimulus exposure duration has been manipulated to examine different facets of attentional bias (Bar-Haim et al., 2007). Exposure conditions involving subliminal presentation, preventing conscious awareness, and supraliminal representation, allowing access to attention, have also been utilised (Bar-Haim et al., 2007). Gupta, Kujawa and Vago (2019) also add that distinct paradigms, such as the dot-probe task, emotional Stroop task, emotional spatial cueing paradigm, and visual search task, have been employed to investigate attentional bias. According to Bar-Haim et al. (2007), each paradigm connects to different dimensions of attention. For instance, the dot-probe task assesses the extent to which threatening stimuli capture attention (Koster et al., 2004; Rossignol et al., 2012), whereas the emotional Stroop task gauges whether attention to emotional content hinders performance when responding to non-emotional content (Thomas et al., 2007).

On the other hand, the emotional spatial cueing paradigm focuses on spatial attention shifts and covert spatial attention movements towards threatening stimuli (Bekhtereva et al., 2021), while the visual search paradigm examines spatial attention allocation and heightened attention capture by threatening and emotional stimuli (Wieser et al., 2018). The dot-probe task is often applied to evaluate facilitated attention towards threats, difficulty disengaging attention from threats, and attentional avoidance; the emotional Stroop and emotional spatial cueing paradigms are appropriate for studying difficulty disengaging attention from threats; and the visual search task holds promise in studying difficulty disengaging attention from and attentional avoidance of threats (Cisler & Koster, 2010). Despite the diverse behavioural outcomes of attention across these tasks, there are underlying neural commonalities. Early and later event-related potentials (ERPs) can be elicited in response to threatening stimuli and targets presented in an emotional context.

Bar-Haim et al. (2007) conducted an extensive meta-analysis of 172 behavioural studies on attentional bias (N = 2,263 anxious individuals, N = 1,768 non-anxious individuals). They concluded that individuals with anxiety, but not non-anxious individuals, exhibit a significant attentional bias towards threat stimuli. Moreover, the magnitude of this bias is consistent across various anxious populations, including those with different clinical disorders, highly anxious non-clinical individuals, anxious children, and adults. Furthermore, individuals with anxiety, but not control subjects, demonstrate significant threat-related bias in emotional Stroop, dot-probe, and emotional spatial cueing paradigms. However, behavioural studies investigating attentional bias's distinct components and time course present conflicting

findings. For instance, Bar-Haim et al. (2007) manipulated the exposure duration of word pairs (100 milliseconds (ms), 500 ms, 1500 ms) in a dot-probe task with non-clinically anxious participants. They found evidence supporting state anxiety-related bias for threat stimuli across all exposure conditions, specifically in the shorter exposure condition of 100 ms, reflecting attentional vigilance for threat. However, the exposure duration of word stimuli did not significantly influence the bias. In other words, the attentional bias for threat did not display substantial variability within this range (100–1500 ms) in non-clinically anxious participants, failing to uphold the vigilance-avoidance hypothesis. Subsequently, Gibb et al. (2017) conducted another dot-probe study using pictorial stimuli for 500 or 1500 ms. They observed that, compared to participants with low trait anxiety, those with high trait anxiety were more vigilant for high-threat scenes at 500 ms yet displayed no attentional bias at 1500 ms. Unfortunately, behavioural measures like reaction times lack the sensitivity to delineate the temporal dynamics of hypervigilance towards or avoidance of threat-related stimuli. Reaction times indirectly measure attentional processing (Horley et al., 2004) and can be influenced by post-perceptual processes such as motor responses and decision-making (Handy et al., 2001; Mueller et al., 2009). Fortunately, event-related potentials (ERPs) can examine the time course of attention to threat with millisecond precision (Kappenman et al., 2014; Kappenman et al., 2015).

8.5 Dot-Probe Investigations

EEG data were recorded from 64 scalp sites with Curry 8 acquisition software and SynampsRT amplifiers using a Quik-Cap arranged according to the International 10-20 system (Compumedics, Melbourne, Australia). An electrode was placed below the left eye to record vertical eye movements (VEOG). All electrodes (except VEOG) were referenced to a site midway between Cz and CPz and grounded midway between Fz and FPz. The impedance of all electrodes was kept below 10k Ω before starting the experiment. All data were continuously sampled at 10Hz with a bandpass filter of 1- 30Hz and a 50Hz notch filter as recommended by Compumedics Neuroscan. A two-minute resting EEG recording was taken whilst the participant's eyes were closed. The EEG was lowpass filtered (1Hz) for images and target stimuli and epoched offline into 700ms windows, including a 100ms pre-stimulus interval for baseline correction. ERPs were measured at the electrodes contralateral and

ipsilateral to the emotional images. The electrodes of interest were PO7 and PO8. For each emotional image type, the ERPs for the contralateral and ipsilateral electrodes were averaged to create a total mean amplitude for electrodes contralateral and ipsilateral to the negative and positive images.

8.6 EEG Procedure.

The same set of participants that took part in the interview stage were invited to the Psychology laboratory. However, only 14 out of 21 participants returned to complete the study, as the others had either graduated or travelled out of the country due to the time interval. The interval was longer than anticipated due to the COVID-19 pandemic and the government lockdown restrictions that followed the laboratory's closing. On arrival, they were made to sit comfortably in front of the computer screen with the Curry 8 acquisition software. The participants were thanked for responding to the invitation and were reminded the purpose of the experiment and were sent the Information sheet and another consent form. This was because there had been over a year's interval between the two studies due to the COVID-19 lockdown restrictions. All participants questions were answered, and they were informed to press the left or right arrow on the computer keyboard depending on where they saw a blue dot appear on the screen. Once the cap was fitted correctly, each electrode was filled with aqueous gel using a blunt needle and syringe. This process was carried out to ensure the electrodes connected well with the scalp measured by impedance below 10k Ω . Again, the participants were informed on what they were expected to do and then participated in the trial run, to help them understand the process before starting the experiment. They then sat in front of the computer screen to read the message, telling them what they expected to do. See Appendix 8 for Displayed Instruction.

This experiment selected 19 pictures from the International Affective Picture Set based on emotional presentation and valence (ten positive, nine negative). These emotional pictures were paired with neutral images (Lang et al., 2008). Lang, Bradley, and Cuthbert (2008; cited in Constantinescu et al., 2016) describe International Affective Picture System (IAPS) as a stimulus database investigating various aspects of emotional processing. All the picture pairs used in this experiment (i.e., positive/neutral and negative/neutral) were matched for arousal (high) to make sure that the only difference between them was affect (i.e., either positive or

negative). The picture sets were presented in greyscale on a black background, measuring 15 x 11cm and a time duration of 250ms in ePrime. One of the negative images selected was omitted because of its extreme nature, which was likely to cause upset.

The positive/neutral or negative/neutral picture pairs were all presented bilaterally along the horizontal meridian, with the centre of each picture being 8.5cm from the central fixation cross. The location of the paired images was counter-balanced across the experiment, with both the emotional and neutral photos appearing equally to the left and right of the fixation cross. See *Appendix 9* for an illustration of the fixation.

The target consisted of a blue dot measuring 2.5cm, which was bilaterally presented along the horizontal meridian. The target (i.e., blue dot) replaced the emotional or neutral picture, which appeared equally under each to the left or right of the fixation cross. See *Appendix 10* for an illustration of the blue dot. Each trial started with a fixation cross appearing in the centre of the screen for 1500ms. This fixation cross remained on the screen until the target offset. After this, a positive/neutral or negative/neutral picture pair was presented for 250ms. This was followed by a target probe replacing either the positive, negative, or neutral face until the participant responded. A blank screen then appeared for 500ms before the subsequent stimuli presentation. The experiment was divided into three blocks of 120 trials (360 trials). A practice block of four trials was introduced to enable participants to understand the task's requirements. Each of the blocks included (i) 30 negative trials (i.e., two emotional picture locations: left and right; two target locations: left and right; repeated four times (ii) 30 positive trials (two emotional picture locations: left and right; two target locations: left and right; repeated four times. (iii) 30 neutral trials (two neutral picture locations: left and right; two target locations: left and right) repeated four times. In half of all trials, the target was on the right and in the other half, it was on the left. All trials in each block were presented randomly. When the participants finished the experiment, some tissue paper and water was used to wipe the excess gel from their hair gently. They were handed over a copy of the Debrief sheet and thanked for their participation.

8.7 Extraction of ERP from Data.

The data was analysed using a comprehensive approach to extract Event-Related Potentials (ERP), and advanced artefact reduction techniques were employed. The provided comprehensive approach was employed to extract Event-Related Potentials (ERP) from the data, incorporating advanced artefact reduction techniques.

8.7.1 Identification and Rejection of Noisy Blocks.

Noisy blocks were detected using the artefact reduction functionality within Curry 8. The parameters for noise assessment were configured with a lower limit of $-200\mu\text{V}$ to $200\mu\text{V}$ and a higher limit of $-200\mu\text{V}$ to $500\mu\text{V}$. The blocks identified as noisy were subsequently excluded from further analysis.

8.7.2 Participant-Specific Exclusion of Bad Electrodes.

On a participant-by-participant basis, electrodes exhibiting poor signal quality were removed. This selection process was carried out to ensure that only reliable electrodes contributed to the subsequent analyses.

8.7.3 Ocular Artefact Rejection.

An extension of the artefact reduction procedures to address ocular artefacts was made. Within Curry 8, the artefact reduction module was applied with parameters set at a lower limit of $-200\mu\text{V}$ to $200\mu\text{V}$ and a higher limit of $-200\mu\text{V}$ to $500\mu\text{V}$. This step facilitated the elimination of ocular-related artefacts from the data.

8.7.4 Common Average Referencing.

All the collected data were re-referenced to the Common Average Reference (CAR) to create a consistent reference baseline.

8.7.5 Filtering of Data.

A user-defined filter was enacted to refine the data. The filter settings included a Low Pass of 1Hz, a High Pass of 30Hz, and a Notch Filter of 50Hz. This filtration process was pivotal in preparing the data for subsequent analysis.

8.7.6 Artefact Reduction Steps.

Utilising the "BAD BLOCKS" selection, artefacts were further mitigated. The specified criteria for the Lower/Upper Threshold were set at $-200\mu\text{V}$ to $200\mu\text{V}$, and the Pre/Post-stimulus window was adjusted to -500ms to 1500ms .

"THRESHOLD" was selected as the subsequent artefact reduction method. Channel VEOG was targeted, and the Lower/Upper Threshold was set to $0\mu\text{V}$ to $200\mu\text{V}$. The Pre/Post-stimulus window was configured as -200ms to 500ms , effectively removing eyeblink-related artefacts. The COVAR (Covariance Artefacts Reduction) approach was applied to enhance artefact reduction further.

The entire set of epochs was subjected to averaging by sequentially clicking "ALL" and then "GLOBAL."

8.7.7 Handling Errors and Finalising Data.

In case any error message arose during the artefact reduction process, the action taken was to click "Cancel." Subsequently, the extracted ERP data underwent a meticulous review to ensure accuracy and quality.

This comprehensive procedure encompassed various steps that collectively ensured the extraction of reliable Event-Related Potentials while effectively addressing multiple forms of artefacts and noise in the data.

8.8 Extracting Average ERP Per Electrode and Time Window.

The following procedure was employed to analyse the average Event-Related Potential (ERP) for each electrode and time window: Initially, the re-referencing was deactivated. Subsequently, the EVENTS option under EPOCHS was used to generate group labels categorised by tabs. These labels included 1 for negative left, 2 for negative right, 3 for positive left, and 4 for positive right.

The time frame for the N2pc (N2 posterior contralateral) component, spanning 180-300 milliseconds, was defined as the start and end latency (Vijayakumar et al., 2021). The IN-PLACE AVERAGING function was then applied, permitting a sequential assessment of each group label after the averaging operation.

To save the computed averages per electrode in the functional data, the following steps were followed:

- a. The "Save" function was clicked, and "Averaged Samples" was chosen.
- b. Files were named by the specific group label visible at the top left of the screen.
- c. This procedure was reiterated for every distinct group label.
- d. The group label text files were opened in Notepad, allowing access to the calculated average amplitude for each electrode within the designated time interval.

8.9 N2pc.

For the N2pc component, analysis of the ERPs was undertaken from the occipitoparietal electrodes, PO7 and PO8, where visual components are considered to be most visible (Li et al., 2017).

Mean amplitudes relative to pre-stimulus baselines were calculated for the PO7 and PO8 electrodes for the N2pc time window (180-300ms) for the two electrode positions (contralateral, ipsilateral), and the two emotions (negative and positive). The PO7 and PO8 mean amplitudes were collapsed across hemispheres to eliminate potential hemispheric asymmetries unrelated to attention. These means were entered into a 2 x 2 repeated measures ANOVA.

The N2pc component was calculated (concerning emotional image and time window) by subtracting the ipsilateral PO7 and PO8 mean amplitude from the contralateral PO7 and PO8 mean amplitude, resulting in four contralateral-ipsilateral N2pc response magnitude scores for each participant. The N2pc yielded emotion (negative, positive) and contralaterality (contralateral, ipsilateral) as within-participant variables.

8.10 Quantitative Study (EEG Experiment) Results

This chapter presents the results of the quantitative phase of this study, an Electroencephalogram (EEG) experiment was used to explore the unconscious emotional processes that influence online consumer behaviour. Building upon the findings from the qualitative phase, this neurophysiological component assesses whether emotional stimuli, particularly those of positive and negative valence, affect attentional processing at an unconscious level, thereby influencing consumer decision-making in the online shopping context.

The EEG experiment was conducted using a Dot Probe Task, a well-established affective neuroscience paradigm used for detecting attentional biases toward emotionally salient stimuli (Bullock & Bonanno, 2013); Thigpen et al., 2018). Emotional faces (angry, sad, happy and neutral) were used as stimuli to assess attentional allocation through the N2pc component, an event-related potential (ERP) that reflects covert shifts in spatial attention. More specifically, the analysis focused on activity recorded at the occipitoparietal electrodes PO7 and PO8 within a 190–220 ms post-stimulus time window, which has been identified as a reliable marker for attentional selection processes (Fox et al., 2008).

This EEG study involved 14 participants who had previously completed the qualitative interviews. Despite the reduced sample size, primarily due to the COVID-19 lockdown and the time lag between phases, the overlap in the participant pool enhances methodological coherence and conceptual continuity across research phases, thereby strengthening the interpretative integration of this mixed-methods research. In line with prior studies, the small sample size is consistent with the time-intensive nature of EEG experimentation and data analysis (Clayson et al., 2019).

The EEG data were analysed using IBM SPSS, employing a combination of repeated measures ANOVA and regression analysis to examine the influence of emotional stimuli on attentional bias. The analysis sought to determine whether participants demonstrated a statistically

significant difference in attentional allocation between negative (angry) and positive (happy) stimuli, and to examine these neural responses in relation to participants' self-reported emotional experiences from the qualitative phase, without assuming convergence or confirmation.

Informed by the literature review and themes emerging from the qualitative study, which highlighted the salience of emotional experiences in online buying contexts, the following hypotheses were formulated for quantitative examination (Toledo, Flikkema and Toledo-Pereyra, 2011).

Two hypotheses were tested:

H1: There is no difference in the relationship between consumer buying behaviour and emotion.

H2: There is a difference in the relationship between consumer buying behaviour and emotion.

These analyses aim to explore whether a measurable emotional bias, indexed by the N2pc component, can be examined in relation to consumer behaviour in online contexts. Thus, they contribute to the overarching research objective of understanding how conscious and unconscious factors, particularly emotions, may influence online buying decisions.

The following sections present the key findings from the EEG analysis. First, the N2pc values are introduced, representing participants' neural responses to emotional stimuli. These values are then examined using repeated measures ANOVA to assess attentional differences across emotional expressions and hemispheric activation. Finally, a regression analysis is conducted to determine the predictive relationship between emotional bias and consumer decision-making tendencies. Together, these results offer exploratory insight into neural responses associated with emotional stimuli, contributing to broader discussion of unconscious emotional processing in digital shopping contexts without implying causal influence on consumer behaviour.

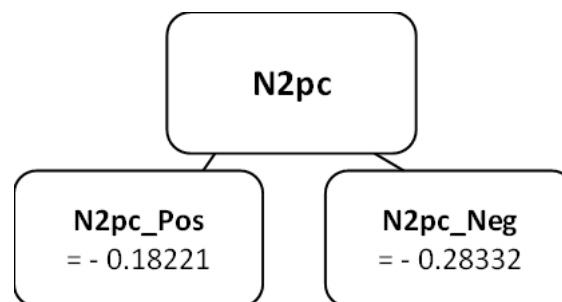
8.10.1 Calculation of N2pc values.

Table 1. ANOVA analysis of Negative Contralateral and N2pc Negative.

PptNumber	NegLPO7	NegLPO8	NegRPO7	NegRPO8	PosLPO7	PosLPO8	PosRPO7	PosRPO8	Pos_Cont	Pos_Ipsi	Neg_Cont	Neg_Ipsi	N2pc_Pos	N2pc_Neg	
1	3.813	2.643	4.055	4.363	0.455	1.898	3.432	3.193	2.665	1.824	3.349	4.088	-0.841	0.739	Pos Bias
2	0.865	0.19	-0.798	1.546	0.537	-0.318	-0.095	-0.417	-0.2065	0.06	-0.304	1.2055	0.2665	1.5095	None
3	-1.293	-0.654	0.212	0.044	2.773	1.59	1.085	1.25	1.3375	2.0115	-0.221	-0.6245	0.674	-0.4035	Neg Bias
4	4.309	4.109	6.241	4.012	3.814	4.04	3.744	3.973	3.892	3.8935	5.175	4.1605	0.0015	-1.0145	Neg Bias
5	2.902	5.733	3.981	3.692	4.203	5.836	3.365	4.615	4.6005	4.409	4.857	3.297	-0.1915	-1.56	Neg Bias
6	5.316	5.672	8.164	8.2	8.263	9.119	5.864	6.179	7.4915	7.221	6.918	6.758	-0.2705	-0.16	Pos Bias
7	1.646	2.348	5.397	5.71	2.81	4.022	0.57	1.221	2.296	2.0155	3.8725	3.678	-0.2805	-0.1945	Pos Bias
8	4.118	6.921	4.857	7.399	4.065	5.896	4.154	4.362	5.025	4.2135	5.889	5.7585	-0.8115	-0.1305	Pos Bias
9	3.8	7.488	2.088	-1.461	1.208	2.826	3.197	3.901	3.0115	2.5545	4.788	1.1695	-0.457	-3.6185	Neg Bias
10	1.355	-0.379	3.516	1.5	4.087	3.73	4.413	3.651	4.0715	3.869	1.5685	1.4275	-0.2025	-0.141	Pos Bias
11	1.231	1.672	-1.083	-0.011	0.232	0.528	1.944	3.029	1.236	1.6305	0.2945	0.61	0.3945	0.3155	None
12	7.433	4.879	4.925	4.483	8.446	7.924	6.199	3.697	7.0615	6.0715	4.902	5.958	-0.99	1.056	Pos Bias
13	4.063	4.456	3.889	3.038	3.5	3.161	3.781	3.182	3.471	3.341	4.1725	3.5505	-0.13	-0.622	Neg Bias
14	4.258	3.243	3.715	3.216	1.632	0.752	4.632	4.326	2.692	2.979	3.479	3.737	0.287	0.258	None
													-0.18221429	-0.28332143	
Key:	Neg	Negative stimuli							Cont	Contralateral to the stimuli				N2pc calculated as ipsilateral - contralateral	
	Pos	Positive stimuli							Ipsi	Ipsilateral to the stimuli					
	L	Left visual field													
	R	Right visual field													
	PO7	Left posterior electrode													
	PO8	Right posterior electrode													

Table 1. Shown above presents the EEG data from the experiment used to calculate the N2pc_pos and N2pc_Neg values as shown below.

Figure. 12. Showing N2pc values



In Figure 12 above, the value assigned to the N2pc was obtained by calculating the mean of the positive and negative N2pc values across all 14 participants as shown in Table 1 above. This involved calculating the average of the positive N2pc values. The calculated N2pc values indicate patterns of neural responsiveness to emotional stimuli within this sample. While

these patterns suggest differential attentional engagement with emotional expressions, they should be interpreted cautiously and do not establish statistically significant evidence of emotional bias or causal influence on decision-making processes. These observations may be considered alongside insights from the qualitative study to support interpretive discussion, without implying convergence or validation across methods. For instance, participants in the qualitative research reported making purchase decisions to induce happiness for themselves or others.

Moreover, the decision to purchase was sometimes driven by the desire to uplift their mood. The observed negative emotional bias, highlighted by the N2pc values, can explain these behavioural tendencies. By gravitating towards negative stimuli, participants may subconsciously seek to fulfil their emotional needs by engaging in actions that can improve their mood or the mood of others. In essence, the established negative emotional bias, as highlighted by the N2pc values, reinforces and deepens the insights gathered from the qualitative study. This combination of quantitative neurophysiological measurements with qualitative behavioural data creates a multidimensional understanding of the intricate dynamics that underpin the interplay between emotions and decision-making processes in the expansive realm of consumer behaviour within the online landscape. Through this, the study underscores the formidable role emotions, particularly those with a negative valence, play in steering the course of consumer choices within the digital sphere of purchasing decisions. This bridging of the analytical and emotional facets enriches the comprehension of the complex link between cognitive and emotional mechanisms that collectively shape consumer behaviour in the modern age of e-commerce. Lastly, the comprehensive investigation of the negative emotional bias and its impact on consumer buying behaviour, supported by qualitative behavioural data and neurophysiological measurements, offers substantial evidence for including emotions in the consumer buying behaviour process. The alignment between empirical findings and qualitative insights emphasises the role of emotions as influential determinants in shaping purchasing decisions. This highlights that consumer choices are not solely rational but are greatly influenced by emotional triggers.

Consequently, the diagram in *Figure 2* simplifies the consumer buying decision process, considering emotion's critical role in the process. *This PhD thesis conceptualises emotion as a*

potentially influential factor across multiple stages of the consumer buying decision process model. The model is presented as a heuristic framework to support interpretation of findings rather than as an empirically validated representation of consumer behaviour.

The integrated approach presented in this study effectively bridges the gap between cognitive and emotional aspects, highlighting the need for marketers and businesses to account for emotions when developing strategies and experiences that resonate with consumers on a deeper level. Therefore, this study highlights the importance of considering emotional factors when seeking to understand consumer buying behaviour, particularly in relation to perceived and experienced influences described by participants.

Emotion is a state of mental readiness that arises from cognitive appraisals of events or thoughts, which can be positive or negative (Siemer et al., 2007). Bagozzi, Gopinath, and Nyer (1999; cited in Bigne et al. (2023) explain that emotions are feelings or moods linked to physical changes in the body, like how one stands, moves, or shows facial expressions. These material changes help deal with the emotions that people experience, depending on what they mean to them. As previously stated, emotions carry distinctive implications for brain waves, and positive emotions considerably influence the cognitive processes of consumers, thereby making them either stable or flexible. Emotions can influence purchases in both physical shops and online purchases. Wacker (2018) explains the reason for this to include the effect of dopamine, which, when it comes into play, potentially alters shopping behaviours.

This PhD study utilised an Electroencephalogram study to gather neurological data from participants who were either students or staff of the University of Suffolk. The same participants who took part in the qualitative interviews were invited to the psychology laboratory in line with the sequential exploratory mixed methodology adopted in this study (Creswell, 2011), with themes from the semi-structured interviews informing the conceptual focus of the EEG experiment. However, out of the 21 participants who participated in the interview, only 14 returned for the EEG part. This was due to the COVID-19 lockdown and the 1.5-year gap between the interview and the EEG study. While this resulted in a reduced sample size, such numbers are common in EEG research due to the time-intensive nature of data collection and analysis (Clayson et al., 2019). In addition, the use of the same participant cohort across qualitative and quantitative phases supports methodological coherence and

continuity, enabling findings from each phase to be interpreted in relation to one another without implying triangulation or confirmatory sufficiency.

The choice to employ a Dot Probe task as a method was informed by themes emerging from the qualitative study, which highlighted the perceived salience of emotional experiences in participants' online buying behaviour. Previous behavioural research has consistently reported attentional biases toward emotional stimuli. For example, studies examining attentional blinking (Thigpen et al., 2018) and Dot Probe detection (Bullock and Bonanno, 2013) have documented such tendencies.

8.11 Regression Test for N2pc.

Accordingly, this phase of the study explores whether participants exhibit differential neural responses to emotional stimuli and examines these responses in relation to reported experiences of online purchasing, without assuming behavioural causality. The insights generated contribute to an exploratory understanding of emotional processing within digital consumer contexts and may inform future research into the role of emotion in online buying behaviour.

The N2pc analysis provides an established approach for examining neural responses to visual stimuli. In this analysis, the occipitoparietal electrodes PO7 and PO8 was used to assess the visual components that are most visible, as suggested by Fox et al. (2008). The analysis focused on the N2pc time window of 190-220ms and assessed four types of display: left negative, left positive, right negative, and right positive. The PO7 and PO8 electrodes were used for each display type and electrode position to calculate the mean amplitudes. The PO7 and PO8 mean amplitudes were then combined across hemispheres for the angry and happy facial stimuli to eliminate any potential hemispheric asymmetries that may be unrelated to attention. The N2pc component was calculated by subtracting the ipsilateral PO7 and PO8 mean amplitude from the contralateral PO7 and PO8 mean amplitude, resulting in two mean N2pc response scores for each participant. The N2pc yielded emotional expression (negative, positive) and contralaterality (contralateral, ipsilateral) as within-subject variables. To assess emotional faces, repeated measures ANOVAs with emotional expression (angry and happy) and electrode position (contralateral and ipsilateral) were used as within-subject factors. This

analysis enables examination of neural responses to emotional stimuli within the specified experimental parameters.

IBM SPSS was used to conduct the statistical analyses by inputting Pos_Cont, Pos_Ipsi, Neg_Cont, and Neg_Ipsi values to calculate the N2pc_pos and N2pc_neg amplitudes. A 2×2 repeated measures ANOVA was then conducted with emotional expression (positive, negative) and electrode position (ipsilateral, contralateral) as within-subject factors to examine patterns of variation across conditions. In addition, regression analyses were performed to explore statistical associations between neural response measures and behavioural variables, without implying causal inference.

8.12 Regression Test Results.

The Durbin–Watson statistic, represented by “d” or “DW”, has values ranging from 0 to 4 and is used to assess whether regression residuals exhibit positive or negative autocorrelation. According to Watson (1950; cited in Chen, 2016), there is no significant autocorrelation when “d” is around 2. If “d” is close to 2 (between 1.5 and 2.5), the regression model is considered to meet the assumption of no significant autocorrelation in the residuals. If “d” is less than 2 (below 1.5), there is evidence of positive autocorrelation, suggesting that some temporal patterns may not be fully accounted for. If “d” is greater than 2 (above 2.5), negative autocorrelation may be present, indicating potential model misspecification.

To determine statistical significance, the conventional rule described in statistical texts, including Sheather (2009), was applied: when $p \leq \alpha$ (e.g., $p \leq 0.05$), the relationship is statistically significant at the specified alpha level; when $p > \alpha$ (e.g., $p > 0.05$), the relationship is not statistically significant at the specified alpha level. The following results were interpreted using the above statistical rules.

8.12.1 Regression Analysis of Positive Contralateral and N2pc positive

Table 1. Model Summary for Regression Analysis of Positive Contralateral and N2pc positive.

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.630 ^a	.397	.347	1.72459

a. Predictors: (Constant), N2PC Positive

When considering the regression analysis of Positive Contralateral and N2pc Positive (Table 1), the R Square value is 0.397. This indicates that approximately 39.7% of the variance in Positive Contralateral values is accounted for by the regression model including N2pc Positive. Considering the Durbin–Watson value of 1.72459, the residuals for Positive Contralateral indicate no significant autocorrelation, suggesting that the assumption of independence is reasonably met.

8.12.2 ANOVA Analysis of Positive Contralateral and N2pc positive.

Table 2. ANOVA Analysis of Positive Contralateral and N2pc positive

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23.513	1	23.513	7.906	.016 ^b
	Residual	35.690	12	2.974		
	Total	59.204	13			

a. Dependent Variable: Positive Contralateral
b. Predictors: (Constant), N2PC Positive

Using the rule:

$p \leq \alpha$ (i.e., $p \leq 0.05$): The relationship is statistically significant.

$p > \alpha$ (i.e., $p > 0.05$): The relationship is not statistically significant.

The ANOVA results presented in Table 2 indicate a statistically significant relationship between Positive Contralateral and N2pc Positive ($p = 0.016$).

8.12.3 Regression analysis between Positive ipsilateral and N2pc Positive.

Table 3. Model Summary for Regression Analysis between Positive ipsilateral and N2pc Positive.

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.459 ^a	.211	.145	1.72459

a. Predictors: (Constant), N2PC Positive

When considering the regression analysis (Table 3) between Positive ipsilateral and N2pc Positive, it can be seen from the model summary that the R-square is 0.211. This indicates that approximately 21.1% of the variance in Positive Ipsilateral values is accounted for by the regression model including N2pc Positive. The Durbin–Watson value of 1.72459 indicates no significant autocorrelation in the residuals, suggesting that the assumption of independence is reasonably met.

8.12.4 ANOVA Analysis of Positive Ipsilateral and N2pc positive.

Table 4. ANOVA Analysis of Positive Ipsilateral and N2pc positive.

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.539	1	9.539	3.207	.099 ^b
	Residual	35.690	12	2.974		
	Total	45.229	13			

a. Dependent Variable: Positive Ipsilateral
b. Predictors: (Constant), N2PC Positive

Using the rule:

$p \leq \alpha$ (i.e., $p \leq 0.05$): The relationship is statistically significant.

$p > \alpha$ (i.e., $p > 0.05$): The relationship is not statistically significant.

The ANOVA results presented in Table 4 indicate no statistically significant effect for the relationship between Positive Ipsilateral and N2pc Positive ($p = 0.099$). This suggests that, within the parameters of this analysis, no statistically detectable difference was observed.

8.12.5 Regression Analysis between Negative Contralateral and N2pc Negative.

Table 5. Model Summary for Regression Analysis between Negative Contralateral and N2pc Negative.

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.363 ^a	.132	.060	2.22756

a. Predictors: (Constant), N2PC Negative

From the regression analysis (Table 5) between Negative Contralateral and N2pc Negative, it can be seen from the model summary that the R-square is 0.132. This indicates that approximately 13.2% of the variance in Negative Contralateral values is accounted for by the regression model including N2pc Negative. The Durbin–Watson value of 2.22756 indicates no significant autocorrelation in the residuals, suggesting that the assumption of independence is reasonably met.

8.12.6 ANOVA analysis of Negative Contralateral and N2pc Negative.

Table 6. ANOVA analysis of Negative Contralateral and N2pc Negative.

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.049	1	9.049	1.824	.202 ^b
	Residual	59.544	12	4.962		
	Total	68.593	13			

a. Dependent Variable: Negative Contralateral
b. Predictors: (Constant), N2PC Negative

Using the rule:

$p \leq \alpha$ (i.e., $p \leq 0.05$): The relationship is statistically significant.

$p > \alpha$ (i.e., $p > 0.05$): The relationship is not statistically significant.

The ANOVA results presented in Table 6 indicate no statistically significant effect for the relationship between Negative Contralateral and N2pc Negative ($p = 0.202$). This suggests that, within the parameters of this analysis, no statistically detectable difference was observed.

8.12.7 Regression analysis between Negative ipsilateral and N2pc Negative.

Table 7. Model Summary for Regression Analysis between Negative ipsilateral and N2pc Negative.

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.189 ^a	.036	-.045	2.22756

a. Predictors: (Constant), N2PC Negative

From the regression analysis (Table 7) between Negative Ipsilateral and N2pc Negative, the model summary indicates an R Square value of 0.036. This suggests that approximately 3.6% of the variance in Negative Ipsilateral values is accounted for by the regression model including N2pc Negative. The Durbin–Watson value of 2.22756 indicates no significant autocorrelation in the residuals, suggesting that the assumption of independence is reasonably met.

8.12.8 ANOVA analysis of Negative Contralateral and N2pc Negative.

Table 8. ANOVA analysis of Negative Contralateral and N2pc Negative.

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.205	1	2.205	.444	.518 ^b
	Residual	59.544	12	4.962		
	Total	61.750	13			

a. Dependent Variable: Negative Ipsilateral
b. Predictors: (Constant), N2PC Negative

Using the rule:

$p \leq \alpha$ (i.e., $p \leq 0.05$): The relationship is statistically significant.

$p > \alpha$ (i.e., $p > 0.05$): The relationship is not statistically significant.

The ANOVA results presented in Table 8 indicate no statistically significant effect for the relationship between Negative Contralateral and N2pc Negative ($p = 0.518$). Then, a paired samples t-test on the N2pc_pos and N2pc_neg was conducted. This is to determine if a significant difference exists between the mean value of N2pc Positive and the N2pc negative.

Using the rule:

$p \leq \alpha$ (i.e., $p \leq 0.05$): The relationship is statistically significant.

$p > \alpha$ (i.e., $p > 0.05$): The relationship is not statistically significant.

8.12.10 Implication of the Paired Samples T-Test Results.

From the above Table 10 shows that the model is not significant ($p > \alpha$, Sig value- 0.780); therefore, with a p-value of 0.780 and an alpha value of 0.05, since $p > \alpha$ ($0.780 > 0.05$), it does suggest that there is no statistically significant difference between the paired observations. The observed results are consistent with the null hypothesis, and any differences observed are likely due to random variation rather than a natural effect.

The paired samples t-test results indicate insufficient statistical evidence to reject the null hypothesis. This suggests that no statistically significant difference was detected between the paired conditions within this sample. Given the relatively small sample size ($n = 14$), it is possible that subtle effects were not detectable within the limits of the experimental design. These findings should therefore be interpreted cautiously and may inform directions for future research employing larger samples or alternative measurement approaches.

9 Final Discussion

This final discussion chapter combines the findings from both the qualitative and quantitative phases of this mixed-methods research, thereby integrating insights in order to address the research aims, questions, and hypotheses. The overall objective of this PhD thesis was to explore and understand the conscious and unconscious factors, especially the unconscious ones, that influence online consumer buying behaviour. The study aimed to determine not only what these factors are but also to understand how they interact and whether unconscious psychological mechanisms like emotional bias contribute to consumers' impulse buying online.

The study employed a sequential exploratory mixed methodology, integrating qualitative semi-structured interviews with a subsequent EEG experiment using a Dot Probe Task. Findings from both phases are considered together to support interpretive discussion, without assuming triangulation or confirmatory convergence.

9.1 Revisiting the Research Questions

Three central research questions guided this thesis:

- RQ1: What are the key conscious and unconscious factors that influence online consumer buying decisions?
- RQ 2: How do conscious and unconscious factors interact to shape the online consumer decision-making process?
- RQ 3: What unconscious psychological mechanisms contribute to impulsive online shopping, and how do they operate within the broader consumer behaviour process?

9.2 Conscious and Unconscious Influences on Consumer Buying

The qualitative phase revealed a diverse range of factors influencing online buying behaviour. Among the most prominent were:

- Positive and negative emotions
- Disposable income

- Ease of online shopping
- Algorithmic recommendations and reminders
- Product appearance and presentation
- COVID-19 impact
- Brand trust and identity
- Social validation through reviews

These factors reflect both conscious drivers, such as price, product appearance, and brand reputation, and perceived unconscious or emotional influences as described by participants, such as the desire to feel better, make someone else feel better, seek pleasure, avoid sadness, or respond to algorithmically nudged suggestions.

The quantitative EEG phase was designed mainly to explore emotional bias as an unconscious mechanism. The Dot Probe Task was used to measure attentional bias through the N2pc component, a neural marker of attentional allocation. The study sought to identify whether participants displayed greater attentional engagement with negative or positive emotional stimuli as a neurophysiological proxy for emotional salience.

9.3 What the EEG Results Reveal

The EEG results revealed that although the mean N2pc values indicated a trend towards greater attentional focus on negative emotional stimuli, indicating a descriptive trend toward greater attentional engagement with negative emotional stimuli, the statistical tests (repeated measures ANOVA, regression analyses, and paired samples t-test) found no statistically significant differences between responses to positive and negative emotional stimuli.

Specifically:

- The Regression analyses showed a significant relationship only between positive contralateral activity and N2pc positive values ($p = 0.016$), but all other comparisons, including those for negative stimuli, were not statistically significant.
- The paired samples t-test comparing N2pc positive and negative amplitudes also yielded a non-significant result ($p = 0.780$), this indicates no reliable difference between attentional responses to emotional valence at the group level.

It is worth noting that while the neurophysiological data suggested a descriptive trend towards a negative bias, statistically significant evidence did not support this trend.

9.4 Linking Quantitative and Qualitative Findings

Despite the lack of statistical significance in the EEG findings, the qualitative data offer rich experiential insight into how participants perceive emotions as influential in their online buying behaviour. Participants described shopping in response to both positive and negative emotional states, including mood regulation, stress relief, and celebration.

While the EEG findings do not provide confirmatory evidence of emotional bias at the neural level, they may be interpreted alongside the qualitative accounts to support broader discussion of unconscious emotional processing. Any observed trends in neural responses should be regarded as exploratory and hypothesis-generating rather than confirmatory. The integration of the qualitative and quantitative findings should therefore be understood as complementary triangulation by source rather than confirmation. The qualitative data provided insight into participants' perceived emotional and unconscious influences on online buying behaviour, while the EEG data provided exploratory physiological observations of attentional responses to emotional stimuli. In mixed methodological research, integration may involve comparing different forms of evidence in order to interpret a complex phenomenon, without requiring one dataset to validate the other (Fetters and Molina-Azorin, 2020). The two sources do not produce identical forms of evidence and should not be interpreted as validating one another. Instead, they provide different perspectives on the same broad phenomenon, allowing a more cautious and transparent interpretation of unconscious and emotional influences in online consumer behaviour. This interpretation is consistent with mixed methodological research, where integration may occur through development, comparison, and complementary interpretation rather than through direct confirmation (Schoonenboom and Johnson, 2017; McCrudden, Marchand and Schutz, 2021).

9.5 Addressing the Hypotheses

Two hypotheses were explored in the quantitative phase of this research:

H1: There is no statistically significant difference in neural attentional responses to emotional stimuli in relation to consumer-related attentional processes.

H2: Emotional stimuli are associated with differential neural attentional responses relevant to consumer-related attentional processes.

The EEG findings did not provide statistically significant evidence to reject the null hypothesis (H1). This indicates that, within the limitations of the experimental sample size and exploratory design, no statistically significant neural attentional differences were observed between emotional stimulus conditions.

The absence of statistically significant findings reflects the exploratory nature of the experimental phase and highlights the importance of interpreting these findings within the context of methodological limitations, including sample size and statistical power. Small sample sizes and exploratory experimental designs may limit the ability to detect statistically significant neural effects, particularly in EEG research, where variability in neural responses and signal-to-noise considerations can influence statistical outcomes (Button et al., 2013; Luck, 2014). Exploratory neuroscientific investigations contribute to conceptual understanding by identifying potential neural mechanisms and informing the design of future, more statistically powered research (Yadava et al., 2017; Ramsoy, 2015).

The qualitative findings provided valuable interpretive insight into participants' perceived emotional influences on their online consumer behaviour. Participants described emotional engagement, algorithmic prompts, and product presentation as influencing their behavioural responses. These findings are consistent with behavioural and consumer neuroscience research demonstrating that emotional engagement and environmental stimuli influence consumer attention and decision-making processes (Plassmann, Venkatraman, Huettel, & Yoon, 2015; Ramsoy, 2015). However, qualitative findings represent subjective experiential

accounts and do not establish physiological or causal relationships. Instead, these findings contribute to the interpretive and conceptual understanding of emotional and unconscious influences in online consumer contexts.

The qualitative and quantitative findings, therefore, provide complementary insights rather than confirmatory evidence. The qualitative phase offered an interpretive understanding of participants' subjective experiences, while the quantitative phase explored physiological attentional responses using EEG measurement. EEG methodologies provide objective measurement of neural attentional processes but may require larger sample sizes and confirmatory experimental designs to establish statistically robust effects (Luck, 2014). Together, these findings contribute to a broader exploratory understanding of unconscious and emotional influences on online consumer behaviour and provide a foundation for future neuroscientific investigation in consumer research (Ramsoy, 2015).

9.6 Linking the Findings with the Research Aims

The findings from this study widely support the main aim of exploring the interaction of conscious and unconscious factors in online consumer behaviour. Specifically, the qualitative phase identified key conscious and unconscious factors, including emotions, pricing, ease, algorithms, and social validation. While the quantitative phase was limited by sample size and statistical power, it contributed exploratory neural data relevant to the study aims. The qualitative and quantitative findings address different dimensions of the research questions and should be interpreted as complementary rather than confirmatory. This highlights the complexity of measuring unconscious processes and the need for multifaceted approaches to capture the full spectrum of consumer decision-making.

10 Conclusion

This last chapter summarises the research findings and draws on knowledge gathered during the qualitative and quantitative phases of the investigation. This study investigated both conscious and unconscious factors influencing online consumer buying behaviour. It also investigated how these procedures relate to the psychological elements underpinning impulsive online buying behaviour. Employing a sequential exploratory mixed methodology, the study contributed to a multifaceted understanding of the complexity of consumer decision-making in the digital world. This conclusion chapter revisits the research aims and questions, discusses how they have been addressed, reflects on the methodological approach, and outlines the implications, limitations, and opportunities for future research.

10.1 Revisiting the Research Aims and Objectives

The primary goal of this study was to look at the function of conscious and unconscious elements, namely emotional processes, and how they interact to influence online consumer buying decisions. Three research questions guided the study:

RQ 1: What are the key conscious and unconscious factors that influence online consumer buying decisions?

RQ 2: How do conscious and unconscious factors interact to shape the online consumer decision-making process?

RQ 3: What unconscious psychological mechanisms contribute to impulsive online shopping, and how do they operate within the broader consumer behaviour process?

The research questions were explored using a two-phase mixed-methods approach, which included qualitative semi-structured interviews and a quantitative EEG experiment. This technique enabled a comprehensive and tiered knowledge of the research topic.

10.2 Addressing Research Question One

The first research question asked: What are the key conscious and unconscious factors that influence online consumer buying decisions?

The findings from the qualitative phase of the study highlighted several key conscious factors. These included price sensitivity, disposable income, product quality, visual appeal, and practical convenience. The participants openly described rational decision-making processes, including consulting product reviews, comparing prices and assessing practicality before making a purchase. At the same time, unconscious influences also emerged prominently within the findings. Emotional drivers, anticipation, mood states, habitual behaviours, and algorithmic nudges, such as reminders and personalised product recommendations, significantly influenced consumers' decision-making processes. The participants frequently described online shopping as an emotional experience, which is sometimes performed as a form of treating oneself, lifting mood, or bringing happiness to others. These findings suggest that emotional gratification is an important perceived motivator in online consumer behaviour and often operates below full conscious awareness. Consequently, Research Question One was addressed by identifying a range of conscious and perceived unconscious influences on online buying decisions.

10.3 Addressing Research Question Two

The second research question asked: How do conscious and unconscious factors interact to shape the online consumer decision-making process?

The findings indicate an interaction between conscious and unconscious processes as described by participants. The participants showed rational strategies for purchasing, but these were often shaped, initiated, or undermined by underlying emotional impulses. For example, a person may do a comprehensive pricing comparison exercise but ultimately make a selection motivated by the desire to improve their mood or satisfy an emotional craving. Furthermore, positive emotional states spurred purchasing behaviour and encouraged impulsive buying, whereas negative emotions might either prevent or stimulate purchases, depending on individual characteristics. This interpretation is consistent with Siemer et al.'s (2007) discussion of emotions as influential regulators of cognitive processes. Taken together, the qualitative findings and descriptive patterns observed in the quantitative phase inform Research Question Two by illustrating how conscious reasoning and emotional experiences may interact in online consumer decision-making.

10.4 Addressing Research Question Three

The third research question asked: What unconscious psychological mechanisms contribute to impulsive online shopping, and how do they operate within the broader consumer behaviour process?

The quantitative EEG experiment further investigated unconscious mechanisms, specifically emotional attentional bias. It used a Dot Probe Task to measure the N2pc component, a neural indicator of visual attention. The results revealed a descriptive trend toward a negative emotional bias, suggesting that participants paid greater attention to negative emotional stimuli. However, statistical significance was not achieved due to the limited sample size.

The descriptive EEG findings do not provide statistically significant evidence of emotional attentional bias and should be interpreted cautiously. Rather than confirming qualitative insights, the EEG data offer exploratory neural observations that may be considered alongside participants' self-reported experiences to inform discussion of unconscious emotional processing.

10.5 Effectiveness of the Sequential Exploratory Mixed Methodology

While Research Question Three was addressed at an exploratory level, the findings highlight both the potential relevance of unconscious emotional mechanisms and the methodological challenges associated with measuring such processes. These results are therefore best viewed as hypothesis-generating and indicative of directions for future research employing larger samples and alternative neuroscientific approaches.

The sequential mixed-methods design contributed to the success of this research and proved to be highly effective. This is because the qualitative phase produced valuable thematic insights that consequently influenced the design of the quantitative EEG experiment. By using the same participant cohort across both stages, the study supported methodological coherence and continuity, enabling findings from each phase to be interpreted in relation to one another without implying triangulation or increased internal validity through convergence. Additionally, the qualitative interviews produced detailed, experienced data showing both rational thought and unconscious emotional aspects. On the other hand, the

EEG data provided objective, albeit limited, physiological indicators of attentional preferences toward emotional stimuli. Together, these methodologies provided a comprehensive understanding of online consumer decision-making processes, demonstrating the effectiveness of a mixed-methods approach in exploring intricate psychological and behavioural phenomena.

10.6 Conceptual Contribution and Theoretical Implications

This research contributes to the academic understanding of online consumer behaviour by applying a sequential exploratory mixed methodological approach to investigate unconscious and emotional influences in digital consumer contexts. Mixed methodological approaches are particularly appropriate for examining complex behavioural phenomena that involve both subjective experience and observable physiological processes, as they allow integration of behavioural interpretation with objective measurement to provide a more comprehensive understanding of decision-making processes (Schoonenboom & Johnson, 2017; Tashakkori, Johnson, & Teddlie, 2020). The qualitative phase contributes interpretive insight into how consumers perceive emotional, algorithmic, and experiential influences on their online purchasing behaviour. These findings enhance understanding of subjective behavioural influences and highlight the importance of emotional engagement within online consumer decision-making processes. Emotional responses and environmental cues have been shown to influence consumer attention, evaluation, and behavioural outcomes, including purchasing decisions in digital environments (Lim, 2018; Ramsoy, 2015).

The quantitative EEG phase contributes exploratory physiological observations relevant to neural attentional responses to emotionally valenced stimuli. EEG methodologies enable objective measurement of neural activity associated with attentional and emotional processing and have been widely used in consumer neuroscience to investigate unconscious and automatic influences on consumer perception and behaviour (Yadava et al., 2017; Luck, 2014). Although statistically significant effects were not observed, integrating neural measurements with behavioural analysis provides an interdisciplinary perspective that contributes to the development of consumer neuroscience and neuromarketing research frameworks (Ramsoy, 2015; Plassmann, Venkatraman, Huettel, & Yoon, 2015). It is important

to state that this research does not claim to establish causal relationships between emotional stimuli and consumer decision-making. Instead, the findings contribute to the conceptual understanding of how subjective experiential influences and physiological attentional processes may interact within online consumer contexts. Consumer neuroscience research demonstrates that emotional and attentional processes play an important role in shaping consumer perception and behavioural response, even when individuals are not consciously aware of these influences (Ramsoy, 2015; Lim, 2018).

The mixed methodological framework employed in this study demonstrates the value of integrating interpretive qualitative insight with exploratory physiological investigation. Integrating behavioural and neuroscientific approaches enables a more comprehensive understanding of consumer decision-making by combining subjective experience with objective neural measurement (Schoonenboom & Johnson, 2017; Ramsoy, 2015). This approach contributes to the development of interdisciplinary research methodologies that enhance understanding of unconscious and emotional influences in online consumer behaviour.

10.7 Practical Implications

The findings of this study suggest potential implications for marketers, designers, and policymakers concerned with online consumer behaviour. Participants' accounts indicate that emotional experiences are perceived as influential in online purchasing contexts, implying that consumer engagement strategies may benefit from considering affective as well as rational factors.

However, these implications should be approached cautiously, given the exploratory nature of the findings and the methodological limitations identified. Ethical considerations are particularly important, as emotionally oriented strategies may heighten consumer vulnerability, especially during emotionally charged periods such as the COVID-19 pandemic (Laato et al., 2020). Policymakers may therefore wish to consider how emotional engagement practices are used in digital marketing environments, balancing innovation with consumer protection.

10.8 Limitations of the Study

This section highlights the study's limitations. Although the study has a strong methodological basis and takes a self-aware approach, the following limitations have been observed. First, the study uses self-reported qualitative data, which includes subjectivity and possible biases such as question misinterpretation and memory impact (Braun & Clarke, 2006). Precautions such as rigorous reflexive practice and careful question phrasing were employed; nevertheless, the inherent limitations of self-report methodologies remain.

Secondly, the participants' responses may have been influenced by social desirability bias, particularly regarding sensitive topics such as emotional vulnerability and impulsive spending. However, efforts were made to create a non-judgmental environment, and such biases are difficult to eliminate.

Thirdly, the study's cultural and geographical context, based on participants affiliated with the University of Suffolk, this limits the generalisability of findings across broader and more diverse populations. Cross-cultural variability in consumer behaviour, as noted in the literature (Kacen & Lee, 2002), was not directly addressed.

Fourthly, the study's timing during the COVID-19 epidemic altered consumer purchase habits. While this provided a unique scenario for investigating emotional triggers, it also shows that the findings may not accurately reflect consumer behaviour in non-pandemic situations.

Finally, the small sample size, especially during the EEG phase, limited the statistical power of the quantitative analysis. Although small sample sizes are common in EEG research due to their resource-intensive nature (Clayson et al., 2019), this constraint emphasises the need for care when applying the findings more generally.

10.9 Directions for Future Research

Future research should include more extensive and more diverse samples to enhance the applicability of the result. Cross-cultural studies could provide insights into how cultural norms and values influence the emotional factors that drive online buying behaviour. Additionally, research conducted outside of pandemic contexts is vital to distinguish temporary impacts and establish baseline behaviours. Employing anonymous surveys or indirect questioning methods may mitigate social desirability biases in qualitative studies.

Future EEG research should target larger groups of participants and conduct more in-depth analyses of attention biases, possibly investigating the long-term emotional consequences of repeated purchases, brand loyalty, and buyer's remorse. Consumer decision-making models that take into consideration the emotional complexity of real-world behaviours would benefit from such research. Additionally, investigating the long-term impacts of emotional engagement tactics on consumer satisfaction and trust may yield important information on moral marketing techniques.

10.10 Final Reflections

The objectives and research questions of this PhD thesis were addressed through an exploratory investigation of conscious and perceived unconscious influences on online consumer buying behaviour. The study examined how emotional experiences are described by participants and how these accounts may be considered alongside exploratory neurophysiological observations. Rather than offering confirmatory evidence, the findings contribute to interpretive understanding of how emotions may be involved in online decision-making processes.

This research contributes to academic discussion by highlighting the complexity of consumer behaviour in digital environments and by encouraging consideration of both rational and emotional dimensions. It also raises ethical and practical considerations relevant to marketers and policymakers, particularly regarding emotionally oriented engagement strategies. Overall, the thesis supports a more nuanced and human-centred perspective on online consumer behaviour, while recognising the methodological limits of the evidence presented. This study explored conscious and perceived unconscious elements that may influence online consumer purchasing decisions. While the findings addressed the research questions at an exploratory level, they also identified new areas of inquiry and practical considerations requiring further investigation. The next chapter presents recommendations informed by the study's limitations and potential, offering guidance for future research and for stakeholders seeking to engage ethically with online consumers.

11 Recommendations for Future Research

Based on the results and limitations described in this PhD thesis, some recommendations have been made for further research aimed at improving the understanding of the complete interactions between conscious and unconscious factors that affect online consumer buying behaviour, based on the results and limitations described in this PhD thesis. In order to explore unconscious decision-making processes in online buying behaviour, the study employed a sequential exploratory mixed-methods design combining semi-structured qualitative interviews with quantitative EEG testing. While the study generated exploratory insights, it also identified gaps and limitations that future research could address.

11.1 Expanding Sample Size and Demographic Diversity

One of the key limitations of this study was the relatively small, convenience-based sample drawn from a single institutional environment. Only UOS university staff and students participated in the qualitative semi-structured interviews and quantitative EEG sessions, thereby limiting the applicability of the findings. According to Ramya and Ali (2016), consumer behaviour is shaped by a variety of contextual and individual factors, such as age, socioeconomic status, and technological proficiency.

Future research should include larger and more demographically varied samples to increase generalisability. Expanding the participant pool to include people of all ages, ethnic origins, economic levels, and digital literacy profiles would offer a more complete picture of how emotional and unconscious factors influence online consumer buying decisions.

11.2 Cross-Cultural Investigations

Another critical consideration is the cultural context in which consumer behaviour is embedded. The current research was confined to a single cultural and geographical setting, thus limiting the ability to generalise findings across different societies. As Kacen and Lee (2002) argue, emotional expression and decision-making styles vary significantly between individualistic and collectivist cultures. Future research should conduct cross-cultural

comparisons to investigate how unconscious emotional triggers and buying behaviours differ between cultures. Such studies would improve theoretical models of consumer buying behaviour and give practical insights into global e-commerce tactics customised to different customer bases.

11.3 Temporal Considerations: Post-Pandemic Consumer Behaviour

The study was carried out during the COVID-19 epidemic, a period marked by emotional instability and disrupted consumption behaviours. Participants noted that internet shopping was frequently used as a coping method or a source of emotional elevation during lockdowns (Participant 16; Participant 17). However, as Dubra (2016) and Laato et al. (2020) suggest, pandemic-induced behavioural shifts may not be permanent.

Future research should adopt a longitudinal approach to examine whether these changes persist in post-pandemic conditions. Exploring consumer behaviours beyond the pandemic context will help isolate the enduring effects of unconscious emotional drivers from temporary adaptations linked to exceptional circumstances.

11.4 Addressing Social Desirability and Subjectivity in Data Collection

While the semi-structured interviews generated rich qualitative insights, the subjective nature of self-reported data introduces risks of memory distortion and social desirability bias. Although a reflexive approach was used, drawing on models such as Gibbs (1988) and Schon (1983), future research should aim to reduce these biases even more. Anonymised interviews, indirect questioning tactics, and projective approaches might all assist in eliciting more real replies. Enhancing reflexivity procedures and researcher self-awareness would increase the data's reliability and openness.

11.5 Strengthening Quantitative Research: EEG and Beyond

The EEG component of this study generated exploratory neural observations related to attentional processing of emotional stimuli; however, no statistically significant effects were identified. Consistent with prior literature, small sample sizes are common in EEG research

due to technical and resource demands (Fabiani et al., 2000). Future studies employing larger samples would increase statistical power and enable more sensitive examination of attentional biases. Future research could also integrate additional psychophysiological methods, such as galvanic skin response, eye-tracking, or heart rate variability, to provide complementary perspectives on emotional processing during online decision-making.

11.6 Isolating Emotional Influences Across Decision-Making Stages

The qualitative findings of this research proposed that emotional triggers underpin each stage of the consumer buying decision process, challenging traditional models that assume an entirely rational, conscious progression (Panwar et al., 2019). Future experimental research should be designed to isolate and examine emotional influences at specific decision stages, such as information search, evaluation of alternatives, and final purchasing decisions. Such experimental designs would contribute significantly to refining existing consumer behaviour models and help determine how emotions modulate decision-making at each critical stage, complementing findings from scholars like Tukkinen (2014) and Verhagen and Van Dolen (2011).

11.7 Future Development of Sequential Exploratory Mixed Methodological Research

The sequential exploratory mixed methodology employed in this thesis provided a structured approach to investigating unconscious and emotional influences in online consumer buying behaviour. Sequential exploratory mixed methodology is appropriate where qualitative findings are used to inform the focus or development of a subsequent quantitative phase (Tashakkori, Johnson and Teddlie, 2020). The study does not claim to advance mixed methodology theory. Rather, it demonstrates the applied value of using qualitative findings to inform the focus of a subsequent exploratory EEG experiment.

In this study, the qualitative phase identified emotion, visual presentation, algorithmic prompts, and impulse-related experiences as important perceived influences on online

buying behaviour. These findings informed the EEG phase by supporting a focus on emotional attentional processing. This relationship between phases reflects integration by development, where one dataset informs the design or focus of another stage of the research (Schoonenboom and Johnson, 2017). The EEG experiment then provided exploratory physiological observations that could be interpreted alongside the qualitative accounts. This represents triangulation by source in a complementary and non-confirmatory sense, where different forms of evidence are used to illuminate the same broad research problem without claiming direct validation or causal proof (Fetters and Molina-Azorin, 2020). Future research could strengthen this approach by using larger samples, clearer pre-registration of hypotheses, and more detailed integration strategies such as joint displays. Joint displays are useful in mixed methodological research because they allow qualitative and quantitative findings to be compared transparently during interpretation (McCrudden, Marchand and Schutz, 2021). Future studies could also include iterative qualitative–quantitative cycles, where interview findings inform experimental design and experimental results then guide follow-up qualitative exploration. Such designs would allow a deeper understanding of the relationship between subjective consumer experience and physiological indicators of attention.

Overall, future research should continue to distinguish clearly between methodology and methods. The methodology refers to the overall rationale and design of the study, while the methods refer to the specific techniques used to collect and analyse data. In the context of this thesis, the sequential exploratory mixed methodology provided the overall research logic, while semi-structured interviews, thematic analysis, EEG measurement, and the dot-probe task were the specific methods used within that design.

11.8 Investigating the Ethical Implications of Algorithmic Influence

Participants' responses demonstrated the importance of algorithmic nudges, such as personalised product suggestions and reminder reminders, in influencing purchasing behaviour (Participants 4 and 13). According to Kroger and Raschke (2019) and Hubert et al. (2013), while personalisation can improve the user experience, it poses ethical issues about manipulating unconscious emotional states. Future studies should look at the balance

between economic advantage and customer autonomy, which might help to build ethical norms and consumer protection rules for e-commerce platforms. Understanding how algorithms amplify emotional triggers might lead to more transparent and responsible digital marketing techniques.

11.9 Concluding Remarks on Future Research

In conclusion, while this thesis has set a solid foundation for understanding the unconscious emotional mechanisms that drive online consumer buying behaviour, there are still considerable prospects for future research. Addressing limits in sample size, cultural variety, and methodological breadth will improve the reliability of future results. Further study on the ethical elements of algorithmic marketing, as well as the stage-specific influence of emotions on decision-making, will make essential contributions to the rapidly growing fields of consumer psychology and digital marketing. Increasing the combination of emotional and intellectual viewpoints in consumer research is critical for gaining a more thorough and accurate picture of online buying habits. Future research will enrich academic debate while also providing companies, governments, and consumers with better insights into the often invisible variables influencing consumer buying behaviour.

12 Reflexivity

Palaganas et al. (2017) state that reflexivity is a critical component of qualitative research, recognising the researcher as both influencing and being influenced by the research process. This study adopts a constructivist stance therefore it is important to continuously acknowledge and analyse my positionality, assumptions, emotional responses, and role during data collection and analysis. This was fundamental to making sure that the credibility, transparency, and rigour of the research.

Reflexivity through Gibbs' Reflective Cycle Gibbs' (1988) Reflective Cycle, as cited in Adeani, Febriani, and Syafryadin (2020), was employed throughout the qualitative phase to facilitate structured reflection. This model comprises of six stages namely: description, feelings, evaluation, analysis, conclusion, and action plan. These stages provided a valuable framework for reflexively examining my thoughts, behaviours, and interactions.

Description:

I conducted 21 semi-structured interviews to investigate participants' online buying behaviours. Open-ended questions were utilised to encourage participants to share their experiences freely, promoting detailed and narrative-rich responses.

Feelings:

Initially, I was conscious of how my academic background and interest in consumer psychology might shape the way I constructed interview questions and interpreted participants' responses. I was also aware of the power dynamics within interviews, particularly when participants sought validation by asking questions such as, "Is this what you mean?" These interactions prompted ongoing reflection on my role in facilitating the conversation.

Evaluation:

The semi-structured interview format proved conducive to in-depth exploration but also presented challenges. I became aware of moments where I was tempted to steer the conversation towards areas aligned with my theoretical interests. Recognising this tendency highlighted the importance of maintaining reflexive awareness and ensuring that participants' voices and experiences remained central to the research.

Analysis:

Using thematic analysis (Braun & Clarke, 2006), I began to see how my own interpretations and theoretical leanings influenced the coding process. I found myself gravitating toward themes that aligned with existing literature I was familiar with. This raised important reflexive questions: Was I supporting specific data due to confirmation bias? Was I interpreting participants' experiences through my own lens? To address this, I engaged in peer debriefing with academic supervisors and used audit trails to remain transparent and grounded in the data.

Conclusion:

Through these reflective processes, I understood that I was playing a dual role as both interpreter and investigator and that I was required to be constantly vigilant. I recognised that my positionality as a researcher interested in unconscious consumer processes could subtly influence how I interact with the data and participants. I also realised the importance of emotional reflexivity (Etherington, 2017), particularly when participants shared sensitive stories relating to emotional spending or financial vulnerability.

Action Plan:

In future research, I plan to incorporate more structured bracketing exercises before the interviews and analysis and maintain a detailed reflective journal throughout the process. This will support an ongoing interrogation of my assumptions and help me manage bias. I also aim to include participant validation to enhance interpretive accuracy and credibility.

Reflexivity through Schon's Reflective Practitioner Model In addition to Gibbs' framework, Schon's (2010) model of the "reflective practitioner" provided further insight into my reflexive practice. His distinction between reflection-in-action and reflection-on-action resonated with my experience as a qualitative researcher.

Reflection-in-action:

During interviews, I often encountered emotionally charged or off-topic responses. These moments required spontaneous decisions, whether to redirect the discussion, probe further or hold space for the participant's narrative. Such instances underscored my co-constructive role in shaping the interview environment and interpretation.

Reflection-on-action:

Following each interview, I documented reflexive field notes to evaluate aspects such as what went well, what felt challenging, and how my own behaviour might have influenced participant responses. These reflections informed iterative adjustments to my interview technique and deepened my awareness of the intersubjective nature of qualitative inquiry.

Reflexivity was not approached as a peripheral consideration but as a continuous and essential commitment to ethical and credible qualitative research. Through the application of both Gibbs' Reflective Cycle and Schon's reflective practitioner model, I was able to interrogate my positionality, challenge assumptions, and uphold the trustworthiness of my research. These reflective practices enhanced the study's methodological rigour and contributed significantly to my development as a critically engaged qualitative researcher.

13 References

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14 Appendices

14.1 Appendix 1 Qualitative Study Approval Letter



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5 August 2020

Project Lead: Uyi Denny Omoregie

Subject: The Influence of Unconscious Decision Making in Online Consumer Buying Behaviour: A Critical Review

Type of study: Postgraduate Research

Start Date: 30 July 2020

End Date: 3 August 2021

Paper Number: RETH19/055

Primary Supervisor: Professor Penny Cavenagh

Second Supervisor/s: Dr Rachael Martin and Dr Tom Vine

Dear Uyi Denny

Thank you for resubmitting your application for ethical approval and taking action on the feedback points provided by the University of Suffolk Research Ethics Committee.

As Chair of the University Research Ethics Committee, I have reviewed your application again, which was resubmitted on 13 July 2020 and am happy to approve this via Chair's action. This approval is based on all your action/s explained or completed.

As principal investigator, your responsibilities include:

- ✓ ensuring that (where applicable) all the necessary legal and regulatory requirements in order to conduct the research are met, and the necessary licenses and approvals have been obtained;
- ✓ approval by the University Research Ethics Committee should not be taken as evidence that the study is compliant with GDPR and the Data Protection Act 2018. You are expected to have completed the GDPR training and follow the guidance from <https://www.ukri.org/files/about/policy/ukri-gdpr-faqs-pdf/>. Final responsibility for GDPR compliance remains with you;
- ✓ reporting any ethics-related issues that occur during the course of the research or arising from the research to the University of Suffolk Research Ethics Committee to the Committee Secretary, Sue at s.raychaudhuri@uos.ac.uk (eg. unforeseen ethical issues, complaints about the conduct of the research, adverse reactions such as extreme distress);
- ✓ submitting details of proposed substantive amendments to the protocol/proposal to the University of Suffolk Research Ethics Committee for further approval.

Yours sincerely

Professor Emma Bond

Director of Research and Chair of the University Research Ethics Committee
University of Suffolk

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14.2 Appendix 2 Interview Questions

Interview questions

Title: The Influence of Unconscious Decision Making in Online Consumer Buying Behaviour: A Critical Review.

Aim:

The aim is to understand how online shopping decisions are made, whether they are based on rational decision-making processes (conscious) as suggested by the consumer behaviour model or if the consumers follow unconscious processes which are influenced by other factors.

Questions:

1. **Main question:** How would you describe your online shopping habits?

Prompts:

Do you shop online regularly?

How many times a week do you online shop in comparison to physically going into a shop?

2. **What kind of items would you normally buy online?**

Prompts:

Can you list at least 5 items you would normally shop for online?

Can you name the last 5 items you bought online?

Were these purchases planned or were they impulse purchases?

3. **Main question:** Describe how you feel after online shopping.

Prompts:

Would you say you feel happy, sad, or with regret?

Are you aware of your feelings changing if you have made an impulse purchase, maybe the next day?

4. How is your feeling after shopping in comparison to your feeling before and during online shopping?

Prompts:

How do you feel before shopping?

How do you feel during shopping?

How do you feel after shopping?

Do your feelings depend on what you are shopping for?

How do you feel before online shopping?

How do you feel during online shopping?

How do you feel after online shopping?

Do your feelings depend on whether or not all of your online purchases were planned?

5. **Main question:** Would you say you normally plan your online shopping?

Prompts:

When shopping online, how do the things you end up buying compare to your original intended purchase?

Is this always the case?

Have you made any impulsive purchases in the past?

6. **Main question:** Has there been a time when you have either discussed a product with someone and later saw items relating to your discussion being advertised to you on social media OR have you looked at items on the Internet and then had the same experience? How did that make you feel?

Prompts:

How tempted were you to buy the items?

Did you end up buying the items?

7. Main question: What factors influence your decision to buy online?

Prompts:

In what ways do you think a brand and colour affect your decision to buy?
What other factors may influence your decision to buy?

8. Main question: Is there anything else you would like to add?

Prompt:

Are there any additional comments or anything you would like to add?

Thanks for your time.

14.3 Appendix 3 Research Flyer.



Postgraduate research study

**COULD YOU HELP US TO UNDERSTAND
THE INFLUENCE OF UNCONSCIOUS
DECISION MAKING IN ONLINE
CONSUMER BUYING BEHAVIOUR?**

Are you aged over 18?
Do you buy things online?
Are you a student or a staff member at
the University of Suffolk?

In this research, you will be interviewed about your online shopping behaviour. During your interview, the researcher will ask questions about your online shopping behaviour.
You will be fully informed about the nature of the study before your participation.
All responses will be thoroughly anonymised.
(You will be asked to choose a unique ID for the research, so you do not need to use your real name).

This research study will be taking place until 30 October 2020
Please contact **Denny Omoregie** at
u.omoregie@uos.ac.uk
if you wish to participate in this study.
The interview will last no longer than 1 hour.

This research is closely supervised and conducted in strict accordance with the University of Suffolk's Ethical Procedures and Policies.
All data handled in accordance with General Data Protection Regulations (GDPR 2016)
Participants will be fully informed about the limits of confidentiality before the interview takes place.

14.4 Appendix 4 Participant Information Sheet

You are invited to take part in a study, which aims to understand how decisions to buy online are made, whether they are well thought-out, planned and conscious or whether they are influenced by other unconscious factors.

Participant Information Sheet	
Study title:	<i>The Influence of Unconscious Decision Making in Online Consumer Buying Behaviour: A Critical Review.</i>
Main Investigator:	<i>Uyi Denny Omoregie (u.omoregie@uos.ac.uk)</i>
Academic Supervisors:	<i>Professor Penny Cavenagh (p.cavenagh@uos.ac.uk)</i> <i>Dr Rachael Martin (r.martin2@uos.ac.uk)</i> <i>Dr Tom Vine (t.vine@uos.ac.uk)</i>

This Participant Information Sheet will help you decide if you would like to take part. It sets out why we are doing the study, what your participation would involve, what the benefits and risks to you might be, and what would happen after the study ends. We will go through this information with you and answer any questions you may have. You do not have to decide today whether you will participate in this study. If you agree to take part in this study, you will be asked to sign the Informed Consent Form. You will be given a copy of both the Participant Information Sheet and the Informed Consent Form to keep. Please make sure you have read and understood all the pages of the Participant Information Form before signing the consent form.

1. What is the purpose of the study?

You are being asked to participate in a research study as part of a PhD project supported by both the University of East Anglia and the University of Suffolk. Your participation will help increase understanding of the process consumers go through when shopping online.

The study will be looking to understand the processes of decision making and the factors that affect decision making when shopping online. This knowledge will help business owners to develop products that consumers require and will help marketers to present the products to online consumers in ways that are both acceptable and ethical.

2. What will my participation in the study involve?

As a participant in this study, you will be asked to take part in an interview in which the researcher will ask questions regarding your online shopping behaviour. This is to find out whether your online shopping behaviour matches any preconceived

thoughts you may have. For example, do you always end up buying what you planned to buy?

You will be given the opportunity at the end of the interview to speak freely concerning the factors that you believe influence your online buying decisions.

The interview should last no longer than 1 hour.

3. What are the possible benefits and risks of the study?

By participating you will be helping to increase understanding of online shopping behaviour and some factors that affect buying decisions.

You do not have to provide your real name, a unique ID will be required. Your data will be safely protected on the researcher's computer, which is password protected and the data itself will be protected with a password. Only the researcher will have access to the information and will not store or request the real names of participants except on the consent form, which will be destroyed on completion of the study.

4. Who pays for this study?

This study is personally funded by the researcher therefore involves no cost to yourself. Your participation is completely voluntary you will receive no monetary compensation for being involved in the study. You will not be reimbursed for your transportation expenses or parking.

5. What if something goes wrong?

It is unlikely that anything should go wrong during this study. This interview will be conducted online using Microsoft Teams software. Should you be disconnected during the interview, the researcher will do all he can to reconnect you to complete the interview.

6. What are my rights?

Your participation in this study is voluntary. You do not have to answer any of the questions you do not feel comfortable answering. Your responses will not be directly linked to your identity since we will be using the unique ID you provided in the Consent form. All the results from this study will be stored separately. You will never be referred to by name, but you will be identified by a unique ID. If your data is referenced in a publication, it will only be described by general demographic characteristics such as gender. All research materials will be held in strictest confidence until three years after the PhD thesis is completed (making 5 years in total) when it will be disposed of in the correct data management manner. Please Note: the use of the data collected from you during the study will only be used for the purpose of the researcher's PhD thesis and any subsequent publications and will therefore not be used for any other purpose.

7. What happens if I change my mind?

You are free to change your mind within 30 days of signing the consent form and you will be removed from the study. If you choose to withdraw, all the information

you have provided will be destroyed and will be disposed of in the correct data management manner.

8. What happens after the study?

Once the study is complete, the data is stored for 3 years after the PhD and the researcher will be available for any questions if you have any. You will also be debriefed.

9. Was ethical approval gained?

The University of Suffolk Ethics Panel has approved this research. Should you have any concerns about the Ethics of this research, please feel free to contact the Chair of the Ethics Panel, Professor Emma Bond (researchoffice@uos.ac.uk).

10. Who do I contact for more information?

If you have any questions that you do not wish to ask now, you may contact the researcher Denny Omoregie, or the research supervisors as detailed at the top of this information sheet.

However, if you have any complaints or concerns relating to this research, then these should be directed to the Chair of the University Research Ethics Committee, Professor Emma Bond at researchoffice@uos.ac.uk

14.5 Appendix 5 Participant Consent Form

Informed Consent Form	
University of Suffolk expects all research to be carried out in accordance with the following principles: • The emotional well-being, physical well-being, rights, dignity and personal values of research participants should be secured. • Research participants and contributors should be fully informed regarding the purpose, methods and end use of the research. They should be clear on what their participation involves and any risks that are associated with the process. These risks should be clearly articulated and if possible quantified. • Research participants must participate in a voluntary way, free from coercion. Participants have the right to withdraw at any time. This research has been approved by a University of Suffolk Ethics Panel. Should you have any concerns about the Ethics of this research, please feel free to contact the Chair of the relevant Department/Faculty Ethics Panel.	
Study Title:	<i>The Influence of Unconscious Decision Making in Online Consumer Buying Behaviour: A Critical Review.</i>

Main Investigator:	<i>Uyi Denny Omoregie (u.omoregie@uos.ac.uk)</i>	
Academic Supervisors:	<i>Professor Penny Cavenagh (p.cavenagh@uos.ac.uk)</i> <i>Dr Rachael Martin (r.martin2@uos.ac.uk)</i> <i>Dr Tom Vine (t.vine@uos.ac.uk)</i>	
Unique ID (memorable word using 3-8 letters) <i>Example: AugFrog</i>		

Consent Statements	
I confirm that I have read and understand the information sheet explaining the above research project and I have had the opportunity to ask questions about the project.	☐
I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason and without there being any negative consequences.	☐
I understand that my responses will be kept strictly confidential.	☐
I give permission for members of the research team to have access to my anonymised responses.	☐
I understand that my name will not be linked with the research materials, and I will not be identified or identifiable in the report or reports that result from the research.	☐
I agree for the data collected from me to be used in future research.	☐
I agree to take part in the above research project.	☐

Name of Participant	Date	Signature
Lead Researcher	Date	Signature

To be signed and dated in presence of the participant

Copies:

Once all parties have signed this form, you will receive a copy of the signed and dated participant consent form, the information sheet and any other written information provided (supporting documents).

A copy of the signed and dated consent form will then be placed in the researcher's project record, which will be kept in a secure location.

14.6 Appendix 6 Debrief Sheet

Debrief Sheet	
Study title:	<i>The Influence of Unconscious Decision Making in Online Consumer Buying Behaviour: A Critical Review.</i>
Main Investigator:	<i>Uyi Denny Omoregie (u.omoregie@uos.ac.uk)</i>
Academic Supervisors:	<i>Professor Penny Cavenagh (p.cavenagh@uos.ac.uk)</i> <i>Dr Rachael Martin (r.martin2@uos.ac.uk)</i> <i>Dr Tom Vine (t.vine@uos.ac.uk)</i>

Thank you for taking the time to take part in this study which is part of my PhD in Business Management for both the University of East Anglia and the University of Suffolk.

The study will attempt to understand how decisions to buy online are made, whether they are well thought-out, planned and conscious or whether they are influenced by other unconscious factors.

The information you have provided from your participation in the interview will be held anonymously – which means you will not be identifiable in the research or in any report or reports that result from the research.

You were asked to provide a unique ID at the start when you filled out the consent form; this was so that the researcher can identify your data should you wish to withdraw. Please remember that you have the right to withdraw from this research within 30 days of signing the consent form, without giving any reason and without there being any negative consequences. If you choose to withdraw from this research, all the information you have provided will be destroyed and disposed of in the correct data management manner.

If you have any questions you would like to ask regarding the study, please do not hesitate to contact myself (Main Investigator) from the details provided at the top of this sheet.

However, if you have any complaints or concerns relating to this research, then these should be directed to the Chair of the University Research Ethics Committee, Professor Emma Bond at researchoffice@uos.ac.uk.

Thank you again,

Kind Regards,

Denny Omoregie

(Main Investigator)

14.7 Appendix 7 for Ethical Approval for EEG Study



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21 March 2022

Project Lead: Uyi Denny Omoregie
Project Title: The Influence of Unconscious Decision Making in Online Consumer Buying Behaviour: A Critical Review.
Type of Study: Post Graduate Research
Start Date: 15 May 2022¹
End Date: 31 July 2022
Lead Supervisor: Professor Penny Cavenagh
Co Supervisor: Dr Rachael Martin
Co Supervisor: Dr Tom Vine
Paper Number: RETH(P)21/008

Dear Denny

Thank you for submitting your amendments for your application for ethical approval and taking action on the feedback points provided by the University of Suffolk PGR Research Ethics Committee.

The Lead Reviewers within the University PGR Research Ethics Committee, have reviewed your amendments which were submitted on 18 March 2022 and consider the study as **Favourable**.

This review is based on all your actions being addressed and completed, with one exception of an incorrect email address on the Debrief Sheet; Dr Sarah Richards' email address is S.Richards@uos.ac.uk, she is not contactable on the email address of the Research Office. Please be advised that this email correction has been made by Joanna Walpole, and the updated Debrief Sheet is also attached to the notification email, so no further action is required, except for you to use the corrected document.

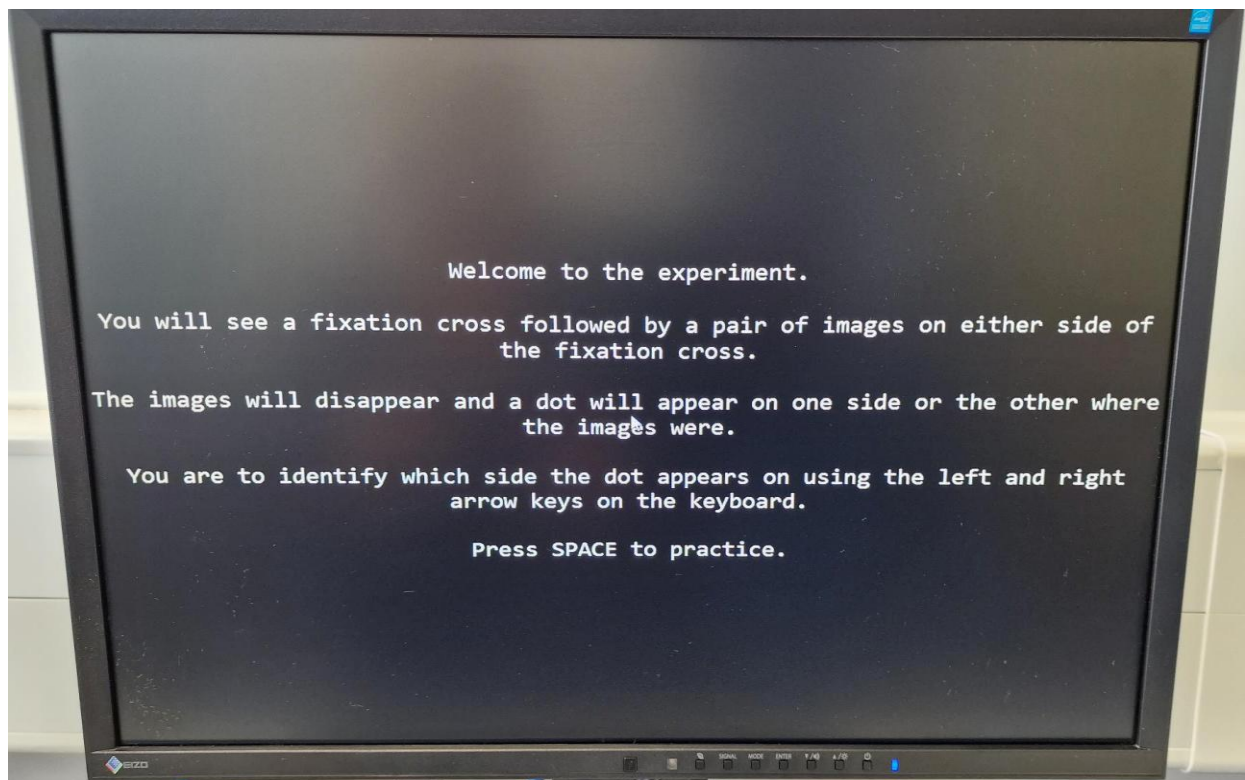
Please note also that the dates for the commencement of your research must be prospective, and this letter confirms that the original dates of November and December 2021 have been updated to reflect this as indicated above.

As principal investigator, your responsibilities include:

- ✓ ensuring that (where applicable) all the necessary legal and regulatory requirements are met in order to conduct the research, and the necessary licenses and approvals have been obtained;
- ✓ noting that approval by the University of Suffolk PGR Research Ethics Committee should not be taken as evidence that the study is compliant with GDPR and the Data Protection Act 2018. You are expected to have completed the GDPR training and follow the guidance from <https://www.ukri.org/files/about/policy/ukri-gdpr-faqs-pdf/>. Final responsibility for GDPR compliance remains with you;
- ✓ reporting any ethics-related issues that occur during the course of the research or arising from the research to the University of Suffolk PGR Research Ethics Committee to the Committee Secretary, Joanna Walpole at j.walpole2@uos.ac.uk (e.g. unforeseen ethical issues, complaints about the conduct of the research, adverse reactions such as extreme distress);
- ✓ submitting details of proposed substantive amendments to the protocol/proposal to the University of Suffolk PGR Research Ethics Committee for further approval.

... / 2

14.8 Appendix 8 Displayed Instruction



14.9 Appendix 9 Illustration for the Fixation Cross



14.10 Appendix 10 Illustration for the Blue Dot

