
Impact of Scarcity Cues and Social Influence on Online Impulse Buying Behavior: The Mediating Role of FoMO and Emotional Arousal

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Abstract

This study examines the effects that scarcity cues and social influence have on online impulse buying behavior in the context of digital commerce environments and how these effects are mediated by the constructs of Fear of Missing Out (FoMO) and emotional arousal. A quantitative, explanatory and cross sectional research design was used. The data were gathered using a structured questionnaire, which was distributed to the active online consumers who have a involvement in ecommerce and social commerce platforms. Convenience sampling was used, and then the technique used to analyze the direct and indirect relationships between the variables in the study was the Structural Equation Modeling (SEM) analysis using SmartPLS software. The results show that scarcity cues have significant effects on emotional arousal, FoMO and online impulse buying behavior, as well as social influence on FoMO and emotional arousal. The model accounted for 70.0% variance in impulsive buying behavior, 76.4% variance in arousal in emotion and 68.9% variance in FoMO. This study further enriches the body of knowledge on consumer behavior and digital marketing by incorporating the emotional and psychological mechanisms into a combined S-O-R approach to explain online impulse buying behavior. The study also offers actionable insights for e-commerce companies and digital marketers looking to improve consumer engagement through scarcity marketing and social interactions.

Keywords: Scarcity Cues, Social Influence, FoMO, Emotional Arousal, Online Impulse Buying Behavior

Introduction

Digital commerce and social media have changed the way consumers shop, and in some cases, when they are shopping online, they make their purchasing decision quickly, which is often based on emotion (Duan & Song, 2024; Miranda et al., 2024). The scarcity approach to marketing and social influence tactics are growing in popularity on online retailers in order to create urgency and encourage consumers to act faster. Short-term presence of scarcity cues like a limited time offer, countdown timers, flash sales, and limited quantities creates a sense of urgency, compelling consumers to take quick decisions about buying products before they are sold out (Khetarpal & Singh, 2024). At the same time, the social influence of endorsements by influencers, reviews on

the internet, live viewers, and suggestions from their peers strengthens the perception of popularity and desirability toward products (Lee & Park, 2014). The digital stimuli have grown to be effective tools to influence online impulse buying in today's e-commerce world (Broeder & Wentink, 2022).

Over the past decade, e-commerce and social commerce have grown at an unprecedented rate worldwide thanks to the technological innovations, penetration of the Internet, the growing use of smartphones, and shifting consumer life styles (Duan & Song, 2024). Online retailing has gone from a more passive and traditional web-based shopping experience to a highly interactive and socially integrated commerce ecosystem, in which consumers interact with products via live-streaming, influencer marketing, and social networking. With the recent launch of digital shopping apps like TikTok Shop, Amazon Live, Instagram Shopping, and Daraz Live, consumers' online shopping experience has been transformed. Digital shopping apps like TikTok Shop, Amazon Live, Instagram Shopping, and Daraz Live are changing the way people discover, consider, and buy online. In today's digital commerce landscape, entertainment, urgency, and interactivity are crucial elements to engage consumers and drive purchase conversions as a key objective (Miranda et al., 2024). Online retailers are continuously incorporating scarcity tactics, social proof, and real-time engagement into their marketing plans to encourage impulsive buying and support their online sales efforts (Broeder & Wentink, 2022).

Although the e-commerce sector has been growing steadily along with the social commerce and live-streaming shopping sectors, the psychological mechanisms underlying the effects of scarcity cues and social influences on online impulse buying behavior have not been adequately studied in the current literature on consumer behavior (Pereira et al., 2023). Previous research has mainly investigated direct links between digital marketing stimuli and impulsive purchase behaviour, neglecting the significant mediating effect of online shopping context (on the combined mechanism of Fear of Missing Out (FoMO) and emotional arousal) in online shopping context (Wu et al., 2021). Moreover, the scarcity cues, social influence and emotional factors have been studied separately from each other in previous studies, rather than studied together in a single framework that accounts for how external stimuli (scarcity, social influence) generate internal psychological responses (hungry, thirsty, excited etc.), which then influence impulsive purchasing (Huang et al., 2021).

Literature Review

Digital commerce has witnessed rapid evolution, significantly influencing consumer purchasing behaviour, especially in online and social commerce, where impulsive buying behaviour has emerged as the norm (Duan & Song, 2024; Pereira et al., 2023). Digital marketing is constantly bombarding online consumers with stimuli to evoke emotion, and to move people quickly into the act of purchasing. Of these stimuli, scarcity cues and social influence have proven to be strong drivers of consumers' cognition and emotions in e-commerce interactions (Broeder & Wentink, 2022). Recent research shows that urgency, social interaction and personalised promotions in the digital shopping environment can greatly encourage consumers to make spontaneous and impulsive purchases (Miranda et al., 2024). Hence, researchers and digital marketers are increasingly interested in elucidating the psychological and behavioral factors behind online purchasing decisions.

Theoretical Foundation

Stimulus-Organism-Response (S-O-R) Model

The Stimulus-Organism-Response (S-O-R) model is the main theoretical basis for this study, which uses this model to identify the relationship between the stimulus of the object and the response of the consumer, through intervening psychological states of the consumer (Mehrabian & Russell, 1974). The S-O-R model is one of the most frequently applied theoretical frameworks

in consumer behavior studies, research on ecommerce and digital marketing because it is an adequate model for explaining how external stimuli in digital marketing can influence online purchase decisions (Pereira et al., 2023). In this study, the scarcity cues and social influence are external stimuli, FoMO and emotional arousal are organismic psychological reactions, and online impulse buying behavior is the behavioral response. The S-O-R framework offers a thorough theoretical foundation for understanding the emotional and psychological reactions consumers may have in digital shopping environments that can contribute to impulsive buying behavior (Rahmania & Sari, 2025).

FoMO theory also enriches this study's theoretical underpinning by shedding light on the feelings of missing out when opportunities to engage socially and in the digital world are missed (Przybylski et al., 2013). According to FoMO Theory, people feel uncomfortable when they sense others are enjoying something or are getting something they might be missing out on. However, in digital commerce settings, the scarcity promotions and social interactions further fuel FoMO continuously, constantly reminding consumers of exclusive offers, trending products and other people's shopping behavior (Zhang et al., 2023). The literature shows that FoMO has a significant impact on online engagement and tendency to use technology compulsively, as well as impulsive buying behavior, especially within social commerce and live stream platforms (Cabeza-Ramirez et al., 2020). The FoMO Theory therefore offers a strong explanation of the psychological mechanisms that are involved in the relationship between scarcity cues and social influence, and its effect on online impulse buying behavior.

Supporting and Negating Views

The scarcity cues have been found to have a positive impact in terms of inducing urgency and elevating the perceived value of the product to the consumer, which in turn positively influences his impulse buying behavior, which is corroborated by the past studies (Aggarwal et al., 2011; Khetarpal & Singh, 2024; Wu et al., 2021). The scarcity marketing concept, like limited-time offers, countdown timers and stock limits, creates fear in customers, prompting them to buy quick (Huang et al., 2021). Scarcity cues also have been found to evoke greater emotional excitement and unplanned buying behavior among online shoppers in the context of social commerce and live streaming shopping (Broeder & Wentink, 2022). However, certain academics do not agree that an extreme scarcity pressure can lead to consumer doubts and psychological barriers, which can diminish consumer purchase motivation and trust in online sellers (Hou et al., 2020). The negative attitudes imply that scarcity strategies are not always effective in terms of consumer response, especially when the consumers seem to believe that the strategy is artificial or manipulative.

There are several studies that suggest that FoMO is a significant psychological factor that affects impulse online purchases (Przybylski et al., 2013; Zhang et al., 2023; Tarka & Harnish, 2021). In the digital shopping environment, FoMO increases consumers' fear of missing out and promotes immediate buying decisions (Cabeza-Ramirez et al., 2020). Scarcity cues and social influence could lead to a rise in FoM by making consumers constantly aware of other shoppers engaging in limited promotions and exclusive shopping events (Ming et al., 2021). However, certain research casts doubt on the general nature of FoMO effects by suggesting that consumers who have robust emotional regulation skills and rational buying habits are less susceptible to FoMO-induced impulsive buying (Lazarus, 1991). Such denegating perspectives suggest that FoMO can be different depending on both psychological differences and situation.

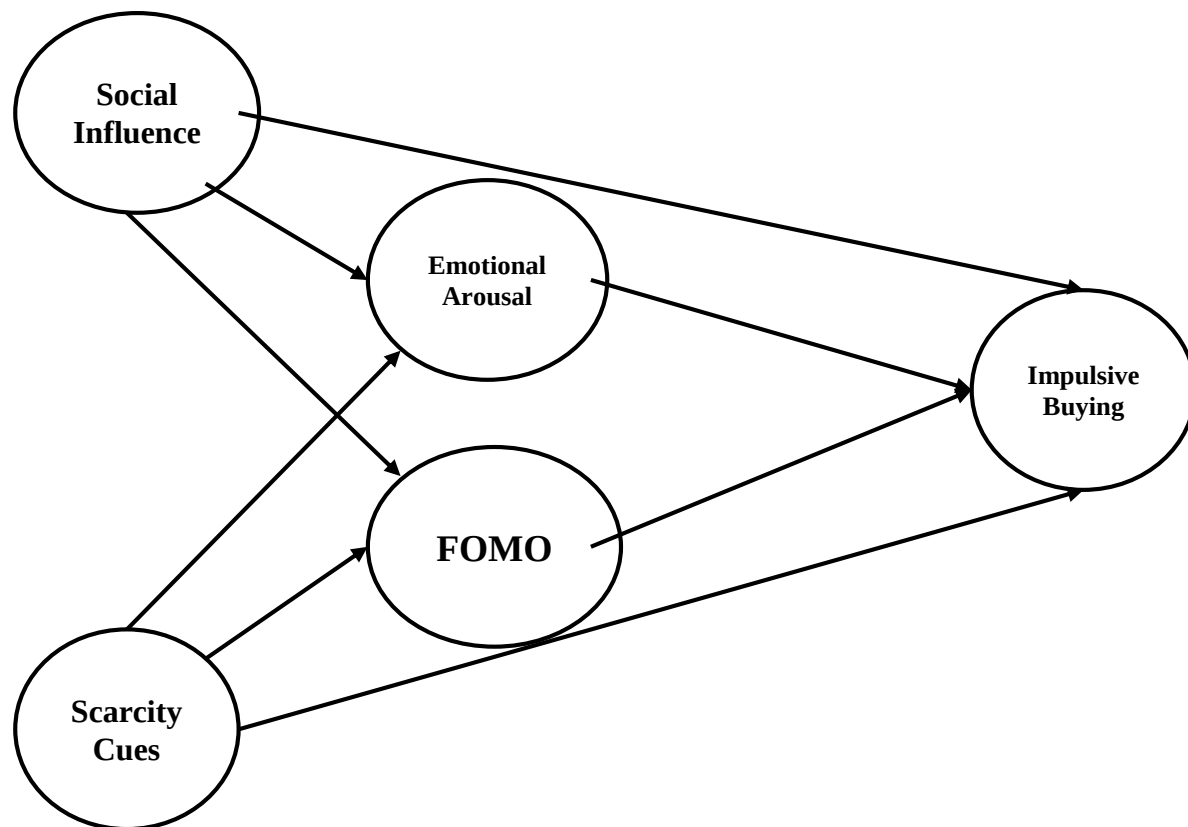


Figure 1 Conceptual Framework

Hypothesis Development

Social Influence and Impulsive Buying Behavior

The influence of social groups or other individuals on an individual's online behavior has long been acknowledged as a significant factor in online commerce and social shopping (Xu et al., 2021; Ming et al., 2021), where consumers are constantly surrounded by their peers, the influencers, and online communities. The social commerce platform is one of the platforms where consumers tend to rely on reviews, ratings, recommendations and influencers' endorsement before purchasing, as these social signals help to decrease uncertainty and boost their trust in products (Wongkitrungrueng & Assarut, 2020). Research has recently indicated that real-time, interactive, live-stream environments of shopping and social media marketing, could enhance the collective participation and emotional involvement of consumers, leading to greater spontaneous buying (Miranda et al., 2024). Additionally, social influence increases consumers' sense of the product's popularity and acceptance by others, which boosts immediate and spontaneous purchase decision-making in strongly interactive online shopping environments (Sohn & Kim, 2020).

H1: There is a positive and strong relationship between social influence and online impulse buying behavior

Scarcity Cues and Impulsive Buying Behavior

One of the most effective psychological marketing tactics in a digital commerce setting to encourage buyers to make immediate buying decisions is the scarcity cue (Khetarpal & Singh, 2024). According to Scarcity Theory, products perceived as scarce, exclusive and/or limited in supply are more sought after, more valuable and more desirable, due to the fear of losing out on their access (Lynn, 1991). Scarcity cues are frequently used in online shops, for example in the form of flash sales, notifications for limited stock, countdown timers, and special offers that

induce urgency and pressure to buy (Wu et al., 2021). Recent studies show that scarcity-based promotions have a significant effect on emotional stimulation and on consumers' impulse buying behavior, as they lessen rational evaluation and stimulate faster decision making (Broeder & Wentink, 2022). Moreover, the scarcity cues have an impact of increasing the perceived competition and urgency for consumers, especially in live stream shopping platforms where products might sell out quickly (Miranda et al., 2024).

H2: Scarcity cues have a significant positive effect on online impulse buying behavior.

Social Influence and FoMO

Social influence plays a significant role in online consumers' FoMO as they constantly compare themselves with others, especially in digital and social media (Zhang et al., 2023). Social media and live shopping platforms ensure that consumers have real-time access to information about pop products, purchases made by their peers, recommendations from influencers, and collective involvement in promotional events (Xu et al., 2021). This social interaction puts psychological pressure on the consumers to avoid being unable to participate in the rewarding experiences or in opportunities that are socially valuable (Przybylski et al., 2013). Recent research studies show that social influence elements like electronic word-of-mouth, influencer marketing and online reviews play a significant role in enhancing FoMO, as consumers feel that others are enjoying access to something they might miss if they don't act fast (Ming et al., 2021).

H3: Social influence has a significant positive effect on FoMO.

Scarcity Cues and FoMO

The limited availability of products and time-sensitive promotions stimulate FOMO among consumers, as a scarcity cue makes them feel a sense of urgency, thereby triggering heightened FoMO (Khetarpal & Singh, 2024). The Scarcity Theory states that when opportunities are scarce, so is the value and reward to the consumer, raising anxiety about missing out on purchase and exclusive experiences (Lynn, 1991). Scarcity signals, like “Only 1 Left” or “Limited Offer” or “Sale Ending Soon,” really exacerbate consumer fears of missing out on desired products in an online shopping setting (Wu et al., 2021). The recent research shows that scarcity-based promotions can effectively induce FoMO as people are worried about the future regret caused by the opportunity to buy something in limited quantities (Huang et al., 2021). Therefore, scarcity cues generate feelings of tension and urgency, which boost the likelihood that consumers will take action right away before opportunities are lost.

H4: Scarcity cues have a significant positive effect on FoMO.

Social Influence, FoMO and Impulsive Buying Behavior

The role of the Fear of Missing Out (FoMO) is an important mediator between social influence and online impulse buying. For social commerce, their exposure to peers' activities, influencer recommendations, online reviews, and live-stream interactions are omnipresent, which further deepens social comparison and collective participation (Ming et al., 2021; Xu et al., 2021). These social interactions generate psychological pressure for consumers that fear being excluded from positive experiences of rewarded shopping opportunities or from the products that are in vogue or popular among other consumers (Przybylski et al., 2013). Several recent studies indicated that social influence mechanisms exhibited on social networking sites can enhance FoMO since people tend to think that others enjoy some useful opportunities they might miss if they do not join the activity right away (Zhang et al., 2023). As a result, FoMO serves as a psychological stimulus which transforms the social pressure and social interaction in online space to impulsive buying behavior among digital consumers.

H5: FoMO significantly mediates the relationship between social influence and online impulse buying behavior.

Scarcity Cues, FoMO and Impulsive Buying Behavior

The scarcity cues have a significant impact on online impulse buying behavior indirectly by the mediation of fear of missing out (FoMO). Limited time promotions and flash sales, countdown timers and low-stock indications can all induce a sense of urgency and incite anxiety about lost buying opportunities, as can scarcity-based strategies (Khetarpal & Singh, 2024). According to the Scarcity Theory, consumers are more likely to find scarce products valuable and desirable because of the scarcity, increasing the psychological pressure and immediate buying intention (Lynn, 1991). The studies recently conducted have found that scarcity cues increase FoMO as customers are afraid to feel regret because they are missing exclusive deals or limited products in digital shopping environments (Wu et al., 2021). Thus, consumers who receive scarcity cues are more likely to feel strong emotions of urgency and become impulsive buyers as a result of the fear-driven decision-making process.

H6: FoMO significantly mediates the relationship between scarcity cues and online impulse buying behavior.

Social Influence, Emotional Arousal and Impulsive Buying Behavior

Social influence can positively influence the impulse buying behavior of online shoppers via emotional arousal. Social commerce environments can stimulate consumers' emotions and engagement by providing interactive features like influencer endorsement, peer review, live comments, and collective shopping participation (Xu et al., 2021; Wongkitrungrueng & Assarut, 2020). When consumers witness others' purchase actions and social recognition, they tend to feel more excited, excited, and urgent, and these emotions can greatly impact spontaneous purchase decisions (Ming et al., 2021). According to recent research, the social interaction and immediate involvement in live stream shopping environments increase emotional stimulation and enhance the susceptibility of consumers to impulsive buying (Rahmania & Sari, 2025). Therefore, the psychological mechanism by which social influence influences online purchases is important and is reflected in emotional arousal.

H7: Emotional arousal significantly mediates the relationship between social influence and online impulse buying behavior.

Scarcity Cues, Emotional Arousal and Impulsive Buying Behavior

Scarcity cues greatly influence the online impulsive buying behavior of consumers through the process of emotional arousal due to the commodity's scarcity and time-sensitive promotions create excitement, urgency and psychological tension among consumers (Khetarpal & Singh, 2024). Emotional triggers like countdown timers, flash sales, and exclusive offers are the tools used in scarcity-based marketing strategies, which create a sense of urgency and competition for consumers, thereby generating emotional reactions. (Wu et al., 2021) Recent research shows that scarcity cues amplify the emotional excitement and urgency to purchase, while undermining rational decisions, and facilitating impulsive buying behavior in online shopping contexts (Broeder & Wentink, 2022). Furthermore, the live-stream shopping and social commerce platforms create an increased emotional stimulation, since consumers are always watching, seeing up to the minute promotions and competitive shopping (Miranda et al., 2024). Consequently, emotional arousal is a significant psychological mechanism between scarcity cues and impulsive buying behavior.

H8: Emotional arousal significantly mediates the relationship between scarcity cues and online impulse buying behavior.

Conceptualization

The independent influence of scarcity cues, social influence, emotional stimulation and impulse buying behavior have been studied extensively in previous digital consumer behavior and online

commerce research (Pereira et al., 2023; Xu et al., 2021). Previous studies have found that scarcity-based promotional tactics and social interactions have a substantial impact on customers' online buying choices, as they boost urgency, excitement, and desirability of a product (Wu et al., 2021). However, studies based on the Stimulus-Organism-Response (S-O-R) model, Scarcity Theory, and Social Influence Theory have revealed that external digital marketing stimuli evoke internal emotional and psychological responses which in turn influence impulsive buying behavior (Mehrabian & Russell, 1974; Lynn, 1991).

Methodology

Research Design

The study investigates the effect of scarcity cues and social influence on online impulse buying behavior with the mediation of two variables that are, Fear of Missing Out (FoMO) and emotional arousal with quantitative research approach. The use of quantitative research is common in the study of consumer behavior and digital marketing due to the fact that it helps researchers to statistically examine the relationship between variables and test the objective theoretical model (Hair et al., 2021). Specific structured questionnaires are well suited to measure psychological constructs like emotional arousal, FoMO and impulsive buying tendencies in online consumer behaviour studies (Pereira et al., 2023). Moreover, due to their capability to yield reliable, generalizable, and empirically sound results, quantitative methods have also been extensively employed in recent studies focusing on online shopping behavior and social commerce (Rahmania & Sari, 2025). Thus, quantitative research method is suitable method for the current study to investigate the concept of the suggested conceptual framework.

The decision to use a quantitative research design was justified by the study's goal of examining the relationship among scarcity cues, social influence, FoMO, emotional arousal and online impulse buying behavior in a quantitative manner. Quantitative research is a research method that can be used to objectively measure the latent constructs and analyze the causal relationships between the various objects in the study through some statistical analysis techniques, including Structural Equation Modeling (SEM) and SmartPLS (Hair et al., 2021). The current study has more than one independent variable and one mediating variable in a conceptual framework, hence, quantitative methods are more accurate and reliable in hypothesis testing (Hair et al., 2022). Besides, recent digital marketing and consumer behavior studies highlight that quantitative methods are very suitable to investigate behavioral responses in online-sales and social commerce context (Rahmania & Sari, 2025). Therefore, the quantitative design is applied to support the empirical nature and analytical objectives of this study.

The present study follows a quantitative approach with self-administered survey method to gather empirical data from online consumers who actively involve in e-commerce and social commerce activities. In digital shopping context, survey methods have been recognized as good tools to collect information about the consumers' perceptions, attitudes, emotional responses, and behavioral intentions (Hair et al., 2021). Structured questionnaire with a five-point Likert scale will be used to assess constructs such as scarcity cues, social influence, FoMO, emotional arousal, and online impulse buying behavior in this study. Even though previous research that examined online consumers' attitudes and behavior in the field of social commerce has adopted different designs and methods for data collection, surveys have been most commonly used because of their reliability, scalability, and appropriateness for statistical analysis (Pereira et al., 2023). Thus, the survey approach is very suitable for the current study.

Sampling

The study will be conducted on the collected data through a structured online questionnaire and will be distributed to the consumers who are active users of eCommerce, social commerce, and live-stream shopping platforms. Online survey methods are commonly used with digital

consumer behavior research due to their ability to collect large volumes of information from geographically dispersed respondents over a relatively short time period (Hair et al., 2021). To reach the target population, the questionnaire will be shared via social media, online shopping forums, and digital communication channels, focusing on individuals who are aware of scarcity promotions and social influence tactics in online shopping contexts (Rahmania & Sari, 2025). Online data collection methods have been widely adopted in recent years to gather information from online sources, which are convenient, accessible and suitable for digitally active populations, as evidenced in online impulse buying and social commerce research (Pereira et al., 2023). Thus, online data collection was deemed to be suitable for the goals of this present study. This study's target population is the group of people who have been actively using the e-commerce platforms, social commerce applications, and live-stream shopping environments to buy products and services online. The chosen population is suitable as it is the consumers who are typically subject to scarcity cues, social influence, promotion activities, are emotionally engaging, and have an impact on online impulse buying behaviour (Miranda et al., 2024). They have individuals utilizing social commerce applications, for example, TikTok Shop, Instagram Shopping, Daraz, Amazon, and others that offer intuitive shopping encounters (Xu et al., 2021). Previous consumer studies focus showed that digitally active online consumers were considered as appropriate populations to analyze psychological and behavioral responses for impulsive buying tendencies (Wongkitrungrueng & Assarut, 2020). Thus, the chosen population is very similar to the conceptual framework and research questions of the present study.

The study will use a non-probability sampling technique – convenience sampling technique for respondents from the target population of online consumers. In online consumer behavior and digital marketing research, convenience sampling is prevalent as it allows researchers to reach respondents who are available and have a good understanding of the study context (Sekaran & Bougie, 2020). Convenience sampling is a practical and cost-effective approach to obtaining data from relevant respondents, which makes it suitable for a study that aims to gather data in relation to the digital realm and consumers' shopping behaviors, such as social commerce, as is done in the present study (Rahmania & Sari, 2025). In addition, previous research on online impulse buying behaviour, social influence and scarcity marketing has also been able to implement convenience sampling because Internet users and online communities are easily accessible (Pereira et al., 2023). Thus, the current study used convenience sampling.

Data analysis and testing of hypotheses will be done using the software of Statistical Package for Social Sciences (SPSS) and SmartPLS software. The basic statistical analysis, demographic analysis, reliability test, and data screening procedures will be carried out using SPSS software. The software used for the basic statistical analysis is SPSS, which includes descriptive statistics, data screening procedures, reliability testing, and data analysis. This study will use the Structural Equation Modeling (SEM) method to identify direct and indirect relationships between scarcity cues, social influence, FoMO, emotional arousal, and online impulse buying behavior, conducted by SmartPLS. In behavioral and marketing sciences, SmartPLS is extensively used in analyzing the complex conceptual frameworks with multiple latent variables and intermediate variables (Wu et al., 2021). Further, SmartPLS can also assess reliability, validity, path coefficients and mediation effects simultaneously, which is very suitable for the conceptual model of the current research.

The measurement instruments will be taken from the existing literature on online consumer behavior and digital marketing that are already validated. For multi-item Likert-scale items, the scarcity cues, social influence, FoMO, emotional arousal and online impulse buying behavior will be measured using instruments with high reliability and content validity that has been adopted from previous empirical studies (Hair et al., 2021). The adaptation of existing instruments is a process that makes the research findings accurate, consistent and comparable in different studies and contexts (Sekaran & Bougie, 2020). The validity of scales has been shown to enhance

measurement quality and boost the theoretical consistency of digital commerce research, as highlighted by recent consumer behaviour studies (Pereira et al., 2023). Hence, adaptation of instruments from literature is considered appropriate in this study.

Results and Discussions

The present study yields important contributions to the understanding of psychological and emotional processes behind online impulse buying in an ecommerce context. The findings show that the scarcity cues and social influence have significant influence on impulsive purchasing behaviours on emotional and cognitive levels. The Stimulus–Organism–Response (S-O-R) theory is applied when external stimuli (flash sales, limited-time offers, influencer recommendations, and social interactions) elicit internal psychological response that leads to an online impulse buying behavior (Mehrabian & Russell, 1974). The results also show that scarcity cues led to increased urgency and emotional pressure for consumers, prompting them to make a purchase without considering all the rational aspects. Likewise, online reviews, peer comments, and live streaming gave consumers a sense of popularity and desire for the products, thereby positively influencing their impulsive purchasing behaviors (Xu et al., 2021). The findings correspond with previous research that indicates that digital shopping contexts can increase the impulse to purchase, by creating urgency, emotional excitement, and social validation (Wu et al., 2021; Pereira et al., 2023; Miranda et al., 2024).

Reliability and Validity

Construct reliability and validity

Overview

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
EMOTIONAL_AROUSAL	0.832	0.840	0.899	0.747
FOMO	0.908	0.909	0.942	0.844
IMPULSIVE_BUYING	0.856	0.859	0.912	0.776
SCARCITY_CUES	0.862	0.867	0.916	0.784
SOCIAL_INFLUENCE	0.887	0.887	0.930	0.815

Table 1 Reliability and Validity Analysis

The construct reliability and validity results demonstrate that the measurement model achieved strong internal consistency and convergent validity across all constructs. The Cronbach's alpha values ranged from 0.832 to 0.908, exceeding the recommended threshold of 0.70, which confirms satisfactory reliability and consistency among the measurement items (Hair et al., 2021). Similarly, the Composite Reliability values for both rho_a and rho_c were above the acceptable limit of 0.70, indicating that the constructs possess strong reliability and accurately measure their respective latent variables. In addition, the Average Variance Extracted (AVE) values ranged from 0.747 to 0.844, which are significantly higher than the minimum required value of 0.50, confirming strong convergent validity and indicating that the constructs explain a substantial proportion of variance in their indicators (Hair et al., 2022). Among the constructs, FOMO exhibited the highest reliability and validity values ($\alpha = 0.908$, AVE = 0.844), suggesting particularly strong measurement accuracy. Overall, the findings confirm that the measurement model is reliable, valid, and suitable for further structural model assessment and hypothesis testing.

PLS SEM Bootstrapping

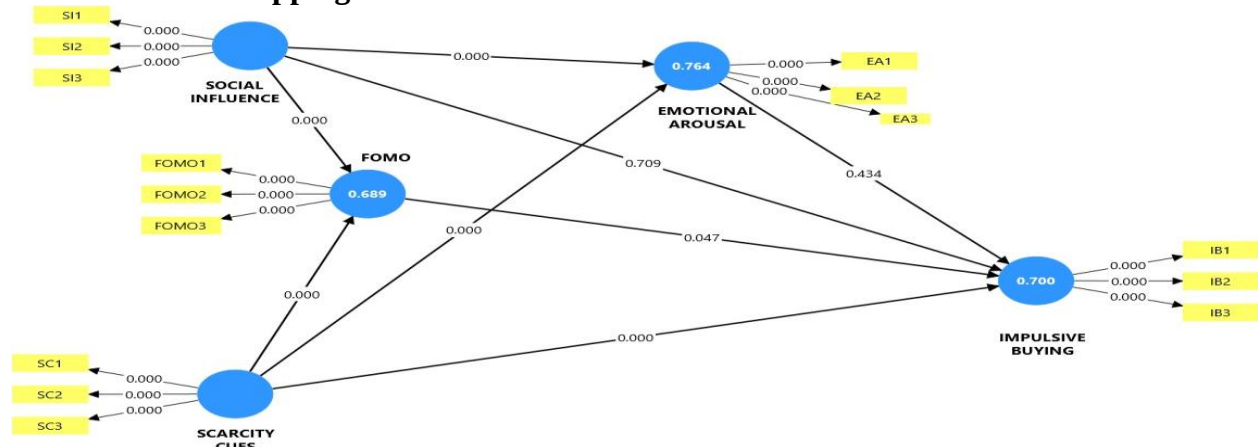


Figure 2 PLS SEM Bootstrapping

The structural model results indicate that scarcity cues and social influence have significant effects on both mediating variables and online impulsive buying behavior. The model explains 68.9% variance in FoMO ($R^2 = 0.689$), 76.4% variance in emotional arousal ($R^2 = 0.764$), and 70.0% variance in impulsive buying behavior ($R^2 = 0.700$), indicating strong predictive power of the proposed framework. The findings demonstrate that social influence and scarcity cues significantly influence FoMO and emotional arousal, as all associated paths show statistically significant relationships ($p = 0.000$). This suggests that online consumers exposed to scarcity promotions, social interactions, influencer recommendations, and peer activities experience higher levels of psychological urgency, emotional excitement, and fear of missing opportunities. The results strongly support the Stimulus–Organism–Response (S-O-R) framework, confirming that external digital marketing stimuli generate internal emotional and psychological reactions among consumers before influencing behavioral outcomes.

Hypothesis Testing

Path coefficients

Mean, STDEV, T values, p values

		Origin al sample (O)	Samp le mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
EMOTIONAL_AROUSAL	->	0.063	0.067	0.081	0.783	0.434
IMPULSIVE_BUYING						
FOMO -> IMPULSIVE_BUYING		0.166	0.176	0.084	1.983	0.047
SCARCITY_CUES	->	0.400	0.399	0.068	5.887	0.000
EMOTIONAL_AROUSAL						
SCARCITY_CUES -> FOMO		0.313	0.313	0.082	3.835	0.000
SCARCITY_CUES	->	0.625	0.615	0.088	7.075	0.000
IMPULSIVE_BUYING						
SOCIAL_INFLUENCE	->	0.516	0.518	0.065	7.898	0.000
EMOTIONAL_AROUSAL						
SOCIAL_INFLUENCE -> FOMO		0.554	0.555	0.066	8.429	0.000
SOCIAL_INFLUENCE	->	0.026	0.021	0.068	0.374	0.709
IMPULSIVE_BUYING						

Table 2 Hypothesis Testing

The path coefficient results indicate that scarcity cues have a strong and statistically significant positive effect on emotional arousal ($\beta = 0.400$, $t = 5.887$, $p = 0.000$), FoMO ($\beta = 0.313$, $t = 3.835$, $p = 0.000$), and impulsive buying behavior ($\beta = 0.625$, $t = 7.075$, $p = 0.000$), demonstrating that urgency-based promotional strategies significantly stimulate consumers' emotional and impulsive purchasing responses. Similarly, social influence significantly affects emotional arousal ($\beta = 0.516$, $t = 7.898$, $p = 0.000$) and FoMO ($\beta = 0.554$, $t = 8.429$, $p = 0.000$), indicating that peer recommendations, influencer interactions, and online social engagement strongly increase consumers' emotional excitement and fear of missing opportunities. However, social influence does not have a significant direct effect on impulsive buying behavior ($\beta = 0.026$, $t = 0.374$, $p = 0.709$), suggesting that its impact occurs indirectly through psychological mechanisms such as FoMO and emotional arousal. Furthermore, FoMO shows a significant positive effect on impulsive buying behavior ($\beta = 0.166$, $t = 1.983$, $p = 0.047$), confirming that consumers experiencing anxiety regarding missed opportunities are more likely to engage in spontaneous purchasing decisions. In contrast, emotional arousal does not significantly influence impulsive buying behavior ($\beta = 0.063$, $t = 0.783$, $p = 0.434$), indicating that emotional excitement alone may not directly trigger impulsive purchases in the current study context. Overall, the findings partially support the proposed hypotheses and confirm the importance of scarcity cues and FoMO in shaping online impulsive buying behavior.

PLS SEM

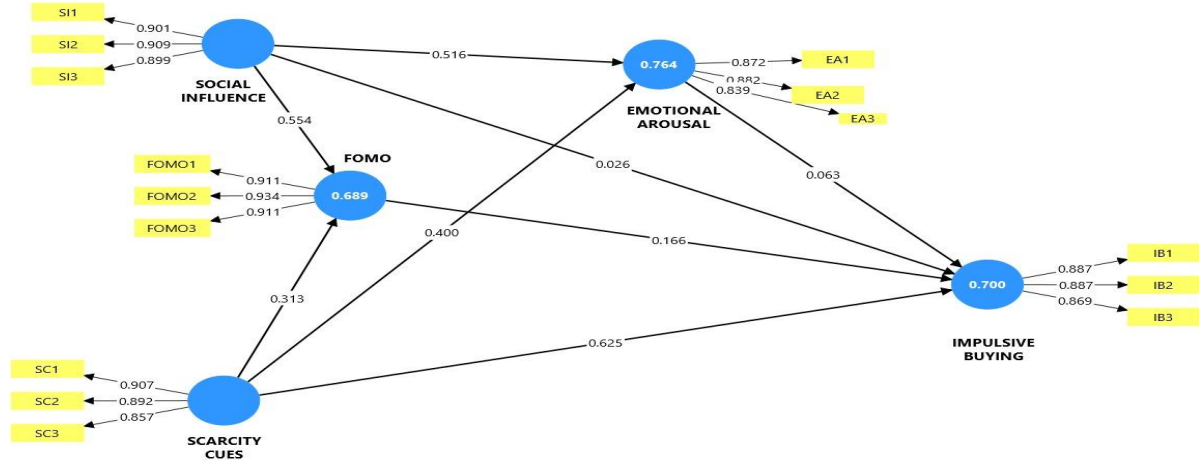


Figure 3 PLS SEM

The structural model demonstrates strong relationships among the study constructs and confirms the predictive strength of the proposed conceptual framework. The model explains 68.9% of the variance in FoMO ($R^2 = 0.689$), 76.4% of the variance in emotional arousal ($R^2 = 0.764$), and 70.0% of the variance in impulsive buying behavior ($R^2 = 0.700$), indicating substantial explanatory power of the independent variables within the model. The path coefficients reveal that social influence has a strong positive effect on emotional arousal ($\beta = 0.516$) and FoMO ($\beta = 0.554$), suggesting that peer recommendations, influencer interactions, and social engagement significantly increase consumers' emotional excitement and fear of missing opportunities. Similarly, scarcity cues positively influence emotional arousal ($\beta = 0.400$) and FoMO ($\beta = 0.313$), indicating that limited-time offers, low-stock notifications, and urgency-based promotions effectively create psychological pressure and emotional stimulation among online consumers. Moreover, the indicator loadings for all constructs are above the acceptable threshold of 0.70, confirming strong measurement reliability and convergent validity of the model constructs.

Model Fitness

R-square
Overview

	R-square	R-square adjusted
EMOTIONAL_AROUSAL	0.764	0.763
FOMO	0.689	0.687
IMPULSIVE_BUYING	0.700	0.696

Table 3 Model Fitness

The results of the R-square show that the proposed structural model is a model that has a good level of explanatory power for the endogenous variables in the study. The model accounts for 76.4% of the variance for emotional arousal ($R^2 = 0.764$), which indicates that scarcity cues and social influences have significant influence on consumers' emotional excitement and psychological stimulation while using internet for shopping activities. Likewise, FoMO can be well explained by the model ($R^2 = 0.689$), meaning that the independent variables make a significant contribution in the consumers' fear of missing out in digital commerce environments. Moreover, the model accounts for the variance of impulsive buying behavior by 70.0% ($R^2 = 0.700$), indicating that the scarcity cues, social influence, FoMO, and emotional arousal have a strong effect in predicting consumers' impulsive buying behavior online. The adjusted R-square values are also very close to the original R-square values, which assures stability and correctness in the model with little estimation bias. Hair et al. (2022) defined values R-square that exceeded 0.50 are moderated to strong explanatory power; the results of the present study can be interpreted as the proposed model having a relatively high predictive potential and good explanation of the consumers' behavioral responses in digital commerce environments.

The results of the present study on the positive effect of scarcity cues on online impulsive buying is in line with earlier research that has been carried out in the digital commerce and social commerce realm. The current findings showed that scarcity cues have a significant effect on emotional arousal, FoMO and impulsive buying behavior, which suggests that these marketing tactic messages greatly activate the consumers' immediate purchasing tendencies. The results of this study align with the findings of Wu et al. (2021) and Khetarpal and Singh (2024) which found that limited-time offers, flash sales and stock limitations greatly enhance consumers emotions of excitement and purchase urgency in online shopping settings. Likewise, Broeder and Wentink (2022) confirmed that scarcity-based promotional tactics in live-stream shopping positively affect impulsive buying behavior, by inducing a sense of urgency and pressure to the customer. Moreover, the results obtained are consistent with previous research done by Aggarwal et al., (2011) who suggested that scarcity increases consumers' perceived value of the product and encourages immediate consumer purchases because of the fear of losing opportunities.

The findings of the present study also validate that social influence has a significant impact on FoMO and emotional arousal of online consumers, but the direct impact of social influence on impulsive buying behavior was insignificant. This is consistent with previous studies by Xu et al. (2021) and Ming et al. (2021) which highlight the importance of social interaction, influencer recommendations and peer engagement in digital commerce contexts in evoking emotional and psychological reactions. Likewise, Wongkitrungrueng and Assarut (2020) found that social validation mechanisms in live-shopping enhance consumers' emotional involvement and buying urgency in the live shopping environment. Sohn and Kim (2020) did not investigate social commerce users' impulsive buying behavior in the same way as the present study, but they did discover that the social influence of social commerce directly and positively impacted the impulsive buying behavior of social commerce users. This incongruity could be attributed to the different characteristics of the consumers, the use of the platforms, and the moderating role of FoMO and emotional arousal in the proposed research model.

The results on the mediation of FoMO are well corroborated with recent digital consumer behavior literature. The results of the present research identified FoMO as a significant mediator in the relationships between scarcity cues, social influence and impulsive buying behavior, suggesting that the individuals who felt that they were missing out on something were more likely to purchase items spontaneously online. The findings of this study are similar to the study of Zhang et al. (2023), which showed that scarcity promotions and social interactions exacerbate consumers' sense of exclusion and their tendency to impulsive purchasing in social commerce settings. Likewise, Cabeza-Ramirez et al. (2020) suggested that FoMO is a key psychological factor that links the digital marketing cue to online buying attitude. The same is observed in the present results, which corroborate the original definition of FoMO as the anxiety of missing or forgoing social and consumption opportunities proposed by Przybylski et al. (2013). Additionally, Tarka and Harnish (2021) noted that digitally active consumers are easily influenced and targeted when making purchase decisions because they constantly compare themselves to others and engage with social media.

Discussion

The results of the present research contribute significantly to the theoretical literature in digital consumer behavior in that the Stimulus–Organism–Response (S-O-R) approach is applied to the field of online impulse buying behavior. The findings showed that the scarcity cues and social influence are important external cues that evoke internal psychological and emotional reactions that ultimately affect the impulsive buying behavior of online consumers. Specifically, it showed that the extent of the scarcity cues and their effects on social influence and impulsive buying behavior is mediated by the FoMO, which indicates the accentuation of psychological fear and social comparisons in digital commerce environments. The results are in strong support of the theoretical hypotheses of Mehrabian and Russell (1974) on the S-O-R (stimulus-organism-emotion) framework that states that the environment affects the response behavior by the internal state of the organism. The current results also support Scarcity Theory which posits that the perceived value of a product and the sense of urgency of customers to purchase a product rises when the product is scarce (Lynn, 1991). Furthermore, the results validate the FoMO Theory, as they indicate that the effects of scarcity promotions and social interaction mechanisms are to raise consumer anxiety about missing out, which in turn is responsible for an increase in impulsive purchases (Przybylski et al., 2013). The present study, however, indicated that emotional arousal did not have a statistically significant direct effect on impulsive buying behavior, contradicting the findings of previous studies which reported that emotional arousal would directly predict impulsive buying behavior (Rahmania & Sari, 2025; Luo et al., 2025). The results partly contradict previous theoretical predictions and indicate that emotional provocation is insufficient to induce impulsive buying behavior, implying that other psychological mechanisms, like FoMO and cognitive urgency, are necessary to stimulate impulsive buying.

On the other hand, from the literature contribution point of view, the study is a significant contribution to the existing body of literature, as it brings together the concepts of scarcity cues, social influence, FoMO, emotional arousal, and impulsive buying behavior under one roof. Previous studies tend to focus on these constructs individually, such as social commerce (Wu et al., 2021), scarcity marketing (Xu et al., 2021), and emotional consumer behavior. The present study is a first attempt to explore the emotional and psychological mediators in contemporary e-commerce settings. The results corroborate those of Cabeza-Ramirez et al. (2020) and Zhang et al. (2023) which highlighted FoMO as a primary psychological motivator of impulsive online buying. Likewise, the high sensitivity of scarcity cues to increase impulsive purchasing behavior can be explained by previous studies by Broeder and Wentink (2022) who suggest that urgency-based promotions have a strong influence on spontaneous purchase decisions in live-stream shopping. The present results, however, partly contradicted the results of Sohn and Kim (2020),

which showed that there was a direct relationship between social influence and impulsive buying behavior. Social influences were found to have significant indirect effect in the current study via FoMO and emotional arousal, but no significant direct effect on impulsive buying behavior. This inconsistency could be due to the differences in cultural setting, platform features, self-control of the online consumers, or different levels of psychological involvement among the online consumers. Consequently, this research is a valuable addition to the literature by providing the influence of digital marketing stimuli on impulsive purchase behavior in social commerce environments in a multidimensional perspective.

Conclusion

The present study managed to show the effect of scarcity cues and social influence on online impulse buying behaviour with the mediation of the concepts of Fear of Missing Out (FoMO) and emotional arousal in a digital commerce context. The results showed that scarcity cues have significant influences on emotional arousal, FoMO, and impulsive buying behavior, which indicated that urgency in promotional techniques has a strong effect on increasing consumers' spontaneous buying tendency. Likewise, social influence plays significant role in FoMO and emotional arousal, suggesting that social interaction, interaction with the influencers and social validation processes increase the emotional and psychological involvement of the consumers during online shopping activities. The results of this study are highly consistent with the Stimulus – Organism – Response (S-O-R) model suggested by Mehrabian and Russell (1974) that the behavioral responses are a function of the psychological reactions of the person in response to the external environmental stimuli. Moreover, the results are in line with the results from Scarcity Theory, which suggests that the less available a product is, the greater its value and need will be perceived (Lynn, 1991).

The study also adds much to the literature by adding scarcity cues, social influence, FoMO, emotional arousal and impulsive buying behavior within a single conceptual framework. These constructs were usually investigated separately in the social commerce field and/or in the digital marketing field (Wu et al., 2021; Xu et al., 2021). The current study however gives a multidimensional explanation for how external digital marketing stimuli and psychological and emotional reactions were found to be influencing online impulsive buying behaviour. The results in particular underscore the importance of FoMO as a key psychological mediator between the scarcity promotion, social interaction and consumer's impulse buying. The findings are similar to previous research by Cabeza-Ramirez et al. (2020) and Zhang et al. (2023) who argued that FoMO is an important factor in influencing online consumer behavior in highly interactive environments for online shopping.

Future Research Direction

The present research provides a number of avenues for future research in digital commerce and online consumer behavior literature. The conceptual model can be further enriched by including other psychological and behavioral variables like perceived enjoyment, digital addiction, trust, self-control, social comparison, and hedonic motivation that can explain impulse purchasing behavior on the Internet in the future. Furthermore, future research should explore other factors that could moderate consumers' psychological reactions to scarcity cues and social influence, such as gender, personality traits, age, and digital literacy. The demographics and psychological distinctions have been reported to play a significant role in the purchase behavior and emotional reactions of people in social commerce settings (Pereira et al., 2023; Zhang et al., 2023). Hence, other constructs and moderators could be included to gain a deeper understanding of impulsive consumer behaviour in digital marketplaces.

The study has also identified a number of methodological limitations that would need to be overcome by future research. The present study used quantitative with cross sectional research

design, which prevented the researchers to observe the consumers' changes in behavior over time. Longitudinal and mixed method studies could be used to gain a better understanding of the changing psychological impacts of scarcity cues and social interaction on online consumers in future studies. In addition, the study employed convenience sampling, which can restrict the applicability of the results to other consumers, but not to the extent of excluding all consumers. Future researchers are encouraged to use probability sampling techniques or more samples to increase representativeness and external validity. In the previous methodological studies, longitudinal and mixed methods methods were highlighted as giving a fuller understanding of consumer behaviour in the dynamic digital environment (Hair et al., 2022; Saunders et al., 2019).

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