Proceedings of ICFTBA 2025 Symposium: Data-Driven Decision Making in Business and Economics
DOI: 10.54254/2754-1169/2025.BL30742

The Influence of Live Streaming Marketing Strategy on Impulsive Buying: Based on an S-O-R Theoretical Perspective

Yirui Bao

School of Architecture, Zhejiang University, Hangzhou, China
19857139566@163.com

Abstract. As live-streaming shopping grows, the phenomenon of impulsive buying in live-streaming shopping has become more prevalent. This study explores the relationship between consumers' perceived marketing strategies employed in live shopping broadcasts and consumers' impulsive buying behavior. In order to gain a more comprehensive understanding of this trend, the study incorporates both theoretical perspectives from the S-O-R model and empirical data collected from consumers' online shopping behaviors. A total of 243 participants answered the questionnaire assessing consumers' perceptions of live streaming marketing strategies, their levels of impulsive purchases and associated anxiety. Correlation analysis showed that impulsive purchasing behaviors are positively correlated with live streaming marketing strategies. The research illustrates that live streaming marketing strategies play an important role in impulsive purchasing behaviors via the mediating role of anxiety, highlighting how emotional states can amplify consumers' susceptibility to strategic stimuli in digital shopping environments.

Keywords: Impulsive buying, Anxiety, Live streaming marketing strategy, Consumer behaviors, SOR theory.

1. Introduction

Over the past three decades, the rapid development of e-commerce has reshaped consumers' buying behavior. Online shopping is gradually substituting for traditional in-store retail formats. Up to December 2024, China's live streaming users reached 833 million, accounting for 75.2% of the total population [1]. The convenience, variety, usability, and availability of online retail have fundamentally reshaped consumers' buying behaviors, which support the large-scale diffusion of online shopping [2]. Originally emerging from the gaming and entertainment domains, live streaming rapidly expanded into the commercial realm, providing expanded possibilities for digital consumer engagement [3]. The marketing strategies of live streaming e-commerce have reshaped the retail landscape through the "People-Product-Place" framework, enabling real-time, context-diverse, and visually engaging interactions, characterized by strong interactivity and authenticity [4]. Compared to traditional e-commerce, live streaming e-commerce is more likely to stimulate impulsive purchasing actions of consumers [5,6].

DOI: 10.54254/2754-1169/2025.BL30742

The key feature of shopping in live streaming environments is interactivity, immediacy, and immersion [7]. Within the live-streaming shopping environment, streamers employ various strategies to cultivate immersive purchasing experiences [8] and instigate impulsive purchases. In live broadcasts, consumers are instantly attracted to products recommended by the streamers, thus enhancing the propensity for impulsive purchases [9].

Impulsive buying refers to consumers' inadvertent buying behavior because of external stimuli such as affective propensity states or environmental cues, without sufficient foresight or rational consideration [6]. This behavior is spontaneous and full of a strong affective propensity impulse and is widely observed in e-commerce and live-streaming shopping. With the growing popularity of online live streaming and promotional campaigns, the incidence of impulsive buying has dramatically increased in recent years. There have been many factors that influence impulsive consumption that scholars have researched. Population characteristics like gender and age have been shown to impact impulse buying habits. Women are much more likely to purchase impulsively [6]. Emotional influences also play a critical role, and the existing research mainly focuses on positive emotions: positive affect, pleasure, and arousal, which have been found to play a mediating role in the influence of external stimuli on impulsive purchasing [10,11]. However, anxiety, which is a negative emotion, can also influence consumer purchasing behavior. In studies on panic purchases during the pandemic period, anxiety has been shown to serve as a significant mediator in the pathways in the relationship between uncertainty, perceived severity, and perceived scarcity, and the occurrence of panic-driven purchases [12].

The existing studies predominantly centered on positive affective reactions, such as contentment, propensity, arousal, and hedonic thrill, but the potential mediating role of negative emotions like anxiety in live broadcast shopping contexts has been underexplored [13]. Building on previous research's blanks, this study conceptualizes anxiety as a key organismic state within the S-O-R framework and investigates a mediating role for anxiety between live-stream marketing strategies and impulse buying. The research questions are proposed:

Q1: Do gender and viewing frequency influence consumers' perceptions of marketing strategies, the levels of anxiety, and impulsive purchasing tendency?

Q2: What's the relationship among marketing strategies, anxiety, and impulse buying?

Q3: Is anxiety a mediating variable between marketing strategies and impulse buying?

From the theoretical perspective, this study will analyze how live-streaming marketing strategies impact impulsive buying as theoretical support for marketing. Additionally, identifying the role of anxiety provides a theoretical basis for emotional mechanisms in live-stream commerce and provides perspectives for developing more evidence-based marketing strategies.

2. Literature review

2.1. Impulsive buying

Impulsive buying refers to inadvertent and immediate purchasing behavior triggered by external stimuli, often accompanied by strong emotional reactions and limited cognitive deliberation [13]. In live-stream shopping environments, such impulses may be intensified by high interactivity, real-time persuasion, and the immersive atmosphere of the sales setting. Prior literature distinguishes between impulsive buying tendency (a stable predisposition) and impulsive buying behavior (a situational reaction) [14]. In this study, we integrate both dimensions to capture consumers' overall impulsive purchase responses in live-stream contexts.

DOI: 10.54254/2754-1169/2025.BL30742

Rook [15] emphasized the features of impulsive purchasing, which are heightened emotional intensity, excitement, and a strong motivational drive toward action. Persuasive cues commonly used in live rooms, such as real-time endorsements, scarcity appeals, and time-limited promotions, have been shown to increase consumers' propensity to act on impulse [16]. Researchers in economics and psychology have proposed that individuals experience an overwhelming urge to buy when confronted with a product [17]. When perceived benefits exceed costs, individuals are more likely to yield to this urge, thereby increasing impulsive purchasing tendencies. Under attractive marketing strategies and emotional influences, perceived benefits may exceed costs [18,19].

Research on impulsive buying initially focused on offline retail settings, where store layout, sensory cues, and situational factors were found to shape impulse purchases [20,21]. With the growth of e-commerce, online stimuli such as visual design, convenience, and promotional cues were shown to increase impulsivity [10]. More recently, live-stream shopping has emerged as a distinct environment where interactivity, real-time social presence, and immersive experiences further amplify impulse buying tendencies [9,22].

Recent studies have reported that there are gender differences in impulsive buying and often attribute these differences to variations in emotional sensitivity, social motivations, and susceptibility to external cues [23]. Women generally exhibit stronger emotional responses and social motivations in shopping contexts, heightening their sensitivity to external cues that trigger impulsive purchasing tendencies [23]. This difference is partly attributable to women's more frequent engagement in social interactions and online communication, which enhances their sense of social presence and emotional contagion in social media or short-video environments [24]. Furthermore, research indicates that emotional reactions mediate the relationship between social media usage and impulsive purchasing, with this pathway being particularly pronounced among female consumers [25].

Moreover, research indicates that stimulating strategies in live-stream shopping promote impulsive buying by eliciting immediate emotional responses [9]. Viewing frequency is considered a key factor influencing the intensity of these emotional and behavioral reactions. High-frequency viewers exhibit stronger immersion, emotional involvement, and psychological anticipation [26], which aligns with the S-O-R perspective that repeated exposure to external triggers heightens organismic responses, thereby increasing impulsive buying tendencies [27]. In contrast, low-frequency viewers exhibit weaker emotional responses and rely more heavily on cognitive evaluation [28].

Previous research has primarily examined the effect of outside factors on impulsive buying, while giving limited attention to the internal psychological mechanisms that drive such behavior [21]. Despite growing evidence on external stimuli in live-stream commerce, limited research has examined the internal emotional mechanisms, particularly anxiety, that may mediate the influence of marketing strategies on impulsive buying. Therefore, this study focuses specifically on the mediating role of anxiety within an S-O-R framework.

2.2. Live streaming marketing strategy

Live-streaming marketing strategies refer to the external cues and persuasive techniques used by streamers and platforms to stimulate consumers' attention, engagement, and purchase decisions, and are therefore conceptualized as external stimuli (S) in the S-O-R framework [29]. Such triggers, when presented in real-time and in highly interactive live-stream environments, are particularly effective in triggering impulsive responses [30]. In traditional marketing strategies, elements such as personal relevance, emotional appeal, eye-catching visuals, promotional incentives, and brand

DOI: 10.54254/2754-1169/2025.BL30742

familiarity have a key influence on consumer engagement [31]. As live-streaming commerce continues to expand rapidly, novel marketing strategies have emerged. The triumph of live retail derives from its interactive nature, entertaining features, authentic presentation, and popularity [32]. Recent research suggests that live-stream marketing strategies typically comprise three components: (1) Anchor characteristics, including credibility, expertise, and persuasive style; (2) Perceived scarcity, operationalized through countdowns, limited stock cues, and flash sales; (3) Immersion, referring to consumers' psychological engagement during real-time interactions [25].

Anchors, who are central to the nucleus of the live-streaming system [31], utilize the interactive features and perceived reliability of online information channels for product promotion, and can exert substantial influence over consumers. Chen [25] suggested that influencers on digital platforms can positively impact consumers' credibility and perceptions of brands and their offerings. Based on social-technical systems theory, researchers discuss how both social and technical factors shape trust, which in turn predicts continued engagement [33]. Most of the existing literature studies on anchors are limited to social influence and brand cognition, and with limited attention to the emotional mechanisms, such as anxiety, through which anchors may drive impulsive purchasing behavior.

Research shows that perceived scarcity could affect impulse-buying decisions [11]. Perceived scarcity involves the intentional creation of limited time offers and restricted quantities to heighten urgency [34]. Consumer-perceived scarcity has a positive effect on panic purchasing [35] and indirectly affects panic or impulse purchasing through perceived arousal [36,37,11]. Moreover, perceived scarcity has been shown to strongly predict online impulse buying in Chinese social commerce [38].

Within the live-streaming environment, immersion refers to the cognitive state in which consumers are "completely focused, engaged, and immersed" in real-time shopping activities [25]. With the development of live-streaming commerce, researchers are increasingly focusing on user immersion on live platforms. For example, real-time engagement contributes a fundamental component of live purchasing behaviors, and serves to narrow the psychological gap between live streamers and consumers [35]. Immersion in live-stream shopping arises from consumers' real-time engagement with anchors, products, and other viewers, producing focused attention and reduced cognitive control [39]. High immersion weakens cognitive deliberation and increases susceptibility to impulsive decisions, especially under time pressure [40]. When customers are fully engrossed in interactions with different objects, their critical thinking may be reduced, increasing their susceptibility to impulsive decisions.

In recent years, live-stream e-commerce has commonly employed scarcity marketing strategies, including time-limited promotions and low-stock alerts, to stimulate an urgent response and scarcity, thereby stimulating immediate purchasing behavior. Research indicates that these strategies not only directly promote impulse buying but may also indirectly influence purchasing decisions by eliciting consumer anxiety and fear of missing out (FOMO) [41]. For instance, countdowns and "only a few left" notifications trigger a sense of time pressure, inducing anxiety over potential missed opportunities [11]. Similarly, flash sales and limited-quantity promotions have been found to significantly increase FOMO and hedonic motivation, thereby enhancing impulse buying tendencies [34]. Therefore, the impact mechanisms of live-stream marketing strategies should not be understood solely as a simple "stimulus–response" relationship but also through the mediating role of emotional responses, such as anxiety.

Chen [25]'s research shows that anchors, perceived scarcity, and immersion have positive impact on impulsive purchases. The investigation centers on the role of involvement as a mediator, which

DOI: 10.54254/2754-1169/2025.BL30742

shows marketing strategies' important role in impulse buying research. Although existing studies show that anchor characteristics, perceived scarcity, and immersion influence impulsive buying, few have examined whether these marketing stimuli also induce negative emotional states such as anxiety and whether such states mediate impulsive purchasing decisions. This represents a critical theoretical gap that the present study addresses.

2.3. Anxiety and consumer behavior

Within the S-O-R framework, emotions are central organismic responses that mediate the influence of external stimuli on consumer actions. Richins [42] identified emotional transitions such as stress and excitement as key influences on purchasing behavior, which provides a foundation for understanding emotional responses in contemporary live-stream shopping environments.

Emotions can modulate the link between consumer-relevant factors and impulsive purchasing [42,13]. Positive emotions, such as pleasure, enjoyment, and arousal, mediate the influence of store environment and promotional information on impulsive purchasing [11]. While positive emotions such as pleasure and arousal have been widely examined as mediators in impulsive buying [10,11], relatively little is known about whether negative emotions, particularly anxiety, operate as mediators, especially in live-stream shopping contexts, where high stimulation and information overload are common.

Research shows that anxiety reduces individuals' self-control and increases reliance on heuristic or impulsive decision-making [43], making consumers more vulnerable to persuasive or high-pressure marketing cues. Rucker and Galinsky [44] propose that a low sense of control prompts individuals to restore control through consumption, such as selecting functional products as compensation. In the live e-commerce context, anxious feelings may be triggered by information overload, choice difficulty, or worry about products. Such emotional states may drive consumers to be more prone to impulse buying during live sessions or to exhibit higher impulsivity in decision-making [5]. Current research on the mediating role of anxiety in live-stream online commerce remains limited, with little empirical evidence supporting its function within live shopping contexts.

3. Theoretical framework

3.1. Theoretical framework: S–O–R theoretical perspective

The S–O–R (Stimulus–Organism–Response) framework was initially proposed by Mehrabian and Russell [45]. The model posits that environmental stimuli can trigger internal organismic states, such as emotional or cognitive responses. Then organismic states determine individuals' behavior. Donovan and Rossiter [46] later used the S–O–R model in retail settings and found that store cues influenced consumers' affective states and which in turn influenced purchase intentions. Eroglu and Machleit [31] further developed the framework for online environments, which provides a theoretical basis for examining highly interactive digital contexts such as live-stream shopping. Currently, substantial studies employ the S-O-R framework as a base theory to analyze online purchasing behavior. Scholars have suggested that external environmental factors, such as playfulness, demand, convenience, and interactivity, can influence impulsive purchase intention by enhancing perceived hedonic value. Others have focused on peculiar media traits of live broadcast platforms, such as interactivity and immersion. Prior studies have indicated that various marketing stimuli, such as interaction between streamers and consumers, promotional cues, and perceived scarcity, act as external stimuli to trigger consumers' internal emotional and cognitive states and thus

DOI: 10.54254/2754-1169/2025.BL30742

influence their purchase intentions or impulse purchases [9,22]. It is suggested that the features of live broadcast, such as interactivity, authenticity, and social presence, intensify affective engagement, could promote impulsive or supportive behaviors [47]. Additionally, individual differences in viewing frequency or habitual exposure can strengthen or weaken these psychological mechanisms by shaping consumers' arousal and immersion [27].

The S-O-R theoretical framework includes three components. Firstly, stimulus (S) refers to the triggering factors that affect a person's perception and subsequently influence their response [9]. Organism (O) refers to an individual's internal state, including both emotional and cognitive responses. It is also seen as a mediating state between stimulus and response [48]. An individual's internal psychological state can be categorized into cognitive responses and emotional responses [49]. And anxiety is a kind of emotional response [50]. Within the study, anxiety is adopted as the organismic variable to investigate impulsive purchasing behavior. Response (R) refers to the consumer's reaction to impulsive purchase stimuli and the outcome of their internal evaluation. It is based on different situational factors influencing their perception. Impulsive buying responses may consist impulsive buying intention and actual impulsive buying behavior [51]. Live streaming shopping is characterized by immediate opportunities for purchasing and strong situational prompts. This study integrates both intention and behavior to capture a more comprehensive measure of impulsive responses. While previous studies mainly measured intention as the response [21], this study integrates both impulsive purchase behavior and intention to measure the level of impulsive buying, using both variables as the dependent variable in the research.

The S–O–R theory shows that environmental stimuli impact individuals' cognitive and emotional reactions [45]. The theory is employed to evaluate how different retail stimuli affect consumers' behavior through organismic [46]. When individuals receive some stimulation, these stimulus factors change the internal state of the organism, which serves as a mediator between stimuli and behavior and regulates the final behavioral response. The response is a summative outcome of the organism's regulatory processes [52].

When consumers are engaging in live-stream shopping, there is a tendency to make impulsive purchases. Therefore, live-stream marketing strategy is mainly based on the creation of many stimulus factors to influence consumers' impulsive purchase actions. According to S - O - R theory, this paper treats anxiety induced by live streams as inner emotional stimuli and examines their impact on consumers' impulsive buying behavior.

3.2. Conceptual model

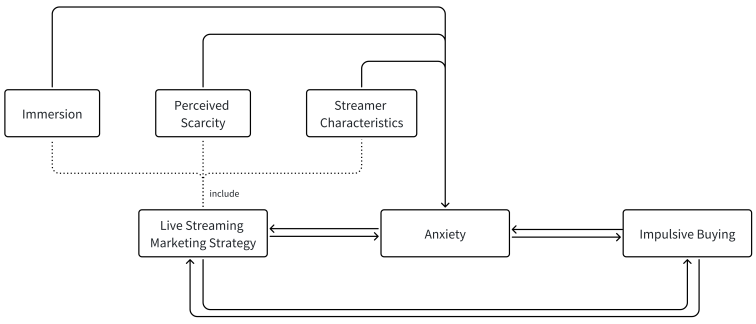

Figure 1. Conceptual model

DOI: 10.54254/2754-1169/2025.BL30742

This study conceptualizes perceived marketing strategies, consisting of anchor characteristics, perceived scarcity, and immersion, as external stimuli (S), whereas anxiety represents the organismic affective state (O) that may mediate their influence on impulsive buying (R). The conceptual framework is constructed by integrating the structural models from previous research on impulsive purchases in live-streaming contexts with relevant theoretical foundations. Chen [25] proposed an S–O–R-based framework in which perceived host characteristics, scarcity cues, and immersion influence consumers' impulse buying through internal psychological mechanisms. Building on this model, the present study extends the framework by incorporating anxiety as a negative emotional mediator. This framework investigates the influence mechanisms of perceived host characteristics, perceived scarcity, and immersion on consumers' impulsive buying from the perspective of user perception.

In this study, marketing strategy functions as the stimulus, encompassing three dimensions: streamer characteristics, perceived scarcity, and immersion. Streamer characteristics can influence viewers' affective states through emotional contagion and parasocial interaction [53]. Certain selling styles, such as urgency framing, intense affect display, or authoritative persuasion, may heighten viewers' anxiety, thereby shaping their purchase decisions. During live broadcasts, streamers' emotional expressions and personal charisma directly influence viewers' emotional states. When streamers elicit anxiety through specific linguistic cues, vocal tone, or performative styles, this emotion can rapidly spread to viewers, thereby affecting their purchasing decisions and behaviors [2].

Perceived scarcity also contributes to anxiety, which emerges from consumers' perceived threat or loss of control, often accompanied by stress [54]. Based on the principle of scarcity, group psychology, and contagion theory, numerous scholars have investigated the elements contributing to panic purchases. Their empirical analyses indicate that perceived scarcity heightens anxiety and loss of control, thereby leading to compulsive hoarding or panic buying behaviors [55,56].

Adams and Rollings [57] and Ryan [58] propose that immersion has been defined as a form of psychological engagement, such as plotlines, characters, or virtual environments. The concept of immersion has been widely applied in multiple contexts, such as digital games, virtual reality, and online shopping [59]. During live-stream e-commerce or online shopping experiences, excessive immersion in promotional events or time-limited discount atmospheres may induce anxiety in consumers—particularly under pressure to make choices or when perceiving high demand for products [40].

Anxiety is a critical variable in consumer psychology. In a study of Canadian university students, anxiety significantly predicted compulsive buying tendencies and impulsive consumption behaviors [60]. Anxiety can influence economic decision-making through shared neural circuits (amygdala–prefrontal cortex–insula) [61]. Accordingly, the conceptual model (Figure 1) proposes that perceived marketing strategies positively influence anxiety (S → O) and impulsive buying (S → R), while anxiety also positively predicts impulsive buying (O → R). Thus, anxiety is hypothesized to partially mediate the effect of marketing strategies on impulsive purchasing.

4. Methodology

The research applies a quantitative methodology, incorporating purposive sampling through online questionnaires to collect data necessary for testing the hypotheses [62]. The questionnaire designed for this study is primarily grounded in the theoretical foundations of previous research and will be further elaborated in Section 4.2 on measurement design.

DOI: 10.54254/2754-1169/2025.BL30742

4.1. Participants and data collection

This study employs a cross-sectional research design to investigate online live broadcast viewers' impulsive purchasing behavior. As major Chinese live-streaming platforms ban commercial transactions for users under 18, purposive sampling was conducted to select adults aged 18 and above who were experienced in live-stream shopping. Participants were recruited via social media platforms (e.g., WeChat groups, QQ communities, and Douyin user forums), enabling access to active live-stream shoppers across diverse demographic groups. A total of 243 questionnaires were collected. Given that this research is situated in the Chinese context of live streaming shopping, data cleaning initially excluded participants who had no prior experience watching live streams. Additionally, reverse-scored items in the questionnaire were examined, retaining only data with transformed score differences less than 3 to ensure data validity and consistency. All invalid or inconsistent responses were subsequently removed. Of the 243 questionnaires collected, 214 were retained after data cleaning, yielding an effective response rate of 88.1%.

4.2. Measurement design

This study examines three key constructs: perceived marketing strategy (three-dimensional), anxiety level, and impulsive purchasing (intention and behavior). All scale items were sourced from validated instruments. All items were scored on a 5-point Likert scale ranging from 1 ('strongly disagree') to 5 ('strongly agree'). Perceived marketing strategy can be categorized into three dimensions: host-related factors [63,64], immersion [65], and perceived scarcity [35]. This study adopts the perceived marketing strategy scale integrated by Chen and Wang [27], with lexical adjustments tailored to contextual settings. To measure consumers' anxiety levels, the Zong Anxiety Scale was selected, which is widely applicable for general populations [66]. To enhance participants' understanding of questionnaire items, the contextual background of the Zong Anxiety Scale was adapted to the scenario of watching live-streamed shopping events, and the questionnaire items were translated into clearer Chinese for improved comprehension. Impulsive consumption was measured using the Chinese Impulse Purchase Intention Scale [67], supplemented with behavior-based items for online contexts. Although the reliability coefficient (α = .686) was slightly below the conventional threshold, the standardized alpha (.715) indicates acceptable internal consistency for exploratory research. In addition to the primary variables, this study also collects data on demographic information such as education level, gender, and frequency of online live-stream shopping participation.

Table 1. Reliability of constructs

Construct	Items	Cronbach's α	Standardized Cronbach's Alpha
Marketing strategy	12	0.797	0.798
Anxiety emotion	7	0.908	0.909
Impulsive buying	11	0.686	0.715

Note: Cronbach's α and Standardized Cronbach's α were calculated to assess the internal consistency of the constructs.

A reliability analysis was conducted for the three measurement scales. The marketing strategy scale demonstrated satisfactory internal consistency, with a Cronbach's α of .797. The anxiety scale showed excellent reliability, with a Cronbach's α of .908, indicating very high internal consistency. The impulsive purchasing scale yielded a Cronbach's α of .686 and a standardized alpha of .715,

DOI: 10.54254/2754-1169/2025.BL30742

slightly below the conventional threshold of .70 but still within an acceptable range for exploratory research. However, the standardized alpha value improved slightly, suggesting that the scale possesses acceptable reliability.

4.3. Data analysis

Data analysis proceeded in four steps: (1) descriptive statistics and normality checks; (2) independent-samples t-tests and one-way ANOVA for group differences; (3) Pearson correlations to examine bivariate associations; and (4) hierarchical linear regressions and mediation analysis based on bootstrap resampling (5,000 samples) to test the hypothesized S–O–R pathways. All analyses were conducted using SPSS 27 software. Descriptive analysis was employed to summarize the basic characteristics of the sample, including participants' gender, age, and other demographic information [68]. T-tests were used to examine differences in key variables between distinct groups, thereby testing the assumption of group differences posited in the research hypotheses [69]. Pearson correlation analysis was used to assess linear relationships among variables prior to regression, ensuring no multicollinearity issues and providing preliminary evidence for mediation testing [70]. Linear regression analysis further examined the direct effects of independent variables on the dependent variable and assessed the predictive power of individual factors [71]. Mediation analysis was utilized to investigate whether a mediating variable exists between perceived marketing strategies and levels of impulsive consumption, and to evaluate the magnitude and statistical significance of the mediation effect [72]. The mediation model was tested using regression-based bootstrapping implemented in PROCESS v.3.5 [73], which allows for robust estimation of indirect effects without assuming normality

5. Results

5.1. Descriptive statistical analysis

Descriptive statistics were first conducted to summarize participants' demographic characteristics and provide contextual information for subsequent group comparison and regression analyses. Among the 214 respondents, 67 were male (31.3%) and 147 were female (68.7%). Most respondents were between 18 and 30 years old (66.8%), followed by those aged 30–50 (23.8%) and over 50 (9.3%). This distribution indicates that live-streaming commerce engages a wide range of adult consumers. Most participants held a bachelor's degree (64.5%), followed by high school (14.5%) and graduate education (11.7%). Regarding live-streaming viewing habits, 19.6% of participants reported watching live streams once or twice per week, 11.2% watched more than twice per week, and 12.6% viewed them nearly every day. Approximately 70% of respondents indicated that they typically watched live streams in the evening, followed by 18.7% who preferred midnight sessions.

Table 2. Demographic characteristics of respondents

	Item	Frequency	Percentage (%)
Gender	Male	67	31.3%
	Female	147	68.7%

DOI: 10.54254/2754-1169/2025.BL30742

Table 2. (continued)

Age	18-30	143	66.8%
	30-50	51	23.8%
	Over 50	20	9.3%
Education background	High school	31	14.5%
	Vocational school	20	9.3%
	Bachelor	138	64.5%
	Master or PhD	25	11.7%
Watching hours	Nearly never	64	29.9%
	Less than twice a month	57	26.6%
	Once or twice a week	42	19.6%
	More than twice a week	24	11.2%
	Nearly everyday	27	12.6%
Watching time	Morning	3	1.4%
	Noon	6	2.8%
	Afternoon	20	9.3%
	Evening	145	67.8%
	Midnight	40	18.7%

Note: This table summarizes the demographic characteristics of the 214 survey respondents.

5.2. Analysis of group differences

Independent-samples t tests revealed that males scored significantly higher than females on perceived marketing strategy (M = 38.98, SD = 7.70 vs. M = 34.93, SD = 8.00), t(212) = 3.53, p = .001, Cohen's d = 0.52. Similarly, males (M = 27.01, SD = 5.07) reported higher levels of impulsive buying than females (M = 25.12, SD = 6.25), t(212) = 2.35, p = .020, d = 0.35.A one-way ANOVA was conducted to examine the effect of live-streaming viewing frequency on anxiety, perceived marketing strategy, and impulsive buying. The results indicated a significant main effect of viewing frequency on perceived marketing strategy, $F(4, 209) = 8.11$, $p < .001$, and on impulsive buying, $F(4, 209) = 6.61$, $p < .001$. Viewing frequency had a significant effect on perceived marketing strategy and impulsive buying but not on anxiety, $F(4, 209) = 0.98$, $p = .421$, indicating that exposure frequency influences behavioral responses more strongly than emotional responses.

Table 3. Independent samples t-test results for gender differences

	9	N	Mean	SD	t	df	P (two-tailed)	Cohen's d
Perceived marketing strategy	Male	147	38.98	7.70	3.53	212	0.001***	0.52
	Female	67	34.93	8.00				
Impulsive buying	Male	147	27.01	5.07	2.35	212	0.02**	0.35
	Female	67	25.12	6.25				

Note: Independent samples t-tests were conducted to compare gender differences in perceived marketing strategy and impulsive buying. Values of $p < 0.05$ indicate significant differences.

DOI: 10.54254/2754-1169/2025.BL30742

Table 4. Results of one-way ANOVA for perceived marketing strategy and impulsive buying

Variable	Source	SS	df	MS	F	p
Perceived marketing strategy	Between	1833.25	4	458.31	8.11	0.000 ***
	Within	11804.79	209	56.48		
	Total	13638.04	213			
Impulsive buying	Between	728.5	4	182.13	6.61	0.000 ***
	Within	5761.65	209	27.57		
	Total	6490.15	213			

Note: $p < 0.001$(***), $p < 0.01$(**), $p < 0.05$(*). ANOVA was conducted to examine group differences in perceived marketing strategy and impulsive buying.

5.3. Linear regression analysis and mediation effect testing

Preliminary correlation analyses supported the hypothesized relationships, revealing significant positive correlations among perceived marketing strategy, anxiety, and impulsive buying ($p < .01$). These findings align with previous research demonstrating the link between marketing strategies and impulsive buying [25]. The full correlation matrix is presented in the Appendix; therefore, only the primary regression results are reported in the main text.

Table 5. Results of path analysis

Path	B	β(Std.)	t	p	R^2
Marketing Strategy Perception → Impulsive Buying	0.251	0.364	5.691	<0.001***	0.133
Anxiety → Impulsive Buying	0.208	0.229	3.429	0.001**	0.053
Impulsive Buying → Marketing Strategy Perception	0.528	0.364	5.691	<0.001***	0.133
Anxiety → Marketing Strategy Perception	0.324	0.246	3.697	<0.001***	0.061
Marketing Strategy Perception → Anxiety	0.187	0.246	3.697	<0.001***	0.061
Impulsive Buying → Anxiety	0.252	0.229	3.429	0.001**	0.053

Note: $p < 0.001$ (***), $p < 0.01$ (**), $p < 0.05$ (*). Standardized coefficients (β) are reported alongside unstandardized coefficients (B).

Table 6. Mediation analysis results

Path (X → M → Y)	Total effect	p	Indirect effect	p	Direct effect	p
Marketing strategy → Anxiety → Impulsive buying	0.2511	<0.001***	0.0252	0.024*	0.2259	<.001***

Note: BC = bias-corrected bootstrap confidence interval; ***$p < 0.001$, **$p < 0.01$, $p < 0.05$.

The results of the linear regression analysis show significant bidirectional predictive relationships among perceived marketing strategies, impulsive buying, and anxiety. Specifically, impulsive buying was found to have a significant positive relationship with perceived marketing strategy ($\beta = 0.364$, $p < .001$, $R^2 = .133$). Similarly, perceived marketing strategy significantly and positively predicted impulsive buying ($\beta = 0.364$, $p < .001$, $R^2 = .133$). In addition, perceived marketing

DOI: 10.54254/2754-1169/2025.BL30742

strategy positively predicted anxiety (β = 0.246, p < .001, R^2 = .061), and impulsive buying also exerted a significant positive effect on anxiety (β = 0.229, p = .001, R^2 = .053). Finally, anxiety significantly predicted impulsive buying (β = 0.229, p = .001, R^2 = .053). Overall, the findings support the proposed S–O–R mechanism: perceived marketing strategies function as external stimuli that heighten anxiety, which in turn increases impulsive purchasing tendencies.

This study used a mediation model to explore how perceived marketing strategies influence impulsive buying. The results indicated that perceived marketing strategy had a significant total effect on impulsive buying (total effect = 0.251, p < .001, 95% CI [0.164, 0.338]). When anxiety was included as a mediator, the direct effect of perceived marketing strategy on impulsive buying remained significant (direct effect = 0.226, p < .001, 95% CI [0.137, 0.315]), while the indirect effect through anxiety was also statistically significant (indirect effect = 0.025, p < .05, 95% CI [0.018, 0.252]). These findings suggest that anxiety partially mediates the relationship between perceived marketing strategies and impulsive buying, indicating that marketing strategies not only directly encourage impulsive behavior but also indirectly affect consumption decisions by elevating individual anxiety levels. The study further highlights that consumers' emotional states are a crucial mechanism connecting marketing stimuli to consumer behaviors.

6. Discussion

Live broadcast e-retailing has rapidly progressed into a dominant form of e-retail, characterized by immediacy, interactivity, and immersive presentation formats. Consistent with prior research (e.g., Wang & Musa, 2024), these features enhance buyer engagement and make impulse purchases more likely within live-stream environments. This study, based on the S-O-R framework, empirically examines the relationships between perceived marketing strategies, anxiety, and impulsive buying. The empirical results from 214 valid responses address the three research questions (RQ) raised in the introduction.

For RQ1, notable gender variations emerged in perceived marketing strategies and impulsive buying, with male participants reporting higher levels on both constructs. This finding diverges from earlier work suggesting stronger impulsive tendencies among women [9]. One possible explanation is that live-stream commerce may activate different motivations from traditional retail: male viewers may be more responsive to scarcity cues, tech-related products, or streamer authority cues, thus increasing susceptibility to marketing stimuli. Additionally, viewing frequency significantly predicted perceived marketing strategy and impulsive buying, supporting the notion that repeated exposure strengthens stimulus sensitivity in S-O-R processes [25]. However, viewing frequency did not significantly affect anxiety, suggesting that emotional arousal may not escalate solely through increased exposure

For RQ2, the positive correlations among perceived marketing strategy, anxiety, and impulsive buying support the S–O–R model. Marketing cues such as scarcity, anchor characteristics, and immersion belong to environmental stimuli (S). These will heighten emotional activation (O), thereby shaping behavioral responses (R). The results align with prior studies demonstrating that live-stream marketing triggers affective arousal that overrides cognitive deliberation [9]. Importantly, the significant predictive effect of anxiety on impulsive buying suggests that negative affect, not just positive hedonic arousal, plays a meaningful role in facilitating impulsive responses.

For RQ3, anxiety was found to partially mediate the link between perceived marketing strategy and impulsive buying. This shows that marketing strategies not only provide direct persuasive cues but also reshape consumers' internal emotional states, which subsequently guide behavior. Unlike prior studies that focused predominantly on positive emotions such as enjoyment or arousal [11], the

DOI: 10.54254/2754-1169/2025.BL30742

current study highlights anxiety, i.e., a negative affective state, as a critical psychological mechanism. This expands existing S–O–R applications by demonstrating that negative emotions may serve as a pathway through which marketing stimuli intensify purchasing impulses.

7. Conclusion

This study examined how perceived marketing strategies influence impulse purchases within live-streaming retail through the mediating role of anxiety. The findings confirm that marketing strategies significantly shape consumers' emotional states and behavioral responses, supporting the S–O–R theoretical framework. Anxiety serves as a partial mediator, indicating that both direct persuasive cues and internal emotional pathways contribute to impulsive consumption.

7.1. Implications

Theoretically, this study contributes to consumer psychology and live-stream commerce literature in three ways: (1) Extending S–O–R theory by demonstrating that negative emotions (anxiety), not solely positive affect; can mediate stimulus–response pathways; (2) Highlighting emotional mechanisms in live-stream contexts, showing how marketing stimuli reshape consumers' internal states; (3) Expanding impulsive buying models by revealing that anxiety serves as a psychological catalyst that amplifies impulsive tendencies.

Practically, the research provides valuable implications for both live broadcast commerce platforms and consumers. For companies and streamers, the findings indicate that employing strategies like perceived scarcity, limited time offers, anchor attractiveness, and immersive presentation appropriately can lead to higher levels of anxiety and purchase desire in consumers, thereby stimulating impulsive purchase [74]. However, it is important to avoid overstimulating anxiety or stress, as this could lead to negative consumer experiences [75]. For consumers, the study shows the importance of recognizing the potential emotional impact of marketing strategies and encourages them to manage their anxiety and make more rational purchasing decisions.

7.2. Limitations and future directions

Despite insightful findings of the research, it still has several limitations. Firstly, the use of self-selected online respondents may limit the sample validity. Secondly, the data were collected in China, which would restrict cross-cultural population validity. Thirdly, the cross-sectional nature of the study limits the causal conclusions, which need to employ longitudinal or experimental designs to examine evolution over time. Moreover, future studies could examine other emotions (e.g., pleasure, excitement, stress) or introduce moderators such as personality traits, product categories, or shopping motivations to clarify boundary conditions.

Future studies can also explore different types of emotions like pleasure, excitement, stress, etc., to obtain a more comprehensive understanding of how various emotional conditions affect impulsive buying. This would enable comparisons between the effects of positive and negative emotions. Moreover, it will be effective to add moderating variables to figure out the boundaries of individual differences, thus providing a more complex view of consumers' emotional and action reactions within live-stream commerce. Methodologically, experimental designs or longitudinal studies could be employed to verify causal relationships. Furthermore, researchers could examine the stability of this mechanism across different product categories or cultural contexts, enriching the theoretical depth and practical value of marketing and consumer psychology research.

DOI: 10.54254/2754-1169/2025.BL30742

References

[1] CNNIC. (2025, July 21). Statistical Reports on Internet Development in China. CNNIC. https://cnnic.cn/n4/2025/0721/c326-11327.html
[2] Li, Z., & Zheng, S. (2024). Influence of language style of anchor on purchase intention. Frontiers in Psychology, 15.
[3] Luo, X., Lim, W. M., Cheah, J. H., Lim, X. J., & Dwivedi, Y. K. (2023). Live streaming commerce: A review. Journal of Computer Information Systems, 65(3), 376–399.
[4] Liu, C., Sun, K., & Liu, L. (2023). Engagement and purchase in livestreaming. Sustainability, 15(7), 5754.
[5] Feng, Z., Al Mamun, A., Masukujjaman, M., Wu, M., & Yang, Q. (2024). Impulse buying behavior during livestreaming: Moderating effects of scarcity persuasion and price perception. Heliyon, 10(7), e28347.
[6] Zheng, X., et al. (2019). Understanding impulse buying in mobile commerce: An investigation into hedonic and utilitarian browsing. International Journal of Information Management, 48, 151–160.
[7] Wan, Q., Chen, J., Yu, C., Lu, M., & Liu, D. (2024). Optimal marketing strategies for live streaming rooms. Electronic Commerce Research, 1–34.
[8] Chen, J., Luo, J., & Zhou, T. (2024). Research on determinants affecting users' impulsive purchase intention in live streaming from the perspective of perceived live streamers' ability. Behavioral Sciences, 14(3), 190.
[9] Lee, C.-H., & Chen, C.-W. (2021). Impulse buying in live streaming commerce. Information, 12(6), 241.
[10] Vonkeman, C., Verhagen, T., & van Dolen, W. (2017). Role of local presence in impulse buying. Information & Management, 54(8), 1038–1048.
[11] Wu, Y., Xin, L., Li, D., Yu, J., & Guo, J. (2021). How does scarcity promotion lead to impulse purchase in the online market? A field experiment. Information & Management, 58, 103283.
[12] Omar, N. A., Nazri, M. A., Ali, M. H., & Alam, S. S. (2021). Panic buying behavior during COVID-19. Journal of Retailing and Consumer Services, 62, 102600.
[13] Redine, A., Deshpande, S., Jebarajakirthy, C., & Surachartkumtonkun, J. (2023). Impulse buying: A systematic review. International Journal of Consumer Studies, 47(1), 3–41.
[14] Sun, T., & Wu, G. (2011). Trait predictors of online impulsive buying. Journal of Marketing Theory and Practice, 19(3), 337–346.
[15] Rook, D. W. (1987). The buying impulse. Journal of Consumer Research, 14(2), 189–199.
[16] Wongkitrungrueng, A., & Assarut, N. (2020). The role of live streaming in building consumer trust and engagement with social commerce sellers. Journal of business research, 117, 543-556.
[17] Verplanken, B., & Sato, A. (2011). Psychology of impulse buying. Journal of Consumer Policy, 34(2), 197–210.
[18] Rook, D. W., & Fisher, R. J. (1995). Normative influences on impulsive buying. Journal of Consumer Research, 22(3), 305–313.
[19] Vohs, K. D., & Faber, R. J. (2007). Spent resources: Self-regulatory resource availability affects impulse buying. Journal of Consumer Research, 33(4), 537–547.
[20] Crawford, G., & Melewar, T. C. (2003). The importance of impulse purchasing behaviour in the international airport environment. Journal of Consumer Behaviour, 3(1), 85–98.
[21] Tinne, W. S. (2010). Impulse purchasing: A literature overview. ASA University Review, 4(2), 65–73.
[22] Lin, S. C., Tseng, H. T., Shirazi, F., Hajli, N., & Tsai, P. T. (2023). Factors influencing impulse buying in live streaming
[23] Cavazos-Arroyo, J., & Máynez-Guaderrama, A. I. (2022). Antecedents of online impulse buying: An analysis of gender and centennials' and millennials' perspectives. Journal of Theoretical and Applied Electronic Commerce Research, 17(1), 122–137.
[24] Gao, P., Zeng, Y., & Cheng, Y. (2022). The formation mechanism of impulse buying in short video scenario. Frontiers in Psychology, 13, 870635.
[25] Chen, L., Rasool, H., & Wang, J. (2022). Research on the impact of marketing strategy on consumers' impulsive purchase behavior in livestreaming e-commerce. Frontiers in Psychology, 13.
[26] Chen, J., & Liao, J. (2022). Antecedents of viewers' live streaming watching: A perspective of social presence theory. Frontiers in Psychology, 13, 839629.
[27] Mao, E. (2022). Live stream content types and support behaviors. Frontiers in Psychology, 13, 951055.
[28] Sjöblom, M., & Hamari, J. (2017). Why do people watch others play video games? Computers in Human Behavior, 75, 985–996.
[29] Zhu, B., Kowatthanakul, S., & Satanasavapak, P. (2019). Generation Y consumer online repurchase intention in Bangkok: Based on the Stimulus-Organism-Response (SOR) model. International Journal of Retail & Distribution Management, 48(1), 53–69.

DOI: 10.54254/2754-1169/2025.BL30742

[30] Floh, A., & Madlberger, M. (2013). The role of atmospheric cues in online impulse-buying behavior. Electronic Commerce Research and Applications, 12(6), 425–439.
[31] Eroglu, S. A., Machleit, K. A., & Davis, L. M. (2003). Empirical testing of a model of online store atmospherics and shopper responses. Psychology & Marketing, 20(2), 139–150.
[32] Bründl, S., Matt, C., & Hess, T. (2017). Consumer use of social live streaming services: The influence of co-experience and effectance on enjoyment. Proceedings of the 25th European Conference on Information Systems (ECIS).
[33] Zhang, M., Liu, Y., Wang, Y., & Zhao, L. (2022). How to retain customers: Understanding the role of trust in live streaming commerce with a socio-technical perspective. Computers in Human Behavior, 127, 107052.
[34] Gupta, S., & Gentry, J. W. (2019). Should I buy, hoard, or hide? Consumers' responses to perceived scarcity. The International Review of Retail, Distribution and Consumer Research, 29(2), 178–197.
[35] Li, X., Zhou, Y., Wong, Y. D., Wang, X., & Yuen, K. F. (2021). What influences panic buying behaviour? International Journal of Disaster Risk Reduction, 64, 102484.
[36] Guo, J., Xin, L., & Wu, Y. (2017). Arousal or not? The effects of scarcity messages on online impulsive purchase. In Nah, F. F.-H., & Tan, C.-H. (Eds.), HCI in business, government and organizations (pp. 29–40). Springer.
[37] Islam, T., Pitafi, H., Wang, Y., Aryaa, V., Mubarik, S., Akhater, N., et al. (2021). Panic buying in the COVID-19 pandemic. Journal of Retailing and Consumer Services, 59, 102357.
[38] Akram, U., Hui, P., Khan, M. K., Tanveer, Y., Mehmood, K., & Ahmad, W. (2018). How website quality affects online impulse buying: Moderating effects of sales promotion and credit card use. Asia Pacific Journal of Marketing and Logistics, 30(1), 235–256.
[39] Hamilton, M., Kaltcheva, V. D., & Rohm, A. J. (2016). Social media and value creation: The role of interaction satisfaction and immersion. Journal of Interactive Marketing, 36, 121–133.
[40] Jiang, Z., & Benbasat, I. (2007). Investigating the influence of online product presentations. Information Systems Research, 18(4), 454–470.
[41] Suhardi, Y., Akhmadi, A., & Darmawan, A. (2023). FOMO, price sensitivity and impulse buying. Jurnal Manajemen Strategi dan Aplikasi Bisnis, 6(1), 171–184.
[42] Richins, M. L. (1997). Measuring emotions in the consumption experience. Journal of consumer research, 24(2), 127-146.
[43] Nielsen, K. S., Bauer, J. M., & Hofmann, W. (2020). Trait self-control & stress. Journal of Research in Personality, 84, 103901.
[44] Rucker, D. D., & Galinsky, A. D. (2008). Desire to acquire: Powerlessness & compensatory consumption. Journal of Consumer Research, 35(2), 257–267.
[45] Mehrabian, A., & Russell, J. A. (1974). A verbal measure of information rate. Environment and Behavior, 6(2), 233–252.
[46] Donovan, R., & Rossiter, J. (1982). Store atmosphere: An environmental psychology approach. Journal of Retailing, 58(1), 34–57.
[47] Guo, J., Li, Y., Xu, Y., & Zeng, K. (2021). How live streaming features impact consumers' purchase intention in cross-border e-commerce. Frontiers in Psychology, 12, 767876.
[48] Chang, H. H., & Chen, S. W. (2008). The impact of online store environment cues on purchase intention: Trust and perceived risk as a mediator. Online Information Review, 32(6), 818–841.
[49] Chan, T. K. H., Cheung, C. M. K., & Lee, Z. W. Y. (2017). The state of online impulse-buying research: A literature analysis. Information & Management, 54(2), 204–217.
[50] Domhardt, M., Geßlein, H., von Rezori, R. E., & Baumeister, H. (2019). Internet- and mobile-based interventions for anxiety disorders: A meta-analytic review. Depression and Anxiety, 36(3), 213–224.
[51] Xiang, L., Zheng, X., Lee, M. K., & Zhao, D. (2016). Exploring consumers' impulse buying behavior on social commerce platform: The role of parasocial interaction. International Journal of Information Management, 36(3), 333–347
[52] Fiore, A. M., & Kim, J. (2007). An integrative framework capturing experiential and utilitarian shopping experience. International Journal of Retail & Distribution Management, 35(6), 421–442.
[53] Chung, S., & Cho, H. (2017). Fostering parasocial relationships with celebrities on social media: Implications for celebrity endorsement. Psychology & Marketing.
[54] Tan, S. H., & Pang, J. S. (2023). Test anxiety. Educational Psychology Review, 35(1), 13.
[55] Cao, C., Chu, C., & Yang, J. (2023). "If you don't buy it, it's gone!": The effect of perceived scarcity on panic buying. Electronic Research Archive, 31(9), 5485–5508.
[56] Ma, X., & Liao, J. (2022). Buying to cope with scarcity. Frontiers in Psychology, 12, 791850.
[57] Adams, Ernest, & Rollings, Andrew. (2006). Fundamentals of game design. Prentice-Hall, Inc.

DOI: 10.54254/2754-1169/2025.BL30742

[58] Ryan, M.-L. (1994). Immersion vs interactivity. Postmodern Culture, 5(1).
[59] Kim, J. H., Kim, M., Park, M., & Yoo, J. (2023). Immersive interactive technologies: AR vs VR. Telematics and Informatics, 77, 101936.
[60] Gallagher, C. E., Watt, M. C., Weaver, A. D., & Murphy, K. A. (2017). I fear, therefore, I shop! Exploring anxiety sensitivity in relation to compulsive buying. Personality and Individual Differences, 104, 37–42.
[61] Hartley, C. A., & Phelps, E. A. (2012). Anxiety and decision-making. Biological Psychiatry, 72(2), 113–118.
[62] Saunders, Mark, Lewis, Philip, & Thornhill, Adrian. (2009). Research methods for business students. Pearson Education.
[63] Zhu, L., Li, H., Nie, K., & Gu, C. M. (2021). How do anchors' characteristics influence consumers' behavioural intention in livestream shopping? A moderated chain-mediation explanatory model. Frontiers in Psychology, 12, 730636.
[64] Wang, S. Q. (2021). How live shopping influences impulse buying desire: An S-O-R model perspective (Master's thesis). Graduate School of Management, St. Petersburg University.
[65] Yang, T., Yang, F., & Men, J. (2021). The impact of Danmu technological features on consumer loyalty intention toward recommendation vlogs: A perspective from social presence and immersion. Information Technology & People.
[66] Dunstan, D. A., & Scott, N. (2020). Norms for Zung's self-rating anxiety scale. BMC Psychiatry, 20(1), 90.
[67] Jing, F., & Yue, H. (2005). A study on impulsive buying tendency of Chinese consumers. Public Finance Research, 21(5), 37–40.
[68] Mishra, P., Pandey, C. M., Singh, U., Gupta, A., Sahu, C., & Keshri, A. (2019). Descriptive statistics and normality tests. Annals of Cardiac Anaesthesia, 22(1), 67–72.
[69] Kim, T. K. (2015). T test as a parametric statistic. Korean Journal of Anesthesiology, 68(6), 540–546.
[70] Sedgwick, P. (2012). Pearson's correlation coefficient. BMJ, 345, e4483.
[71] Seber, George A. F., & Lee, Alan J. (2003). Linear regression analysis. John Wiley & Sons.
[72] MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. (2002). Comparing mediation methods. Psychological Methods, 7(1), 83–104.
[73] Hayes, A. F. (2018). Partial, conditional, and moderated moderated mediation: Quantification, inference, and interpretation. Communication monographs, 85(1), 4-40.
[74] Sun, B., Zhang, Y., & Zheng, L. (2023). Time pressure & impulsive buying. Heliyon, 9(12), e23185
[75] Hao, S., & Huang, L. (2023). How the time-scarcity feature of live-streaming e-commerce affects impulsive buying. The Service Industries Journal, 43(11–12), 875–895.

Appendix

Table 7. Correlation analysis table

Variable	Impulsive Buying	Anxiety	Perceived Marketing Strategy
Impulsive Buying	—		
Anxiety	0.229**	—	
Perceived Marketing Strategy	0.364**	0.246**	—

Note. N = 214. p < 0.01** (two-tailed).