Impact of Entertainment Interaction in Live E-commerce on the Impulsive Consumption Behavior of Consumers of Well-known Clothing Brands: A Study of Zhejiang Province, China

Chenshun Sun[*] and Chanchai Bunchapattanasakda

Graduate School, Stamford International University, Bangkok 10250, Thailand

(*Corresponding author's e-mail: 2007020023@students.stamford.edu)

Abstracts

In recent years, live streaming e-commerce has emerged rapidly as a new consumption model, especially in large cities such as Hangzhou, Zhejiang Province, China. The main purpose of this study is to explore the impact mechanism of live streaming interaction on impulse buying intention, especially the mediating and moderating role of consumer pleasure and user experience in this process. This study used a questionnaire survey method to distribute 500 questionnaires, and finally collected 268 valid questionnaires. The structural equation model (SEM) was used to analyze the data. The results showed that live streaming interaction significantly affected consumers' impulse buying intention and mediated through consumer pleasure. At the same time, user experience played a significant moderating role in the relationship between consumer pleasure and impulse buying intention. When the user experience level was high, consumer pleasure had a stronger influence on impulse buying intention. This study not only provides theoretical support for further understanding of consumer behavior in live streaming e-commerce, but also puts forward practical suggestions for the design and marketing strategies of future live streaming e-commerce platforms.

Keywords: Live-streaming E-commerce, Impulse purchase intention, Consumer pleasure, User experience, Interactivity

Introduction

In recent years, with the rapid development of e-commerce, live shopping has gradually become a new form of consumption, especially in large cities in China such as Hangzhou, Zhejiang Province, where its influence continues to increase. The core of live shopping lies in its interactivity and entertainment, which enable consumers to communicate with anchors or other consumers through real-time interaction, enhancing the immersion and emotional connection during the shopping process. Studies have shown that live shopping effectively stimulates consumers' shopping impulse by providing a highly interactive entertainment experience (Zou, 2022).

The entertainment and engagement aspects of live streaming not only enhance consumer enjoyment but also stimulate purchase desires by providing instant feedback and personalized recommendations. For example, Cui et al. (2022) found that factors like content, website design, and time pressure positively influence impulsive buying behavior by enhancing consumer enjoyment. These features of live streaming can lead to immediate purchase decisions, often resulting in impulsive consumption.

Moreover, the shopping experience in live streaming is highly influenced by the platform's design and interactivity. High-quality user experiences not only enhance consumers' purchase intentions but also increase their overall satisfaction. Studies have shown that good user experiences can deepen consumer engagement and prompt faster purchasing decisions (Zhang et al., 2022). Particularly for younger consumers, the instant interaction and entertainment of live streaming make them more susceptible to impulsive purchases, especially when emotional engagement is high.

The rise of live-streaming commerce has not only changed consumers'shopping habits but also

revolutionized traditional marketing models. By offering a richer and more interactive shopping experience, live streaming has shifted consumer behavior from rational purchasing to emotional consumption. This phenomenon has garnered attention globally, particularly in markets with large consumer bases like China. Researchers widely agree that live-streaming commerce will continue to shape consumer habits in the coming years (Park, & Lee, 2023).

In summary, live shopping has significantly changed consumers' shopping behavior through its unique entertainment and interactive characteristics, especially in metropolitan areas such as Hangzhou. This research direction is of great significance for understanding modern consumer behavior and provides a theoretical basis for future e-commerce platform design and marketing strategies.

Research objectives

This study aims to systematically investigate how entertainment-oriented live-streaming interaction influences consumers' impulsive buying intentions for well-known clothing brands, with a focus on the underlying roles of consumer enjoyment and user experience.

The first objective is to examine the direct impact of live-streaming interaction on consumers' impulsive purchase intention by analyzing how real-time engagement between hosts and viewers may stimulate unplanned buying behavior.

The second objective is to explore whether such interactions enhance consumers' sense of fun during the live-streaming experience— characterized by entertainment, engagement, and enjoyment—which could indirectly shape their purchasing intentions.

The third objective is to assess the mediating role of consumer pleasure between live interaction and impulse buying, thereby uncovering how emotional responses act as a psychological bridge between stimulus and consumer behavior.

Lastly, this study aims to determine the moderating effect of user experience, examining whether the strength of the relationship between consumer pleasure and impulse purchase intention varies depending on the level of perceived user experience.

Contribution to the literature and research gap

Although previous studies have examined factors influencing impulsive consumption in online settings, few have specifically addressed the role of interactive entertainment in live streaming e-commerce within the context of well-known clothing brands. Most existing research has focused on general e-commerce platforms or single-brand case studies, without considering how live broadcasting changes consumer behavior in highly digitized and competitive regional markets.

This study fills this gap by focusing on Zhejiang Province, China— particularly Hangzhou— which is a leading hub of digital innovation and live-streaming commerce in the country. The region has not only seen rapid adoption of live-streaming e-commerce but also features a dense concentration of well-known domestic and international clothing brands. Therefore, studying consumer behavior in this context provides a unique opportunity to understand how interactivity and user experience shape impulsive consumption behavior in a mature digital retail environment. By exploring the mediating role of consumer pleasure and the moderating role of user experience, this study contributes to a deeper theoretical understanding of how live-streaming platforms influence consumer decision-making in fashion retail.

Literature review

The impact of live streaming interaction on impulse purchase intention

Live streaming interaction, as a novel marketing tool, has been shown to significantly influence consumers' impulse purchase behavior across global markets. Real-time interactivity, enhanced engagement, and immersive experiences provided by live-streaming platforms play a critical role in triggering impulsive buying.

For instance, Cui et al. (2022) found that in the Chinese market, cognitive and perceptual stimuli such as information content, platform design, time pressure, and personalized recommendations significantly contribute to consumer enjoyment, thereby promoting impulse buying behavior. Similarly, Zhang et al. (2022) emphasized that emotional interaction between the host and viewers enhances affective intensity and strengthens the likelihood of impulse purchases.

To expand the theoretical background, international studies have also shown similar effects. Andika et al. (2023), in a study based in the U.S., demonstrated that social presence and interactivity in live-streaming e-

commerce lead to emotional arousal and lower cognitive control, which directly increase consumers' impulse buying tendencies. Likewise, Gunadi et al. (2023), studying Spanish consumers, reported that real-time chat and streamer credibility positively affect consumer trust and trigger impulsive behavior through hedonic motivation.

Additionally, Xu et al. (2022) highlighted that trust, built through live interaction, reduces information asymmetry and increases consumer confidence, reinforcing impulse buying. This is consistent with Maulana et al. (2021), who showed in a cross-national study (Singapore and U.S.) that real-time engagement and host responsiveness improve consumer-brand connection, which is a predictor of unplanned purchases.

Based on the literature, this study proposes the following hypothesis:

H1: Live streaming interaction significantly influences impulse purchase intention.

The impact of live streaming interaction on consumer pleasure

Live streaming interaction has emerged as a key factor influencing consumer pleasure by offering real-time engagement, emotional resonance, and immersive experiences. These features contribute to greater consumer satisfaction and enjoyment during the shopping process.

In the Chinese context, Chen et al. (2022) found that emotional engagement, social presence, and immersion in live-streaming interactions significantly affect consumers' enjoyment and gift-giving behaviors. Likewise, Lin et al. (2021) showed that the broadcaster's emotional expressiveness enhances viewers' happiness, increasing their willingness to interact, such as through tipping or engaging in chats.

International research supports and extends these findings. For example, Hilvert-Bruce et al. (2018), studying Twitch users in Western markets, found that emotional gratification and social interaction in live-streaming platforms significantly increase users' pleasure and engagement. Martin and Cohen (2023) similarly noted that live streaming allows for the development of parasocial relationships, which deepen viewers' emotional satisfaction and enjoyment.

Shavitt and Barnes (2020) in a cross-cultural study, discovered that interactive affordances—such as live chat

and emoji reactions— enhance hedonic value, thereby heightening consumer pleasure and increasing engagement duration. Kim (2024), in their study of live-commerce in South Korea, revealed that entertainment value and emotional arousal positively influence consumer satisfaction and enjoyment, which are predictors of continued usage and unplanned purchases.

These findings collectively demonstrate that live-streaming interaction enhances consumer pleasure by strengthening emotional connections, increasing immersion, and stimulating hedonic responses.

Based on the literature, this study proposes the following hypothesis:

H2: Live streaming interaction significantly influences consumer pleasure.

The impact of consumer pleasure on impulse purchase intention

Consumer pleasure, defined as the positive emotional experience derived from the shopping process, has been widely recognized as a major driver of impulse purchase intention. When consumers feel enjoyment, excitement, or emotional arousal during the shopping experience, they are more likely to make unplanned and spontaneous purchases.

In a domestic context, Liapati et al. (2015) found that hedonic consumption tendencies and brand love significantly stimulate positive emotional states, which directly increase consumers' impulse buying of fashion products. Similarly, Aouinti (2013) noted that consumer pleasure mediates the influence of in-store factors, such as salesperson behavior, on impulsive buying decisions, reinforcing the role of emotional gratification in driving purchase behavior.

International studies provide additional support for this relationship. For example, Galtekin (2012), in their study on online fashion retailing in the Netherlands, showed that hedonic browsing behavior and emotional enjoyment significantly boost consumers' tendency to engage in impulse purchases. Palilingan et al. (2022), based on data from U.S. consumers, found that store atmospherics and emotional response to visual merchandising positively influence impulse buying through the pathway of pleasure.

More recently, Hsu et al. (2024) examined the role of immersive technologies such as 3D and augmented reality and discovered that consumers' emotional pleasure

derived from such experiences significantly increases their impulsive purchasing intentions. Their findings demonstrate that the more emotionally stimulating the experience, the greater the likelihood of unplanned purchases.

Additionally, Yi and Jai (2020) confirmed that emotional regulation and hedonic motivation strongly influence consumer desire, which in turn triggers impulsive purchase behaviors across both Western and Eastern consumer groups.

In summary, research from both domestic and international perspectives consistently indicates that emotional pleasure plays a pivotal role in stimulating impulse purchase intention. By enhancing hedonic value, businesses can effectively leverage emotional engagement to drive sales.

Based on the literature, this study proposes the following hypothesis:

H3: Consumer pleasure significantly influences impulse purchase intention.

The mediating role of consumer pleasure between live streaming interaction and impulse purchase intention

As live-streaming e-commerce continues to gain global popularity, consumer pleasure has emerged as a central emotional mechanism mediating the effect of interactive features on impulse purchase intention. Real-time engagement and immersive experiences not only drive consumer satisfaction but also significantly influence impulsive buying behavior through emotional arousal.

In the Chinese context, Yu and Liu (2023) confirmed that immersive experiences fully mediate the relationship between interactivity and purchase intention in travel-related live streaming.

International research has validated these findings. Kanthawongs and Jabutay (2024), in a study of social commerce in Western settings, highlighted that user experience and enjoyment mediate the influence of social interaction on impulsive behavior. Similarly, Koufaris (2002) found that flow and hedonic experience serve as psychological bridges between live-streaming interaction and consumers' purchase responses in hospitality e-commerce.

Esposito et al. (2017) emphasized that emotional engagement in digital settings enhances the likelihood of unplanned purchases, particularly when consumers are in a pleasurable psychological state. Pappas et al. (2014) also noted that positive emotions resulting from online interactivity increase affective trust, which contributes to spontaneous purchase behaviors.

These findings collectively suggest that consumer pleasure, shaped by live-streaming interactivity, serves as a psychological catalyst that transforms engagement into action. Emotional gratification not only enhances user satisfaction but also reduces rational deliberation, making impulsive purchases more likely.

Based on the above literature, this study proposes the following hypothesis:

H4: Consumer pleasure mediates the relationship between live-streaming interaction and impulse purchase intention.

The Moderating Role of User Experience Between Consumer Pleasure and Impulse Purchase Intention

While consumer pleasure has been established as a key factor in driving impulse buying, the strength of this relationship may vary depending on the user's experience during the shopping process. User experience (UX), which includes interface quality, ease of navigation, system responsiveness, and emotional resonance, is increasingly seen as a moderating variable that amplifies or dampens emotional effects on purchasing behavior.

In the Chinese context, Lee et al. (2021) found that in e-wallet systems, perceived enjoyment strongly influenced users' impulse buying, and this relationship was moderated by the overall quality of user experience. Likewise, Chiu (2023) reported that gamified shopping experiences—through interactive design and challenge-based engagement—enhanced perceived pleasure and increased purchase intention, highlighting the moderating effect of UX.

Internationally, several studies support this framework. Van et al. (2024) found that user experience quality significantly moderates the relationship between emotional satisfaction and behavioral intention in mobile commerce, suggesting that superior UX can heighten emotional impacts on buying behavior. Similarly, Widagdo and Roz (2021) demonstrated that website aesthetics and usability positively moderate the effect of hedonic shopping value on unplanned purchases.

Moreover, Park and Yoo (2020) argued that

responsive, intuitive, and immersive digital environments increase consumer psychological immersion and reduce cognitive resistance to impulse buying. Liu et al. (2024) also found that when user experience is flow-oriented— where challenge and skill are balanced— users report heightened engagement and are more likely to make hedonic consumption decisions.

These findings suggest that an engaging user experience strengthens the emotional impact of consumer pleasure, making spontaneous purchases more likely. Therefore, UX acts as a contextual amplifier in the pleasure–impulse buying relationship.

Based on the above research, this study proposes the following hypothesis:

H5: User experience moderates the relationship between consumer pleasure and impulse purchase intention.

Conceptual framework

Based on the reviewed literature and proposed hypotheses, this study constructs a conceptual framework to systematically explore the mechanisms driving impulse purchase intention in live-streaming e-commerce. Existing studies have examined individual relationships between interaction, emotional experience, and consumer

behavior, yet few have integrated these elements into a cohesive model that explains both how and under what conditions these effects occur.

The proposed framework incorporates two key mechanisms: (1) consumer pleasure as a mediating variable between live-streaming interaction and impulse purchase intention, and (2) user experience as a moderating variable that influences the strength of the relationship between consumer pleasure and impulse buying. This dual-path model reflects both the emotional pathway (mediated effect) and contextual amplification (moderated effect), aligning with theories of hedonic consumption, flow experience, and media interactivity.

By visualizing these relationships, the framework addresses a theoretical gap in current research by integrating emotional and contextual factors into a single explanatory structure. It also offers practical implications for marketers seeking to optimize live-stream environments for maximum consumer engagement and conversion.

Figure 1 Conceptual framework of the study, showing the hypothesized links among live-streaming interaction, consumer pleasure, user experience, and impulse purchase intention.
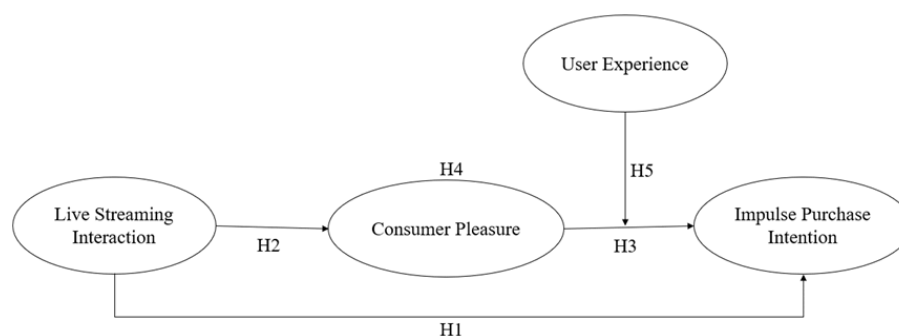

Figure 1 Conceptual framework of the study

Distinguishing contribution of this study

While prior research has established that live streaming interaction can trigger impulse buying through emotional and cognitive pathways, these studies often examine this relationship in a general or fragmented manner. What sets this study apart is its integrative examination of how consumer pleasure mediates, and how user experience moderates, the link between live streaming interaction and impulse purchase intention.

By synthesizing these two mechanisms into a

unified conceptual framework, the study advances understanding of not just whether, but how and under what conditions live-streaming interactivity leads to impulsive buying. This dual-pathway model—mediated by pleasure and moderated by experience—offers a more nuanced and actionable explanation of impulse purchase behavior in live-streaming commerce, especially in cross-cultural and digitally immersive contexts.

Research methodology

This study investigates the impact of interactivity and entertainment in live-streaming e-commerce on consumers' impulse buying behavior, with a specific focus on consumers in Hangzhou, Zhejiang Province, China. The research is contextualized within the rapid growth of live-streaming commerce in China, particularly in urban markets where digital platforms significantly influence consumer behavior. By narrowing the geographical scope to Hangzhou, the study ensures clarity in positioning and relevance to the target demographic known for high engagement in digital consumption.

A quantitative research method was adopted, and data were collected through a structured questionnaire survey. The survey was conducted between March and April 2025 using both online and offline approaches. Offline distribution was carried out in popular shopping areas and universities in Hangzhou, while the online version of the questionnaire was shared through social platforms such as WeChat and QQ, as well as in live-streaming-related consumer groups. A random sampling method was used to ensure that the sample was representative of the broader consumer population in the region and to reduce sampling bias. In total, 500 questionnaires were distributed, 342 were returned, and 268 were deemed valid after screening, yielding an effective response rate of 78.36%. This sample size is appropriate for the intended statistical analysis, as it exceeds the commonly recommended minimum of 200 cases for Structural Equation Modeling (SEM), thus ensuring sufficient statistical power and model stability.

The questionnaire consists of two main sections. The first section gathers demographic data, including respondents' gender, age, income level, and education background. The second section contains measurement scales covering four core constructs: Live Streaming Interaction, Consumer Pleasure, User Experience, and Impulse Purchase Intention. All items were measured using a five-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). The measurement scales were primarily adopted from validated instruments in existing literature. Minor modifications were made to improve contextual relevance and comprehension while preserving the integrity of the original scales. The source references for each item are provided in Table 1 to ensure transparency and traceability. The questionnaire has passed ethical review with approval number STIU-HREC005/2025.

To evaluate the reliability and validity of the data collection instrument, Cronbach's alpha was calculated for each construct, and Confirmatory Factor Analysis (CFA) was conducted. The results confirmed acceptable levels of internal consistency and construct validity across all four variables. The selection of Structural Equation Modeling (SEM) as the main analysis technique was based on its ability to simultaneously assess multiple complex relationships, including direct, mediating, and moderating effects among latent variables. Given the conceptual framework of this study, SEM was deemed the most appropriate and robust method for hypothesis testing.

Prior to SEM analysis, a comprehensive data cleaning process was undertaken. This included screening for incomplete or patterned responses, testing for normality using skewness and kurtosis values, identifying multivariate outliers via Mahalanobis distance, and verifying assumptions such as linearity and absence of multicollinearity. These procedures were essential to ensure the data met the assumptions required for SEM and to enhance the reliability and rigor of the study findings. All analyses were performed using SPSS 26.0 and Amos 24.0.

Data analysis

This study uses consumers in Hangzhou, Zhejiang Province as the research object, adopts random sampling method, distributes 500 questionnaires, and actually collects 342 questionnaires, 268 valid questionnaires, and the efficiency rate is 78.36%. The sample distribution of valid questionnaires is shown in Table 2, and the statistical analysis is mainly based on the three variables of gender, age and monthly income.

In terms of gender, 47.01% of respondents were male and 52.99% were female, with slightly more females than males. For age, the majority (63.06%) were aged 21-40, followed by 18-20 (26.12%), and those aged 60 and above were the fewest at 1.12%. Regarding monthly income, 44.40% earned 3000 yuan or less, and 84.33% earned below 5000 yuan. Overall, the sample consisted mainly of consumers aged 21-40 with lower incomes, with a slight female majority, providing a foundation for studying the impact of entertainment interaction on impulsive consumption in live-streaming e-commerce.

Table 3 presents the reliability analysis for the

variables in this study, including Live Streaming Interaction, Consumer Pleasure, User Experience, and Impulse Purchase Intention. Cronbach's α coefficient was used as a reliability measure to evaluate the internal consistency of each scale.

Table 1 Questionnaire items and sources

Dimension	Item Code	Item	Reference
Live Streaming Interaction	LSI1	The host responds to my comments or questions promptly.	Ko & Chen (2020)
	LSI2	I feel involved when I interact with the host during the live stream.	
	LSI3	I frequently engage with the live stream's chat or interactive features.	
	LSI4	The interaction during the live stream makes me more interested in the product.	
Consumer Pleasure	CP1	Watching the live stream is a fun experience.	Kanthawongs and Jabutay (2024)
	CP2	I enjoy the excitement of discovering new products during the live stream.	
	CP3	The live streaming environment adds to my overall shopping enjoyment.	
	CP4	I find the live stream entertaining, regardless of whether I make a purchase.	
User Experience	UE1	The platform makes it easy to watch and interact with live streams.	Chiu (2023)
	UE2	I can find what I am looking for during the live stream with little effort.	
	UE3	The live stream quality (e.g., video, sound) enhances my shopping experience.	
	UE4	Navigating through the live stream features feels intuitive.	
Impulse Purchase Intention	IPI1	I am likely to make an unplanned purchase during a live stream.	Lyu (2021)
	IPI2	The limited-time offers in live streams make me want to buy immediately.	
	IPI3	I feel tempted to buy products during live streams, even when I do not need them.	
	IPI4	Watching live streams increases my spontaneous purchasing behavior.	

The reliability and validity analysis in Table 3 shows that the Cronbach's α coefficient values of each variable are all higher than 0.8 (live interaction 0.898, consumer pleasure 0.892, user experience 0.887, impulse purchase intention 0.880), and the CITC values of all items are between 0.715 and 0.820, all exceeding the minimum threshold of 0.5. It is worth noting that the α value of the dimension after deleting any item does not exceed the reliability index of the original dimension. For example, when LSI4 is deleted from the live interaction dimension, the α value drops from 0.898 to 0.882, indicating that the existing item combination has achieved the optimal internal consistency. This result verifies the reliability of the measurement tool and meets the analysis requirements of the structural equation model.

Table 2 Demographic characteristics of the sample

Variable	Category	Frequency	Percentage
Gender	Male	126	47.01%
	Female	142	52.99%
Age	18-20 years old	70	26.12%
	21-40 years old	169	63.06%
	41-60 years old	26	9.70%
	Over 60 years old	3	1.12%
Monthly income	3,000 yuan and below	119	44.40%
	3000-5000 yuan	107	39.93%
	5,000-10,000 yuan	34	12.69%
	10,000 yuan and above	8	2.99%

Table 3 Reliability analysis of measurement scales

Dimension	Item Code	CITC	Cronbach's a after deleting the question item	Cronbach's α
Live Streaming Interaction	LSI1	0.768	0.870	0.898
	LSI2	0.805	0.856	
	LSI3	0.783	0.865	
	LSI4	0.736	0.882	
Consumer Pleasure	CP1	0.802	0.847	0.892
	CP2	0.743	0.869	
	CP3	0.782	0.854	
	CP4	0.729	0.874	
User Experience	UE1	0.727	0.864	0.887
	UE2	0.749	0.856	
	UE3	0.820	0.828	
	UE4	0.715	0.869	
Impulse Purchase Intention	IPI1	0.716	0.855	0.880
	IPI2	0.752	0.841	
	IPI3	0.723	0.852	
	IPI4	0.769	0.835	

Table 4 Model fit indices

Indicators	CMIN/DF	RMSEA	GFI	AGFI	CFI	RMR
Value	0.872	0.000	0.974	0.959	1.000	0.030
Criterion	≤ 3	≤ 0.05	≥ 0.95	≥ 0.90	≥ 0.95	≤ 0.07
Reference	Kline (1998)	MacCallum et al. (1996)	Kline (2005)	Tabachnick & Fidell (2007)	Hu & Bentler (1999)	Steiger (2007)

The model fit index analysis in Table 4 shows that all indicators meet or exceed the recommended standards of the academic community: CMIN/DF=0.872 ($\leq$3), RMSEA=0.000 ($\leq$0.05), GFI=0.974 ($\geq$0.95), AGFI=0.959 ($\geq$0.90), CFI=1.000 ($\geq$0.95), RMR=0.030 ($\leq$0.07). Among them, RMSEA is a perfect fit value, and CFI reaches the theoretical maximum value of 1, indicating that the model fits the observed data well and fully meets the fitness requirements of the structural equation model.

According to the convergent validity analysis in Table 5, the standardized factor loadings of all latent variables exceeded the recommended threshold of 0.7 (LSI: 0.783-0.871; CP: 0.779-0.870; UE: 0.767-0.897; IPI: 0.776-0.836), which meets the measurement requirements of Hair et al. (2019). In terms of composite reliability (CR), the CR values of all constructs were significantly higher than the minimum standard of 0.8 (LSI = 0.899; CP = 0.893; UE = 0.888; IPI = 0.880), indicating that the measurement tool has excellent internal consistency. The average variance extracted value (AVE) of each construct exceeded the benchmark of 0.5 (LSI = 0.689; CP = 0.677; UE = 0.666; IPI = 0.648), which fully met the convergent validity requirements (Fornell & Larcker, 1981). This shows that the measurement model can effectively explain the relationship between the latent variables and their observed indicators.

Table 5 Convergent validity analysis

			Unstandardized estimates	Standardized estimates	CR	AVE
LSI.	→	LSI4	1.000	0.783		
LSI.	→	LSI3	1.066	0.843	0.899	0.689
LSI.	→	LSI2	1.121	0.871		
LSI.	→	LSI1	1.079	0.821		
CP.	→	CP4	1.000	0.779		
CP.	→	CP3	1.141	0.840	0.893	0.677
CP.	→	CP2	1.006	0.798		
CP.	→	CP1	1.263	0.870		
UE.	→	UE4	1.000	0.767		
UE.	→	UE3	1.152	0.897	0.888	0.666
UE.	→	UE2	1.002	0.810		
UE.	→	UE1	1.002	0.785		
IPI.	→	IPI4	1.000	0.836		
IPI.	→	IPI3	0.950	0.786	0.880	0.648
IPI.	→	IPI2	1.021	0.821		
IPI.	→	IPI1	0.955	0.776		

Note: Annotation: LSI is Live Streaming Interaction; CP is Consumer Pleasure; UE is User Experience; IPI is Impulse Purchase Intention.

According to the Fornell-Larcker criterion, the discriminant validity test in Table 6 shows that the AVE square root (bold diagonal value) of each latent variable is significantly greater than its correlation coefficient with other variables (lower triangle value). For example, the AVE square root of LSI is 0.830, which is much higher than its correlation coefficient with CP (0.292), UE (0.246) and IPI (0.332). All variables meet this criterion (CP = 0.823 > 0.327; UE = 0.816 > 0.230; IPI = 0.805 > 0.332), indicating that the measurement model has good discriminant validity. In addition, the correlation coefficients between variables are between 0.161 and 0.332 (all p < 0.05), showing a medium to low correlation strength, which not only verifies the theoretical association but also avoids the problem of multicollinearity (Hair et al., 2019).

Table 6 Discriminant validity analysis (Fornell-Larcker Criterion)

|	LSI	CP	UE	IPI
LSI	**0.830**			
CP	0.292***	**0.823**		
UE	0.246***	0.161*	**0.816**	
IPI	0.332***	0.327***	0.230**	**0.805**

Note: *** p < 0.001, ** p < 0.01, * p < 0.05, the value on the diagonal represents the root mean square of AVE, and the correlation coefficients between variables are below the diagonal.

According to the path analysis results in Table 7 and the path analysis diagram in Figure 2, live interaction has a significant positive impact on impulse purchase intention (H1) (β = 0.258, C.R. = 3.711), indicating that for every 1 standard deviation increase in live interaction, impulse purchase intention will increase by 25.8%, verifying the direct stimulating effect of real-time interactive functions on consumer behavior; at the same time, the path coefficient of live interaction that significantly positively affects consumer pleasure (H2) is 0.293 (C.R. = 4.263), and its explained variance increment ΔR^2 is 8.58%, confirming the mechanism of "interaction strengthens emotional involvement" in social presence theory. The standardized effect of consumer pleasure on impulse purchase intention (H3) is 0.251 (C.R. = 3.608), and the unstandardized coefficient shows that for every 1 unit increase in consumer pleasure, the probability of impulse purchase increases by 34.6%, revealing the key role of the emotion-behavior conversion mechanism in irrational consumption. On the theoretical level, the total effect of the "interaction → fun → impulse consumption" transmission chain constructed by the three paths reached 0.332 (direct effect 0.258 + indirect effect 0.0736), of which the entertainment experience undertook a mediating effect of 54.3%, which provided empirical support for the application of S-O-R theory in live e-commerce scenarios and highlighted the core role of emotional factors in the new consumption model.

Table 7 Results of path analysis for hypotheses testing

Hypothesis	Path	Std.	Unstd.	S.E.	C.R.	P	Result
H1	LSI→IPI	0.258	0.250	0.067	3.711	***	Accepted
H2	LSI→CP	0.293	0.206	0.048	4.263	***	Accepted
H3	CP→IPI	0.251	0.346	0.096	3.608	***	Accepted
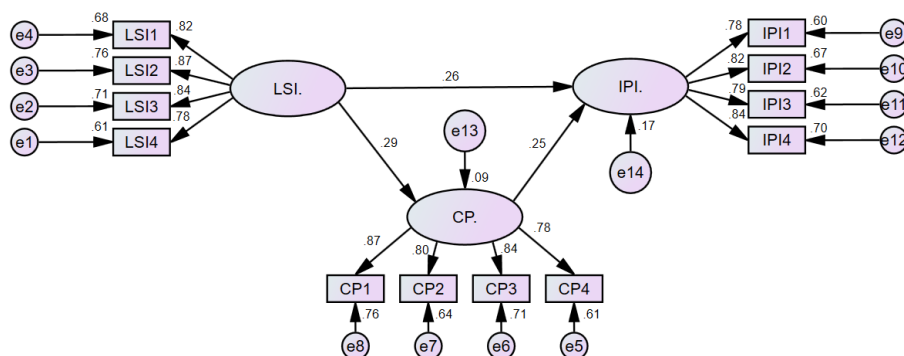
Figure 2 Structural path diagram of the hypotheses

The mediation effect analysis in Table 8 shows that there are significant dual paths for the impact of live streaming interaction (LSI) on impulse purchase intention (IPI): direct effect (β=0.2186, p=0.0001) and indirect effect through consumer pleasure (CP) (β = 0.0569, Bootstrap 95% CI = [0.0185, 0.1098]). The total effect is 0.2755 (p < 0.001), of which the indirect effect accounts for 20.7% (0.0569/0.2755), indicating that live streaming interaction not only directly stimulates impulse consumption (for every 1 unit increase in interactivity, the purchase intention increases by 21.86%), but also generates an additional 5.69% indirect drive by enhancing consumer pleasure experience (path LSI→CP→IPI). The direct effect confidence interval [0.109, 0.3281] and the indirect effect interval do not contain zero, which verifies the partial mediating effect of consumer pleasure. Hypothesis 4 is established, which is consistent with the chain conduction mechanism of "stimulus-body-response" in S-O-R theory.

Table 8 Mediation effect analysis

	Effect	se	t	p	LLCI	ULCI
Direct effect	0.2186	0.0557	3.9267	0.0001	0.1090	0.3281
Indirect effect LSI→CP→IPI	0.0569	0.0234			0.0185	0.1098
Total effect	0.2755	0.0552	4.9932	0.0000	0.1668	0.3841

Hypothesis H5 (user experience has a moderating effect between consumer pleasure and impulse purchase intention) was verified by the moderating effect analysis in Table 9 (PROCESS model 14). Specifically, the interaction term between consumer pleasure (CP) and user experience (UE) has a significant explanatory power for impulse purchase intention (IPI) (R^2 change = 1.89%, F = 6.0032, p = 0.0149). Simple slope analysis (shown in the three-line graph in Figure 3) further revealed that: at low consumer pleasure levels (M-1SD), the moderating effect of user experience was not significant (β = 0.1330, p = 0.1709); at medium and high pleasure levels (mean and above), the positive moderating effect of user experience was significantly enhanced (β mean = 0.2986, p < 0.001; β high = 0.4642, p < 0.001), and the moderating effect strength of the high CP group (Δβ = 0.4642) was 3.49 times that of the low CP group (Δβ = 0.1330). This result shows that the optimization of user experience significantly enhances the driving effect of consumer pleasure on impulse buying intention (H5 is established), especially when consumers are immersed in highly entertaining live broadcasts, smooth interface design and functional experience (such as clear picture quality and instant interaction) can further trigger the emotion-cognitive synergy mechanism, prompting consumers to make irrational purchasing decisions faster (Cohen's f^2=0.043, a small to medium effect size).

Table 9 Moderation effect analysis

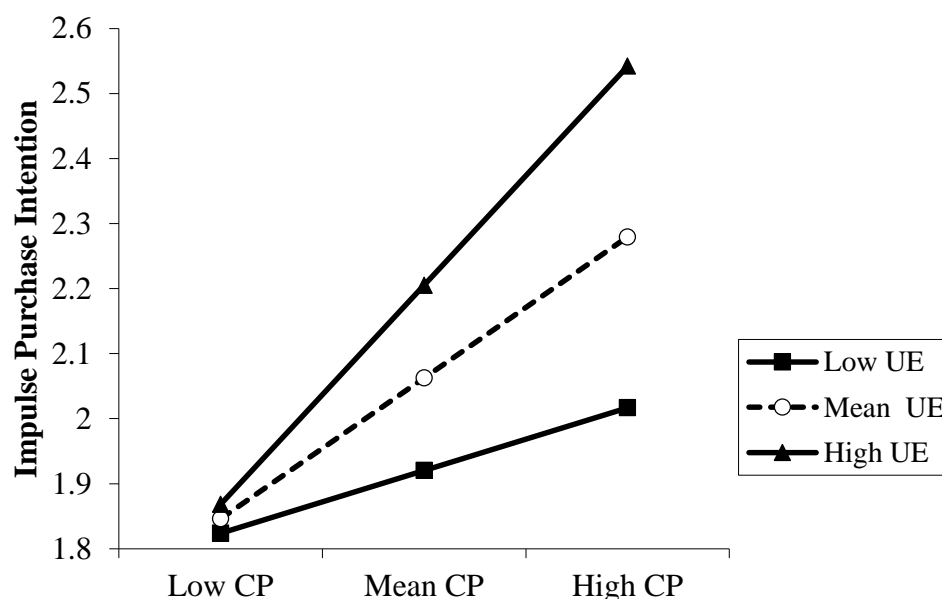|	R^2-change	F	df1	df2	p
CP*UE	0.0189	6.0032	1.0000	263.0000	0.0149
Condition effect of the focal predictor at value of the moderator(s):					
CP	Effect	se	t	p	LLCI	ULCI
Low	0.1330	0.0969	1.3730	0.1709	-0.0577	0.3237
Medium	0.2986	0.0759	3.9331	0.0001	0.1491	0.4480
High	0.4642	0.1062	4.3703	0.0000	0.2550	0.6733

Figure 3 Simple slope analysis of the moderation effect

Research findings

This study analyzed the relationships between live streaming interaction, consumer pleasure, user experience, and impulse purchase intention through structural equation modeling (SEM). The results support the hypotheses, showing that live streaming interaction significantly influences consumers' impulse purchase intention, both directly and indirectly through consumer pleasure.

First, Hypothesis 1 (H1) confirmed that live streaming interaction has a significant positive impact on impulse purchase intention. Factors like real-time interaction and immediate feedback during live streams enhance consumers' emotional engagement, leading to impulsive purchasing behavior.

Second, Hypothesis 2 (H2) verified that live streaming interaction significantly influences consumer pleasure. The high level of interactivity and immersion in live streams increases consumer enjoyment and engagement, making the viewing experience more enjoyable.

Hypothesis 3 (H3) further indicated that consumer pleasure has a significant positive effect on impulse purchase intention. The enjoyment experienced during the shopping process enhances the consumer's impulse to purchase, especially in the highly immersive environment of live streaming, where pleasure becomes a key driver of purchasing behavior.

Hypothesis 4 (H4) was confirmed through mediation analysis, showing that consumer pleasure mediates the relationship between live streaming interaction and impulse purchase intention. The results indicate that live streaming interaction indirectly influences impulse purchase intention by enhancing consumer pleasure.

Lastly, Hypothesis 5 (H5) demonstrated that user experience significantly moderates the relationship between consumer pleasure and impulse purchase intention. When the level of user experience is high, the impact of consumer pleasure on impulse purchase intention is strongest. Conversely, at low levels of user experience, the effect of pleasure on impulse purchase intention is weaker or non-significant.

In conclusion, the research findings suggest that the interactivity and entertainment of live-streaming e-commerce not only directly influence impulse purchase intention but also strengthen this effect through the mediation of consumer pleasure and the moderation of user experience.

Discussion

This study investigated the relationships among live streaming interaction, consumer pleasure, user experience, and impulse purchase intention in the context of live-streaming e-commerce. The findings provide empirical support for all hypothesized relationships and

offer theoretical and practical insights into consumer behavior within this emerging shopping format.

First, the significant positive effect of live streaming interaction on impulse purchase intention (H1) underscores the persuasive power of real-time engagement. This finding supports previous research (e. g. , Cui et al. , 2022) that emphasizes the role of interactivity in driving impulsive consumption. The immediacy and social presence of live streaming foster a sense of urgency and emotional involvement, making consumers more responsive to situational cues. These results also expand upon existing literature by demonstrating that interactive environments can create decision-making contexts where impulsive behavior is more likely.

Second, live streaming interaction was found to significantly enhance consumer pleasure (H2). This aligns with studies such as Chen et al. (2022), which highlight that emotional engagement and entertainment value are key drivers of consumer enjoyment in live-streaming contexts. Our findings suggest that interactive features not only facilitate product information exchange but also create a hedonic experience that keeps consumers entertained and emotionally engaged. This dual function of live streaming—informational and experiential—may explain its growing popularity in digital commerce.

The link between consumer pleasure and impulse purchase intention (H3) further supports the role of emotional states in shaping consumer behavior. As demonstrated in prior studies (e. g., Liapati et al., 2015), pleasure serves as an affective trigger that lowers consumers' self-control, leading to spontaneous purchases. Our results reaffirm this pathway within the specific environment of live-streaming e-commerce, where emotional stimulation is often heightened through visual appeal, dynamic presentations, and social interaction.

Importantly, consumer pleasure was found to mediate the relationship between live streaming interaction and impulse purchase intention (H4) , consistent with Koufaris (2002) findings on flow experiences. This mediation highlights a psychological mechanism through which interactive experiences translate into behavioral outcomes. It implies that marketers should not only focus on functional aspects of live streaming but also invest in enhancing the entertainment and enjoyment factors that generate positive emotions and, in turn, encourage purchases.

Finally, user experience moderated the relationship between consumer pleasure and impulse purchase intention (H5) . When user experience was high, the impact of pleasure on impulse buying was stronger. This suggests that a seamless, satisfying user interface enhances the emotional effect of pleasure, making consumers more likely to act on their impulses. Conversely, a poor user experience can interrupt this emotional-behavioral link. This finding extends previous research by introducing user experience as a contextual enhancer that amplifies the effects of emotional drivers in online shopping.

Conclusion

This study examined the complex relationships among live streaming interaction, consumer pleasure, user experience, and impulse purchase intention within the context of live-streaming e-commerce. Through structural equation modeling (SEM) , the findings confirmed that live streaming interaction directly promotes impulse purchase intention and indirectly influences it through the mediating role of consumer pleasure. Furthermore, user experience was shown to moderate the relationship between consumer pleasure and impulse purchase intention.

These results provide a more nuanced understanding of the psychological and experiential factors that drive impulse buying behavior in live-streaming environments. The study contributes to the growing literature by highlighting that live streaming is not only a transactional platform but also an emotional and interactive space where real-time engagement and user satisfaction jointly shape consumer behavior.

Recommendations

To ensure actionable and evidence-based guidance, the following recommendations are logically derived from the study's validated findings.

1. Theoretical implications

The study confirms that live streaming interaction, consumer pleasure, and user experience significantly influence impulse purchase intention. Building on this framework, future research could incorporate additional variables such as perceived scarcity, streamer credibility, or consumer trust to examine more nuanced psychological

pathways influencing impulsive behavior. These variables may act as additional mediators or moderators and provide a deeper understanding of live-streaming consumer dynamics.

Additionally, it is recommended that scholars conduct cross- cultural studies to assess the generalizability of these findings in different socio-economic and cultural environments. Cultural differences in online shopping behavior, emotional expression, or platform usage could significantly alter the impact of interaction and pleasure on purchase intentions. Such comparative studies would enhance the external validity and theoretical applicability of the current model.

Finally, longitudinal research should be conducted to assess whether the observed effects persist over time or change as consumers become more experienced with live-streaming e-commerce. This would help determine if the emotional and interactive drivers of impulse buying are short-lived or if they can establish longer-term behavioral patterns.

2. Policy recommendations

The findings of this study highlight how emotional engagement and platform interactivity influence consumer behavior, which raises important implications for public policy and platform regulation. Governments and regulatory agencies should consider establishing more rigorous consumer protection measures in the live-streaming commerce sector. These could include mandatory disclosures, clearer refund policies, and real-time content monitoring to reduce the risk of deceptive marketing, especially in emotionally charged buying environments.

In addition, public policy should support the development of small and medium- sized enterprises (SMEs) by providing subsidies, digital infrastructure, or educational resources to enable broader participation in the live- streaming economy. This will not only promote innovation and market competition but also ensure that smaller retailers can benefit from the impulse- driven nature of this format.

Furthermore, policymakers should encourage platforms to prioritize user experience enhancements. Government- backed digital economy initiatives could incentivize improvements in interface design, accessibility standards, and consumer feedback mechanisms, all of which play a role in shaping consumer

emotion and behavior in online shopping contexts.

3. Managerial and practical recommendations

From a business perspective, the results offer several actionable strategies for firms seeking to capitalize on the emotional and interactive characteristics of live-streaming e-commerce. First, firms should strengthen real- time interactivity by incorporating features such as live comment displays, on-screen shoutouts, interactive games, or limited- time offers. These elements create urgency and a sense of community, both of which are known to elevate emotional engagement and impulsive buying behavior.

Second, businesses should deliberately design live-stream content that maximizes consumer pleasure. This includes using charismatic hosts, entertaining storytelling, and dynamic visual effects to evoke positive emotional responses. The pleasurable experiences generated through such content not only enhance consumer satisfaction but also serve as psychological triggers for impulse purchases.

Third, user experience must be treated as a strategic priority. Firms should invest in optimizing the usability and technical quality of their platforms, including fast-loading interfaces, intuitive navigation, and clear visual layouts. A seamless user experience amplifies the effect of emotional pleasure on consumer decision- making, acting as a critical moderator in the purchase process.

Lastly, marketers should leverage personalization technologies to tailor live- streaming experiences to individual consumer preferences. Data-driven recommendations, customized greetings, and segmented promotions can create a sense of personal relevance, enhancing emotional resonance and increasing the likelihood of spontaneous purchases.

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