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An Empirical Study on the Influencing Factors of Consumers' Impulsive Consumption Behavior in Live-streaming Commerce

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Abstract. This study examines the factors influencing consumers' impulsive consumption behavior in live-streaming e-commerce and their underlying mechanisms. By integrating intra-sale and post-sale dimensions into an analytical framework, it investigates the direct impacts of platform performance, return policy, and switch barrier on impulsive consumption, alongside the mediating roles of perceived risks and flow experience, and the moderating effect of optimal stimulation level (OLS). Using PLS-SEM analysis of 522 Chinese consumer questionnaires, the findings reveal that platform performance exerts the strongest positive influence, followed by return policy and switch barrier. Notably, OLS significantly enhances all three pathways, particularly amplifying the impact of return policy. Theoretically, this work addresses gaps in live-streaming impulsive consumption research by unifying pre- and post-purchase factors, while practically offering actionable insights for merchants to optimize interactive designs, tailor return policies, and reduce switching costs. Limitations include regional sample biases and exclusion of pre-sale dynamics, suggesting avenues for cross-cultural or experimental expansions.

Keywords: Live-streaming e-commerce, Impulsive consumption, Platform performance, Return policy, Optimal stimulation level (OLS).

1. Introduction

China's e-commerce ecosystem is shifting from the traditional shelf model to social live-streaming e-commerce. By December 2024, the market size of live-streaming retail had reached 4.3 trillion yuan, with a compound annual growth rate of 82.6% from 2019 to 2024, and its transaction volume as a share of total online retail sales jumped from 4.9% in 2019 to 37.8% in 2023. However, the industry's rapid growth is bringing it closer to a perfectly competitive market structure (Samuelson, 2010), manifested by a stock of tens of millions of merchants, high transparency of product information, and homogenization of operation models, which leads to higher costs for merchants to acquire customers. In this context, it is of great practical significance to explore the driving mechanism of impulsive consumption in the live-streaming scenario.

Existing studies have analyzed the impact of live streaming on impulsive consumption from four dimensions: live room interactivity , consumer presence , host characteristics (Lu et al., 2021), and live-streaming platform performance (Zhou et al., 2019). However, existing studies have mostly focused on offline retail and traditional e-commerce scenarios, with relatively scarce discussions on live-streaming e-commerce. They have mainly focused on the mechanism of the sales process, rarely touched upon the stimulating effect of post-sale factors on impulsive consumption, and ignored the heterogeneous impact of individual consumer preference differences on live-streaming effects.

To fill the gap, this study empirically examines the driving effects of platform performance, return policy, and switch barrier on impulsive consumption in live-streaming scenarios, and discusses the mediating role of flow and perceived risks. Further, the level of optimal stimulation level (OLS) was introduced as a moderating variable to reveal the moderating mechanism of individual consumer preference heterogeneity in impulsive behavior.

This study achieves theoretical breakthroughs in three aspects: First, it constructs an integrated analysis framework covering both in-sale and after-sale links, extending the research conclusions on satisfaction and switch barrier of return policy in the traditional retail sector (Powers et al., 2013) to the live-streaming scenario to verify their positive stimulating effect on impulsive consumption;

Second, through a multipath model, we revealed the differential effects of platform performance, return policy, and switch barrier on impulsive consumption via flow (Zhou, 2019) and perceived risks (Chen et al., 2024); Third, the concept of optimal stimulation level (OLS) was introduced to confirm the moderating effect of consumer preference heterogeneity on live-streaming stimulus, complementing the theoretical limitations of existing studies that regarded consumers as homogeneous groups and providing a theoretical basis at the individual difference level for precision marketing in live-streaming e-commerce.

2. Literature review and hypotheses

Platform performance refers to the interaction effect between the host, the product, other consumers, and the target consumers in the live-streaming scenario, which has a significant driving effect on impulsive consumption. The pathways of its effect include: hosts create a high sense of social presence through real-time audio and video interaction, reduce consumers' psychological defense and stimulate pleasant emotions (Lu et al., 2016); Strengthening the psychological connection of consumers through dynamic display of product usage scenarios, triggering sensory stimulation and immediate possessiveness (Vonkeman et al., 2017); The simultaneous viewing experience constructed by the bullet-screen system enhances the perception of existence among viewers, creates group emotional contagion and drives immediate decision-making. To sum up, platform performance stimulates impulsive consumption by strengthening emotional involvement and weakening rational assessment (Kang et al., 2020; Shiv et al., 1999). Therefore, the hypothesis is proposed:

H1: Platform performance positively drives consumers to make impulsive consumption.

Switch barrier refer to the time, effort, and opportunity costs that consumers have to bear to switch live-streaming merchants. High switch barrier strengthen consumers' path dependence on familiar merchants by restricting their comparison behavior with alternative merchants. When familiar with the products and services of a merchant meeting expectations, consumers are more likely to buy directly rather than continue searching, thereby increasing the probability of impulsive consumption. So the hypothesis is put forward:

H2: Switch barrier positively drive consumers' impulsive consumption behavior.

The return policy reflects the leniency of the merchant's return conditions and the perceived risks of consumers on them. Lenient policies have a psychological boosting effect by reducing purchase perceived risks and decision-making uncertainty, eliminating consumers' concerns about high-value or experiential goods (Dhar et al., 2000). Therefore, the hypothesis is put forward:

H3: The return policy is driving consumers to make impulsive consumption.

2.1 Indirect Effects

The mechanism by which platform performance, return policies, and switch barrier play a role in impulsive consumption remains to be explored. This study introduces perceived risks and flow as mediating variables to explain the transmission pathways of these explanatory variables to impulsive consumption.

Perceived risks refers to a consumer's subjective assessment of the potential negative consequences of a purchase, reflecting their level of concern about transaction risk. Existing research has confirmed that online shopping perceived risks can directly suppress consumption behavior (Almousa, 2011). In live-streaming scenarios, host interaction, product display, and the atmosphere among consumers can promote impulsive consumption by reducing psychological risk (Almousa, 2011), product risk, and performance risk perception; A lenient return policy reduces product and psychological risk perception by alleviating concerns about product quality and fit; High switch barrier, on the other hand, drive impulsive consumption by reducing the time cost and product uncertainty for consumers to switch businesses and lowering their perception of decision-making risks. The hypothesis is based on this:

H4: Perceived risks affects impulsive consumption through negative transmission

H4a: Platform performance promotes impulsive consumption by reducing perceived risks

H4b: Switch barrier promotes impulsive consumption by reducing perceived risks

H4c: Return policy promotes impulsive consumption by reducing perceived risks

Flow refers to the state of "lost sense of time, high concentration and pleasant experience" that occurs when an individual is fully engaged in an activity. In live-streaming commerce, flow drives impulsive consumption by enhancing user engagement and willingness to continue using (Hoffman et al., 2009; Liu et al., 2016). Platform performance enhances flow by creating an immersive atmosphere through streamer guidance, product presentation, and audience interaction to stimulate positive emotions and shopping experiences (Kang, 2020); The lenient return policy alleviates purchase concerns through after-sales guarantees and strengthens the positive mood and flow experience; High switch barrier prompt consumers to focus on familiar merchants, and past success experiences give rise to pleasure and trust, which also boosts flow levels. Based on this hypothesis:

H5: The flow experience influences impulsive consumption through positive conduction

H5a: Platform performance promotes impulsive consumption by boosting flow

H5b: Switch barrier promotes impulsive consumption by boosting flow

H5c: Return policy promotes impulsive consumption by boosting flow

2.2 Moderating effect

The optimal stimulation level (OLS) theory states that an individual has an ideal stimulation threshold at which they can obtain maximum pleasure. High OLS consumers are more sensitive to novel marketing stimuli, such as live-streaming interactions, and are more likely to immerse themselves in the atmosphere of the live-streaming room; Low OLS consumers, on the other hand, are more concerned with price deals and practicality and have less interest in socialized shopping forms. In addition, high OLS consumers are more active in complex interaction scenarios, while low OLS consumers prefer a simple and smooth shopping experience.

In this study, OLS was introduced into the model as a moderating variable to explore its heterogeneous effect on impulsive consumption. Specifically, high OLS consumers are more inclined to pursue novel experiences, and when the platform performance matches their stimulus preferences, their impulsive consumption intentions are significantly enhanced; At the same time, lenient return policies can further reduce their decision-making concerns and strengthen the tendency to make impulsive consumption. In addition, high OLS consumers' preference for familiar businesses has a synergistic effect with switch barrier—high switch barrier drive impulsive consumption by locking in their focus. Based on this, the hypothesis is proposed:

H6a: The positive moderating platform performance of the optimal stimulation level promotes impulsive consumption

H6b: The optimal stimulation level positively moderates the effect of switch barrier on impulsive consumption

H6c: The optimal stimulation level positively moderates the effect of return policies on impulsive consumption

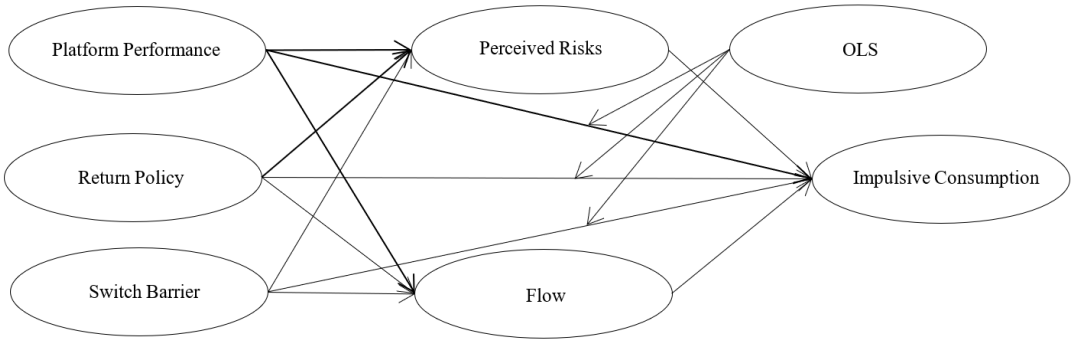

Figure 1.The research framework of Impulsive Consumption

3. Data and Methods

3.1 Sample and Data collection

The study was conducted in China in April 2024, covering first-tier cities such as Beijing, Shenzhen, Guangzhou and Shanghai, as well as some second - and third-tier cities, to ensure the diversity of sample income, education and cultural background. The respondents spanned the entire age range from under 18 to over 50 years old, all of whom had live-streaming shopping experience. The study recruited 30 users through wechat for a pre-survey to assess the logical coherence, clarity of expression and relevance of the questionnaire, and to optimize the ambiguous or repetitive items based on the feedback, and finally formed the formal questionnaire.

The formal survey was conducted through the Wenjuanxing platform, with age and gender quotas set according to the city's development level, and a reward of 5 yuan was paid for each qualified questionnaire. After data collection, invalid questionnaires with repeated responses, missing answers, five consecutive questions with the same option, and responses lasting less than 2 minutes were excluded, resulting in a total of 522 valid samples. The characteristics of the sample showed that the male-to-female ratio was about 2:3, nearly 57% were married, more than 60% had a bachelor's degree or above, and the monthly income was concentrated in the range of 5,000 to 7,999 yuan.

Table 1: Respondents' demographics attributes

Characterise	Demographic	Freqeuncy	Percentage(%)
Gender	Male	220	42.15
	female	302	57.85
Marital Status	Married	297	56.90
	Single	225	43.10
Age(years)	20 and blow	62	11.88
	20-29	204	39.08
	30-39	128	24.52
	40-49	105	20.11
	51 and above	23	4.41
Educational	Junior high or below	7	1.34
	Senior high	27	5.17
	Associate degree	156	29.89
	Bachelor degree	265	50.77
	Master degree	52	9.96
	PH.D. degree	15	2.87
Income(monthly)	Less than 3000($410)	80	15.33
	￥3000($410)-￥4999($684)	66	12.64
	￥5000($684)-￥5999($821)	156	29.89
	￥6000($821)-￥7999($1,095)	133	25.48
	More than ￥8000($1,095)	87	16.67
City	First-tier city	326	62.45
	Second-tier city	118	22.61
	Lower-tier cities	78	14.94
Job	Currently enrolled	81	15.52
	Employed	407	77.97
	Else	34	6.51
LCUT	Less than one year	55	10.54
	1-2 years	150	28.74
	2-3 years	221	42.34
	Four years or more	96	18.39
LCUF	Once a week	150	28.74

	2-4 times a week	179	34.29
	5-6 times a week	132	25.29
	6 times a week or more	61	11.69
Total		522	100.00

LCUT: Live Commerce Usage Tenure; LCUF: Live Commerce Usage Frequency

3.2 Research Methods

The questionnaire consists of two parts. The first part is used to count the demographic characteristics of live-streaming commerce users, and the second part is used to describe platform performance, switch barrier, return policy, optimal stimulation level (OLS), flow, perceived risks, impulsive consumption, and other structures of the model.

The research project was based on the original maturity scale and modified appropriately according to the specific circumstances. Platform performance items were adapted from (Ma et al., 2020), switch barrier was based on (Powers et al.,2022), return policy was referenced from (Ma et al., 2020), and optimal stimulation level (OLS) were based on (Richard et al., 2016). Flow originated from (Algharabat et al., 2020), perceived risks referred to (Zhang et al., 2023), impulsive consumption borrowed (Zhang et al., 2023). Each item was quantified using a Likert scale to assess the respondents' feelings about the question, ranging from "1" indicating strong disagreement to "5" indicating strong agreement.

3.3 Analytical Techniques

The data analysis mainly adopts the partial least squares structural equation model (PLS-SEM). The reasons for adopting this model are as follows: Firstly, the model used in this study has a total of three independent variables, two mediating variables, one moderating variable and one dependent variable, and its structure is relatively complex. PLS-SEM is suitable for dealing with such complex models that involve mediation and adjustment. PLS-SEM is the preferred and superior method for addressing mediation and moderation models by Sarstedt et al.(2020). Secondly, PLS-SEM has low requirements for data, and its algorithm can transform multivariate non-normally distributed data . Thirdly, PLS-SEM has high statistical performance and can handle the increasing computational load as research progresses while ensuring the accuracy and efficiency of the results (Hair et al.,2019). In this study, SmartPLs version 4.0 was used to test the model, and bootstrap resampling was used to test statistical significance, with the resampling set at 5000.

4. Data analysis and results

4.1 Common method tests and descriptive statistics

We conducted the common method variance (CMV) test using Harman's univariate test (Schwarz et al., 2017). The results showed that 33.5% of the total variance in factor analysis was explained by the first factor, well below the 50% threshold (Harman, 1967). In addition, no significant correlation was shown in Table 2. These results indicate that the CMV test has passed.

Descriptive statistics of the sample showed that the mean of the platform performance was 3.34 (SD=1.15), respondents evaluated moderately above average, but there were significant individual differences; The average return policy was 3.41 (SD=1.15), with slightly higher consumer satisfaction but significant divergence of opinion; Switch barrier (SD=1.16) converged with optimal stimulation level (OLS) (SD=1.16), indicating that consumers' evaluations of the merchant lock-in effect were close to their preference for stimulus. The mean perceived risks was the lowest (SD=1.27), indicating a lower overall level of concern but higher data dispersion; The mean flow experience was 3.29 (SD=1.20), indicating widespread shopping immersion and significant individual differences in experience. The average impulsive consumption propensity was 3.38 (SD=1.18), slightly higher than the flow experience, indicating moderate impulsiveness in the shopping decisions of respondents. Overall, the mean values of all variables were concentrated in the range of 3.0 to 3.4, which was at a

medium level, but the standard deviations were all greater than 1.15, indicating significant heterogeneity in respondents' attitudes.

4.2 Measurement Model

The study used Cronbach's α and composite reliability (CR) as metrics when constructing the reliability and validity model. Table 2 shows that both Cronbach's α and CR are above the threshold of 0.7, indicating good internal consistency of the scale.

Convergence refers to whether a measurement item shows the same structure when it constitutes each variable, using AVE and Standard. It was evaluated by Loadings . The results showed that Standard Loadings for all items were greater than 0.7 to meet the requirements, and all AVE values were greater than 0.5, indicating that the samples had sufficient convergent validity.

Table 2: Reliability and validity tests of the constructs

Constructs	VIF	Items	Standard Loadings	Cronbach's Alpha.	CR	AVE
PP	2.238	The host's interactions made the live stream engaging.	0.804	0.930	0.931	0.642
	2.223	You felt a human connection during live interactions.	0.796			
	2.091	The host-audience interaction made me feel warmth.	0.778			
	2.311	Many viewers showed interest in the promoted products..	0.803			
	2.401	Many viewers purchased products in the live room.	0.814			
	2.193	Many viewers shared information about the live room.	0.799			
OSL	2.332	I could imagine myself using the showcased products.	0.805	0.863	0.866	0.708
	2.393	I could observe the actual usage effects of the products.	0.813			
	2.317	The live room effectively displayed product information I needed.	0.803			
	2.055	I like to experience novelty and change in my daily life.	0.854			
	1.972	I prefer jobs with variety, diversity, and travel.	0.828			
	2.099	I enjoy constantly changing activities.	0.845			
	2.089	When bored, I seek novel experiences.	0.840			
RP	1.717	I am familiar with the return policy of my primary platform.	0.844	0.824	0.824	0.740
	2.002	I am satisfied with the return policy of my primary live-streaming platform.	0.870			

	1.936	The return policy of my primary platform is better than competitors'.	0.867			
	1.959	Generally, switching to a different live-streaming merchant is troublesome.	0.838			
SB	1.938	Finding a new trustworthy live-streaming merchant demands significant effort.	0.824	0.859	0.861	0.703
	1.946	Adapting to a new e-commerce platform requires time.	0.825			
	2.615	I often worry about product reliability (e.g., durability).	0.884			
	2.705	I worry about paying more than the product's actual value.	0.886			
PR				0.902	0.904	0.773
	2.542	I worry products may not meet expected performance.	0.869			
	2.543	I often worry about being deceived when purchasing.	0.878			
	1.929	When using this live-streaming e-commerce room, time seems to pass quickly.	0.862			
Flow	1.998	The live rooms I visited were interesting.	0.882	0.834	0.837	0.751
	1.884	I feel immersed in a world created by the network.	0.855			
	2.020	While browsing live-streaming sessions, I purchased unplanned items.	0.877			
IC	2.001	After live-streaming shopping, my spending exceeded the initial budget.	0.868	0.833	0.833	0.749
	1.792	I immediately purchase products I like in live rooms.	0.852			

Note(s): (1) PP is short of Platform Performance; (2)OSL is short of Optimal Stimulate Level; (3) RP is short of Return Policy; (4) SB is short of Switch Barrier; (5) PR is short of Perceived Risks; (6) IC is short of Impulsive Consumption

Source(s): Author's work

The method for determining validity was the HTMT method and the Fornell-Larcker criterion. As shown in Table 3, the correlation of each variable with the other variables is less than the square root of the periodic AVE value. Table 4 shows that the HTMT ratios for all variable combinations were all below 0.850. Therefore, all variables have good discriminant validity.

Table 3:Correlations and square roots of AVEs(Fornell-Larcker criterion)

	IC	PP	Flow	OLS	SB	RP	PR
IC	0.866						
PP	0.466	0.802					
Flow	0.465	0.489	0.867				

OLS	0.437	0.477	0.469	0.842			
SB	0.374	0.374	0.413	0.407	0.839		
RP	0.412	0.463	0.446	0.438	0.401	0.860	
PR	-0.310	-0.287	-0.331	-0.182	-0.289	-0.319	0.879

Note(s): The diagonal (italic) elements are the square roots of AVEs, and the off-diagonal elements are the correlations among constructs

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Source(s): Authors' work

Table 4:Heterotrait-Monotrait ratio (HTMT) and confidence interval

	IC	PP	Flow	OLS	SB	RP
PP	0.506 [0.425, 0.579]					
Flow	0.556 [0.447, 0.631]	0.553 [0.472, 0.628]				
OLS	0.556 [0.472, 0.635]	0.533 [0.451, 0.610]	0.551 [0.474, 0.627]			
SB	0.441 [0.354, 0.525]	0.417 [0.329, 0.499]	0.488 [0.402, 0.567]	0.472 [0.385, 0.555]		
RP	0.496 [0.408, 0.578]	0.528 [0.450, 0.602]	0.536 [0.453, 0.616]	0.518 [0.434, 0.598]	0.474 [0.387, 0.555]	
PR	0.357 [0.255, 0.453]	0.311 [0.209, 0.409]	0.381 [0.277, 0.476]	0.206 [0.102, 0.311]	0.326 [0.225, 0.423]	0.369 [0.266, 0.472]

Note(s): The italic elements are the correlations among constructs and the confidence interval of the value is in parentheses.

(1) PP is short of Platform Performance; (2)OSL is short of Optimal Stimulate Level; (3) RP is short of Return Policy; (4) SB is short of Switch Barrier; (5) PR is short of Perceived Risks; (6) IC is short of Impulsive Consumption

Source(s): Authors' work

4.3 Path relationship evaluation

The path test results, as shown in Table 5, are consistent with predictions. Platform performance ($\beta = 0.143$, $p = 0.002$), switch barrier ($\beta = 0.084$, $p = 0.042$), and return policy ($\beta = 0.099$, $p = 0.028$) have a positive impact on impulsive consumption. H1, H2, and H3 were validated. Additionally, flow ($\beta=0.173$, $p<0.001$) positively affects impulsive consumption, while perceived risks ($\beta=-0.115$, $p=0.002$) negatively influences impulsive consumption. H4, H5 were verified.

4.3 Mediating effects of risk perception and flow

Table 5 presents the direct, indirect and overall effects of platform performance, return policy and switch barrier on impulsive consumption. The study used Bootstrapping to verify the mediating mechanism (Streukens et al., 2016). Table 6 shows that all indirect path effects are significant, indicating that perceived risks and flow are effective mediators between explanatory variables and impulsive consumption.

Combined with Table 5, it can be seen that perceived risks play a negative mediating role, and platform performance, return policy, and switch barrier indirectly promote impulsive consumption by reducing perceived risks; Flow acts as a positive mediator, and the three directly reinforce impulsive consumption by enhancing the flow experience.

Path significance analysis showed that the direct effects of platform performance, return policy, and switch barrier were all less significant than the total effect, indicating that the mediating mechanism of perceived risks and flow played a central role in explaining variables, verifying H4a-H4c and H5a-H5c.

Table 5: The results of the mediating effect

	Specific indirect effect			Total indirect effect			Direct effect			Total effect		
Hypothese and paths	Beta.	T-value	Confidence intervals	Beta.	T-value	Confidence intervals	Beta.	T-value	Confidence intervals	Beta.	T-value	Confidence intervals
PP → PR → IC	0.016*	1.985	[0.003, 0.034]	0.069**	4.129	[0.038, 0.103]	0.143**	3.126	[0.054, 0.232]	0.212***	4.810	[0.124, 0.297]
PP → Flow → IC	0.053***	3.480	[0.025, 0.085]									
SB → PR → IC	0.018*	2.160	[0.005, 0.038]	0.055**	3.881	[0.029, 0.084]	0.084*	2.034	[0.003, 0.168]	0.139***	3.385	[0.059, 0.220]
SB →Flow → IC	0.036**	3.044	[0.015, 0.061]									
RP → PR → IC	0.022*	2.291	[0.006, 0.044]	0.060**	3.766	[0.032, 0.093]	0.099*	2.204	[0.011, 0.187]	0.159***	3.449	[0.068, 0.248]
RP →Flow → IC	0.038**	2.929	[0.015, 0.061]									

Note(s): *p < 0.05. **p < 0.01. ***p < 0.001

(1) PP is short of Platform Performance; (2) RP is short of Return Policy; (3) SB is short of Switch Barrier; (4) PR is short of Perceived Risks; (7) IC is short of Impulsive Consumption

Source(s): Authors' work

4.4 Moderating effects of optimal stimulus levels

We added the crossover term of the moderating variable and the corresponding independent variable to the original model to study the mechanism of the effect of the optimal stimulation level (OLS) on impulsive consumption. As shown in Table 6, the OLS enhances the impact of platform performance, switch barrier, and return policy on impulsive consumption. Among them, the OLS enhanced the effect of return policy on impulsive consumption the most (β=0.156, $p<0.001$). Secondly, it also had a certain degree of enhancement effect on the pathways of switch barrier to impulsive consumption (β=0.091, $p<0.05$). Finally, the OLS had a weaker effect on platform performance (β=0.074, $p<0.05$), which was less effective than the previous two. Therefore, the results support H6a, H6b, and H6c.

Table 6: The results of the moderating effect

Moderator variable	Interacting	Dependent variable	Beta.	p	Support
OLS	OLS*PP	IC	0.074^{*}	0.045	H6a is supported
OLS	OLS*SB	IC	0.091^{*}	0.019	H6b is supported
OLS	OLS*RP	IC	0.156^{***}	0.000	H6c is supported

Note(s): *p < 0.05, **p < 0.01, ***p < 0.001

(1) PP is short of Platform Performance; (2)OSL is short of Optimal Stimulate Level; (3) RP is short of Return Policy; (4) SB is short of Switch Barrier; (5) IC is short of Impulsive Consumption

Source(s): Authors' work

4.5 Predictive correlation

The study used cross-validated redundancy (Q^2) and determination coefficient (R^2) to evaluate predictive relevance. R^2 ranges from 0 to 1, with larger values indicating stronger explanatory power of the model , where < 0.3, 0.3-0.6, and > 0.6 correspond to weak, medium, and strong predictive power respectively (Schwarz et al., 2017). In the model, the R^2 value of PR is 0.147 (< 0.3), indicating a relatively weak explanatory power; The R^2 values for IC and Flow were 0.359 and 0.336 (0.3-0.6), respectively, indicating moderate explanatory power.

The auxiliary test used the Q^2 metric, with a value > 0 indicating acceptable prediction accuracy , and 0.02-0.15, 0.15-0.35, and > 0.35 corresponding to weak, moderate, and strong effects, respectively. In this model, the Q^2 values of IC and Flow were 0.310 and 0.326 respectively (> 0.15), indicating moderate-intensity predictive relevance; The Q^2 value of PR was 0.135 (> 0.02), indicating a weak predictive effect. The Q^2 test results were consistent with R^2, effectively verifying the predictive relevance between IC, Flow and PR (R^2 versus Q^2 results are shown in Table 7).

Table 7:Fit indices for the model in the study

Endogenous latent constructs	R^2	Q^2
IC	0.359	0.310
Flow	0.336	0.326
PR	0.147	0.135

Note(s):(1) PP is short of Platform Performance; (2) PR is short of Perceived Risks; (3) IC is short of Impulsive Consumption

Source(s): Authors' work

5. Discussion

The study found that platform performance, return policy, and switch barrier all significantly affect impulsive consumption behavior in live-streaming commerce, but there are differences in intensity and mechanism. Specifically, platform performance has the most prominent promoting effect, with its driving effect on immediate consumption decisions through real-time interactive experience being significantly stronger than the psychological suggestion of post-sale guarantee. This conclusion not only validates Zhang et al.'s (2022) study on the stimulation of consumption by live-streaming interaction, but further extends to prove that it is the primary stimulating factor. At the same time, this study extends the conclusion from the traditional retail sector (Powers, 2013) to the live streaming scenario, confirming that both return policy (impact intensity > switch barrier) and switch barrier constitute positive stimuli: a well-developed return guarantee promotes impulsive consumption through psychological comfort, while switch barrier intensifies impulsive consumption by shortening the decision-making cycle.

Further analysis shows that the above factors influence consumer behavior through two paths: perceived risks and flow, but in opposite directions - perceived risks generate a negative inhibitory

effect, while flow plays a positive driving role, and the mediating effect of the latter is stronger. This finding supports Zhou's (2019) conclusion on the mediating role of flow and complements the inhibitory function of perceived risks.

In addition, the optimal stimulation level (OLS) of consumers played an enhanced moderating role in all three pathways of influence, with different effects: the return policy was the most moderating because people with a high stimulus preference tended to try novelty products, while the generous return policy reduced their purchase concerns; Switch barrier came second, as stores that matched the consumer's stimulus threshold were more likely to trigger immediate purchases, and high switch barrier strengthened this binding effect, reducing the number of consumers changing shopping stores; The moderating effect of platform performance is relatively weak, possibly due to individual fit differences in the positive stimulation of presence and group effects.

6. Conclusions, significance and limitations

6.1 Conclusions

First, platform performance, return policy, and switch barrier are direct factors influencing impulsive consumption in live-streaming commerce. Among them, the intensity of the direct impact is the same as that of the total impact, in descending order: platform performance, return policy, and switch barrier. Secondly, platform performance, return policy, and switch barrier can respectively influence impulsive consumption through perceived risks and flow, with flow having a stronger mediating effect. The optimal stimulation level (OLS) as a moderating mechanism enhances the three direct pathways effectively, with the most significant enhancement effect on return policy, followed by switch barrier, and finally platform performance.

6.2 Meaning

Firstly, when choosing and training live-streaming hosts, merchants should consider and train them based on their professional knowledge, expression skills, and ability to evoke emotions. First, the hosts need to have a thorough understanding of the products they are selling. Second, they need to master relevant sales techniques to effectively convey reliable product information to consumers. Third, they can create a sense of urgency for consumers based on the situation to stimulate their purchasing desire. Additionally, merchants can organize interactive reward activities in the live-streaming room. Such activities can not only create a good sales atmosphere and enhance consumers' sense of presence, but also increase the popularity of the live-streaming room and attract potential customers to enter it. These aspects can effectively improve the performance of the platform, stimulate impulse purchases, and increase sales.

Secondly, live-streaming merchants can promote sales by publicizing their return policies and promoting memberships and vouchers through live-streaming. By informing consumers of their favorable return policies, such as seven-day no-reason return and free return shipping, through live-streaming, merchants can reduce consumers' concerns about purchasing and boost sales. These strategies can effectively enhance consumers' satisfaction with the return policies, lower their conversion barriers, and increase sales.

Finally, live-streaming merchants can encourage buyers to upload photos or videos of the received and used products along with positive reviews and display them in the live-streaming room. This can effectively reduce consumers' perception of risk. At the same time, this interaction among consumers and the use of products shown in the photos can enhance consumers' sense of presence and promote their flow state.

6.3 Limitations

This study has three limitations. First, in the selection of explanatory variables, we only chose the in-sale and after-sale variables. Further research could consider studying the possible influencing factors in the pre-sale stage. Secondly, the data used in the study were collected through online

questionnaires, which may lead to measurement errors and sample selection errors. Actual behavioral data or experimental methods can be used for future studies. Finally, the experimental background and samples are from China, so the results may not be applicable to other countries and cultures.

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