

MARKETING | RESEARCH ARTICLE

Driving Sales by Shopee Live: Investigating the Determinants of Impulsive Purchase Behavior

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Abstract:

Background: Digital technology has transformed customer buying behavior, particularly through live-streaming commerce. Interactive features enable real-time engagement between sellers and consumers, making purchasing more dynamic and time-sensitive.

Purpose: This study investigates drivers of impulsive buying on Shopee Live using the Stimulus-Organism-Response (S-O-R) framework. It examines how five external stimuli, namely the social presence of streamers, viewers, and products, promotional incentives, and product scarcity, influence consumers' internal states (perceived risk and perceived value), which in turn affect their urge to buy impulsively.

Method: A quantitative approach with purposive sampling targeted individuals who had made purchases via Shopee Live. Data from 178 respondents were collected through surveys and analyzed using PLS-SEM.

Findings: The social presence of streamers, viewers, and products substantially reduces perceived risk. However, only product social presence and promotional information significantly enhance perceived value. Both perceived risk and value substantially influence the urge to buy impulsively, with perceived risk exerting a negative effect and perceived value a positive one.

Conclusions: Perceived risk and perceived value mediate the relationship among external stimuli and impulsive buying. The distinct effects of social presence and promotional strategies highlight the importance of targeted marketing in live-streaming commerce.

Research implication: The findings emphasize optimizing interactive, product-focused content while ensuring transparent promotional communication. Managing consumers' perceptions of risk and value can strengthen engagement and drive sales performance on live-streaming platforms.

Keywords: customer perception, impulsive buying, live streaming commerce, promotional incentive information, scarcity product, social presence, SOR framework

JEL Classification: M31

Article history:
Received
August 28, 2025

Revision submit
September 19, 2025
October 10, 2025
November 24, 2025
January 20, 2026
February 16, 2026

Accepted
February 27, 2026

Available online
February 28, 2026

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PUBLIC INTEREST STATEMENT

This study shows how live-streaming commerce drives impulsive buying through product engagement, promotions, and scarcity signals. Beyond marketing relevance, the findings raise public concerns: persuasive tactics can heighten psychological pressure and financial risk, highlighting the need for stronger digital literacy and consumer awareness.

The results emphasize that transparency and ethical practices are vital not only for sustaining trust but also for protecting consumer well-being. By clarifying how risk and value perceptions drive impulsive decisions, this research contributes to public understanding of online shopping behavior and supports healthier digital marketplaces. For policymakers, the study underscores the importance of regulations that promote transparency and discourage manipulative scarcity cues, ensuring that live-streaming platforms balance innovation with consumer protection.



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1. Introduction

Advancements in digital technology have profoundly transformed consumer purchasing behavior, particularly through the emergence of live-streaming commerce on e-commerce platforms. A 2024 Jakpat survey revealed that 77% of online shoppers who were aware of live shopping features expressed interest in purchasing through such platforms, and 64% had made purchases after watching a live session. These figures underscore the growing significance of live-streaming features in driving online sales (Jakpat, 2024).

Indonesia, recognized for its high stage of e-commerce penetration, provides a fertile environment for the growth of live-streaming commerce. Platforms such as Shopee, TikTok, and Lazada are actively enhancing their live-commerce features to improve user experience and gain a competitive advantage. A 2023 Ipsos survey reported that more than 67% of local brands and micro, small, and medium enterprises (MSMEs) identified Shopee Live as having the greatest impact on sales revenue compared to other platforms. In this context, the present study uses Shopee Live as a case study to examine consumer behavior and promotional strategies within Indonesia's live-commerce landscape (CNN Indonesia, 2024).

This research is grounded in the Stimulus-Organism-Response (S-O-R) model, which posits that external stimuli (S) influence an individual's internal psychological state (O), ultimately leading to a behavioral response (R) (Mehrabian & Russell, 1974). The model is widely used to explain how interactive features and promotional cues shape consumer cognition and emotions, which in turn translate into impulsive purchasing behavior in the context of live-streaming commerce (Huo et al., 2023; M. Li et al., 2022; Lin et al., 2023).

Although the framework has been widely applied in digital commerce research, a substantial gap remains in understanding how social presence, promotional incentives, and scarcity cues interact simultaneously. Most existing studies have examined these factors in isolation or have been conducted in markets and platforms with different dynamics and consumer characteristics, such as China or the United States. This study addresses this gap by exploring the synergistic effects of these stimuli within Indonesia's distinct digital ecosystem and cultural context, where consumer responses to live-streaming stimuli may differ.

Based on the S-O-R model, this paper examines the role of three key stimuli: social presence, promotional incentives, and scarcity cues, and their combined effects on impulsive buying behavior. Previous studies have shown that social presence enhances perceived value and stimulates impulse buying through emotional and cognitive engagement (Huo et al., 2023; Zhang et al., 2023). Similarly, promotional incentives (comprising discounts and vouchers) and scarcity tactics (comprising countdown timers) intensify positive emotions, urgency, and emotional arousal, thereby enhancing impulse buying behavior (Wu et al., 2021).

The study further explores the mediating roles of perceived risk and perceived value. While perceived risk inhibits impulsive purchasing decisions (Kaniati et al., 2024), perceived value (both functional and emotional) encourages them (Zhang et al., 2025). This study addresses a research gap by integrating scarcity cues, promotional incentives, and social presence as stimuli within the S-O-R model. By capturing their combined effects, the study advances theoretical understanding of impulsive buying behavior while offering practical insights for global e-commerce platforms.

2. Literature Review

2.1 Stimulus-Organism-Response (S-O-R) framework

The Stimulus-Organism-Response (S-O-R) model provides a strong theoretical foundation for examining impulsive buying in live-streaming commerce. Within this framework, stimuli refer to external environmental cues that consumers encounter during live shopping sessions. Beyond technical features, social signals, including the presence of streamers, viewers, and products, play a prominent role in shaping consumer responses. Social presence, commonly defined as the feeling of being present in a mediated environment, is widely recognized as the strongest driver of online consumer behavior. Ming et al. (2021) discovered three dimensions of social presence (platform, audience, streamer), all of which positively influence consumer trust and create a state of flow that increases the likelihood of impulsive buying. In addition to social presence, promotional incentives and product scarcity serve as powerful marketing stimuli. Promotional offers, including discounts, vouchers, and time-limited deals, as well as scarcity cues (e.g., “only a few items left”), are known to trigger emotional arousal and a sense of urgency, both of which increase the likelihood of impulsive purchasing behavior. Luo et al. (2025) argue that intense, real-time interactions facilitated by social presence enhance the quality of product information through two-way communication, thereby increasing consumer engagement and strengthening impulse-buying tendencies. Supporting this view, Guo et al. (2021) emphasize that live-streaming features, as environmental stimuli, substantially shape consumers’ internal psychological states and subsequent behavioral responses.

The organism component of the S-O-R framework refers to consumers’ internal cognitive and emotional processes that mediate the relationship between external stimuli and behavioral responses. In the consumer behavior literature, perceived value is conceptualized as a key internal state, reflecting consumers’ affective and cognitive evaluations of a product’s utility prior to purchase (Wu & Huang, 2023). Conversely, perceived risk, defined as a consumer’s subjective assessment of adverse consequences, acts as an inhibitory factor in impulse buying. Wu et al. (2020) identify perceived risk as a key mediating variable in impulsive purchases. Notably, perceived risk has been shown to decrease in real-time live-streaming contexts where social proof is present, thereby contributing to impulsive purchasing behavior (Ming et al., 2021).

2.2 Social Presence of Streamers (SPS) and Perceived Value (PV)

In live-streaming commerce, streamers act as dynamic intermediaries, showcasing products in real time and interacting directly with viewers. This immediacy and responsiveness create a strong sense of social presence that extends beyond traditional e-commerce interfaces (Lu & Chen, 2021). Live communication, including answering questions, demonstrating product usage, and addressing consumer concerns, is perceived as more credible and helps build consumer confidence while reducing uncertainty. Previous studies confirm that this form of interactivity substantially lowers perceived risk in online transactions, as consumers feel better informed and less apprehensive (Hamidah et al., 2024; Song et al., 2022). Therefore, it is hypothesized:

H1a: Social presence of streamers has substantial negative effects on consumers’ perceived risk

2.3 Social Presence of Streamers (SPS) and Perceived Value (PV)

Beyond mitigating perceived risk, streamers also play a crucial role in enhancing perceived value. Through personalized communication, transparent product demonstrations, and exclusive live-stream offers, streamers create both economic and emotional value for viewers (Wu & Huang, 2023). These features contribute to both utilitarian and hedonic value perceptions, making the consumer experience more comprehensive at both cognitive and affective stages (Li et al., 2022). The immediacy and authenticity of live interactions make product offerings more relevant and trustworthy, thereby increasing their perceived value.

H1b: Social presence of streamers has substantial positive effects on consumers' perceived value.

2.4 Social Presence of Product (SPP) and Perceived Risk (PR)

Live-streaming commerce allows streamers to showcase products in real time from multiple angles, demonstrate functionality and usage scenarios, and respond directly to audience questions. This high level of dynamic visualization enhances transparency and builds consumer trust, which is critical for reducing perceived risk in online transactions. Compared with static images or text-based descriptions, live demonstrations provide a more immersive understanding of how a product function (Zhang et al., 2023). Empirical evidence confirms that such levels of visibility and interactivity have a strong negative effect on consumers' perceptions of risk and uncertainty (Fadhilah et al., 2023). Based on this premise, this study hypothesizes that product social presence has a significant negative effect on consumers' perceived risk.

H2a: Social presence of products has a substantial negative effect on consumers' perceived risk.

2.5 Social Presence of Product (SPP) and Perceived Value (PV)

Beyond its role in reducing perceived risk, product social presence has also been shown to enhance perceived value. Emotional and functional evaluations of a product are strengthened by the provision of detailed and tangible information, including real-time demonstrations and multi-angle product presentations (Zhang, 2023). These visual cues, combined with contextual usage scenarios, allow consumers to accurately evaluate a product's relevance, quality, and benefits, thereby enhancing its perceived value (Mishra, 2025; Song et al., 2022; Zhang et al., 2023). This heightened sense of utility and emotional resonance experienced by viewers during detailed product presentations supports the hypothesis that product-based social presence positively influences perceived value.

H2b: Social presence of products has a substantial positive effect on consumers' perceived value.

2.6 Social Presence of Viewers (SPV) and Perceived Risk (PR)

Active viewer involvement through comments, reactions, and purchase notifications creates a sense of collective shopping that fosters trust and reduces uncertainty. This visible interaction serves as a form of social proof, enhancing product credibility and lowering consumers' perceived risk in live-streaming commerce (Li et al., 2025; Sidik & Roostika, 2024). Thus, the social presence of viewers is expected to have a substantial negative effect on perceived risk.

H3a: Social presence of the viewer has a substantial negative effect on perceived risk.

2.7 Social Presence of Viewers (SPV) on Perceived Value (PV)

Viewer interaction also contributes positively to perceived value. Shared excitement, feedback, and real-time engagement enrich the shopping experience, making it more emotionally and cognitively rewarding (Fara & Hartono, 2024; Ma et al., 2022). Therefore, the social presence of viewers is hypothesized to have a substantial positive effect on perceived value.

H3b: Social presence of the viewer has a substantial positive effect on perceived value.

2.8 Promotional Incentive Information (PII) and Perceived Risk (PR)

In live-streaming commerce, promotional incentives, including discounts, vouchers, and exclusive deals, are widely used to reduce consumer hesitation and foster trust. These offers convey a sense of transparency and reliability, thereby reassuring consumers about product quality and transaction security (Chen & Zhang, 2023; Wu & Huang, 2023). By reducing uncertainty, promotional messaging is consequently anticipated to have a substantial negative impact on perceived risk.

H4a: Promotional incentive information has a substantial negative effect on perceived risk.

2.9 Promotional Incentive Information (PII) and Perceived Value (PV)

The use of promotional incentives, such as discounts and vouchers, enhances perceived value by engaging both economic and emotional drivers. These offers provide tangible financial benefits while simultaneously evoking positive consumer emotions, including excitement and satisfaction (Lee & Chen, 2021). Such promotions enhance perceived value and align with consumers' desire to make strategic purchases by creating a sense of urgency and exclusivity. Discounts and vouchers are particularly effective because they strengthen perceptions of value while also evoking positive emotions. In live-streaming commerce, monetary-savings cues have been shown to substantially enhance consumers' value perceptions (Guo et al., 2021).

H4b: Promotional incentive information has a substantial positive effect on perceived value.

2.10 Scarcity Product (SP) and Perceived Value (PV)

Scarcity cues, such as "limited time only" or "only a few left" are powerful psychological stimuli that influence consumer perceptions and behavior. In the context of live-streaming commerce, these cues create a sense of urgency and convey an impression of product popularity, prompting consumers to infer that the item is in high demand and

therefore valuable (Sari & Karsono, 2023). This heuristic encourages fast decision-making and enhances the product's perceived value. Moreover, scarcity increases emotional responses by generating urgency to purchase before the opportunity is lost, thereby increasing the item's perceived significance and desirability. Martiza and Hadi (2025) found that perceived scarcity substantially increases fear of missing out (FOMO), which in turn enhances both the emotional and functional value of products in impulsive buying contexts. Consequently, product scarcity is expected to have a substantial positive effect on perceived value.

H5: Product scarcity has a substantial positive effect on perceived value.

2.11 Perceived Risk (PR) and Urge to Buy Impulsively (UBI)

Perceived risk is consumers' evaluation of the uncertainty and potential adverse consequences associated with a purchase, including dissatisfaction, fraud, or transaction failure. Sutisna et al. (2023) found that perceived risk has a substantial negative effect on online purchasing behavior. Wu et al. (2020) discovered that the perceived risk has a negative effect on the perceived usefulness and satisfaction, thereby decreasing the likelihood of making impulsive purchases. However, in the live-streaming context, this risk can be mitigated by real-time communication and social proof, which enhance consumer confidence and may ultimately lead to impulsive purchases (Ming et al., 2021). Furthermore, Huo et al. (2023) highlighted that live engagement enhances information flow and emotional connection, thereby reducing uncertainty and increasing the likelihood of spontaneous purchases.

H6: Perceived risk has a substantial negative effect on the urge to buy impulsively.

2.12 Perceived Value (PV) and Urge to Buy Impulsively (UBI)

Perceived value refers to a consumer's evaluation of benefits relative to the costs incurred, encompassing both functional utility and emotional satisfaction. Live-streaming commerce enhances perceived value by vivid product demonstrations, interactive engagement, and the frequent use of special promotional offers (Lee & Chen, 2021; Mishra, 2025). The emotional satisfaction derived from live-streaming experiences adds value to the consumer decision-making process, particularly when trust in the seller has been established (Caesalpinia & Suryawardani, 2025). As Huo et al. (2023) highlighted, real-time engagement enhances emotional resonance and perceived benefits, thereby increasing impulsive buying tendencies.

H7: Perceived value has a substantial positive effect on the urge to buy impulsively.

3. Conceptual Framework

Indonesian consumers' impulsive purchasing behavior was examined within the SOR framework. Previous studies have shown that perceived trust and perceived value play a crucial role in driving consumers' impulsive buying tendencies (Zhang, 2022; Yan et al., 2023; Li et al., 2024). This study extends prior research by incorporating the social presence characteristics of streamers, viewers, and products (Ming et al., 2021; Zhang et al., 2023), along with promotional incentive information (Zhang et al., 2022) and scarcity-based promotions (Lamis et al., 2022), to explore their respective contributions to the emergence of impulse buying behavior. These variables collectively inform the development of the conceptual framework, as depicted in Figure 1.

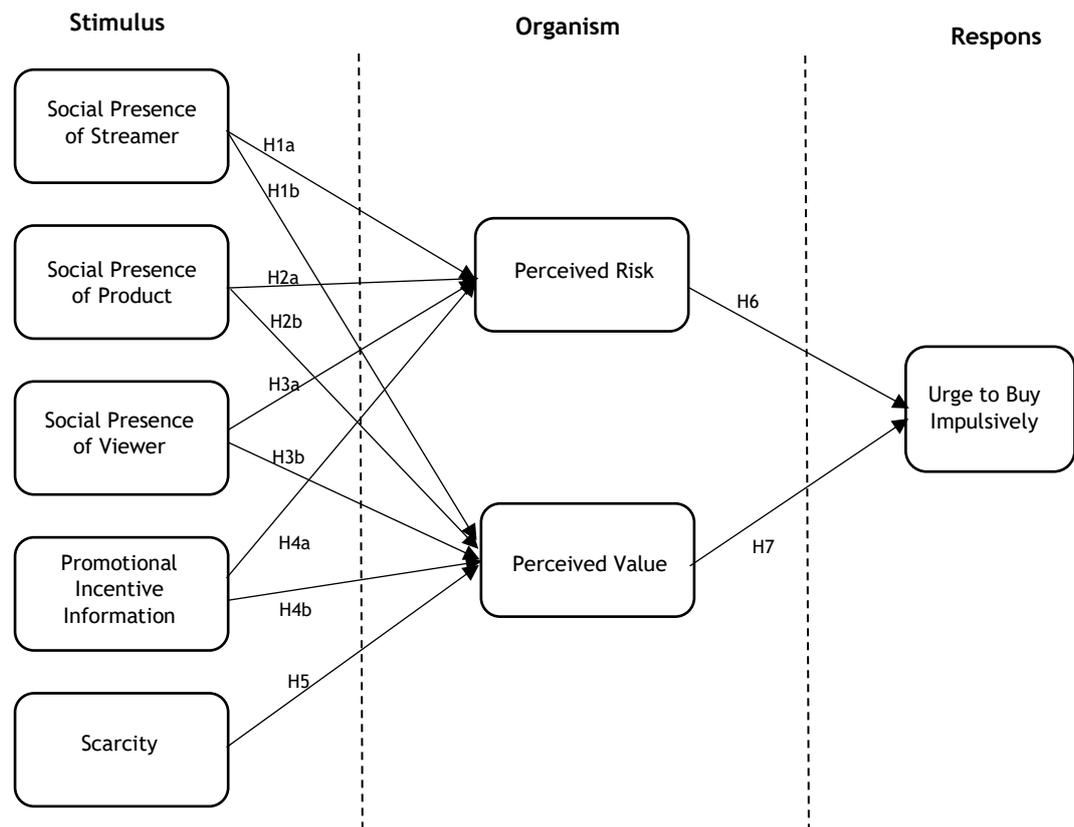


Figure 1. Conceptual framework of impulsive buying intention, shaped by perceived risk and perceived value, which are influenced by the social presence of streamers and viewers, product information, promotional incentives, and product scarcity.

The relationships among these variables are examined by the following hypotheses:

- H1a: Social presence of streamer (SPS) has a substantial negative effect on perceived risk (PR)
- H1b: Social presence of streamer (SPS) has a substantial positive effect on perceived value (PV)
- H2a: Social presence of product (SPP) has a substantial negative effect on perceived risk (PR)
- H2b: Social presence of product (SPP) has a substantial positive effect on perceived value (PV)
- H3a: Social presence of viewer (SPV) has a substantial negative effect on perceived risk (PR)
- H3b: Social presence of viewer (SPV) has a substantial negative effect on perceived value (PV)
- H4a: Promotional incentive information (PII) has a substantial negative effect on perceived risk (PR)
- H4b: Promotional incentive information (PII) has a substantial positive effect on perceived value (PV)
- H5: Scarcity promotion (SP) has a substantial positive effect on perceived value (PV)
- H6: Perceived risk (PR) has a substantial negative effect on the urge to buy impulsively (UBI)
- H7: Perceived value (PV) has a substantial positive effect on the urge to buy impulsively (UBI)

4. Methods

4.1 Research Design

The SOR model was employed to analyze the causal relationships among variables in this quantitative explanatory study. This approach is well-suited for hypothesis testing and for examining both direct and indirect effects among variables. Data were analyzed using PLS-SEM, which is appropriate for complex models with multiple indicators and is robust to nonnormality in exploratory and predictive research (Hair et al., 2021). PLS-SEM is particularly appropriate for both confirmatory and exploratory studies with moderate sample sizes. This research was conducted in Indonesia and focused on consumers who actively use the e-commerce platform Shopee Live. The platform was selected due to its leading role in live-streaming commerce penetration and high stage of consumer adoption in the Indonesian market. To ensure the validity and appropriateness of the measurement instrument, the questionnaire underwent content validation by academic experts in consumer behavior and digital commerce. In addition, a pilot test involving 30 respondents was conducted to assess item clarity and reliability. Feedback from the pilot phase was used to refine the wording and structure of several items prior to full-scale data collection.

4.2 Sampling

Purposive sampling was employed to guide participant selection in accordance with the study objectives. The criteria for respondents included Indonesian users who had installed and actively used the Shopee application and had previously made purchases through Shopee Live. The minimum sample size for the PLS-SEM analysis was determined using the Inverse Square Root Method proposed by Kock and Hadaya (2018). At a 5% significance level, the analysis required a minimum sample of 125 respondents. To enhance statistical reliability and the accuracy of parameter estimation, the final sample comprised 178 respondents. Of these, 127 respondents (71.15%) were female, and 51 respondents (28.85%) were male. However, regarding age distribution, 3.93% of respondents were under 18 years old ($n = 7$), 55.06% were aged 18-24 years ($n = 98$), 30.34% were aged 25-34 years ($n = 54$), 8.99% were aged 35-44 years ($n = 16$), and 1.69% were over 45 years old ($n = 3$).

4.3 Measurement

The operational variables related to impulsive buying behavior were measured using a five-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Each indicator was adapted from established measurement scales in the prior literature (Table 1).

Table 1. Operational definitions and indicators of the urge to buy impulsively, as impacted by perceived risk and perceived value, which are influenced by the social presence of streamers, viewers, product information, promotional incentives, and product scarcity

Construct	Operational Definition		Items
Social presence of live streamer (Ming et al., 2021; Zhang et al., 2023)	The extent to which viewers perceive the presence of the live streamer by interactive communication, emotional warmth, and expressive behavior during live streaming.	SPS1	I can sense the streamer's attitude through our interaction.
		SPS2	Communicating by the streamer feels personal and human.
		SPS3	My communication with the streamer feels warm.

Table 1. Operational definitions and indicators of the urge to buy impulsively, as impacted by perceived risk and perceived value, which are influenced by the social presence of streamers, viewers, product information, promotional incentives, and product scarcity (Continue)

Construct	Operational Definition	Items	Construct
Social presence of other viewers (Ming et al., 2021; Zhang et al., 2023)	The stage of social engagement among other viewers during live streaming is reflected in their interest in the product, purchasing activity, and information exchange.	SPV1	Many other viewers showed interest in the product. Many other viewers had purchased the product. Other viewers actively shared information about the product.
		SPV2	
		SPV3	
Social presence of product (Zhang et al., 2023)	The degree to which viewers mentally visualize and imagine using the product while watching live-streaming content.	SPP1	I thought about using the product while watching. I imagined myself using the displayed product. Mental images of me using the product came to mind.
		SPP2	
		SPP3	
Promotional incentive information (Zhang et al., 2023)	The stage of attention viewers pay to promotional content comprising discounts, coupons, product bundles, and flash deals presented during live streaming.	PII1	I regularly pay attention to information regarding promotional pricing and coupon offers. I prefer to buy promoted products in the livestream. Livestream promotions help me get more reasonable prices. The price discounts make me feel I'm getting a great deal. Purchasing during the livestream feels more affordable.
		PII2	
		PII3	
		PII4	
		PII5	
Scarcity Product (Lamis et al., 2022)	A marketing approach that emphasizes limited product availability and time-limited promotions, prompting viewers to make quick purchase decisions.	SP1	The available product stock in the flash sale feels limited. Products that capture my interest often sell out rapidly during flash sale events. I worry about the limited product availability in flash sales. The shopping time during flash sales feels limited. The flash sale duration seems to end quickly. I feel concerned about the remaining time while shopping during flash sales. I worry about the product's reliability when purchasing. I fear the product won't provide the expected benefits. I'm concerned that the product may not provide sufficient value for the money spent.
		SP2	
		SP3	
		SP4	
		SP5	
		SP6	
Perceived risks (Ming et al., 2021; Zhang et al., 2023)	Consumers' perceptions of uncertainty and potential loss when purchasing products by live-streaming commerce, including concerns about product quality, usefulness, and value.	PR1	I worry about the product's reliability when purchasing. I fear the product won't provide the expected benefits. I'm concerned that the product may not provide sufficient value for the money spent.
		PR2	
		PR3	
Perceived value (Zhang et al., 2022)	Consumers' evaluation of the benefits and economic value of products offered by live-streaming commerce, particularly when accompanied by promotional offers.	PV1	The recommended products meet my needs well. Sales promotions give me a sense of being economical. I feel satisfied when obtaining a good deal during sales. I find snapping up sales to be very cost-effective.
		PV2	
		PV3	
		PV4	

Table 1. Operational definitions and indicators of the urge to buy impulsively, as impacted by perceived risk and perceived value, which are influenced by the social presence of streamers, viewers, product information, promotional incentives, and product scarcity (Continue)

Construct	Operational Definition	Items	Construct
Urge to buy impulsively (Zhang et al., 2022)	A spontaneous and unplanned desire to purchase products while watching live-streaming commerce, regardless of initial shopping intentions.	UB1	I felt the urge to purchase items outside my intended shopping objective.
		UB2	I felt a tendency to acquire products outside my intended shopping purpose.
		UB3	I was inclined to buy items beyond my planned shopping goal.

4.4 Data Collection

Data were collected online using a structured questionnaire administered through Google Forms. To reach the target population of digitally active consumers familiar with live-streaming commerce, the survey link was distributed via Twitter. Respondents were required to meet specific eligibility criteria, namely having previously engaged with Shopee Live by watching a live-streaming session and making a subsequent purchase. Data collection was conducted over a three-month period to ensure sufficient diversity and reliability of the responses.

4.5 Data Analysis

This study employed PLS-SEM to analyze the data, following the two-step approach proposed by Hair et al. (2021), which consists of measurement (outer) model and structural (inner) model evaluation. In the first stage, indicator reliability was assessed using outer loadings (≥ 0.70), while construct reliability was examined using Composite Reliability (CR ≥ 0.70) and Cronbach's alpha (≥ 0.70). Convergent validity was evaluated using the Average Variance Extracted (AVE > 0.50), whereas discriminant validity was assessed using the Fornell-Larcker criterion and the HTMT ratio (HTMT < 0.90). In the second stage, the coefficient of determination (R^2) was used to evaluate the structural relationships among the latent constructs and to determine the proportion of variance explained by the endogenous variables. Bootstrapping with 5,000 subsamples was conducted to assess the significance of the path coefficients. Effects were considered statistically substantial when the t-statistic exceeded 1.96 and the p-value was below 0.05. In addition, effect sizes (f^2) and predictive relevance (Q^2) were evaluated using the blindfolding procedure to assess the contribution of each exogenous construct. A Q^2 value of 0.01 or higher indicates sufficient predictive relevance within the model.

5. Outcomes

5.1 Measurement Model

As indicated in Table 2, most indicators have factor loadings exceeding the 0.70 mark, indicating strong relationship with their respective latent constructs. Construct reliability was assessed using Cronbach's alpha and Composite Reliability (CR). All values exceeded the recommended threshold of 0.70, indicating satisfactory internal consistency across all constructs. These outcomes demonstrate strong reliability and confirm the suitability of the measurement model for subsequent structural analysis.

Convergent validity was evaluated using the Average Variance Extracted (AVE), with values above the recommended threshold of 0.50 indicating that a construct explains at least half of the variance in its indicators. In this study, all constructs achieved AVE values greater than 0.50, confirming that the indicators adequately represent their underlying constructs.

Table 2. Factor loadings and construct reliability values

Construct	Items	Factor Loading	Cronbach's alpha	CR	AVE
SPS	SPS1	0.756	0.770	0.864	0.680
	SPS2	0.845			
	SPS3	0.870			
SPP	SPP1	0.842	0.844	0.906	0.764
	SPP2	0.931			
	SPP3	0.846			
SPV	SPV1	0.857	0.734	0.849	0.654
	SPV2	0.814			
	SPV3	0.751			
PII	PII1	0.746	0.857	0.898	0.638
	PII2	0.847			
	PII3	0.837			
	PII4	0.782			
	PII5	0.777			
SP	SP1	0.784	0.871	0.903	0.609
	SP2	0.719			
	SP3	0.752			
	SP4	0.862			
	SP5	0.825			
	SP6	0.731			
PR	PR1	0.845	0.870	0.921	0.795
	PR2	0.918			
	PR3	0.909			
PV	PV2	0.839	0.864	0.917	0.788
	PV3	0.901			
	PV4	0.920			
	PV4	0.920			
UBI	UBI1	0.910	0.902	0.938	0.835
	UBI2	0.911			
	UBI3	0.920			

Note: SPS = Social presence of streamer; PR = on perceived risk; PV = perceived value; SPP = Social presence of product; SPV = Social presence of viewer; PII = Promotional incentive information; SP = Scarcity promotion; UBI = urge to buy impulsively

Table 3 presents the HTMT values for all pairs of constructs in the model, including UBI, PR, PV, PII, SPP, SPS, SPV, and SP. As all HTMT values are below the recommended threshold of 0.90, the outcomes confirm adequate discriminant validity, indicating that each construct is conceptually distinct.

Table 3. Heterotrait-Monotrait (HTMT) value

Construct	UBI	PR	PV	PII	SPP	SPS	SPV	SP
UBI								
PR	0.882							
PV	0.694	0.649						
PII	0.653	0.671	0.731					
SPP	0.649	0.668	0.678	0.564				
SPS	0.805	0.822	0.704	0.708	0.632			
SPV	0.768	0.898	0.752	0.757	0.690	0.818		
SP	0.756	0.817	0.693	0.690	0.799	0.725	0.788	

Note: SPS = Social presence of streamer; PR = on perceived risk; PV = perceived value; SPP = Social presence of product; SPV = Social presence of viewer; PII = Promotional incentive information; SP = Scarcity promotion; UBI = urge to buy impulsively

5.2 Structural Model Evaluation

The model's explanatory power was assessed using R^2 and Q^2 values, as reported in Table 4. The outcomes show that the R^2 value for PR is 0.572, indicating that the exogenous variables explain 57.2% of the variance in perceived risk. Similarly, the R^2 value for UBI is 0.585, suggesting that the predictors account for 58.5% of the variance in impulsive buying intention. The R^2 value for PV is 0.639, indicating that 63.9% of the variance in perceived value is explained by the independent constructs. Taken together, these outcomes suggest that the five stimulus variables SPS, SPV, SPP, PII, and SP exert substantial explanatory influence on both the organismic states (PR and PV) and the behavioral response (UBI) within the SOR framework.

Table 4 also shows that the three endogenous constructs have Q^2 values of 0.43 (PR), 0.41 (PV), and 0.48 (UBI). According to Hair et al. (2021), a model demonstrates predictive relevance for a given construct when the Q^2 value exceeds zero. As all Q^2 values in this study are above zero, the model exhibits adequate predictive validity, indicating its ability to predict the endogenous variables with sufficient accuracy.

Table 4. Evaluation of the structural model

Variables	R^2	Description	Q^2	Description
PR	0.572	Moderate	0.430	Predictive Relevance
PV	0.639	Moderate	0.416	Predictive Relevance
UBI	0.585	Moderate	0.482	Predictive Relevance

Note: PR = on perceived risk; PV = perceived value; UBI = urge to buy impulsively

5.3 Hypothesis Testing

Based on the outcomes of the path coefficient analysis and hypothesis testing, the study's hypotheses were evaluated sequentially. Path coefficients were used to assess the magnitude and direction of the relationships among the latent constructs, while bootstrapped t-statistics and p-values were employed to test the significance of each hypothesized association. Following conventional statistical criteria, a hypothesis was accepted when the p-value was below 0.05, indicating a statistically substantial relationship among constructs. Conversely, when the p-value exceeded 0.05, the hypothesized effect was considered not statistically significant, and the corresponding hypothesis was rejected.

Based on the analysis of path coefficients and hypothesis testing presented in Table 5, several variables were found to be statistically significant and thus supported. Specifically, the p-values for SPS, SPV, and SPP were below 0.05, indicating their substantial influence on PR. In addition, SPP and PII yielded p-values below 0.05, reflecting substantial effects on PV. Both PR and PV also showed substantial relationships with UBI, as evidenced by p-values below 0.05. In contrast, several variables did not demonstrate statistically significant effects. SPS, SPV, and SP exhibited p-values greater than 0.05 for PV, indicating no substantial influence and leading to the rejection of the corresponding hypotheses. Similarly, PII did not show a substantial effect on PR, as its p-value exceeded the 0.05 threshold. Beyond statistical significance, effect size (f^2) was examined to assess the magnitude of each predictor's contribution to the explained variance of the endogenous variables. Regarding effect sizes (f^2), SPS (0.143) and SPV (0.191) contribute meaningfully to PR, whereas SPP, though significant, has a smaller impact (0.040). For PV, the contributions are modest: SPP (0.049) and PII (0.095) are moderate, while SPS, SPV, and SP is negligible. The strongest effect observed is PR → UBI (0.816), underscoring PR's dominant role in driving impulsive buying, with PV (0.127) serving as a secondary driver.

Table 5. Hypothesis analysis

Hypotheses	Relationship	Path Coefficient	Effect Size (f ²)	T Statistics	P Values	Status
H1a	SPS → PR	-0.278	0.143	2.075	0.019	Accepted
H1b	SPS → PV	0.155	0.025	1.308	0.095	Rejected
H2a	SPV → PR	-0.249	0.191	2.731	0.003	Accepted
H2b	SPV → PV	0.071	0.024	1.001	0.158	Rejected
H3a	SPP → PR	-0.331	0.040	3.557	0.000	Accepted
H3b	SPP → PV	0.314	0.049	2.559	0.005	Accepted
H4a	PII → PR	-0.085	0.011	1.300	0.097	Rejected
H4b	PII → PV	0.376	0.095	3.056	0.001	Accepted
H5	SP → PV	0.093	0.007	1.560	0.059	Rejected
H6	PR → UBI	-0.508	0.816	5.953	0.000	Accepted
H7	PV → UBI	0.342	0.127	5.363	0.000	Accepted

Note: SPS = Social presence of streamer; PR = on perceived risk; PV = perceived value; SPP = Social presence of product; SPV = Social presence of viewer; PII = Promotional incentive information; SP = Scarcity promotion; UBI = urge to buy impulsively

To further examine the underlying mechanisms of these relationships, a mediation analysis was conducted to assess whether PR and PV substantially facilitate the effects of the exogenous variables on UBI. As shown in Table 6, PR significantly mediates the effects of SPS ($\beta = 0.141$, $p = 0.035$), SPV ($\beta = 0.126$, $p = 0.008$), and SPP ($\beta = 0.168$, $p < 0.001$) on UBI, while PII shows no mediation through PR. PV, in turn, mediates the effects of SPP ($\beta = 0.107$, $p = 0.003$) and PII ($\beta = 0.128$, $p = 0.005$), but not SPS, SPV, or SP. Overall, only SPP demonstrates significant mediation through both PR and PV, underscoring its central role in shaping impulsive buying tendencies.

Table 6. Mediation analysis

Variables	Path Coefficient	t-statistics	P Values	Status
SPS → PR → UBI	0.141	1.815	0.035	Mediated
SPV → PR → UBI	0.126	2.396	0.008	Mediated
SPP → PR → UBI	0.168	3.264	0.001	Mediated
PII → PR → UBI	0.043	1.306	0.096	None
SPS → PV → UBI	0.053	1.115	0.132	None
SPV → PV → UBI	0.024	0.916	0.180	None
SPP → PV → UBI	0.107	2.803	0.003	Mediated
PII → PV → UBI	0.128	2.554	0.005	Mediated
SP → PV → UBI	0.032	1.384	0.083	None

Note: SPS = Social presence of streamer; PR = on perceived risk; PV = perceived value; SPP = Social presence of product; SPV = Social presence of viewer; PII = Promotional incentive information; SP = Scarcity promotion; UBI = urge to buy impulsively

6. Discussion

6.1 The Effect of Social Presence of Streamer (SPS) on Perceived Risk (PR)

The results of this study indicate that SPS plays a substantial role in reducing PR, thereby supporting hypothesis H1a. When consumers watch Shopee Live, they experience a sense of direct interaction with the streamer by real-time communication and engagement, which helps alleviate concerns about potential losses associated with online product purchases. This perceived interactivity serves as a trust-building mechanism, reducing uncertainty and strengthening consumers' confidence in product reliability. These findings align with previous studies showing that interactive live-streaming features substantially enhance purchase intention by lowering perceived risk, particularly in cross-border e-commerce contexts (Guo et al., 2021). Hamidah et al. (2024) also found that streamers' credibility and interactivity reduce risk perceptions among consumers. Studies on Generation Z buyers in TikTok Live further support this view. Taken together, these findings reinforce the conclusion that high stages of streamer interactivity during live-commerce sessions are critical for mitigating product-related uncertainties and fostering consumer trust.

6.2 The Effect of Social Presence of Streamer (SPS) on Perceived Value (PV)

The result of this study indicates that Hypothesis H1b is rejected. While streamer interaction during live-streaming sessions appears to positively influence consumers' perceived value of the showcased products, this effect is not statistically substantial. Although streamer social presence may foster a sense of closeness between consumers and streamers, it does not inherently enhance perceived product value, as consumers tend to evaluate value primarily based on signals of utility and benefit rather than interpersonal engagement (Xin et al., 2024). This aligns with signaling theory, which stresses that only consistent and diagnostic signals shape purchase behavior. Wang et al. (2025) show that weak or inconsistent cues, comprising casual streamer interaction, fail to elevate PV, while Schweidel et al. (2022) highlight that digital signals must clearly convey product benefits to influence consumer evaluation. Thus, interpersonal engagement alone is insufficient in the absence of credible, utility-oriented signals. Moreover, factors comprising low product involvement may further limit the extent to which social interaction translates into meaningful value perceptions (Joo & Yang, 2023). Similarly, a lack of streamer credibility and competence, resulting in poor communication quality, may further limit the impact on PV (Meng & Lin, 2023). Overall, the non-substantial finding extends signaling theory by demonstrating that interpersonal engagement alone lacks sufficient diagnostic strength. Consumers remain cautious about equating social closeness with product utility, reinforcing the importance of credible, utility-oriented signals.

6.3 The Effect of Social Presence of Viewers (SPV) on Perceived Risk (PR)

The results in this study support Hypothesis H2a, demonstrating that viewer social presence has a substantial negative effect on consumers' perceived risk in live-streaming commerce. This finding reinforces the idea that real-time peer interactions, such as comment sections and shared consumer experiences, function as forms of social proof. These mechanisms help reduce perceived risk by providing immediate and seemingly authentic feedback about the product (Chen et al., 2023; Kang et al., 2022). However, reliance on peer feedback also raises concerns regarding authenticity, highlighting the need to monitor viewer interactions to ensure credibility and safeguard consumer well-being.

6.4 The Effect of Social Presence of Viewers (SPV) on Perceived Value (PV)

Other results in this study showed that viewer social presence has a positive but non-substantial effect on consumers' perceived value, thereby rejecting Hypothesis H2b. Previous studies suggest that live chat interactions tend to entertain rather than shape product value perceptions, as viewers often prefer to direct their questions to streamers instead (Muna & Setyawan, 2025; K. Wang et al., 2025). This finding also aligns with prior outcomes, indicating that social presence primarily enhances shopping enjoyment (Huang et al., 2024), while it tends to stimulate impulsive buying tendencies rather than rational value assessment (Liu et al., 2025). The non-substantial outcome suggests that viewer social presence functions more as a hedonic cue than as a diagnostic signal of product utility. This outcome highlights a theoretical distinction between enjoyment-driven engagement and value-driven evaluation, reinforcing the importance of differentiating affective and cognitive pathways in live-streaming commerce.

6.5 The Effect of Social Presence of Product (SPP) on Perceived Risk (PR)

Hypothesis H3a is supported in this study, indicating that product social presence has a substantial negative effect on perceived risk. This outcome suggests that increased product visibility can substantially reduce consumers' uncertainty and anxiety associated with online shopping. In live-streaming sessions, real-time demonstrations and visual cues enable consumers to mentally simulate product usage, thereby enhancing perceived diagnosticity and authenticity (Cheng et al., 2022). This process reduces ambiguity and strengthens consumers' confidence in product reliability, consistent with prior outcomes that credible product information is more effective than price promotions in mitigating perceived risk (Kim, 2024).

6.6 The Effect of Social Presence of Product (SPP) on Perceived Value (PV)

The product's social presence has a statistically substantial and positive effect on perceived value, leading to the acceptance of Hypothesis H3b in this study. This outcome underscores the critical role of product-focused interaction in shaping consumer evaluations within live-streaming commerce. Live-streaming platforms allow sellers to demonstrate product features, benefits, and usage in real time, creating a vivid and highly interactive experience for viewers. Such product-oriented interactions, through visual demonstrations, detailed explanations, and feature presentations, effectively enhance consumers' perceptions of value (Xin et al., 2024; Zhang et al., 2022).

6.7 The Effect of Promotional Incentive Information (PII) on Perceived Risk (PR)

In addition, although promotional information in this study negatively affected perceived risk, this effect was not statistically significant, leading to the rejection of Hypothesis H4a. This finding may reflect consumer skepticism toward promotional offers, which are sometimes perceived as attempts to obscure inferior product quality (Kim, 2024). Moreover, research on cue utilization indicates that consumers differentiate between extrinsic cues, such as promotions, and intrinsic cues, such as product quality, with the latter playing a more influential role in reducing perceived risk (Kakaria et al., 2024). Furthermore, while price promotions and time-limited offers can stimulate purchase intention, they do not necessarily reduce perceived risk unless supported by interpersonal interaction and credible communication (Sanjaya et al., 2023). Taken together, these outcomes suggest that promotional incentives may capture consumer attention but are insufficient to reduce perceived risk in the absence of trustworthy, transparent, and diagnostic signals.

6.8 The Effect of Promotional Incentive Information (PII) on Perceived Value (PV)

The other result study indicate that Hypothesis H4b is supported, demonstrating that promotional information intensity has a substantial positive effect on perceived value. This outcome suggests that informative promotional content, such as price discounts, limited-time offers, and voucher incentives substantially enhances consumers' perceptions of value in live-streaming commerce (Wu & Huang, 2023). When consumers are exposed to such promotional cues, they tend to interpret them as added transactional benefits, thereby strengthening their overall evaluation of the product's value (Royanda & Hidayat, 2024).

6.9 The Effect of Scarcity Product (SP) on Perceived Value (PV)

This study also shows that scarcity pressure does not have a substantial positive effect on consumers' perceived value, thereby rejecting Hypothesis H5. Although scarcity signals may trigger emotional urgency, they appear insufficient to enhance perceived value. Prior studies suggest that consumers may not feel motivated to compete after exposure to scarcity cues (Broeder & Wentink, 2022), and frequent scarcity messaging can be perceived merely as a marketing tactic, thereby reducing its credibility and impact on PV (Hamilton et al., 2019; Ladeira et al., 2023). Recent evidence further suggests that scarcity appeals tend to influence impulsive buying rather than rational value assessment, as consumers often prioritize urgency over utility (Li et al., 2025). Taken together, these outcomes indicate that scarcity cues function more as affective triggers than as diagnostic signals of product quality, which explains why their effect on perceived value remains limited unless supported by credible and transparent product information.

6.10 The Effect of Perceived Risk (PR) on Urge to Buy Impulsively (UBI)

Other results also confirm that Hypothesis H6 is supported, indicating that perceived risk has a substantial negative effect on the urge to buy impulsively. This finding aligns with prior research suggesting that concerns regarding product reliability act as psychological barriers that suppress impulsive buying behavior (Telaumbanua & Firmialy, 2024; Zhang et al., 2023). When consumers perceive a high stage of risk, they tend to adopt more cautious decision-making strategies, which in turn reduce spontaneous purchasing tendencies, even within dynamic and interactive environments such as live-streaming commerce.

6.11 The Effect of Perceived Value (PV) on Urge to Buy Impulsively (UBI)

This study concludes that perceived value has a significant positive effect on the urge to buy impulsively, thereby supporting Hypothesis H7. These outcomes underscore the importance of perceived value as a key determinant of impulsive purchasing behavior. When consumers perceive that the balance among functional, emotional, and economic benefits and the associated costs or sacrifices is favorable, their spontaneous motivation to purchase increases substantially (Zhang et al., 2023; Zhang et al., 2024). Supporting this perspective, Dang et al. (2025) emphasize that in interactive retail environments such as live-streaming commerce, perceived value functions not only as a rational evaluation of product worth but also as an emotional trigger that amplifies impulsive buying behavior.

6.12 Managerial Implication

This study offers several practical implications for stakeholders in live-streaming commerce. While impulsive buying can boost sales revenue, related strategies should be designed with transparency and consumer protection at their core. Promotional incentives, including vouchers and discounts, should be carefully planned and communicated with clear terms and conditions. Transparency ensures that consumers perceive these offers as genuine sources of economic value rather than as signals of low product quality. Time-based promotions should also be calibrated carefully: overly short durations may create excessive psychological pressure, while excessively long periods may weaken the sense of urgency. Hence, balancing urgency and credibility is crucial.

Hosts and moderators should actively foster authentic audience engagement by encouraging live testimonials, inviting questions, and showcasing genuine consumer feedback. Such practices strengthen product credibility and reduce hesitation among potential buyers. Scarcity-based tactics should be applied authentically and reflect actual stock limitations, as overuse of artificial scarcity cues can trigger consumer skepticism and ethical concerns, ultimately diminishing perceived product value. Therefore, scarcity communication should be based on real-time inventory data and supported by transparent disclosure of product availability.

Finally, investments in streamer training are essential. Streamers should be equipped not only with persuasive communication skills and strong product knowledge, but also with ethical awareness. This dual emphasis on persuasion and responsibility fosters trust and enhances perception of functional, emotional, and social value. Such an approach ensures that impulsive buying is encouraged in ways that protect consumer well-being and support long-term customer loyalty.

6.13 Theoretical Contribution

This study advances the theoretical understanding of live-streaming commerce by disaggregating social presence into three distinct dimensions, namely streamers, viewers, and products, and demonstrating that their effects on perceived risk and perceived value are not uniform. The finding that product presence simultaneously reduces perceived risk and enhances perceived value underscores the importance of distinguishing different forms of interactivity inside of the S-O-R framework, rather than treating social presence as a monolithic construct.

The outcomes also confirm dual mediation effects of perceived risk and perceived value in shaping impulsive buying behavior. This finding enriches the S-O-R model by demonstrating how external stimuli are translated into affective evaluations and, ultimately, consumer behavior. Another key contribution of this study lies in clarifying the role of promotional incentives. The evidence suggests that consumers perceive promotions primarily as value-enhancing cues rather than mechanisms for reducing risk, offering new insights into the literature on price promotions and quality perception. This finding also raises important theoretical questions about the ethical boundaries of promotional design, as excessive emphasis on value cues may overshadow risk considerations and potentially compromise consumer protection.

Finally, the non-substantial effect of scarcity on perceived value challenges longstanding assumptions in scarcity marketing. Rather than automatically enhancing value, scarcity cues appear to depend on their authenticity and frequency of use. Overuse or perceived manipulation can trigger consumer skepticism and psychological reactance, reframing scarcity as a marketing tactic and as a potential source of consumer stress. This finding contributes to theory by situating scarcity within a broader ethical and psychological context, emphasizing that its effectiveness depends on credibility, authenticity, and responsible application.

6.14 Limitations

Notwithstanding these theoretical contributions, this study has several limitations that future research could address. Its cross-sectional design limits the ability to capture changes in consumer perceptions over time, and the findings are limited to Indonesian Shopee Live users, which may reduce their generalizability across cultures and platforms. Product category variation was not controlled for, which may moderate the effects of perceived risk, perceived value, and impulsive buying behavior. In addition, the model

does not account for individual traits such as impulsivity, brand trust, or situational factors. Finally, this study focuses solely on the drivers of impulsive buying and does not examine post-purchase outcomes, including repurchase or regret, financial stress, or product returns. Future research should incorporate these post-impulsive outcomes to provide a more comprehensive understanding of consumer well-being in live-streaming commerce.

7. Conclusions

This research highlights how the Shopee Live platform leverages key stimuli, namely social presence (from streamers, viewers, and product engagement), promotional offers, and scarcity signals, to shape consumers' psychological responses, particularly perceived value and perceived risk, ultimately driving impulsive purchasing behavior. The empirical analysis shows that while all dimensions of social presence help reduce perceived risk, product-related social presence and promotional incentives have the strongest effect on enhancing perceived value. Notably, perceived value emerges as a more influential mediator of impulse buying than perceived risk. From a practical standpoint, the findings suggest that effective live-commerce strategies should prioritize enhancing perceived value through immersive product presentations and trust-building mechanisms, while using scarcity and promotional tactics judiciously to create urgency without undermining credibility. Theoretically, this study reinforces the S-O-R framework by offering nuanced insights into how cognitive and affective evaluations jointly shape spontaneous consumer decisions, while also emphasizing the importance of considering consumer well-being alongside commercial outcomes.

8. Recommendation

Future studies should adopt longitudinal or experimental designs to capture changes in consumer perceptions over time. Comparative research across cultures, platforms, and product categories is needed to enhance generalizability and examine potential moderating effects. Incorporating individual traits such as impulsivity, brand trust, and situational contexts would further enrich the model, while extending the scope to post-impulsive outcomes, such as repurchase intention, regret, financial stress, and product returns, would provide a more comprehensive view of consumer well-being.

For practitioners, live-streaming commerce strategies should balance commercial objectives with consumer protection. Promotional incentives must be communicated transparently, with clear terms and conditions, and scarcity tactics should be applied authentically to avoid scepticism and psychological reactance. Streamers should be trained not only in persuasive communication and product knowledge but also in ethical practices that safeguard consumer trust and well-being. For policymakers, regulations should promote transparency in promotional design and discourage manipulative scarcity cues. Platforms should monitor promotional practices and viewer interactions to ensure compliance with ethical standards and to protect consumers from misleading signals.

9. Acknowledgement

The authors sincerely acknowledge the valuable support provided by Universitas Muhammadiyah Surakarta and the Majelis Pendidikan Tinggi Penelitian dan Pengembangan PP Muhammadiyah (Diktilitbang PP Muhammadiyah) by the RisetMU Batch 8 (2024/2025) Fundamental Research Scheme II, under Grant No. 0258.649/I.3/D/2025. This funding played a crucial role in enabling the successful completion of this research.

Citation information

Cite this article as: Waskito, J., Sofi, P. L. (2026). Driving sales by Shopee live: Investigating the determinants of impulsive purchase behavior. *Journal of Consumer Sciences*, 11(1), 75-96. <https://doi.org/10.29244/jcs.11.1.75-96>

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