Jurnal Minds: Manajemen Ide dan Inspirasi
Vol. 13, No.3 (December) 2026: 777-794

THE ROLE OF POSITIVE EMOTION IN THE RELATIONSHIP BETWEEN LIVE STREAMING SHOPPING, FLASH SALE, AND IMPULSE BUYING

Yulianingsih[1]*, Sri Hartono[2], Nursabrina Saskia Putri[3]
[1]Universitas Djuanda, Indonesia
[2]Universitas Mercu Buana, Indonesia
[3]The University of Queensland, Australia

Citation (APA 7th): Yulianingsih, Y., Hartono, S., & Putri, N. S. (2026). The Role of Positive Emotion in the Relationship between Live Streaming Shopping, Flash Sale, and Impulse Buying. *Jurnal Minds: Manajemen Ide Dan Inspirasi*, *13*(3), 777–794. https://doi.org/10.24252/minds.v13i3.67850

Submitted: 12 May 2026
Revised: 20 June & 28 August 2026
Accepted: 04 September 2026
Published: 16 November 2026

Copyright: © 2026 by the authors.

ABSTRACT: Digital commerce increasingly relies on live-stream shopping and flash sales to transform momentary consumer excitement into unplanned purchases. This study extends the Stimulus–Organism–Response (S–O–R) framework by integrating interactive and scarcity-driven promotional stimuli within a unified model and identifying positive emotion as their shared psychological mechanism. Survey data from 200 Indonesian consumers were analyzed using covariance-based structural equation modeling (CB-SEM) with LISREL. The findings demonstrate that both live-stream shopping and flash sales positively influence impulse buying, directly and indirectly through positive emotion. The partial mediating effects establish positive emotion as an important psychological pathway through which distinct digital marketing stimuli translate into impulsive purchasing behavior. These findings advance the understanding of emotional mechanisms in digital consumer behavior and suggest that online retailers should coordinate engaging live-stream experiences and time-sensitive promotions to stimulate positive emotions and encourage purchasing decisions.

Keywords: Live Streaming Shopping; Flash Sale; Positive Emotion; Impulse Buying; Digital Consumer Behavior

*Corresponding Author: yulianingsih@unida.ac.id
DOI: https://doi.org/10.24252/minds.v13i3.67850
ISSN-E: 2597-6990
ISSN-P: 2442-4951
http://journal.uin-alauddin.ac.id/index.php/minds
Publisher: Management Department, Universitas Islam Negeri Alauddin Makassar, Indonesia

INTRODUCTION

The rapid evolution of digital commerce has transformed online shopping from a transaction-oriented activity into an interactive and experience-driven consumption environment. Advances in internet infrastructure, mobile technologies, digital payment systems, and platform-based commerce have enabled e-commerce platforms to integrate commercial transactions with social interaction and entertainment, creating increasingly immersive shopping experiences (Islam et al., 2020). This transformation is particularly evident in Indonesia, one of Southeast Asia's fastest-growing digital commerce markets, where expanding internet penetration and smartphone adoption continue to accelerate online retail participation (We Are Social, 2024). As competition intensifies, sustainable competitive advantage increasingly depends on retailers' ability to deliver engaging shopping experiences rather than relying solely on product offerings or price-based promotions. Accordingly, understanding how digital marketing strategies shape consumers' emotional and behavioral responses has become an important research priority.

Among digital commerce innovations, Live Streaming Shopping has emerged as a prominent experiential marketing strategy that enhances consumer engagement through real-time interaction, product demonstrations, and direct communication between sellers and consumers. These interactive features reduce information asymmetry while strengthening perceived authenticity and social presence, creating immersive shopping experiences that foster positive emotional responses (Wongkitrungrueng & Assarut, 2020; Sun et al., 2019). Consequently, consumers become more likely to make purchase decisions driven by enjoyment and trust rather than deliberate cognitive evaluation. Consistent with previous research, Live Streaming Shopping enhances positive emotional experiences and purchasing behavior, establishing it as an influential experiential marketing stimulus in contemporary digital commerce (Wang et al., 2021; Gong et al., 2023; Qu et al., 2023).

Another prominent digital marketing strategy is Flash Sale, a scarcity-based promotional mechanism that stimulates immediate purchasing through limited-time offers and restricted product availability. Unlike Live Streaming Shopping, which creates value through interactive consumer engagement, Flash Sale relies on scarcity and urgency to accelerate purchase decisions (Aggarwal et al., 2011; Luo et al., 2022). These scarcity cues reduce consumers' deliberative evaluation and encourage affect-driven purchasing responses (Peng et al., 2021). Consistent with previous research, Flash Sale enhances positive emotional arousal and impulse buying, establishing it as a complementary marketing stimulus that influences consumer behavior through scarcity-induced psychological mechanisms (Luo et al., 2022; Zhang et al., 2022).

Within digital commerce, consumers' purchasing behavior is influenced not only by external marketing stimuli but also by the affective processes through which these stimuli shape behavioral responses. The Stimulus–Organism–Response (S–O–R) framework (Mehrabian & Russell, 1974) explains that environmental stimuli influence behavior through consumers' internal affective states. Within this framework, Positive Emotion, reflected in feelings of enjoyment, excitement, and pleasure, functions as the organismic mechanism that translates digital shopping experiences into behavioral responses (Li et al., 2023). By shifting decision-making from deliberate cognitive evaluation toward affect-driven processing, positive emotional experiences increase consumers' propensity for Impulse Buying (Beatty & Ferrell, 1998; Verplanken & Herabadi, 2001; Huang, 2016; Liu et al., 2023; Zhao et al., 2024). Accordingly, the S–O–R framework provides the theoretical foundation for explaining how experiential and scarcity-based marketing stimuli jointly influence Impulse Buying through the mediating role of Positive Emotion.

Previous studies consistently demonstrate that digital marketing strategies and consumers' affective responses play important roles in stimulating Impulse Buying within digital commerce. Live Streaming Shopping enhances purchasing behavior through interaction, social presence, and consumer engagement, whereas Flash Sale accelerates purchase decisions through scarcity and time pressure (Wongkitrungrueng & Assarut, 2020; Wang et al., 2021; Gong et al., 2023; Peng et al., 2021; Luo et al., 2022). In addition, Positive Emotion has been widely recognized as the key psychological mechanism linking digital shopping experiences to impulsive purchasing behavior (Li et al., 2023; Liu et al., 2023; Zhao et al., 2024). However, existing research has largely examined these mechanisms independently, leaving limited understanding of how experiential and scarcity-based marketing stimuli jointly influence consumers' emotional and

behavioral responses. Consequently, an integrated framework is needed to explain these complementary effects through the mediating role of Positive Emotion.

Despite substantial progress in digital commerce research, several theoretical gaps remain. First, prior studies have largely examined Live Streaming Shopping and Flash Sale as independent marketing strategies (Sun et al., 2019; Wongkitrungrueng & Assarut, 2020; Luo et al., 2022; Gong et al., 2023), providing limited understanding of how these complementary stimuli jointly shape consumer behavior in increasingly integrated e-commerce environments. Second, although Positive Emotion is widely recognized as a key driver of Impulse Buying (Li et al., 2023; Liu et al., 2023; Zhao et al., 2024), its role in simultaneously mediating the effects of multiple digital marketing stimuli remains underexplored. Third, while the Stimulus–Organism–Response (S–O–R) framework has been widely applied to explain online consumer behavior (Jacoby, 2002), its application has predominantly focused on single environmental stimuli, limiting its explanatory power in contemporary multi-stimulus digital commerce contexts. Accordingly, this study addresses these gaps by developing an integrated S–O–R model that examines the complementary effects of Live Streaming Shopping and Flash Sale on Impulse Buying through the mediating role of Positive Emotion.

To address these gaps, this study develops an integrated Stimulus–Organism–Response (S–O–R) model that examines the complementary effects of Live Streaming Shopping and Flash Sale on Impulse Buying through the mediating role of Positive Emotion. By integrating experiential and scarcity-based marketing stimuli within a unified framework, the study extends the application of the S–O–R framework to contemporary multi-stimulus digital commerce environments. Furthermore, evidence from Indonesia, one of the world's fastest-growing digital commerce markets, broadens the contextual applicability of the proposed model beyond the predominantly developed-market settings represented in previous research. From a managerial perspective, the findings provide practical guidance for designing integrated digital marketing strategies that combine interactive live-stream shopping with scarcity-based promotional campaigns to strengthen consumers' emotional engagement and stimulate Impulse Buying.

THEORETICAL REVIEW

Stimulus–Organism–Response (S–O–R) Theory

The Stimulus–Organism–Response (S–O–R) framework, proposed by Mehrabian and Russell (1974), explains how environmental stimuli influence behavioral responses through consumers' internal psychological states. By emphasizing the mediating role of cognitive and affective processes, the framework has been widely applied to explain consumer behavior in digital commerce, where purchasing decisions are shaped by multiple marketing stimuli rather than by product attributes alone (Wang et al., 2021). Within this framework, Live Streaming Shopping and Flash Sale are conceptualized as complementary external stimuli, Positive Emotion represents the organismic state, and Impulse Buying constitutes the behavioral response. Accordingly, the S–O–R framework provides a coherent theoretical foundation for explaining how experiential and scarcity-based digital marketing strategies jointly stimulate impulse buying through consumers' positive emotional responses (Li et al., 2023; Zhao et al., 2024).

The S–O–R framework is particularly relevant to contemporary digital commerce because online shopping environments simultaneously expose consumers to interactive communication, promotional incentives, and real-time purchasing opportunities. Rather than processing these environmental cues independently, consumers integrate them into affective evaluations that shape subsequent behavioral responses (Wang et al., 2021). Consequently, this study extends the application of the S–O–R framework by conceptualizing Live Streaming Shopping and Flash Sale as complementary marketing stimuli operating through distinct but convergent psychological mechanisms to generate Positive Emotion and ultimately encourage Impulse Buying. This theoretical perspective underpins the proposed conceptual model and the development of the research hypotheses (Li et al., 2023).

Live Streaming Shopping

Live Streaming Shopping refers to a digital commerce format that integrates real-time video broadcasting with online purchasing, enabling consumers to interact directly with sellers while obtaining product information and completing transactions simultaneously (Sun et al., 2019). Compared with conventional e-commerce, it facilitates real-time product demonstrations, two-way communication, and immediate feedback, creating an interactive shopping environment that enhances social presence, perceived authenticity, and consumer trust (Wongkitrungrueng & Assarut, 2020; Gong et al., 2023). These characteristics position Live Streaming Shopping as an experiential digital marketing strategy capable of strengthening consumer engagement and influencing purchasing behavior.

Within the Stimulus–Organism–Response (S–O–R) framework, Live Streaming Shopping functions as an environmental stimulus that generates positive emotional responses through interactive and immersive shopping experiences. By reducing product uncertainty and strengthening consumers' confidence in purchase decisions, it encourages affect-driven rather than purely cognitive evaluations, thereby increasing the likelihood of impulse buying (Li et al., 2023). Empirical evidence consistently demonstrates that Live Streaming Shopping enhances consumer engagement, trust, purchase intention, and impulse buying, supporting its role as an experiential stimulus that influences purchasing behavior through Positive Emotion (Wang et al., 2021; Gong et al., 2023; Li et al., 2023).

Flash Sale

Flash Sale refers to a time-limited promotional strategy in which products are offered at substantially discounted prices for a limited period and often in restricted quantities, encouraging consumers to make immediate purchase decisions (Luo et al., 2022). Unlike conventional price promotions, Flash Sale combines temporal and quantity scarcity to create a heightened sense of urgency that accelerates consumers' purchasing decisions (Aggarwal et al., 2011). These scarcity cues increase the perceived value of promotional opportunities, reduce extensive product evaluation, and encourage immediate purchasing responses (Peng et al., 2021). Consequently, Flash Sale has become a prominent scarcity-based digital marketing strategy for stimulating rapid consumer responses in online shopping environments.

Within the Stimulus–Organism–Response (S–O–R) framework, Flash Sale functions as an environmental stimulus that influences consumers through scarcity-induced psychological mechanisms. Time pressure and limited product availability encourage consumers to rely more on affective than deliberative decision-making, increasing positive emotional arousal and the likelihood of impulse buying (Aggarwal et al., 2011; Peng et al., 2021). Empirical evidence consistently demonstrates that Flash Sale strengthens perceptions of scarcity, urgency, and fear of missing out, thereby reinforcing Positive Emotion and impulsive purchasing behavior (Luo et al., 2022; Zhao et al., 2024). These findings support the conceptualization of Flash Sale as a scarcity-based marketing stimulus that complements the experiential influence of Live Streaming Shopping within the proposed S–O–R framework.

Positive Emotion

Positive Emotion refers to favorable affective states experienced by consumers during the shopping process, including feelings of enjoyment, excitement, pleasure, and enthusiasm elicited by marketing stimuli and shopping experiences (Mehrabian & Russell, 1974). Within consumer behavior research, Positive Emotion is recognized as a key psychological construct because it shapes consumers' evaluations of shopping experiences and influences subsequent behavioral decisions (Li et al., 2023). In digital commerce, interactive shopping experiences and promotional activities frequently evoke positive emotional responses that enhance consumer engagement and purchasing motivation, making Positive Emotion a central construct for explaining online consumer behavior (Liu et al., 2023; Zhao et al., 2024).

Within the Stimulus–Organism–Response (S–O–R) framework, Positive Emotion represents the organismic state that mediates the influence of external marketing stimuli on consumers' behavioral responses (Mehrabian & Russell, 1974). Positive emotional experiences

reduce reliance on extensive cognitive evaluation and encourage affect-driven decision-making, thereby increasing consumers' propensity for impulse buying (Li et al., 2023). Both experiential stimuli, such as Live Streaming Shopping, and scarcity-based stimuli, such as Flash Sale, are capable of generating favorable emotional states that strengthen consumers' motivation to purchase immediately (Liu et al., 2023). Empirical evidence consistently demonstrates that Positive Emotion mediates the relationship between digital marketing stimuli and impulse buying, supporting its role as the central psychological mechanism through which complementary marketing strategies translate into impulsive purchasing behavior (Li et al., 2023; Zhao et al., 2024).

Impulse Buying

Impulse Buying refers to a spontaneous, immediate, and unplanned purchasing behavior that occurs when consumers experience a sudden urge to buy a product without prior planning or extensive deliberation (Beatty & Ferrell, 1998). Unlike planned purchasing, impulse buying is characterized by rapid decision-making and a greater reliance on affective rather than cognitive evaluation (Verplanken & Herabadi, 2001). In digital commerce, interactive marketing features and promotional incentives increasingly encourage immediate purchase decisions, making impulse buying one of the most prominent behavioral outcomes of online shopping environments (Zhang et al., 2022; Li et al., 2025).

Within the Stimulus–Organism–Response (S–O–R) framework, Impulse Buying represents the behavioural response that results from consumers' affective reactions to environmental stimuli (Mehrabian & Russell, 1974). Positive emotional experiences reduce extensive cognitive processing and strengthen consumers' motivation to make immediate purchase decisions, thereby increasing the likelihood of spontaneous purchasing behavior (Li et al., 2023). Empirical evidence consistently demonstrates that interactive shopping experiences, promotional scarcity, and Positive Emotion collectively increase consumers' propensity for impulse buying (Gong et al., 2023; Zhao et al., 2024). These findings support the conceptualization of Impulse Buying as the ultimate behavioral outcome through which experiential and scarcity-based digital marketing stimuli exert their influence within the proposed S–O–R framework.

Live Streaming Shopping and Positive Emotion

Live Streaming Shopping creates an interactive and immersive shopping environment that enhances consumer engagement through real-time communication and direct interaction between sellers and consumers (Sun et al., 2019; Wongkitrungrueng & Assarut, 2020). Within the Stimulus–Organism–Response (S–O–R) framework, these interactive experiences function as environmental stimuli that evoke favourable emotional states by increasing social presence, trust, and shopping enjoyment (Li et al., 2023). Empirical studies consistently demonstrate that Live Streaming Shopping strengthens Positive Emotion by fostering engaging and authentic online shopping experiences (Gong et al., 2023; Li et al., 2023).
H1: Live Streaming Shopping positively influences Positive Emotion.

Flash Sale and Positive Emotion

Flash Sale generates scarcity and time pressure that encourage consumers to make immediate purchase decisions, creating favourable emotional responses during the shopping process (Aggarwal et al., 2011; Luo et al., 2022). Within the Stimulus–Organism–Response (S–O–R) framework, these scarcity-based promotional cues function as environmental stimuli that increase consumers' excitement, enthusiasm, and shopping enjoyment, thereby strengthening Positive Emotion (Peng et al., 2021). Empirical evidence consistently demonstrates that Flash Sale enhances Positive Emotion by reinforcing perceptions of urgency, scarcity, and promotional attractiveness in online shopping environments (Peng et al., 2021; Luo et al., 2022; Zhao et al., 2024).
H2: Flash Sale positively influences Positive Emotion.

Live Streaming Shopping and Impulse Buying

Live Streaming Shopping facilitates interactive and immersive shopping experiences that encourage immediate purchase decisions through real-time communication and continuous consumer engagement (Sun et al., 2019; Wongkitrungrueng & Assarut, 2020). Within the Stimulus–Organism–Response (S–O–R) framework, these interactive marketing cues directly stimulate behavioural responses by reducing consumers' hesitation and increasing their responsiveness to immediate purchasing opportunities. Empirical evidence consistently demonstrates that Live Streaming Shopping enhances Impulse Buying by strengthening consumer engagement, social interaction, and responsiveness to promotional information in digital commerce (Gong et al., 2023; Qu et al., 2023; Li et al., 2025).
H3: Live Streaming Shopping positively influences Impulse Buying.

Flash Sale and Impulse Buying

Flash Sale creates scarcity-based purchasing conditions that encourage consumers to make immediate purchase decisions by increasing perceptions of urgency and reducing extensive cognitive evaluation (Aggarwal et al., 2011; Luo et al., 2022). Within the Stimulus–Organism–Response (S–O–R) framework, these promotional cues directly stimulate behavioural responses by increasing consumers' responsiveness to immediate purchasing opportunities. Empirical evidence consistently demonstrates that Flash Sale enhances Impulse Buying by reinforcing perceptions of scarcity, urgency, and promotional attractiveness in digital commerce (Peng et al., 2021; Luo et al., 2022; Zhao et al., 2024).
H4: Flash Sale positively influences Impulse Buying.

Positive Emotion and Impulse Buying

Within the Stimulus–Organism–Response (S–O–R) framework, Positive Emotion represents the organismic state that directly influences consumers' behavioural responses. Positive emotional experiences encourage consumers to rely on affective rather than deliberative evaluations, thereby increasing the likelihood of spontaneous and unplanned purchasing decisions (Li et al., 2023; Zhao et al., 2024). Empirical evidence consistently demonstrates that Positive Emotion is a strong predictor of Impulse Buying, with consumers experiencing greater enjoyment, excitement, and emotional engagement exhibiting a higher propensity for spontaneous purchasing behaviour across digital commerce settings (Li et al., 2023; Liu et al., 2023; Zhao et al., 2024). Therefore, the following hypothesis is proposed:
H5. Positive Emotion positively influences Impulse Buying.

Within the Stimulus–Organism–Response (S–O–R) framework, the influence of environmental stimuli on consumers' behavioural responses is transmitted through their internal affective states (Mehrabian & Russell, 1974). As an experiential marketing stimulus, Live Streaming Shopping enhances consumers' emotional engagement through interactive shopping experiences, making Positive Emotion the psychological mechanism through which these experiences are translated into Impulse Buying (Li et al., 2023). Empirical evidence consistently demonstrates that interactive live-stream shopping strengthens Positive Emotion, which subsequently increases consumers' propensity for spontaneous purchasing behaviour (Li et al., 2023; Zhao et al., 2024). Therefore, the following hypothesis is proposed:
H6: Positive Emotion mediates the relationship between Live Streaming Shopping and Impulse Buying.

Within the Stimulus–Organism–Response (S–O–R) framework, the effects of environmental stimuli on consumers' behavioral responses are transmitted through their internal affective states (Mehrabian & Russell, 1974). As a scarcity-based marketing stimulus, Flash Sale strengthens consumers' emotional engagement by creating urgency and promotional attractiveness, making Positive Emotion the psychological mechanism through which these

promotional cues are translated into Impulse Buying (Peng et al., 2021; Luo et al., 2022). Empirical evidence consistently demonstrates that scarcity-based promotional strategies enhance Positive Emotion, which subsequently increases consumers' propensity for spontaneous purchasing behaviour in digital commerce (Peng et al., 2021; Zhao et al., 2024). All hypotheses can be constructed in a research path as in Figure 1.

H7: Positive Emotion mediates the relationship between Flash Sale and Impulse Buying.

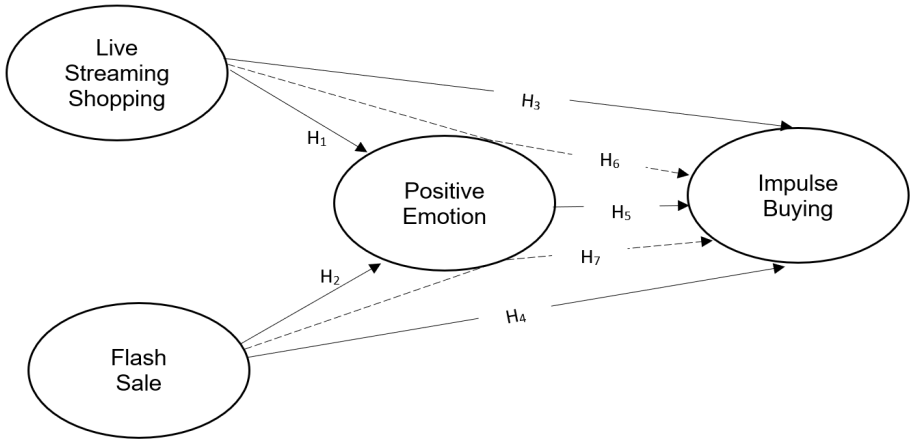


Figure 1. Conceptual Framework of the Study
Source: Developed by the authors.

RESEARCH METHOD

Population, Sample, and Data Collection

This study employed a quantitative cross-sectional survey to examine the effects of Live Streaming Shopping and Flash Sale on Impulse Buying through the mediating role of Positive Emotion among Indonesian e-commerce consumers. The target population comprised Indonesian consumers with direct purchasing experience using both Live Streaming Shopping and Flash Sale features on e-commerce platforms. Covariance-based Structural Equation Modelling (CB-SEM) was employed to test the proposed Stimulus–Organism–Response (S–O–R) model.

Purposive sampling was used to recruit eligible respondents. Participants were required to (1) be at least 17 years old, (2) reside in Indonesia, (3) have made at least one purchase through Live Streaming Shopping, (4) have participated in a Flash Sale promotion, and (5) have experienced both features within the previous three months. These criteria ensured that respondents possessed relevant experience with the digital marketing stimuli examined in this study. Because purposive sampling is a non-probability sampling technique, the findings should be interpreted within the context of the selected respondents rather than as statistically representative of the broader Indonesian e-commerce consumer population.

Data were collected between January and March 2026 using a structured online questionnaire administered through Google Forms and distributed via WhatsApp, Instagram, Telegram, and online shopping communities. Of the 215 questionnaires received, 15 were excluded because of incomplete responses, inconsistent response patterns, or failure to satisfy the eligibility criteria, resulting in 200 valid responses for analysis. The final sample of 200 respondents was considered adequate for estimating the proposed CB-SEM model, which comprised four latent constructs and seven hypothesised relationships.

Measurement of Variables

The measurement instruments were adapted from previously validated scales to ensure content validity, construct comparability, and consistency with prior digital commerce research. All constructs were operationalised as reflective latent variables and measured using a five-point

Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The measurement items were contextually adapted to reflect consumers' experiences with Live Streaming Shopping and Flash Sale in Indonesian e-commerce while preserving the original conceptual meaning of each construct.

Live Streaming Shopping was measured using indicators of interaction quality, real-time communication, product visualisation, and trust in streamers, adapted from Wongkitrungrueng and Assarut (2020). Flash Sale was measured using indicators of time pressure, scarcity perception, limited product availability, and purchase urgency, adapted from Luo et al. (2022) and Peng et al. (2021). These indicators captured consumers' perceptions of promotional stimuli rather than their objective characteristics.

Positive Emotion was measured using indicators of enjoyment, excitement, and pleasure experienced during the shopping process. Consistent with the S–O–R framework, this construct captures consumers' immediate emotional responses to digital marketing stimuli rather than post-purchase evaluations such as satisfaction.

Impulse Buying was measured using indicators of spontaneous purchasing, unplanned buying behaviour, immediate purchase decisions, and limited cognitive deliberation, adapted from Beatty and Ferrell (1998) and Zhang et al. (2022). The operational definitions, measurement indicators, and corresponding references are presented in Table 1, whereas the complete questionnaire items are provided in Appendix A to enhance measurement transparency and facilitate future research replication.

Table 1. Operationalization of Variables

Variable	Indicators	Scale	Sources
Live Streaming Shopping	• Interaction quality • Real-time communication • Product demonstration • Trust in streamer	Likert (1–5)	Wongkitrungrueng & Assarut (2020)
Flash Sale	• Time pressure • Scarcity perception • Limited product availability • Purchase urgency	Likert (1–5)	Luo et al. (2022); Peng et al. (2021)
Positive Emotion	• Excitement • Enjoyment • Pleasure	Likert (1–5)	Wang et al. (2021); Liu et al. (2023)
Impulse Buying	• Spontaneous purchasing, • Unplanned buying behaviour • Immediate purchase decision • Minimal cognitive evaluation	Likert (1–5)	Beatty & Ferrell (1998); Zhang et al. (2022)

Source: Adapted from previous studies.

Data Analysis

The data were analysed using Covariance-Based Structural Equation Modelling (CB-SEM) implemented in LISREL. CB-SEM was selected to validate the proposed Stimulus–Organism–Response (S–O–R) model by simultaneously assessing the measurement properties of the constructs and the structural relationships among the latent variables. Given that all constructs were specified as reflective latent variables, CB-SEM was considered appropriate for theory testing and model confirmation.

The analysis comprised two stages: measurement model evaluation and structural model assessment. The measurement model was evaluated by examining convergent validity, internal consistency reliability, and discriminant validity. Convergent validity was assessed using standardised factor loadings and Average Variance Extracted (AVE), whereas reliability was evaluated using Cronbach's Alpha and Composite Reliability (CR). Discriminant validity was subsequently examined to ensure that each construct represented a distinct conceptual domain.

The structural model was evaluated using goodness-of-fit indices, standardised path coefficients, t-values, and coefficients of determination (R^2). Hypotheses were supported when

the corresponding t-values exceeded the critical value of 1.96 at the 5% significance level. Mediation effects were assessed through indirect effect estimates and their associated t-values generated by LISREL to determine the mediating role of Positive Emotion.

To minimize common method bias (CMB), both procedural and statistical remedies were implemented. Respondents were assured of anonymity and confidentiality, and the questionnaire was designed to minimize evaluation apprehension and response bias. Harman's single-factor test indicated that no single factor accounted for the majority of the total variance, suggesting that common method bias was unlikely to threaten the validity of the study findings.

RESULTS

This section presents the empirical findings from the covariance-based structural equation modelling (CB-SEM) analysis using LISREL. The results are organized into five stages: respondent characteristics, measurement model assessment, structural model assessment, hypothesis testing, and mediation analysis, providing a systematic evaluation of the proposed Stimulus–Organism–Response (S–O–R) model.

Respondent Characteristics

Following data screening, 200 valid questionnaires were retained for analysis. Table 2 summarizes the demographic and shopping characteristics of the respondents, providing an overview of the sample profile used to evaluate the proposed research model.

Table 2. Respondent Characteristics

Characteristics	Category	Frequency	Percentage (%)
Gender	Male	78	39.0
	Female	122	61.0
Age	17–25 years	110	55.0
	26–35 years	60	30.0
	>35 years	30	15.0
Occupation	Student	64	32.0
	Private employee	71	35.5
	Entrepreneur	34	17.0
	Civil servant	18	9.0
	Others	13	6.5
Monthly Spending	< IDR 1 million	42	21.0
	IDR 1–3 million	89	44.5
	> IDR 3 million	69	34.5
Shopping Frequency	1–2 times/month	72	36.0
	3–5 times/month	83	41.5
	>5 times/month	45	22.5
Product Category	Fashion	68	34.0
	Beauty	39	19.5
	Electronics	35	17.5
	Household products	27	13.5
	Others	31	15.5
E-commerce Platform	Shopee	95	47.5
	TikTok Shop	85	42.5
	Others	20	10.0

Source: Processed data (2026).

As presented in Table 2, the sample was predominantly female (61.0%) and aged 17–25 years (55.0%), indicating that the study primarily captured younger consumers actively engaged in digital commerce. Private employees (35.5%) and students (32.0%) constituted the largest occupational groups, reflecting a relatively diverse socioeconomic profile.

Most respondents reported monthly expenditures of IDR 1–3 million (44.5%) and purchased products online three to five times per month (41.5%). Fashion was the most frequently

purchased product category (34.0%), followed by beauty products (19.5%) and electronics (17.5%). Shopee (47.5%) and TikTok Shop (42.5%) were the dominant e-commerce platforms. Overall, the sample adequately represents active Indonesian consumers with relevant experience in Live Streaming Shopping and Flash Sale, supporting the suitability of the dataset for subsequent model evaluation.

Convergent validity was assessed using standardized factor loadings obtained from Confirmatory Factor Analysis (CFA). Following Hair et al. (2022), factor loadings above 0.50 indicate acceptable convergent validity, whereas values exceeding 0.70 provide strong evidence of indicator reliability. The standardized factor loadings for all measurement indicators are presented in Table 3**.**

Table 3. Standardized Loading Factors

Variable	Indicator	Loading Factor	Remark
Live Streaming Shopping (LS)	X1.1	0.91	Valid
	X1.2	0.85	Valid
	X1.3	0.88	Valid
	X1.4	0.90	Valid
Flash Sale (FS)	X2.1	0.73	Valid
	X2.2	0.79	Valid
	X2.3	0.71	Valid
	X2.4	0.87	Valid
Positive Emotion (PE)	Z1	0.88	Valid
	Z2	0.86	Valid
	Z3	0.93	Valid
	Z4	0.86	Valid
Impulse Buying (IB)	Y1	0.92	Valid
	Y2	0.70	Valid
	Y3	0.81	Valid
	Y4	0.90	Valid

Source: LISREL Output (2025).

As presented in Table 3, all standardized factor loadings ranged from 0.70 to 0.93, exceeding the recommended threshold of 0.50. Moreover, nearly all indicators surpassed the more stringent criterion of 0.70, indicating strong relationships between the observed indicators and their respective latent constructs. These findings confirm satisfactory convergent validity for all measurement items. Accordingly, all indicators were retained for subsequent analyses, supporting the adequacy of the measurement model for reliability assessment, discriminant validity evaluation, and structural model testing.

Reliability and Validity Assessment

Following the assessment of indicator-level convergent validity, construct reliability and convergent validity were evaluated using Cronbach's Alpha (CA), Composite Reliability (CR), and Average Variance Extracted (AVE). Following Hair et al. (2022), CA and CR values above 0.70 indicate satisfactory internal consistency, whereas AVE values above 0.50 confirm adequate convergent validity. The results are presented in Table 4.

Table 4. Composite Reliability and Average Variance Extracted

Construct	Cronbach's Alpha	Composite Reliability	AVE	Decision
Live Streaming Shopping	0.91	0.94	0.79	Reliable and Valid
Flash Sale (FS)	0.82	0.86	0.61	Reliable and Valid
Positive Emotion (PE)	0.90	0.93	0.78	Reliable and Valid
Impulse Buying (IB)	0.87	0.89	0.67	Reliable and Valid

Source: Calculated from standardized loading factors based on LISREL output (2026).

As indicated in Table 4, all constructs satisfied the recommended reliability and validity criteria. Cronbach's Alpha ranged from 0.82 to 0.91, Composite Reliability from 0.86 to 0.94, and AVE from 0.61 to 0.79, all exceeding the recommended thresholds (CA and CR > 0.70; AVE > 0.50). These results demonstrate strong internal consistency and adequate convergent validity across all latent constructs. Hence, the measurement model exhibited satisfactory reliability and validity, confirming that all constructs were measured consistently and were appropriate for subsequent discriminant validity assessment and structural model evaluation.

Discriminant Validity

Discriminant validity was assessed using the Fornell–Larcker criterion, which establishes discriminant validity when the square root of the Average Variance Extracted (AVE) for each construct exceeds its correlations with other constructs (Fornell & Larcker, 1981). The results are presented in Table 5.

Table 5. Discriminant Validity Assessment (Fornell–Larcker Criterion)

Construct	LS	FS	PE	IB
Live Streaming Shopping (LS)	0.89			
Flash Sale (FS)	0.10	0.78		
Positive Emotion (PE)	0.67	0.49	0.88	
Impulse Buying (IB)	0.61	0.53	0.79	0.82

Source: Calculated from LISREL Output (2026).

As presented in Table 5, the square root of the AVE for each construct exceeded its correlations with all other constructs, satisfying the Fornell–Larcker criterion. These findings confirm that each latent construct shares greater variance with its own indicators than with other constructs, thereby demonstrating satisfactory discriminant validity.The measurement model exhibited adequate construct distinctiveness, indicating that Live Streaming Shopping, Flash Sale, Positive Emotion, and Impulse Buying represent empirically distinct constructs. Accordingly, the measurement model was considered suitable for subsequent structural model evaluation, hypothesis testing, and mediation analysis.

Goodness of Fit Evaluation

The adequacy of the proposed covariance-based Structural Equation Modelling (CB-SEM) model was evaluated using multiple goodness-of-fit indices. Following Hair et al. (2022) and Kline (2023), model fit should be assessed using a combination of absolute, incremental, and parsimonious fit indices rather than relying on a single statistic. The goodness-of-fit results are presented in Table 6.

Table 6. Goodness-of-Fit Evaluation

Fit Index	Recommended Value	Result	Interpretation
Chi-Square	Small value expected	102.49	Acceptable Fit
Degrees of Freedom (DF)	-	74	-
Normed Chi-Square (χ^2/df)	≤ 3.00	1.39	Good Fit
p-value	≥ 0.05	0.016	Marginal Fit
RMSEA	≤ 0.08	0.044	Good Fit
GFI	≥ 0.90	0.98	Good Fit
AGFI	≥ 0.90	0.97	Good Fit
NFI	≥ 0.90	1.00	Good Fit
NNFI (TLI)	≥ 0.90	1.03	Good Fit
CFI	≥ 0.90	1.00	Good Fit
IFI	≥ 0.90	1.02	Good Fit
RMR	≤ 0.05	0.017	Good Fit
SRMR	≤ 0.08	0.011	Good Fit

Source: LISREL Output (2026).

As presented in Table 6, the proposed model demonstrated an overall satisfactory fit with the observed data. The normed chi-square (χ^2/df = 1.39), RMSEA (0.044), RMR (0.017), and SRMR (0.011) satisfied the recommended thresholds, while the incremental fit indices (GFI, AGFI, NFI, NNFI, CFI, and IFI) all indicated good model fit. Collectively, these results confirm that the proposed measurement and structural models adequately represent the observed covariance structure. Although the chi-square test was statistically significant ($\chi^2 = 102.49$, $df = 74$, $p = 0.016$), this outcome is not uncommon because the chi-square statistic is sensitive to sample size and model complexity (Hair et al., 2022; Kline, 2023). Therefore, the overall model fit was evaluated based on the combined evidence from multiple fit indices rather than the chi-square statistic alone.

Structural Model Evaluation

The structural model was evaluated by examining the coefficient of determination (R^2), which indicates the proportion of variance in each endogenous construct explained by its predictor variables. Following Hair et al. (2022), higher R^2 values reflect greater explanatory power. The results are presented in Table 7.

Table 7. Coefficient of Determination (R^2)

Endogenous Variable	R^2	Interpretation
Positive Emotion (PE)	0.63	Substantial
Impulse Buying (IB)	0.69	Substantial

Source: LISREL Output (2026).

As shown in Table 7, Live Streaming Shopping and Flash Sale jointly explained 63% of the variance in Positive Emotion (R^2 = 0.63), whereas Live Streaming Shopping, Flash Sale, and Positive Emotion jointly explained 69% of the variance in Impulse Buying (R^2 = 0.69). These findings indicate that the proposed Stimulus–Organism–Response (S–O–R) model possesses substantial explanatory power for both endogenous constructs**.**

Based on the standardized LISREL solution, the structural relationships among the latent constructs are expressed as follows:

PE = 0.63LS + 0.42FS ..... (1)

IB = 0.50PE +0.25LS + 0.26FS..... (2)

Equation (1) indicates that Live Streaming Shopping and Flash Sale positively predict Positive Emotion, whereas Equation (2) shows that Positive Emotion, Live Streaming Shopping, and Flash Sale positively predict Impulse Buying. The statistical significance of these structural relationships is presented in the subsequent hypothesis testing section.

Hypothesis testing was conducted by examining the standardized path coefficients (β) and *t*-values estimated using LISREL. Following Hair et al. (2022), a hypothesis was considered supported when the corresponding *t*-value exceeded the critical value of 1.96 at the 5% significance level. The results are presented in Table 8.

Table 8. Hypothesis Testing Results

Hypothesis	Relationship	Path Coefficient	t-value	Decision
H_1	Live Streaming Shopping → Positive Emotion	0.63	18.19	Supported
H_2	Flash Sale → Positive Emotion	0.42	17.21	Supported
H_3	Positive Emotion → Impulse Buying	0.50	20.67	Supported
H_4	Live Streaming Shopping → Impulse Buying	0.25	2.54	Supported
H_5	Flash Sale → Impulse Buying	0.26	3.98	Supported

Source: LISREL Output (2026).

As presented in Table 8, all hypothesized relationships were statistically significant, with *t*-values exceeding the critical threshold of 1.96. Accordingly, H1–H5 were supported, confirming the proposed structural relationships within the Stimulus–Organism–Response (S–O–R) framework. Among the proposed relationships, Live Streaming Shopping exerted the strongest positive effect on Positive Emotion (β = 0.63), whereas Positive Emotion showed the strongest direct effect on Impulse Buying (β = 0.50). In addition, both Live Streaming Shopping and Flash Sale had significant direct effects on Impulse Buying, indicating that digital marketing stimuli influence consumers' purchasing behavior both directly and through their emotional responses.

Mediation Analysis

The mediating role of Positive Emotion was evaluated by examining the standardized indirect effects and their corresponding *t*-values estimated using LISREL. Following Hair et al. (2022), an indirect effect is considered significant when the *t*-value exceeds 1.96. The mediation results are presented in Table 9.

Table 9. Mediation Analysis Results

Hypothesis	Relationship	Indirect Effect	t-value	Decision
H_6	Live Streaming Shopping → Positive Emotion → Impulse Buying	0.31	2.75	Supported
H_7	Flash Sale → Positive Emotion → Impulse Buying	0.21	2.70	Supported

Source: LISREL Output (2026).

As presented in Table 9, both indirect effects are statistically significant ($t > 1.96$), supporting H6 and H7. The indirect effect of Live Streaming Shopping on Impulse Buying through Positive Emotion (β = 0.31) is stronger than that of Flash Sale (β = 0.21), indicating that interactive shopping experiences generate a greater emotional influence on consumers' impulse buying behavior. Because both the direct effects (Table 8) and indirect effects (Table 9) remain significant, Positive Emotion functions as a partial mediator in both relationships.

DISCUSSION

The findings support the hypothesis that Live Streaming Shopping positively influences Positive Emotion, establishing interactive shopping experiences as an important source of consumers' emotional engagement. Within the proposed model, live-stream shopping exhibits a stronger association with positive emotion than flash sales. This pattern suggests that experiential engagement may generate greater emotional value than promotional incentives alone. Real-time communication, authentic product demonstrations, and social interaction transform online shopping into a participatory experience that satisfies consumers' informational, social, and hedonic needs. Consistent with the Stimulus–Organism–Response (S–O–R) framework (Mehrabian & Russell, 1974; Jacoby, 2002), these findings highlight the importance of experiential stimuli in shaping consumers' affective responses. Previous studies similarly emphasize the contributions of social presence, interaction, and authenticity to emotional engagement (Sun et al., 2019; Hu & Chaudhry, 2020; Wongkitrungrueng & Assarut, 2020; Wang et al., 2021; Gong et al., 2023; Liu et al., 2023).

The hypothesis proposing a positive relationship between Flash Sale and Positive Emotion is supported, confirming that scarcity-based promotions contribute to favorable emotional responses in digital commerce. Limited-time offers create perceived opportunities for advantageous purchases and may generate excitement through anticipated savings and acquisition benefits. This interpretation aligns with research emphasizing the emotional significance of scarcity, perceived value, and promotional urgency (Aggarwal et al., 2011; Peng et al., 2021; Luo et al., 2022; Qu et al., 2023). However, the comparatively weaker association of Flash Sale with Positive Emotion suggests that promotional incentives may offer a narrower emotional experience than interactive shopping environments. Recent literature similarly

recognizes the growing importance of immersive and socially engaging digital shopping experiences alongside economic incentives (Lee et al., 2025; Li et al., 2025).

The findings support the hypothesis that Positive Emotion positively influences Impulse Buying, identifying consumers' affective states as a central psychological explanation for spontaneous purchasing. Positive Emotion exhibits the strongest direct association with Impulse Buying in the proposed model, highlighting the relevance of emotional experiences beyond exposure to marketing stimuli. Feelings of enjoyment, excitement, and pleasure may increase the attractiveness of immediate consumption while reducing consumers' inclination toward extended purchase deliberation. This interpretation is consistent with previous research linking favourable emotional states to impulsive purchasing tendencies (Beatty & Ferrell, 1998; Verplanken & Herabadi, 2001; Huang, 2016; Li et al., 2023; Liu et al., 2023; Zhao et al., 2024). The theoretical contribution lies in positioning Positive Emotion as a common affective mechanism connecting distinct digital marketing stimuli with impulse buying.

The hypothesis that Live Streaming Shopping positively influences Impulse Buying is supported, confirming that interactive digital shopping environments are directly associated with spontaneous purchasing behaviour. Real-time product demonstrations, immediate responses to consumer inquiries, and social interaction may reduce purchase uncertainty and encourage quicker decisions. These findings align with previous studies linking live-stream commerce to consumer engagement, trust, social presence, and impulsive purchasing (Sun et al., 2019; Wongkitrungrueng & Assarut, 2020; Wang et al., 2021; Gong et al., 2023). However, the direct relationship is weaker than the corresponding relationship between Live Streaming Shopping and Positive Emotion. This distinction suggests that the behavioural relevance of live-stream shopping extends beyond transactional convenience and includes its emotional dimension. The study contributes to S–O–R research by establishing the coexistence of direct behavioural and emotion-mediated pathways within the same model.

The hypothesis proposing a positive relationship between Flash Sale and Impulse Buying is supported, demonstrating that scarcity-based promotions remain relevant to spontaneous purchasing in digital commerce. Limited-time discounts and perceived scarcity create purchasing urgency and encourage consumers to respond before promotional opportunities disappear. This finding corroborates previous research associating scarcity cues and promotional urgency with impulsive consumer behaviour (Aggarwal et al., 2011; Peng et al., 2021; Luo et al., 2022; Qu et al., 2023). Nevertheless, the weaker direct association of Flash Sale with Impulse Buying relative to Positive Emotion suggests that promotional urgency alone does not fully explain spontaneous purchasing.

The hypothesis proposing that Positive Emotion mediates the relationship between Live Streaming Shopping and Impulse Buying is supported, confirming partial mediation. Interactive live-stream environments are associated with spontaneous purchasing both directly and through favourable emotional experiences. This finding complements previous research emphasizing social presence, enjoyment, trust, and consumer engagement in live-stream commerce (Sun et al., 2019; Wongkitrungrueng & Assarut, 2020; Gong et al., 2023; Li et al., 2023; Liu et al., 2023). Importantly, the estimated indirect pathway exceeds the direct pathway, suggesting that emotional engagement constitutes a particularly relevant explanation for the association between live-stream shopping and impulse buying.

The hypothesis that Positive Emotion mediates the relationship between Flash Sale and Impulse Buying is supported, confirming partial mediation. Flash sales are associated with spontaneous purchasing through both direct promotional influence and the positive emotions associated with perceived purchasing opportunities. This finding supports earlier research emphasizing scarcity, anticipated acquisition benefits, and purchasing urgency (Aggarwal et al., 2011; Peng et al., 2021; Luo et al., 2022; Qu et al., 2023). It also complements evidence that favourable emotional experiences are associated with stronger impulsive purchasing tendencies (Li et al., 2023; Zhao et al., 2024). Notably, the estimated emotional mediation pathway is weaker for Flash Sale than for Live Streaming Shopping. This comparison offers a theoretical distinction between experiential and scarcity-based stimuli: both operate through Positive Emotion, but their associations with this psychological pathway differ. The findings extend the S–O–R framework by demonstrating the relevance of a shared emotional mechanism across distinct forms of digital marketing. From a managerial perspective, integrating time-sensitive promotions with interactive

live-stream experiences may provide a more engaging purchasing environment than implementing either strategy in isolation.

CONCLUSION AND FUTURE RESEARCH

This study advances the understanding of impulse buying in digital commerce by demonstrating the distinct yet complementary roles of Live Streaming Shopping and Flash Sale within the Stimulus–Organism–Response (S–O–R) framework. Both marketing stimuli positively influence Positive Emotion and Impulse Buying, while Positive Emotion partially mediates both relationships. The central finding is that consumers' emotional responses represent a particularly important psychological pathway linking digital marketing stimuli to spontaneous purchasing behavior. Live Streaming Shopping exhibits a stronger association with Positive Emotion than Flash Sale, suggesting that experiential interaction offers greater emotional relevance than scarcity-based promotional incentives. Theoretically, this study extends the S–O–R framework by distinguishing the emotional contributions of experiential and promotional stimuli within a unified model. Managerially, digital retailers should integrate authentic product demonstrations, real-time communication, and engaging live-stream experiences with carefully designed promotional campaigns. Such integration may strengthen emotional engagement and purchasing responses while reducing excessive dependence on price-oriented competition.

Several limitations provide opportunities for further research. The cross-sectional design restricts causal inference and cannot capture changes in emotional responses and purchasing behavior over time. The exclusive focus on Positive Emotion also limits the explanation of alternative psychological mechanisms, while the Indonesian consumer sample constrains the generalizability of the findings across cultural and market contexts. Future studies should employ longitudinal and experimental designs to examine causal relationships and the evolving influence of digital marketing stimuli. Additional mediators, including fear of missing out, perceived authenticity, social presence, trust, and perceived value, could clarify the psychological processes underlying impulse buying. Cross-cultural comparisons and the examination of consumer impulsiveness, product involvement, digital literacy, and platform characteristics as moderators would further establish the boundary conditions of the proposed relationships. Future research should also investigate whether combining live-stream shopping and flash-sale promotions produces synergistic effects beyond their independent contributions. These extensions would strengthen the theoretical precision of the S–O–R framework and provide more context-sensitive guidance for designing effective and responsible digital marketing strategies.

ETHICAL DISCLOSURE

All participants provided informed consent prior to participation in this study. Respondents were informed about the purpose of the research, their voluntary participation, the right to withdraw at any time, and the confidentiality of their responses. All collected data were used solely for academic purposes and were analyzed anonymously.

CONFLICT OF INTERESTS

The authors declare no conflict of interest.

REFERENCES

Aggarwal, P., Jun, S. Y., & Huh, J. H. (2011). Scarcity messages: A consumer competition perspective. *Journal of Advertising, 40*(3), 19–30. https://doi.org/10.2753/JOA0091-3367400302

Beatty, S. E., & Ferrell, M. E. (1998). Impulse buying: Modeling its precursors. *Journal of Retailing, 74*(2), 161–167. https://doi.org/10.1016/S0022-4359(98)90009-4

Gong, X., Ye, Z., Wu, Y., & Chen, Z. (2023). Understanding consumer impulse buying in livestreaming commerce: The role of social presence and streamer attractiveness. *Frontiers in Psychology, 14*, 1104349. https://doi.org/10.3389/fpsyg.2023.1104349

Hu, M., & Chaudhry, S. S. (2020**).** Enhancing consumer engagement in e-commerce live streaming via relational bonds. *Internet Research, 30*(3), 1019–1041. https://doi.org/10.1108/INTR-03-2019-0082

Huang, L. T. (2016). Flow and social capital theory in online impulse buying. *Journal of Business Research, 69*(6), 2277–2283. https://doi.org/10.1016/j.jbusres.2015.12.042

Islam, J. U., Rahman, Z., & Hollebeek, L. D. (2020). Consumer engagement in online brand communities: A solicitation of congruity theory. *Internet Research, 30*(1), 77–104. https://doi.org/10.1108/INTR-09-2018-0419

Jacoby, J. (2002). Stimulus–organism–response reconsidered: An evolutionary step in modeling consumer behavior. *Journal of Consumer Psychology, 12*(1), 51–57. https://doi.org/10.1207/S15327663JCP1201_05

Lee, Z. W. Y., Liu, W. Z. H., Chan, T. K. H., & Wei, G. G. Z. (2025). Impulse buying in live streaming commerce: A literature review and research agenda. *Information & Management, 62*(8), 104220. https://doi.org/10.1016/j.im.2025.104220

Li, Y., García-de-Frutos, N., & Ortega-Egea, J. M. (2025). Impulse buying in live streaming e-commerce: A systematic literature review and future research agenda. *Computers in Human Behavior Reports, 19*, 100676. https://doi.org/10.1016/j.chbr.2025.100676

Li, Y., Peng, Y., & Chen, X. (2023). How emotional responses drive impulse buying in online shopping: Evidence from live streaming commerce. *Electronic Commerce Research and Applications, 58*, 101209. https://doi.org/10.1016/j.elerap.2023.101209

Li, Y., Xu, X., & Ki, C. W. C. (2025). Impulse buying in live streaming e-commerce: A systematic literature review. *Journal of Innovation and Knowledge, 10*(2), 100612. https://doi.org/10.1016/j.jik.2025.100612

Liu, X., He, M., Gao, F., & Xie, P. (2023). Emotional engagement and impulse buying behavior in live-stream commerce environments. *Journal of Retailing and Consumer Services, 72*, 103274. https://doi.org/10.1016/j.jretconser.2023.103274

Luo, X., Andrews, M., Fang, Z., & Phang, C. W. (2022). Mobile targeting and online impulse buying: Evidence from flash sales. *Information Systems Research, 33*(2), 545–561. https://doi.org/10.1287/isre.2021.1057

Mehrabian, A., & Russell, J. A. (1974). *An approach to environmental psychology*. MIT Press.

Peng, L., Zhang, W., Wang, X., & Liang, S. (2021). Moderating effects of time pressure on the relationship between perceived value and purchase intention in e-commerce. *Electronic Commerce Research, 21*(2), 1–24. https://doi.org/10.1007/s10660-020-09438-6

Qu, Y., Khan, J., Su, Y., Tong, J., & Zhao, S. (2023). Impulse buying tendency in live-stream commerce: The role of viewing frequency and anticipated emotions influencing scarcity-induced purchase decision. *Journal of Retailing and Consumer Services, 75*, 103534. https://doi.org/10.1016/j.jretconser.2023.103534

Silaningsih, E., Yulianingsih, & Alfahri, H. (2025). The influence of hedonic motivation, store atmosphere, and positive emotion on consumer impulse buying. *International Journal of Education and Life Sciences (IJELS), 3*(1), 1459–1474. https://doi.org/10.59890/ijels.v3i1.94

Sun, Y., Shao, X., Li, X., Guo, Y., & Nie, K. (2019). How live streaming influences purchase intentions in social commerce: An IT affordance perspective. *Electronic Commerce Research and Applications, 37*, 100886. https://doi.org/10.1016/j.elerap.2019.100886

Verplanken, B., & Herabadi, A. (2001). Individual differences in impulse buying tendency: Feeling and no thinking. *European Journal of Personality, 15*(S1), S71–S83. https://doi.org/10.1002/per.423

Wang, Y., Hong, A., Li, X., & Gao, J. (2021). Marketing innovations during a global crisis: A study of e-commerce live streaming. *Journal of Business Research, 130*, 543–555. https://doi.org/10.1016/j.jbusres.2020.11.039

We Are Social. (2024). *Digital 2024: Indonesia*. https://wearesocial.com/digital-2024

Wongkitrungrueng, A., & Assarut, N. (2020). The role of live streaming in building consumer trust and engagement with social commerce sellers. *Journal of Business Research, 117*, 543–556. https://doi.org/10.1016/j.jbusres.2018.08.032

Yulianingsih, Y., Pramestidewi, C. A., & Arifah, A. (2024). Analisis faktor-faktor yang mempengaruhi impulse buying: Studi kasus pada shopping lifestyle, fashion involvement,

dan store atmosphere terhadap impulse buying konsumen. *Innovative: Journal of Social Science Research, 4*(6), 855–866. https://doi.org/10.31004/innovative.v4i6.16411

Zhang, K. Z. K., Benyoucef, M., & Zhao, S. J. (2016). Consumer participation and impulse buying in social commerce: The role of social influence and emotional engagement. *International Journal of Information Management, 36*(3), 333–347. https://doi.org/10.1016/j.ijinfomgt.2015.12.001

Zhang, Y., Lu, H., Gupta, S., & Zhao, L. (2022). Understanding impulse buying behavior in online shopping environments: Evidence from e-commerce platforms. *Journal of Retailing and Consumer Services, 68*, 103070. https://doi.org/10.1016/j.jretconser.2022.103070

Zhao, Y., Wang, L., & Zhang, J. (2024). The influence of digital marketing stimuli on impulse buying behavior: The mediating role of emotions in e-commerce. *Journal of Business Research, 172*, 114123. https://doi.org/10.1016/j.jbusres.2024.114123

APPENDIX: MEASUREMENT INSTRUMENT

A. Respondent Eligibility Criteria

The respondents included in this study were required to meet the following criteria:

1. Aged 17 years or older.
2. Residing in Indonesia.
3. Have made at least one purchase through Live Streaming Shopping.
4. Have participated in a Flash Sale promotion.
5. Have experienced both Live Streaming Shopping and Flash Sale within the previous three months.
6. Willing to participate voluntarily by completing the questionnaire.

B. Questionnaire Instructions

Please indicate the extent to which you agree with each of the following statements based on your shopping experience using Live Streaming Shopping and Flash Sale features in e-commerce platforms.

Table A1. Measurement Scale

Scale	Response Category
1	Strongly Disagree (SD)
2	Disagree (D)
3	Neutral (N)
4	Agree (A)
5	Strongly Agree (SA)

The questionnaire items used to operationalize each construct are presented in Table A2. All items were adapted from previously validated studies and contextualized for Indonesian e-commerce platforms.

Table A2. Questionnaire Items

Construct	Source	Code	Measurement Items	1	2	3	4	5
Live Streaming Shopping	Wongkitrungrueng & Assarut (2020)	X1.1	The interaction with the seller during live streaming was responsive and informative.					
		X1.2	Real-time communication during live streaming helped me understand the product more clearly.					
		X1.3	The product demonstration during live streaming enabled me to evaluate the product effectively.					
		X1.4	I trusted the information provided by the streamer					

			during the live streaming session.					
Flash Sale	Luo et al. (2022); Peng et al. (2021)	X2.1	Flash Sale promotions created a sense of time pressure when making purchase decisions.					
		X2.2	The limited quantity of products made me feel that the products were scarce.					
		X2.3	The limited availability of products encouraged me to purchase immediately.					
		X2.4	Flash Sale promotions increased my urgency to complete the purchase without delay.					
Positive Emotion	Wang et al. (2021); Liu et al. (2023)	Z1	I felt excited while shopping through Live Streaming Shopping and Flash Sale.					
		Z2	I enjoyed the shopping experience when using Live Streaming Shopping and Flash Sale.					
		Z3	I felt pleased during the shopping process.					
		Z4	Overall, I felt positive about my shopping experience.					
Impulse Buying	Beatty & Ferrell (1998); Zhang et al. (2022)	Y1	I purchased products spontaneously.					
		Y2	I purchased products without prior planning.					
		Y3	I made purchase decisions immediately after seeing the product.					
		Y4	I made purchase decisions with little cognitive deliberation.					

Note: All questionnaire items were measured using a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The measurement items were adapted and operationalized from the referenced studies to fit the context of Indonesian e-commerce platforms.