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Scarcity Messages, Streamer Credibility, And Impulse Buying Behavior In Tiktok Live Shopping: The Mediating Roles Of Anticipated Regret And Pre-Order Intention

Reinissa Putri Ramadhani[1], Dyah Sugandini[2], Mohamad Irhas Effendi[3]

[1, 2, 3] Faculty of Economics and Business, Universitas Pembangunan Nasional "Veteran" Yogyakarta, Yogyakarta, Indonesia.

Abstract

This study examines the effects of scarcity message and streamer credibility on impulse buying behavior in TikTok Live Shopping, with anticipated regret and pre-order intention as sequential mediators. Data were collected from 140 consumers aged 18–29 years in the Special Region of Yogyakarta who had considered or purchased pre-order fashion products and were analysed using PLS-SEM. The results show that scarcity message and streamer credibility positively affect anticipated regret, which subsequently increases pre-order intention. Pre-order intention and streamer credibility positively affect impulse buying behavior, whereas scarcity message has no significant direct effect. Anticipated regret and pre-order intention sequentially mediate the effects of both scarcity message and streamer credibility on impulse buying behavior. These findings indicate that scarcity operates primarily through an emotional-behavioral mechanism, whereas streamer credibility operates through both direct and indirect pathways, extending the SOR framework in the context of pre-order live commerce.

Keywords: scarcity message; streamer credibility; anticipated regret; pre-order intention; impulse buying behavior

INTRODUCTION

Digital technology has transformed global e-commerce, particularly through the rapid development of live streaming commerce, which combines live broadcasts, real-time interaction, and digital transactions. Initially growing rapidly in China, this model has expanded globally and has become an important part of digital retail in Indonesia. TikTok Live Shopping is one of the fastest-growing live commerce channels in Indonesia, with

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transactions reaching approximately IDR 100 trillion in 2024 (SWA, 2025; Bloomberg Technoz, 2025). Fashion is one of its major product categories, with Kalodata data for 1–31 July 2026 showing that Womenswear & Underwear recorded the highest fashion GMV at IDR 1,859.30 billion, compared with IDR 667.94 billion for Women's Tops.

An important feature of this market is that several high-performing fashion products are sold through pre-orders (Kalodata, 2026). Consumers place orders and make payment before the products are physically available, then wait for a certain period before receiving them. This creates greater uncertainty because fashion is an experience-based product whose important attributes, including fabric comfort, size suitability, and fit, can only be properly evaluated after use (Wang et al., 2024). Unlike search-based products such as electronics, consumers purchasing pre-order fashion products may also have limited access to previous customer reviews because the products have not yet reached other buyers. Under these conditions, consumers would normally be expected to become more cautious about purchase.

However, TikTok Live Shopping creates an environment in which consumers are exposed to real-time marketing stimuli, including product demonstrations, streamer interactions, and interactions with other viewers, which can encourage online impulse buying (Feng et al., 2024). In practice, consumers may still purchase pre-order fashion products despite having limited product information and being required to wait for delivery. Their decisions may therefore depend more strongly on the streamer's presentation and scarcity claims regarding limited stock or time. This behavior presents an important issue: consumers may commit to a purchase, and even do so impulsively, despite relatively high uncertainty.

Regret provides one possible psychological explanation for this behavior. In advance selling, regret can play an important role in consumers' decisions to purchase before a product becomes available (Nasiry & Popescu, 2012). When consumers encounter scarcity messages, they may anticipate the regret associated with missing a purchasing opportunity, which can encourage them to act despite the uncertainty involved in pre-orders (Zeelenberg & Pieters, 2007). This mechanism is consistent with loss aversion, whereby individuals tend to be more motivated to avoid losses than to obtain equivalent gains (Kahneman & Tversky, 1979). At the same time, when previous customer reviews are unavailable, streamer credibility may become an important source of validation because consumers rely more heavily on the streamer's expertise, trustworthiness, and attractiveness.

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Despite the growing literature on live stream commerce and impulse buying, several gaps remain. Previous studies have mainly examined psychological mediators such as arousal, fear of missing out (FoMO), trust, and social presence (Qu et al., 2023; Feng et al., 2024), while pre-order intention has generally been treated as part of a selling or pricing strategy rather than as a mechanism in the consumer decision process (Kim & Kim, 2026). Anticipated regret has also been shown to mediate the relationship between scarcity-based impulsive buying tendencies and purchase decisions (Qu et al., 2023), but limited attention has been given to pre-order intention as a subsequent stage following this emotional response. Furthermore, the psychological process underlying pre-orders for fashion products without previous customer reviews remains underexplored, particularly in TikTok Live Shopping, where consumers may rely more heavily on emotional responses and source credibility than on objective product information.

This study addresses these gaps by extending the Stimulus–Organism–Response (SOR) framework to live streaming commerce. Scarcity message and streamer credibility represent the stimuli (S), anticipated regret represents the internal psychological state or organism (O), while pre-order intention and impulse buying behavior represent sequential behavioral responses (R). Specifically, pre-order intention is positioned as an initial behavioral response that mediates the relationship between anticipated regret and the subsequent impulse buying behavior. By incorporating pre-order intention into this process, the study provides a more detailed explanation of how scarcity messages and streamer credibility may lead to impulse buying behavior through anticipated regret and pre-order intention. The findings may also help TikTok Live sellers better understand the psychological process behind consumers' pre-order and impulse buying decisions.

LITERATURE REVIEW

Stimulus–Organism–Response (SOR)

The Stimulus–Organism–Response (SOR) framework explains how external stimuli influence an individual's internal psychological state, which subsequently produces a behavioral response (Mehrabian & Russell, 1974). In digital marketing, SOR has been widely used to explain how online environmental stimuli influence consumers' emotions, cognition, and purchasing behavior (Eroglu et al., 2001; Hussain et al., 2023). Previous studies have also applied SOR to live commerce, where marketing and social stimuli influence consumers' internal states and subsequently encourage purchasing

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behavior (Qu et al., 2023; Chen et al., 2021; Li et al., 2022; Lo et al., 2022; Bagozzi et al., 1999). In this study, scarcity message and streamer credibility represent the stimuli (S), anticipated regret represents the organism (O), while pre-order intention and impulse buying behavior represent sequential behavioral responses (R).

Scarcity Message

Scarcity message refers to a marketing strategy that emphasises limited product availability in terms of quantity or time to create urgency in consumer decision-making (Aggarwal et al., 2011). Scarcity can increase the perceived value of a product and encourage consumers to act quickly, particularly in live commerce where scarcity claims can be communicated repeatedly by streamers in real time (Gupta & Gentry, 2019; Qu et al., 2023). Within the SOR framework, scarcity message is positioned as a stimulus (S) that can trigger consumers' internal psychological reactions and subsequent behavioral responses. In this study, scarcity message is measured through two dimensions: limited-quantity scarcity and limited-time scarcity (Wu et al., 2021; Aggarwal et al., 2011).

Streamer Credibility

Streamer credibility refers to consumers' perceptions of a streamer's ability to provide accurate, trustworthy, and persuasive product information, reflected through expertise, trustworthiness, and attractiveness (Ohanian, 1990; Chen et al., 2022). Based on Source Credibility Theory, the credibility of an information source can increase consumers' acceptance of marketing information and reduce uncertainty in purchase decisions (Hovland et al., 1953; Ohanian, 1990). This role becomes particularly important in live commerce because consumers rely heavily on information provided directly by streamers when evaluating products (Wongkitrungrueng & Assarut, 2020; Qu et al., 2023). Within the SOR framework, streamer credibility is positioned as a stimulus (S) that can influence consumers' internal psychological states before generating behavioral responses. In this study, streamer credibility is measured through three dimensions: expertise, trustworthiness, and attractiveness (Ohanian, 1990).

Anticipated Regret

Anticipated regret is a prospective negative emotion in which individuals imagine the regret they may experience if they make, or fail to make, a particular decision (Zeelenberg & Pieters, 2007). Unlike experienced regret, anticipated regret occurs

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before a decision and can motivate individuals to change their behavior to avoid future regret. This mechanism is related to loss aversion, as individuals tend to be more motivated to avoid losses than to obtain equivalent gains (Kahneman & Tversky, 1979). In live commerce, scarcity messages and credible information can strengthen anticipated regret when consumers perceive that a purchasing opportunity may disappear (Qu et al., 2023; Ohanian, 1990; Filieri et al., 2021; Li et al., 2021). Within the SOR framework, anticipated regret is positioned as the organism (O), representing the consumer's internal psychological reaction to external stimuli, and is measured based on Fan et al. (2025) and Qu et al. (2023).

Pre-Order Intention

Pre-order refers to ordering or purchasing a product before it becomes physically available or is officially released to the market (Kim & Kim, 2026). Pre-order decisions involve uncertainty because consumers commit to products that they may not yet be able to see, touch, or evaluate directly, making psychological considerations important in the decision process (Jun et al., 2019; Kim & Kim, 2026). This condition is particularly relevant to experience-based products such as fashion, where consumers may rely more heavily on hedonic, social, and emotional considerations when objective product information is limited (Wang et al., 2024; Wongkitrungrueng & Assarut, 2020). Within the SOR framework, pre-order intention is positioned as the initial behavioral response (R1) following the consumer's internal psychological reaction. It also serves as a mediator between anticipated regret and impulse buying behavior, reflecting an initial commitment before the final behavioral response (Nasiry & Popescu, 2012; Kim & Kim, 2026).

Impulse Buying Behavior

Impulse buying behavior refers to consumers' tendency to make spontaneous and unplanned purchases, often driven more strongly by emotional impulses than by deliberate evaluation (Rook & Fisher, 1995). This behavior can result from the interaction between internal factors, such as emotions and motivation, and external factors, including promotions, product presentation, and social interaction (Beatty & Ferrell, 1998). In live streaming commerce, interactivity, entertainment, scarcity messages, and other real-time stimuli can strengthen consumers' emotional responses and encourage impulsive purchasing (Wu et al., 2024; Joo & Yang, 2023; Qu et al., 2023; Przybylski et al., 2013). In this study, impulse buying behavior is measured using indicators adapted from Lo et al. (2022) and Qu et al. (2023).

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Effect of Scarcity Message on Anticipated Regret

Scarcity messages can increase consumers' emotional responses by creating urgency and the perceived risk of losing a purchasing opportunity (Aggarwal et al., 2011; Kahneman & Tversky, 1979). Qu et al. (2023) found that scarcity in live-stream commerce triggers anticipated emotions, while Li et al. (2021), Guo et al. (2017), and Feng et al. (2024) also support the role of scarcity in strengthening emotional responses associated with impulsive purchasing. Consistent with regret regulation theory, consumers may anticipate greater regret when they perceive that an opportunity is likely to disappear (Zeelenberg & Pieters, 2007).

H_1: Scarcity message has a positive effect on anticipated regret.

Effect of Streamer Credibility on Anticipated Regret

Streamer credibility can strengthen consumer trust, reduce perceived risk, and increase the perceived value of product information (Gulfraz et al., 2022; Hamidah et al., 2024; Filieri et al., 2021). Previous studies also show that social presence, trust, and other social factors in live streaming can influence consumers' emotional responses (Hongsuchon et al., 2025; Tedry et al., 2025; Gulfraz et al., 2022). Based on regret regulation theory, credible information may make a purchasing opportunity appear more convincing, thereby increasing the anticipated regret associated with missing it (Zeelenberg & Pieters, 2007).

H_2: Streamer credibility has a positive effect on anticipated regret.

Effect of Anticipated Regret on Pre-Order Intention

Anticipated regret can encourage consumers to take preventive action to avoid future regret (Zeelenberg & Pieters, 2007). Nasiry and Popescu (2012) showed that regret plays an important role in advance-selling decisions, while Mukherjee et al. (2023) found that anticipated emotions significantly influence consumers' pre-order evaluations and choices. This is also consistent with evidence that psychological factors play an important role in pre-order decisions (Jun et al., 2019; Qu et al., 2023).

H_3: Anticipated regret has a positive effect on pre-order intention.

Effect of Pre-Order Intention on Impulse Buying Behavior

Pre-order commitment may make consumers more receptive to subsequent purchases by shifting their attention towards expected product benefits (Jun et al., 2019). Kim and Kim (2026) showed that pre-order commitment encourages information-

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seeking engagement, while Wang et al. (2024) highlighted importance of hedonic and social benefits for experience-based products. Jaswadi et al. (2024) also found that the pre-order system significantly increases purchase intention among fashion consumers. These findings suggest that stronger pre-order intention may increase consumers' tendency to make spontaneous and unplanned purchases.

H_4: Pre-order intention has a positive effect on impulse buying behavior.

Effect of Scarcity Message on Impulse Buying Behavior

Scarcity messages have generally been associated with stronger impulsive purchasing responses in live commerce. Qu et al. (2023) found a positive and significant effect of scarcity promotion on impulse buying tendency, while Guo et al. (2017) showed that quantity and time scarcity increase consumers' emotional arousal. Similarly, Feng et al. (2024) found that scarcity persuasion increases the urge to buy impulsively, and Hongsuchon et al. (2025) showed that scarcity influences positive affect associated with impulse buying.

H_5: Scarcity message has a positive effect on impulse buying behavior.

Effect of Streamer Credibility on Impulse Buying Behavior

Streamer credibility can act as a social stimulus that strengthens consumers' confidence in product information (Hovland et al., 1953; Ohanian, 1990). Hongsuchon et al. (2025) found that social factors in live streaming influence positive affect associated with impulse buying, while Gulfraz et al. (2022) reported a positive and significant relationship between trust and online impulse buying. Tedry et al. (2025) also showed that social presence influences impulse buying through emotional responses such as pleasure and arousal.

H_6: Streamer credibility has a positive effect on impulse buying behavior.

Mediating Role of Anticipated Regret and Pre-Order Intention in the Effect of Scarcity Message on Impulse Buying Behavior

Scarcity can trigger anticipated regret by increasing consumers' perception that a purchasing opportunity may be lost (Aggarwal et al., 2011; Qu et al., 2023). Anticipated emotions can subsequently encourage pre-order decisions (Nasiry & Popescu, 2012; Mukherjee et al., 2023; Kim & Kim, 2026), while pre-order commitment may increase consumers' receptiveness to subsequent purchasing behavior (Jun et al., 2019; Wang

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et al., 2024). Nguyen et al. (2025) also demonstrated the relevance of sequential mediation in explaining impulsive buying in live streaming commerce.

H_7: Anticipated regret and pre-order intention sequentially mediate the effect of scarcity message on impulse buying behavior.

Mediating Role of Anticipated Regret and Pre-Order Intention in the Effect of Streamer Credibility on Impulse Buying Behavior

Streamer credibility can increase trust, reduce perceived risk, and strengthen the perceived value of product information (Gulfraz et al., 2022; Hamidah et al., 2024; Filieri et al., 2021). These conditions may strengthen anticipated regret when consumers consider missing a recommended opportunity (Zeelenberg & Pieters, 2007), which may subsequently encourage pre-order intention and impulse buying behavior. Nguyen et al. (2025) further showed that source credibility can influence impulsive buying through a sequential mediation mechanism in live streaming commerce.

H_8: Anticipated regret and pre-order intention sequentially mediate the effect of streamer credibility on impulse buying behavior.

Conceptual Framework

This study positions scarcity message and streamer credibility as stimuli, anticipated regret as the organism, and pre-order intention and impulse buying behavior as sequential responses, representing a staged-response structure. The proposed conceptual framework is presented in Figure 1.

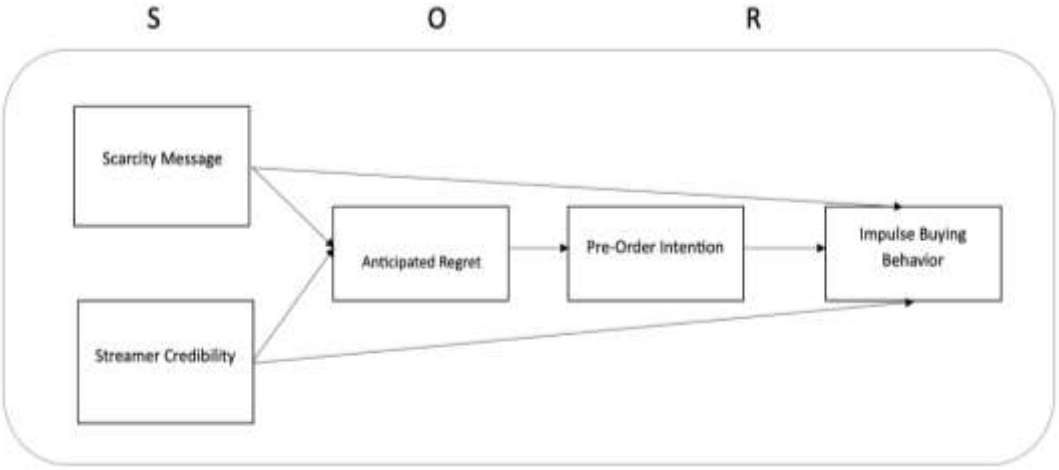


Figure 1. Conceptual Framework

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RESEARCH METHOD

Research Design and Sample

This study employed a quantitative survey design using primary data collected from TikTok Live Shopping consumers in the Special Region of Yogyakarta. The respondents were individuals aged 18–29 years who had watched TikTok Live Shopping and had considered or purchased fashion products through a pre-order system. A non-probability purposive sampling technique was used because the study required respondents with specific characteristics and relevant experience. The final sample consisted of 140 respondents, determined using the 10-times rule based on 14 indicators in the research model (Hair et al., 2021). This sample size also exceeded the minimum requirement obtained from statistical power analysis with three predictors, a medium effect size ($f^2 = 0.15$), a significance level of 0.05, and statistical power of 0.80 (Cohen, 1992). Data were collected through a structured online questionnaire distributed using Google Forms.

Measurement

The questionnaire measured five constructs: scarcity message, streamer credibility, anticipated regret, pre-order intention, and impulse buying behavior. Scarcity message was measured using limited quantity and limited time (Aggarwal et al., 2011; Song et al., 2021; Broeder & Wentink, 2022; Hao & Huang, 2025; Tuncer et al., 2023). Streamer credibility covered expertise, trustworthiness, and attractiveness (Ohanian, 1990; Hamidah et al., 2024; Chen et al., 2021), while anticipated regret focused on regret of inaction (Fan et al., 2025; Qu et al., 2023). Pre-order intention included willingness to pre-order, confidence in product, waiting intention, and purchase commitment (Kim & Kim, 2026; Fan et al., 2025; Wang et al., 2024; Wongkitrungrueng & Assarut, 2020). Impulse buying behavior covered spontaneous purchase tendency, immediate urge to buy, unplanned buying tendency, and emotional buying desire (Rook & Fisher, 1995; Beatty & Ferrell, 1998; Lo et al., 2022; Qu et al., 2023). All items were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Data Analysis

The data were analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM) with SmartPLS. The measurement model was evaluated through convergent validity, discriminant validity, and construct reliability, while the structural model was assessed using R^2, Q^2, and bootstrapping (Hair et al., 2021; Ghozali &

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Hengky, 2015). Hypothesis testing used a significance level of 5%, with mediation examined through specific indirect effects to assess the sequential mediating roles of anticipated regret and pre-order intention.

RESULTS AND DISCUSSION

Respondent Profile

A total of 140 valid responses were obtained and included in the analysis. The respondents were profiled based on gender, age, domicile, and frequency of watching TikTok Live Shopping, as presented in Table 1.

Table 1. Respondent Profile

Characteristics	Category	Frequency	Percentage (%)
Gender	Female	114	81.43
	Male	26	18.57
Age	18–22 years	33	23.57
	23–25 years	35	25.00
	26–29 years	72	51.43
Domicile	Yogyakarta City	39	27.86
	Sleman	48	34.29
	Bantul	35	25.00
	Kulon Progo	9	6.43
	Gunungkidul	9	6.43
TikTok Live Shopping viewing frequency in the previous month	1–2 times	23	16.43
	3–5 times	46	32.86
	More than 5 times	71	50.71

The respondent profile shows that the sample was predominantly female (81.43%), with most respondents aged 26–29 years (51.43%). Geographically, respondents were distributed across all five regencies/cities in the Special Region of Yogyakarta, with the largest proportion residing in Sleman (34.29%). In terms of viewing frequency, 50.71% of respondents watched TikTok Live Shopping more than five times

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during the previous month, indicating that most respondents had relatively frequent exposure to the live-shopping environment examined in this study.

Characteristics of Variables

Descriptive statistics were used to describe respondents' perceptions of the five constructs. The results are presented in Table 2.

Table 2. Descriptive Statistics of Variables

Variable	Mean	Category
Scarcity Message	4.00	High
Streamer Credibility	4.18	High
Anticipated Regret	3.42	High
Pre-Order Intention	3.67	High
Impulse Buying Behavior	3.58	High

Source: Primary data processed, 2026

Overall, all constructs were rated in the high category. Streamer credibility recorded the highest mean (4.18), indicating that respondents generally perceived streamers as credible in presenting fashion products. Scarcity message also received a relatively high mean (4.00), showing that respondents strongly perceived time-limited offers during TikTok Live Shopping. Meanwhile, anticipated regret had the lowest mean (3.42), suggesting that although respondents anticipated regret from missing an offer, this emotional response was less pronounced than their perceptions of the other constructs. Pre-order intention (3.67) and impulse buying behavior (3.58) were also high, indicating relatively strong intentions to purchase pre-order fashion products and a tendency towards impulsive purchases during TikTok Live Shopping.

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Data Analysis Results

Following the descriptive analysis of the respondents and research variables, the next stage examined the relationships among the constructs in the proposed research model. Data were analysed using Structural Equation Modelling–Partial Least Squares (SEM-PLS) with SmartPLS 4.1. The analysis was conducted in two stages, beginning with the assessment of the measurement model (outer model), followed by the assessment of the structural model (inner model).

Outer Model Analysis

As the first stage of SEM-PLS analysis, the outer model was examined to ensure that the indicators adequately represented their respective constructs before testing the structural relationships. The estimated path model provides an overall visual representation of the relationships between the latent constructs and their indicators, as presented in Figure 1.

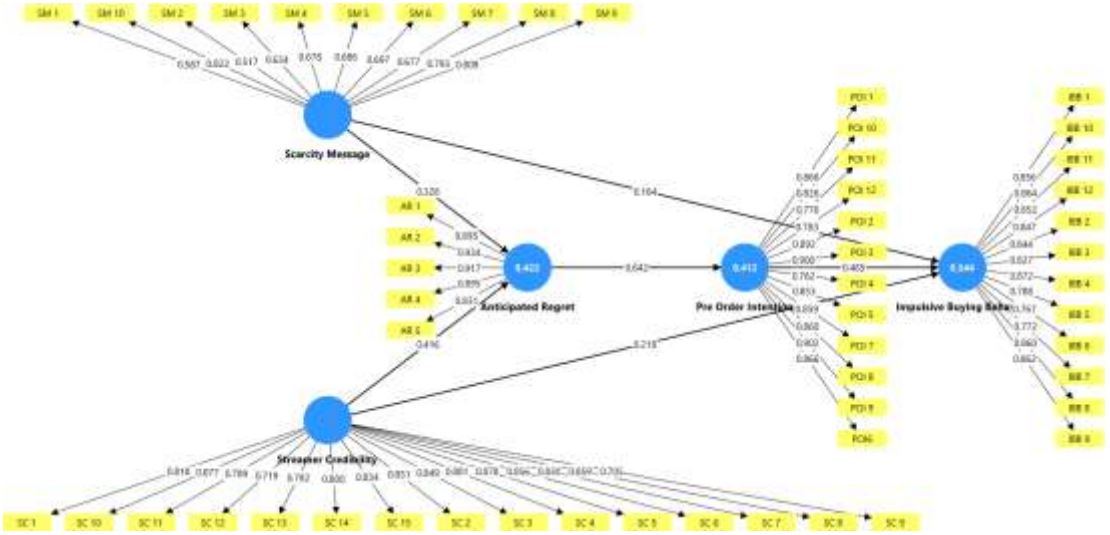


Figure 1. Path Model–Outer Model

The path model presented in Figure 1 provides an overall representation of the relationships between the constructs and their respective indicators. To examine the quality of these measurements in greater detail, the outer model was evaluated through validity and reliability testing. The validity assessment was conducted first, beginning with convergent validity based on the outer loading values of each indicator. The results are presented in Table 3.

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Table 3. Convergent Validity Test Based on Outer Loading

Variable	Item	Outer Loading	Description
Scarcity Message (SM)	SM7	0,806	Valid
	SM8	0,875	Valid
	SM9	0,897	Valid
	SM10	0,882	Valid
Streamer Credibility (SC)	SC1	0,818	Valid
	SC2	0,851	Valid
	SC3	0,849	Valid
	SC4	0,881	Valid
	SC5	0,878	Valid
	SC6	0,856	Valid
	SC7	0,83	Valid
	SC8	0,859	Valid
	SC9	0,705	Valid
	SC10	0,877	Valid
	SC11	0,789	Valid
	SC12	0,719	Valid
	SC13	0,782	Valid
	SC14	0,8	Valid
	SC15	0,834	Valid
Anticipated Regret (AR)	AR1	0,895	Valid
	AR2	0,934	Valid
	AR3	0,917	Valid
	AR4	0,895	Valid
	AR5	0,831	Valid
Pre-order Intention (POI)	POI1	0,866	Valid
	POI2	0,892	Valid
	POI3	0,9	Valid
	POI4	0,762	Valid
	POI5	0,853	Valid
	POI6	0,866	Valid

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	POI7	0,859	Valid
	POI8	0,86	Valid
	POI9	0,902	Valid
	POI10	0,826	Valid
	POI11	0,776	Valid
	POI12	0,783	Valid
Impulse Buying Behavior (IBB)	IBB1	0,856	Valid
	IBB2	0,844	Valid
	IBB3	0,827	Valid
	IBB4	0,872	Valid
	IBB5	0,788	Valid
	IBB6	0,767	Valid
	IBB7	0,772	Valid
	IBB8	0,86	Valid
	IBB9	0,861	Valid
	IBB10	0,864	Valid
	IBB11	0,852	Valid
	IBB12	0,847	Valid

Source: SmartPLS 4.1 output (2026)

Based on Table 3, SM1–SM6 were removed due to outer loading values below 0.70. After re-estimation, the remaining 48 indicators had outer loadings ranging from 0.705 to 0.934, confirming convergent validity. The analysis then proceeded to discriminant validity using Fornell–Larcker criterion, as presented in Table 4.

Table 4. Discriminant Validity – Fornell–Larcker Criterion

Variabel	AR	IBB	POI	SM	SC
AR	**0,895**				
IBB	0,634	**0,835**			
POI	0,642	0,697	**0,847**		
SM	0,519	0,424	0,38	**0,866**	
SC	0,586	0,612	0,665	0,432	**0,824**

Source: SmartPLS 4.1 output (2026)

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Based on Table 4, the square root of the AVE for each construct was greater than its correlations with the other constructs in the corresponding rows and columns. Therefore, all constructs met the discriminant validity requirements based on the Fornell–Larcker criterion. The assessment then proceeded with Cronbach's Alpha, Composite Reliability, and AVE, as presented in Table 5.

Table 5. Composite Reliability and Average Variance Extracted (AVE)

Construct	Cronbach's Alpha	rho_a	rho_c	AVE
Anticipated Regret	0.938	0.938	0.953	0.801
Impulse Buying Behavior	0.960	0.962	0.965	0.697
Pre-Order Intention	0.964	0.965	0.968	0.717
Scarcity Message	0.890	0.915	0.923	0.749
Streamer Credibility	0.966	0.969	0.969	0.678

Source: SmartPLS 4.1 output (2026)

As shown in Table 5, all constructs had AVE values above 0.50, while Cronbach's Alpha and Composite Reliability values exceeded 0.70. These results confirm that all constructs met the required validity and reliability criteria, indicating that the measurement model was satisfactory. Therefore, the analysis proceeded to the inner model assessment.

Inner Model Analysis

After the measurement model met the validity and reliability criteria, the analysis proceeded to the inner model. This stage examines the structural relationships among the latent constructs and provides an overall assessment of the proposed research model. The estimated path model serves as the basis for the subsequent structural model evaluation and is presented in Figure 2.

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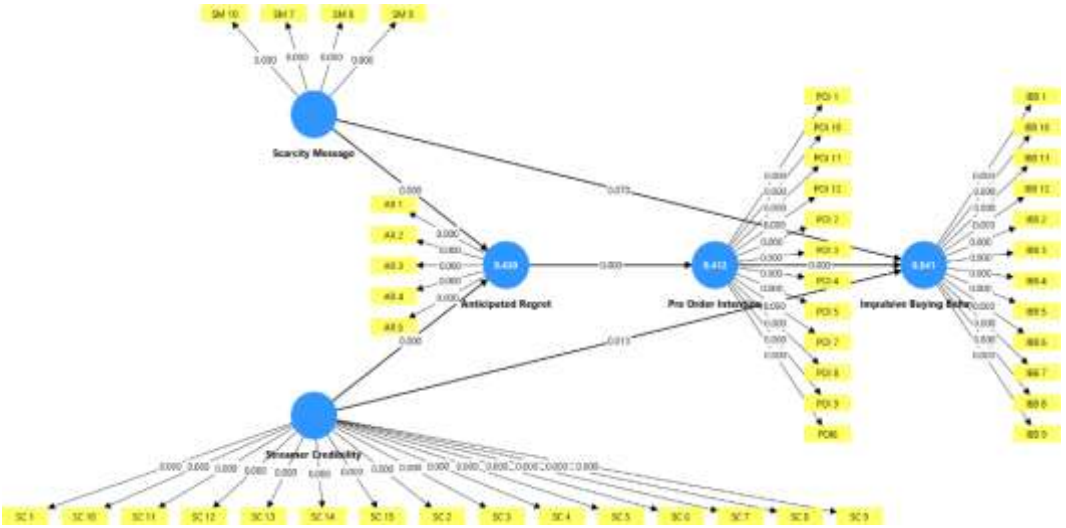


Figure 2. Path Model–Inner Model

The structural relationships illustrated in Figure 2 were further evaluated through the inner model assessment. The first evaluation focused on the coefficient of determination (R^2), which indicates the model's explanatory power for each endogenous construct. The R^2 results are presented in Table 6.

Table 6. Coefficient of Determination (R^2)

Variable	R-Square	R-Square Adjusted
Anticipated Regret	0,43	0,422
Pre-order Intention	0,412	0,408
Impulse Buying Behavior	0,541	0,531

As shown in Table 6, the R^2 values for anticipated regret, pre-order intention, and impulse buying behavior were 0.430, 0.412, and 0.541, respectively, indicating moderate explanatory power for all three endogenous constructs. The analysis then proceeded to predictive relevance (Q^2) to assess the model's predictive capability, as presented in Table 7.

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Table 7. Predictive Relevance (Q^2)

Variabel Endogen	Q^2 predict	Interpretasi
Anticipated Regret	0,244 - 0,369	Memiliki predictive relevance
Pre-order Intention	0,183 - 0,283	Memiliki predictive relevance
Impulse Buying Behavior	0,158 - 0,319	Memiliki predictive relevance

Source: SmartPLS 4.1 output (2026)

As shown in Table 7, all endogenous constructs had Q^2 values above zero, including anticipated regret (0.244–0.369), pre-order intention (0.183–0.283), and impulse buying behavior (0.158–0.319). These positive values indicate that the model has predictive relevance for all endogenous constructs and is capable of predicting the observed data beyond the model estimation alone. Following the structural model assessment, hypothesis testing was conducted to examine the proposed relationships among the constructs, as presented in Table 8.

Table 8. Hypothesis Testing Results

Relationship	Sample	T Statistics	P Values	Decision
Direct Effect				
SM → AR	0.327	4.111	0.000	**H1 Accepted**
SC → AR	0.445	5.933	0.000	**H2 Accepted**
AR → POI	0.642	12.085	0.000	**H3 Accepted**
POI → IBB	0.497	5.426	0.000	**H4 Accepted**
SM → IBB	0.140	1.813	0.070	**H5 Rejected**
SC → IBB	0.221	2.491	0.013	**H6 Accepted**
Indirect Effect				
SM → AR → POI → IBB	0.104	3.378	0.001	**H7 Accepted**
SC → AR → POI → IBB	0.142	3.178	0.001	**H8 Accepted**

Note: SM = Scarcity Message; SC = Streamer Credibility; AR = Anticipated Regret; POI = Pre-Order Intention; IBB = Impulse Buying Behavior.

As shown in Table 8, seven of the eight hypotheses were supported. H1–H4 and H6 showed significant positive direct effects, whereas the direct effect of scarcity message on impulse buying behavior (H5) was not significant (β = 0.140, p = 0.070).

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The sequential indirect effects were significant for both scarcity message (H7: β = 0.104, p = 0.001) and streamer credibility (H8: β = 0.142, p = 0.001) through anticipated regret and pre-order intention. Thus, H1–H4 and H6–H8 were supported, while H5 was not supported.

DISCUSSIONS

The results showed that scarcity message had a positive and significant effect on anticipated regret. Stronger scarcity messages, particularly time-limited offers, were associated with greater anticipated regret among consumers. This finding is consistent with Qu et al. (2023), who found that scarcity in live-stream commerce significantly triggers anticipated regret, and Aggarwal et al. (2011), who highlighted the emotional consequences of perceived scarcity. From the perspective of loss aversion (Kahneman & Tversky, 1979) and regret regulation theory (Zeelenberg & Pieters, 2007), limited purchasing opportunities may make the potential loss of an offer more salient, leading consumers to anticipate regret if they fail to act.

Streamer credibility also had a positive and significant effect on anticipated regret. Consumers who perceived streamers as more credible were more likely to anticipate regret from missing the purchasing opportunity. Although the direct relationship between streamer credibility and anticipated regret remains relatively underexplored, this finding is consistent with evidence that credible streamers can strengthen trust and reduce perceived uncertainty in live commerce (Wongkitrungrueng & Assarut, 2020; Gulfraz et al., 2022; Hamidah et al., 2024).

Anticipated regret had a positive and significant effect on pre-order intention and represented the strongest direct relationship in the model. This finding supports regret regulation theory, which suggests that individuals anticipate future regret and adjust their current decisions to avoid that negative emotional outcome (Zeelenberg & Pieters, 2007). It is also consistent with Nasiry and Popescu (2012), who identified regret as an important mechanism in advance-selling decisions, and with Kim and Kim (2026), who emphasised the psychological aspects of pre-order decisions. Thus, pre-ordering may function as an anticipatory response through which consumers secure an opportunity that they fear they may later regret missing.

Pre-order intention had a positive and significant effect on impulse buying behavior. Consumers with stronger intentions to commit to a pre-order were more likely to exhibit spontaneous and unplanned purchasing behavior. This result can be explained by the temporal-distance perspective of Jun et al. (2019), whereby pre-ordering may

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shift consumers' attention from feasibility considerations towards the anticipated desirability of the product. This interpretation is also consistent with Kim and Kim (2026) and Wang et al. (2024), who emphasised consumer engagement and hedonic considerations in pre-order and experience-based product decisions.

In contrast, scarcity message did not have a significant direct effect on impulse buying behavior. This finding differs from Feng et al. (2024) and Guo et al. (2017), who reported that scarcity can stimulate impulsive responses in online or live-commerce settings. One possible explanation lies in the pre-order context of this study, where consumers cannot immediately receive or fully evaluate the fashion product. Consequently, time pressure alone may be insufficient to produce impulse buying behavior and may first need to generate an internal emotional response. This interpretation is supported by significant sequential indirect effect through anticipated regret and pre-order intention and is consistent with the SOR framework, in which external stimuli may influence behavior through internal psychological.

Streamer credibility, however, had a positive and significant direct effect on impulse buying behavior. This finding indicates that credible streamers may reduce consumers' uncertainty and facilitate faster purchasing decisions. It is consistent with Hamidah et al. (2024), who found that streamer credibility significantly influences purchase intention, and Wongkitrungrueng and Assarut (2020), who highlighted the role of streamer credibility in building trust and consumer engagement in live commerce. From the source credibility perspective (Ohanian, 1990), expertise, trustworthiness, and attractiveness may therefore serve as persuasive cues that facilitate impulsive purchasing decisions.

The sequential mediation results further showed that anticipated regret and pre-order intention significantly mediated the relationship between scarcity message and impulse buying behavior. Since the direct effect of scarcity message was not significant, the result indicates that scarcity operates primarily through the psychological and behavioral sequence of anticipated regret and pre-order intention. This pattern is consistent with indirect-only mediation (Zhao et al., 2010) and extends Qu et al. (2023) by introducing pre-order intention as a subsequent behavioral response following anticipated regret. Thus, scarcity does not necessarily translate directly into impulse buying; its effect becomes meaningful when consumers first anticipate regret and subsequently develop an intention to secure the product through pre-ordering.

Finally, anticipated regret and pre-order intention also significantly mediated the relationship between streamer credibility and impulse buying behavior. Unlike scarcity

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message, streamer credibility had both significant direct and indirect effects, indicating that credibility can influence impulse buying through more than one pathway. This finding is consistent with Nguyen et al. (2025), who demonstrated that source credibility can influence impulsive buying through sequential psychological mechanisms, although their mediators differed from those examined in this study. Overall, the findings suggest that scarcity message primarily operates through anticipated regret and pre-order intention, whereas streamer credibility can influence impulse buying behavior both directly and through this sequential mechanism.

CONCLUSION

This study demonstrates that scarcity message and streamer credibility significantly increase anticipated regret, which subsequently strengthens pre-order intention. Pre-order intention and streamer credibility also have significant positive effects on impulse buying behavior, whereas scarcity message has no significant direct effect. Furthermore, anticipated regret and pre-order intention sequentially mediate the effects of both scarcity message and streamer credibility on impulse buying behavior. These findings indicate that scarcity primarily operates through an emotional and behavioral process, while streamer credibility can influence impulse buying both directly and through the sequential mediation mechanism.

The findings provide practical implications for fashion sellers using TikTok Live Shopping. Sellers should prioritise streamer credibility through product knowledge, trustworthy information, and engaging communication, while using time-based scarcity strategies such as clear promotional deadlines or countdown timers. The pre-order process should also be made simple and convenient to facilitate consumer commitment. However, scarcity messages should not be relied upon alone, as their direct effect on impulse buying behavior was not significant. These strategies should also be applied responsibly to maintain long-term consumer trust.

Future research could incorporate other psychological mechanisms, such as fear of missing out (FOMO), perceived risk, trust, arousal, perceived value, or social presence. Further studies could also compare pre-order and ready-stock products to determine whether anticipated regret and pre-order intention operate differently when consumers face delayed rather than immediate product availability.

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