

# THE EFFECT OF SCARCITY-BASED PROMOTION ON IMPULSE BUYING IN TIKTOK SHOP LIVE STREAMING: A STIMULUS, ORGANISM, RESPONSE PERSPECTIVE

Nazwa Ramadhani<sup>1</sup>, Adnan Kasofi<sup>2</sup>, Osly Usman<sup>3</sup>, Ryna Parlyna<sup>4</sup>

<sup>1</sup>Universitas Negeri Jakarta, Indonesia

<sup>2</sup>Universitas Negeri Jakarta, Indonesia

<sup>3</sup>Universitas Negeri Jakarta, Indonesia

<sup>4</sup>Universitas Negeri Jakarta, Indonesia

Email: nazwarmdhn23@gmail.com<sup>1</sup>, adnankasofi@unj.ac.id<sup>2</sup>, oslyusman@unj.ac.id<sup>3</sup>, rynaparlyna@unj.ac.id<sup>4</sup>

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## Abstract

This research looks at how well scarcity promotions work in TikTok Shop live streams, using the Stimulus-Organism-Response (S-O-R) model. Limited-time and limited-quantity scarcity types are tested, with emotional excitement as the mediator, analyzed via SEM-PLS. The findings show that scarcity signals do not significantly impact emotional excitement or impulse buying, with no mediating effect despite positive path directions. The results suggest that promotional overload can weaken emotional and behavioral responses, serving as contextual limits for the S-O-R framework in mature live commerce platforms.

## 1. INTRODUCTION

Live streaming commerce has emerged as an influential channel in digital retailing by combining real-time interaction, product demonstration, and instant purchasing within a single platform. TikTok Shop represents one of the most rapidly growing examples of this model, where shopping activities are embedded within entertainment-oriented content. As competition among sellers intensifies, promotional strategies based on urgency and limited availability have become increasingly prevalent.

Previous studies largely conclude that scarcity-based promotions, such as time-limited offers and restricted stock availability, effectively stimulate impulse buying by generating urgency and emotional excitement. However, much of this literature implicitly assumes that the psychological impact of scarcity cues remains stable across different levels of consumer experience and platform maturity. In practice, TikTok Shop users are repeatedly exposed to identical scarcity signals, including countdown timers and stock limitation messages, across numerous live sessions.

This condition raises an important research gap concerning the sustainability of scarcity effects in highly saturated promotional environments. Specifically, it remains unclear whether scarcity cues continue to function as effective emotional and behavioral triggers when consumers become accustomed to such tactics. Addressing this gap, the present study investigates the effectiveness of scarcity-based promotion in a mature live streaming commerce context and examines whether the S-O-R framework remains applicable under conditions of promotional saturation.

## 2. LITERATURE REVIEW

### 2.1 SOR Theory

The Stimulus-Organism-Response model describes consumer actions as a sequence where outside environmental triggers affect inner mental conditions, which then drive specific behaviors. In digital shopping platforms, elements like ads and design features serve as the stimuli, feelings or thoughts form the organism stage, and buying decisions make up the response. Live streaming shopping setups offer vivid sensory and engaging inputs, ideal for applying S-O-R analysis.

That said, newer research on online markets points out that constant contact with the same triggers can lessen emotional responses gradually. When promo signals turn routine and foreseeable, shoppers might evaluate them logically instead of feeling them deeply, which could cut down on their influence on actions.

## 2.2 Scarcity Promotion - Based Promotion in Live Streaming Commerce

Scarcity promotions involve sales strategies that stress limited supply to boost a sense of rush and worth. During live streams for shopping, this typically appears in two forms: time-bound deals and stock-limited options.

Time-limited scarcity adds time pressure by showing that deals last only briefly, pushing quick choices. Quantity-limited scarcity, on the other hand, stresses low inventory, sparking ideas of rivalry and uniqueness. Even though these differ in theory, live stream sellers often blend them together, so buyers view scarcity as one overall promo tactic instead of distinct signals.

## 2.3 Emotional Arousal

Emotional arousal means a boosted mental state with sensations of thrill, pressure, and preparedness for action. Earlier studies often see it as the main link between scarcity signals and sudden buys, since high arousal cuts back on careful thinking and ramps up instant spending. Still, in places flooded with regular urgency promos, these feelings might fade as people get used to the ongoing triggers.

## 2.4 Impulse Buying

Impulse buying refers to sudden, unplanned purchases sparked by strong feelings right at the purchase moment (Vera Rachmania et al., 2025). In online retail, this often gets triggered by sales tactics, eye-catching displays, and limits like short windows or low stock.

On TikTok Shop live streams, shoppers face higher risks of impulse buys due to emotional boosts amid live promo alerts. Past empirical work shows that mixing scarcity tactics with strong emotional pull greatly raises the chances of snap purchases in live shopping scenarios (Siregar & Firdausy, 2024).

# 3. RESEARCH METHODOLOGY

## 3.1 Research Model

This study creates a model based on the Stimulus-Organism-Response (S-O-R) idea to explain why people buy on impulse during TikTok Shop live streams. In the model, short-time scarcity and low-stock scarcity are the starting triggers, since sellers often use these in live shows. Emotional excitement is the middle part, showing how shoppers feel inside when hit with these promos. Impulse buying is the end result, tracking what people actually buy. The model checks both the direct links from scarcity promos to impulse buys and the indirect ones that go through emotional excitement.

## 3.2 Hypothesis Development

From the S-O-R idea, scarcity promos in live streams should stir up shoppers' feelings, which then lead to quick buys. Short-time scarcity creates a rush and time squeeze, while low-stock scarcity makes things feel rare and competitive. Emotional excitement acts as the link explaining shoppers' reactions to these. So, hypotheses are set up to test the connections between short-time scarcity, low-stock scarcity, emotional excitement, and impulse buying.

**H1:** Limited time scarcity positively influences emotional arousal.

**H2:** Limited quantity scarcity positively influences emotional arousal.

**H3:** Emotional arousal positively influences impulse buying.

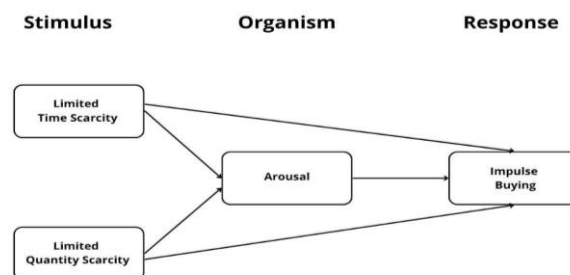
**H4:** Limited time scarcity positively influences impulse buying.

**H5:** Limited quantity scarcity positively influences impulse buying.

**H6:** Emotional arousal mediates the relationship between limited time scarcity and impulse buying.

**H7:** Emotional arousal mediates the relationship between limited quantity scarcity and impulse buying.

Based on these hypotheses, a comprehensive research model grounded in the SOR framework can be formulated, illustrating how the proposed variables are interconnected and interact within the stimulus–organism–response structure, as shown in Figure 1.



**Figure 1.** Framework

**Source:** Authors (2025)

### 3.2 Research Design

To hit the study's goals, it uses a numbers-based method with an explanatory setup to check links between the key factors. Data came from a one-time online survey where people shared their views and past experiences at that moment. The analysis tool chosen was Structural Equation Modeling via Partial Least Squares (SEM-PLS), great for predicting outcomes, checking mediators, and handling medium-sized groups of responses.

#### 3.3.1 Population and Sample

The target group includes TikTok users who have bought stuff before through TikTok Shop live streams. Purposive sampling was used with strict filters to pick only fitting people. They had to be active on TikTok, any gender, ages from under 18 up to over 25, and have at least one buy from a live stream session. This made sure everyone knew about live shopping firsthand. In the end, 182 solid replies that passed the checks were used for analysis.

#### 3.3.2 Data Collection

Data was gathered with a fixed online form sent to qualified TikTok users in West Java, Indonesia, who matched the filters. Joining was optional, and no names or private details were taken to keep things anonymous. This setup cut down on bias from how questions were asked and got real, truthful answers. People filled it out thinking about their own TikTok Shop live stream experiences.

#### 3.3.3 Measurement of Variables

Every main idea was scored on a 5-point Likert scale, from 1 (totally disagree) to 5 (totally agree). Like Hair et al. (2016) say, these balanced scales work as number-like data for SEM-PLS. Questions for short-time scarcity, low-stock scarcity, emotional excitement, and impulse buying came from past research but tweaked for TikTok Shop lives. All were set up as reflective types.

Short-time and low-stock scarcity differ in idea, but live streams mix them often. So, they might link strongly in the data. This fits how live shopping works and counts as a study limit.

**Table 1.** Constructs indicator items.

| Constructs                | Code | Indicators                                                                                                                                 | References               |
|---------------------------|------|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Limited Time Scarcity     | LT1  | I feel that the promotions offered during TikTok Shop live streaming are only available for a short period of time.                        | (Widyarini et al., 2025) |
|                           | LT2  | In my opinion, the duration of promotions during TikTok Shop live streaming does not last long.                                            | (Widyarini et al., 2025) |
|                           | LT3  | While the live streaming is ongoing, I notice that the remaining promotion time keeps decreasing, which forces me to make quick decisions. | (Widyarini et al., 2025) |
|                           | LT4  | I feel that the opportunity to get promotions during TikTok Shop live streaming ends quickly if I do not purchase immediately.             | (Widyarini et al., 2025) |
| Limited Quantity Scarcity | LQ1  | While watching TikTok Shop live streaming, I feel that the number of products being sold is limited.                                       | (Widyarini et al., 2025) |
|                           | LQ2  | I notice that product stock during TikTok Shop live streaming runs out quickly.                                                            | (Widyarini et al., 2025) |
|                           | LQ3  | I feel that product sales during TikTok Shop live streaming are limited in quantity.                                                       | (Widyarini et al., 2025) |
|                           | LQ4  | I feel that products promoted during TikTok Shop live streaming are rarely available again after the live session ends.                    | (Widyarini et al., 2025) |
| Emotional Arousal         | EA1  | The promotions displayed during TikTok Shop live streaming influence my emotions and make me more interested in paying attention.          | (Widyarini et al., 2025) |
|                           | EA2  | I feel more excited when I see product offers during TikTok Shop live streaming.                                                           | (Widyarini et al., 2025) |
|                           | EA3  | While watching the live stream, I feel an urge to immediately purchase the products being offered.                                         | (Widyarini et al., 2025) |
|                           | EA4  | I feel enthusiastic when participating in TikTok Shop live streaming.                                                                      | (Widyarini et al., 2025) |
| Impulse Buying            | IB1  | I often make spontaneous purchases while watching TikTok Shop live streaming.                                                              | (Widyarini et al., 2025) |

|     |                                                                                                         |                          |
|-----|---------------------------------------------------------------------------------------------------------|--------------------------|
| IB2 | I make purchases during TikTok Shop live streaming even though I did not plan to do so beforehand.      | (Widyarini et al., 2025) |
| IB3 | I buy products during TikTok Shop live streaming that were not originally part of my shopping plan.     | (Widyarini et al., 2025) |
| IB4 | My decision to purchase products during TikTok Shop live streaming often occurs without prior intention | (Widyarini et al., 2025) |

Source: Authors (2025)

## 4. RESULT AND DISCUSSION

### 4.1 Preliminary Factor Adequacy Test

First, the data got checked to make sure it fit for factor checks. This used the Kaiser-Meyer-Olkin (KMO) score and Bartlett's Sphericity Test. KMO measures if the sample size and links between items are good enough—over 0.50 means it's ready.

Results gave a KMO of 0.916, which is top-notch for sample quality. Bartlett's Test also came out strong ( $p < 0.001$ ), showing solid links between variables, not just random. All this proves the data works well for factor analysis and SEM-PLS next steps.

**Table 2.** KMO and Bartlett's test.

| Kaiser-Meyer-Olkin Measure of Sampling Adequacy |                    | 0.916    |
|-------------------------------------------------|--------------------|----------|
| Bartlett's Test of Sphericity                   | Approx. Chi-Square | 2199.048 |
|                                                 | df                 | 120      |
|                                                 | Sig.               | .000     |

Source: Authors (2025)

### 4.2 Reliability and validity

Before checking the main model, the measurement side was tested for solid and true results. Cronbach's alpha and composite reliability scores hit the right marks for all parts, meaning good consistency inside each.

For convergent validity, item loadings and AVE numbers were solid—every part explained enough of its items' changes. Discriminant validity mostly holds, but short-time scarcity and low-stock scarcity link tightly. This happens because live streams mix them, not a measuring flaw.

**Table 3.** Construct reliability and convergent validity.

| Constructs | Cronbach's Alpha | Composite Reliability | AVE   |
|------------|------------------|-----------------------|-------|
| IB         | 0.911            | 0.913                 | 0.938 |
| LT         | 0.847            | 0.855                 | 0.897 |
| LQ         | 0.836            | 0.854                 | 0.892 |
| EA         | 0.848            | 0.849                 | 0.898 |

Source: Authors (2025)

**Table 4.** Outer-loadings matrix.

| Constructs | EA    | IB    | LQ    | LT    |
|------------|-------|-------|-------|-------|
| EA1        | 0.816 |       |       |       |
| EA2        | 0.801 |       |       |       |
| EA3        | 0.871 |       |       |       |
| EA4        | 0.825 |       |       |       |
| IB1        |       | 0.891 |       |       |
| IB2        |       | 0.847 |       |       |
| IB3        |       | 0.903 |       |       |
| IB4        |       | 0.913 |       |       |
| LQ1        |       |       | 0.828 |       |
| LQ2        |       |       | 0.858 |       |
| LQ3        |       |       | 0.754 |       |
| LQ4        |       |       | 0.869 |       |
| LT1        |       |       |       | 0.891 |

|            |       |
|------------|-------|
| <b>LT2</b> | 0.665 |
| <b>LT3</b> | 0.843 |
| <b>LT4</b> | 0.874 |

**Source:** Authors (2025)

Discriminant validity was evaluated using both the Fornell–Larcker criterion and the Heterotrait–Monotrait Ratio (HTMT). The Fornell–Larcker results indicate that the square root of the AVE for each construct is greater than its correlations with other constructs, suggesting that the constructs are empirically distinguishable. However, the HTMT analysis reveals a very strong association between limited time scarcity and limited quantity scarcity. This finding indicates a high degree of conceptual proximity between the two scarcity dimensions, which may reflect the way scarcity cues are simultaneously presented in live streaming commerce environments. Rather than indicating a measurement flaw, this overlap is treated as a contextual characteristic of the research setting and is taken into account in the interpretation of the structural model results.

**Table 5.** Fornell-Lacker Criterion.

| <b>Constructs</b> | <b>EA</b> | <b>IB</b> | <b>LQ</b> | <b>LT</b> |
|-------------------|-----------|-----------|-----------|-----------|
| <b>EA</b>         | 0.829     |           |           |           |
| <b>IB</b>         | 0.709     | 0.889     |           |           |
| <b>LQ</b>         | 0.715     | 0.604     | 0.829     |           |
| <b>LT</b>         | 0.786     | 0.681     | 0.836     | 0.823     |

**Source:** Authors (2025)

**Table 6.** Heterotrait-Monotrait Ratio of correlation.

| <b>Constructs</b> | <b>EA</b> | <b>IB</b> | <b>LQ</b> | <b>LT</b> |
|-------------------|-----------|-----------|-----------|-----------|
| <b>EA</b>         |           |           |           |           |
| <b>IB</b>         | 0.806     |           |           |           |
| <b>LQ</b>         | 0.843     | 0.683     |           |           |
| <b>LT</b>         | 0.930     | 0.782     | 0.993     |           |

**Source:** Authors (2025)

#### 4.3 The Importance–Performance Map Analysis

Importance-Performance Map Analysis (IPMA) added extra views on each part's role. Emotional excitement and short-time scarcity scored higher on both importance and performance than low-stock scarcity. This means they drive the model's predictions more, even if main links aren't strong stats-wise.

Low-stock scarcity performs well but matters less, so people notice it but it doesn't push impulse buys as much. Treat these as early insights to back up, not swap, the key SEM-PLS findings.

**Table 7.** IPMA testing.

| <b>Constructs</b> | <b>Importance</b> | <b>LV Performance</b> | <b>Description</b>                     |
|-------------------|-------------------|-----------------------|----------------------------------------|
| <b>EA</b>         | 0.451             | 83.591                | High Importance – High Performance     |
| <b>LQ</b>         | 0.113             | 81.439                | Moderate Importance – High Performance |
| <b>LT</b>         | 0.587             | 85.122                | High Importance – High Performance     |

**Source:** Authors (2025)

#### 4.4 Hypothesis testing

The main model got tested with path scores, p-values, confidence ranges, and overlap checks. All predicted links go the right way and make sense in theory, but none hit significance at 5%. Short-time and low-stock scarcity don't strongly sway emotional excitement or impulse buys, and excitement doesn't directly push buys either.

Mediator checks show emotional excitement doesn't bridge scarcity to impulse buys. Overlap stats (VIF) are fine, no distortion. Plus, good Q<sup>2</sup> scores mean the model still predicts okay without strong paths.

**Table 8.** Hypothesis path coefficient testing.

| <b>Hypothesis</b> | <b>Relationship</b> | <b>β</b> | <b>T Statistics</b> | <b>P values</b> | <b>2.5% CI</b> | <b>97% CI</b> | <b>VIF</b> | <b>f<sup>2</sup></b> | <b>R<sup>2</sup></b> | <b>Q<sup>2</sup></b> |
|-------------------|---------------------|----------|---------------------|-----------------|----------------|---------------|------------|----------------------|----------------------|----------------------|
| <b>H1</b>         | LT → EA             | 0.625    | 0.617               | 0.112           | 0.381          | 0.827         | 3.315      | 0.318                |                      |                      |
| <b>H2</b>         | LQ → EA             | 0.912    | 0.200               | 0.129           | -0.049         | 0.462         | 3.315      | 0.030                | IB = 0.544           | IB = 0.422           |

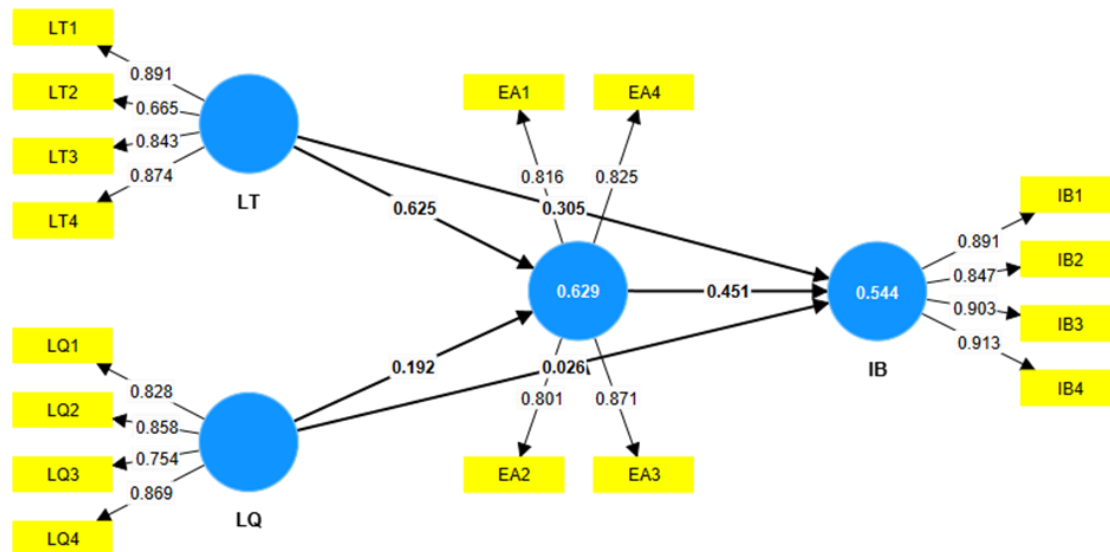
|           |         |       |       |       |        |        |       |       |            |            |
|-----------|---------|-------|-------|-------|--------|--------|-------|-------|------------|------------|
| <b>H3</b> | EA → IB | 0.451 | 0.451 | 0.180 | 0.075  | 0.785  | 2.693 | 0.165 | EA = 0.629 | EA = 0.418 |
| <b>H4</b> | LT → IB | 0.305 | 0.295 | 0.171 | -0.052 | 0.626  | 4.368 | 0.047 |            |            |
| <b>H5</b> | LQ → IB | 0.026 | 0.042 | 0.120 | 0.161  | -0,312 | 3.415 | 0.000 |            |            |

Source: Authors (2025)

**Table 9.** Hypothesis mediation testing.

| Hypothesis | Relationship | $\beta$ | T Stats | P val | 2.5% CI | 97% CI |
|------------|--------------|---------|---------|-------|---------|--------|
| <b>H6</b>  | LT → EA → IB | 0.087   | 0.082   | 0.063 | 0.037   | 0.567  |
| <b>H7</b>  | LQ → EA → IB | 0.282   | 0.284   | 0.136 | -0.031  | 0.220  |

Source: Authors (2025)



**Figure 2.** Outer Loading Evaluation

Source: Authors (2025)

The extremely high association between limited time scarcity and limited quantity scarcity may partly explain the absence of statistically significant structural effects. When promotional cues are perceived as highly overlapping, their individual explanatory power may be diluted, resulting in weak and non-significant path estimates despite positive directional relationships. This reinforces the interpretation that scarcity-based promotions in live streaming commerce operate as a combined promotional mechanism rather than as independent stimuli.

#### 4.5 Result Summary

Applying the S-O-R framework, this research explores scarcity promos' role in driving impulse buys on TikTok Shop live streams. Measurements and data passed all key checks easily. Yet, the stats don't back links connecting scarcity signals, emotional excitement, and final impulse buys.

People see short-time scarcity and low-stock scarcity as blended together during lives. Instead of feeling like separate tricks, they hit as one overall alert. This real-world mix in live shopping explains the tight data overlap spotted.

#### 4.6 Discussion

In TikTok Shop live streams, scarcity tactics fall short at sparking emotional excitement or fueling impulse buys, as findings highlight. Constant repeats like flashing timers ticking down or stock alerts blaring non-stop wear thin fast. Over time, what starts as thrilling turns into background noise, processed coolly as simple updates rather than gut-punch motivators.

Without a firm link from emotional excitement straight to impulse buys, it points to shoppers keeping a clear head amid the live action. Choices lean toward practical stuff: Do I trust this seller? Does the price match the quality? Is it really a steal for me? Personal fit trumps fleeting hype. IPMA sheds light too emotional excitement and short-time scarcity edge out others in prediction strength, but only indirectly. Their real sway depends heavily on live extras, from lively host chats to buzzing viewer comments that amp the moment.

## 5. CONCLUSION

This study examines the effectiveness of scarcity-based promotional strategies in stimulating impulse buying within TikTok Shop live streaming using the Stimulus Organism Response (S-O-R) framework, with emotional arousal as a mediating variable. The results indicate that none of the proposed hypotheses are statistically supported, although all relationships show positive directional tendencies. Limited time scarcity and limited quantity scarcity do not significantly affect emotional arousal or impulse buying, and emotional arousal does not mediate the relationship between scarcity cues and impulse buying behavior.

These findings suggest that the traditional S-O-R mechanism does not function in the same way in live streaming commerce environments that are highly saturated with promotional stimuli. Repeated exposure to urgency-based cues may reduce their emotional impact, leading consumers to process scarcity signals more cognitively than emotionally.

As live streaming platforms continue to mature, the ability of scarcity-based promotions to trigger impulsive purchases may weaken. This study contributes to the literature by showing that the effectiveness of scarcity cues is context-dependent and influenced by platform maturity and promotional intensity.

From a managerial perspective, the findings imply that relying solely on scarcity tactics may be insufficient in mature live streaming environments. Other elements of the live commerce experience, such as trust, interaction quality, and perceived value, may play a more important role in shaping purchasing decisions. Future research is encouraged to explore these factors and refine the conceptualization of scarcity-based promotion in live streaming contexts.

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