

The Effect of Flash Sales and Urgency Marketing on Impulse Buying Through FOMO as a Mediating Variable Among E-Commerce Users in Indonesia

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Abstract

This study aims to analyze the effects of flash sales and urgency marketing on impulse buying, both directly and indirectly through Fear of Missing Out (FOMO) as a mediating variable among e-commerce users in Indonesia. This study employed a quantitative approach with an explanatory research design. Data were collected through a survey of 92 e-commerce users selected using purposive sampling, with the inclusion criteria of being at least 17 years old, actively using e-commerce platforms, and having made purchases during flash sale events. Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4. The results indicate that flash sales have no significant effect on either impulse buying or FOMO. In contrast, urgency marketing has a positive and significant effect on FOMO but does not have a significant direct effect on impulse buying. FOMO has a positive and significant effect on impulse buying. The mediation analysis shows that FOMO does not mediate the relationship between flash sales and impulse buying, whereas FOMO mediates the relationship between urgency marketing and impulse buying while its direct effect on impulse buying is not significant. These findings indicate that impulsive purchasing behavior is more strongly influenced by the psychological mechanism of FOMO triggered by urgency marketing. Theoretically, these findings extend the Stimulus-Organism-Response (S-O-R) framework by distinguishing promotional stimuli that primarily provide economic incentives, such as flash sales, from urgency cues that more directly activate an internal psychological response in the form of FOMO, which subsequently drives impulse buying. The study highlights the importance of urgency-based marketing strategies in e-commerce.

Keywords: flash sale, urgency marketing, fear of missing out, impulse buying, e-commerce

Introduction

The development of digital technology has accelerated the transformation of the economic structure, particularly in the e-commerce sector. In Indonesia, e-commerce has become increasingly integrated into public economic activities. In 2024, national e-commerce transactions reached Rp1,288.93 trillion, representing a 17.08% increase from the previous year, while approximately 4.4 million businesses participated in the e-commerce ecosystem (BPS, 2025). The number of e-commerce users was also projected to exceed 73 million by 2025 (Statista, 2025). Rather than merely indicating market expansion, this rapid growth has intensified competition among digital platforms and encouraged the increasingly aggressive use of promotional mechanisms designed to accelerate consumer purchase decisions.

In this highly competitive environment, e-commerce platforms increasingly rely on time pressure, scarcity cues, and limited-time promotions to stimulate immediate and

potentially unplanned purchasing. Platforms such as Shopee, Tokopedia, and TikTok Shop are not only competing on price and product variety but also in designing marketing strategies capable of quickly capturing consumer attention. One of the most widely used strategies is the flash sale a limited-time discount offer featuring a specific number of products. This strategy is often accompanied by urgency marketing, a marketing communication approach that emphasizes time and stock limitations through elements such as countdown timers, “stock running low” notifications, and real-time purchase count indicators. Although both strategies restrict consumers' decision time, they communicate different forms of promotional value. Flash sales primarily provide an economically attractive opportunity through temporary price reductions, whereas urgency marketing more explicitly emphasizes the possibility of imminent loss if consumers delay their decisions (Feng et al., 2024; Hao & Huang, 2025).

From a theoretical perspective, this phenomenon can be explained through the Stimulus-Organism-Response (S-O-R) framework proposed by Mehrabian and Russell (1974). Within this framework, flash sales and urgency marketing serve as stimuli (S) that influence consumers' internal psychological states (organism), which in turn generate behavioral responses (response) in the form of purchasing decisions. Recent research in the context of digital shopping and live commerce indicates that a stimulus-rich digital environment, whether through time-based promotions or real-time social interactions, can increase the tendency toward impulse buying (Xia, Chae, & Xiang, 2024; Feng et al., 2024). However, the S-O-R framework also suggests that different external stimuli need not activate the same internal psychological process. An economically attractive stimulus may encourage consumers through perceived transaction value, whereas an urgency-based stimulus may operate more strongly by activating psychological pressure associated with the possibility of losing an opportunity.

Furthermore, the dynamics of digital consumer behavior cannot be separated from the psychological phenomenon known as Fear of Missing Out (FOMO)—that is, an individual's anxiety about the possibility of missing out on opportunities perceived as valuable (Przybylski et al., 2013). In the context of e-commerce, this condition is amplified by the real-time nature of digital platforms, such as notifications of other users' activities, limited-stock indicators, and ongoing promotional deadlines. Recent studies confirm that individuals with high levels of FOMO tend to be more responsive to scarcity-based marketing stimuli and are more prone to making unplanned purchases (Tang, Shao, & Zhang, 2025; Ngo, Nguyen, Mai, & Nguyen, 2025). Accordingly, FOMO provides a relevant psychological mechanism through which consumers may translate external promotional cues into impulsive purchasing responses. Nevertheless, the likelihood of activating FOMO may differ according to the nature of the stimulus. Flash sales emphasize the economic benefit of obtaining a product at a temporarily lower price, whereas urgency marketing explicitly communicates that the opportunity may disappear, making urgency cues theoretically more proximal to FOMO.

Nevertheless, findings regarding the role of FOMO as a link between marketing stimuli and impulse buying have not been entirely consistent. Some studies indicate that scarcity-based strategies significantly increase FOMO but do not always have a direct impact on impulse buying, whereas time-urgency-based strategies can directly influence impulse buying without first requiring an increase in FOMO (Rosiqlin & Pambudi, 2025). Thus, the unresolved issue is not simply whether flash sales and urgency marketing are associated with

impulse buying, but whether these two promotional stimuli operate through the same psychological pathway. Existing research has not sufficiently clarified whether an economically attractive promotional event, such as a flash sale, activates FOMO in the same manner as psychologically urgent messages that explicitly signal impending loss. This distinction is theoretically important because treating both stimuli as equivalent scarcity mechanisms may obscure their different roles within the S-O-R process. The role of FOMO therefore needs to be examined specifically as a mediating mechanism rather than merely as an independent or moderating variable (Hodkinson, 2021).

Based on this gap, the present study distinguishes flash sales as predominantly economic-incentive stimuli and urgency marketing as psychologically urgency-based stimuli within a single S-O-R model. It examines whether each stimulus is directly associated with impulse buying and whether FOMO provides the psychological mechanism through which these stimuli are translated into impulsive purchasing behavior. By comparing these two pathways simultaneously, the study seeks to clarify whether promotional attractiveness and perceived impending loss generate impulse buying through similar or distinct psychological mechanisms among e-commerce users in Indonesia.

Stimulus-Organism-Response (S-O-R) Framework

This study employs the Stimulus-Organism-Response (S-O-R) framework, which explains how external environmental stimuli influence individuals' internal psychological states and subsequently generate behavioral responses (Mehrabian & Russell, 1974). In the context of e-commerce, promotional mechanisms represent external stimuli that may alter consumers' cognitive and emotional states before influencing purchasing behavior. Accordingly, this study positions flash sales and urgency marketing as stimuli (S), Fear of Missing Out (FOMO) as the internal psychological state or organism (O), and impulse buying as the behavioral response (R).

Although flash sales and urgency marketing are both designed to accelerate purchasing decisions, they represent theoretically distinct forms of stimuli. Flash sales primarily offer an economic incentive by combining price reductions with limited purchasing opportunities, whereas urgency marketing explicitly communicates the possibility of impending loss through countdown timers, limited-stock notifications, and other time-sensitive cues. This distinction is important because economic attractiveness may directly increase consumers' willingness to purchase, whereas urgency cues may first activate a psychological concern about missing an opportunity. Therefore, the two stimuli may follow different psychological pathways within the S-O-R mechanism.

Flash Sales and Impulse Buying

A flash sale is a promotional strategy that offers substantial price reductions for a limited period and often for a limited quantity of products. Its economic attractiveness and restricted availability are intended to shorten consumer deliberation and encourage immediate purchase decisions. In digital commerce, these characteristics can reduce the time available for rational evaluation and increase consumers' sensitivity to promotional opportunities (Feng et al., 2024; Ngo et al., 2025).

From the S-O-R perspective, flash sales function as an external stimulus that may directly generate a behavioral response when consumers perceive the economic benefits of the promotion as sufficiently attractive. Price reductions increase perceived transaction value,

while limited availability creates pressure to make a decision before the opportunity disappears. Consumers who initially have no intention to purchase may therefore respond spontaneously when they encounter a temporary and economically advantageous offer. Previous research has also shown that promotional and scarcity-related stimuli can encourage impulsive purchasing in digital environments (Feng et al., 2024; Ngo et al., 2025).

Accordingly, the economic incentive and restricted opportunity embedded in flash sales are expected to increase consumers' tendency to make unplanned purchases. Therefore, the following hypothesis is proposed:

H1: Flash sales have a positive effect on impulse buying.

Urgency Marketing and Impulse Buying

Urgency marketing refers to marketing communication designed to accelerate consumer decision-making by emphasizing that an opportunity may soon become unavailable. Typical urgency cues include countdown timers, limited-stock notifications, promotional deadlines, and alerts indicating that products are selling quickly. Unlike flash sales, which primarily emphasize economic incentives through discounts, urgency marketing focuses on time pressure and impending loss (Hao & Huang, 2025).

Within the S-O-R framework, urgency cues represent environmental stimuli capable of reducing consumers' perceived decision time. When consumers are repeatedly reminded that an offer or product may no longer be available, they may devote less attention to extensive information processing and become more inclined to act immediately. Such pressure can encourage spontaneous purchase decisions because postponing the decision is perceived as increasing the possibility of losing access to the desired opportunity.

Prior research indicates that scarcity and urgency messages can accelerate purchase decisions and strengthen impulsive tendencies in online shopping environments (Hao & Huang, 2025; Rosiqin & Pambudi, 2025). Thus, stronger perceptions of urgency are expected to correspond with stronger impulse-buying tendencies.

H2: Urgency marketing has a positive effect on impulse buying.

Flash Sales and Fear of Missing Out (FOMO)

FOMO refers to an individual's apprehension that a valuable opportunity or experience may be missed (Przybylski et al., 2013). Within e-commerce, this psychological state may emerge when consumers perceive that access to attractive products or promotions is restricted. Flash sales combine economic incentives with limited availability, creating the possibility that consumers will lose access to a favorable price if they delay their purchase.

From the S-O-R perspective, the restricted opportunity embedded in a flash sale may function as a stimulus that activates an internal psychological response. Consumers may experience concern not only about paying a higher price later but also about losing access to a temporarily advantageous deal. Consequently, limited promotional periods and product quantities may strengthen consumers' awareness that the opportunity is temporary and potentially unavailable in the future.

However, the psychological pathway of flash sales may be less direct than that of urgency marketing because the primary appeal of flash sales remains economic value rather than an explicit message of impending loss. Nevertheless, limited time and quantity may still stimulate FOMO when consumers perceive the promotional opportunity as valuable and difficult to recover (Feng et al., 2024; Tang et al., 2025). Therefore:

H3: Flash sales have a positive effect on Fear of Missing Out (FOMO).

Urgency Marketing and Fear of Missing Out (FOMO)

Urgency marketing is theoretically more proximal to FOMO because its central purpose is to communicate that consumers may lose an opportunity if they fail to act immediately. Countdown timers, stock scarcity notifications, and promotional deadlines continuously remind consumers that access to an offer is temporary. Such cues do more than communicate product information; they explicitly emphasize the potential consequences of delaying a purchase.

FOMO is characterized by anxiety or concern about missing valuable opportunities (Przybylski et al., 2013). Consequently, urgency messages are likely to activate FOMO because they make the possibility of loss salient and immediate. When consumers encounter statements such as “only a few items left” or observe a rapidly decreasing countdown timer, their attention may shift from evaluating whether the product is needed to considering whether the opportunity will remain available.

Recent evidence suggests that scarcity-related and time-sensitive cues can intensify consumers' psychological concern about losing desirable opportunities (Tang et al., 2025; Rosiqin & Pambudi, 2025). Therefore, compared with economically oriented promotional stimuli, urgency marketing should have a more direct psychological connection with FOMO.

H4: Urgency marketing has a positive effect on Fear of Missing Out (FOMO).

Fear of Missing Out (FOMO) and Impulse Buying

FOMO represents an internal psychological state characterized by concern that an individual may lose access to an opportunity perceived as valuable. In digital shopping environments, FOMO can be amplified by limited-stock information, promotional deadlines, real-time purchasing activities, and other cues indicating that consumers may lose a favorable opportunity if they postpone their decision (Przybylski et al., 2013; Tang et al., 2025).

Within the S-O-R framework, FOMO functions as the organism that connects environmental stimuli with behavioral responses. Consumers experiencing higher FOMO may feel greater emotional pressure to act immediately, reducing deliberate evaluation and increasing spontaneous purchasing behavior. Thus, the decision to purchase may be motivated not only by actual product needs but also by an effort to avoid the negative feeling associated with missing a valued opportunity.

Previous research has identified FOMO as an important psychological mechanism associated with impulsive purchasing behavior in digital environments (Ngo et al., 2025; Maggon, 2025). Accordingly, consumers experiencing stronger FOMO are expected to demonstrate a greater tendency toward impulse buying.

H5: Fear of Missing Out (FOMO) has a positive effect on impulse buying.

The Mediating Role of FOMO in the Relationship between Flash Sales and Impulse Buying

The S-O-R framework proposes that an environmental stimulus may influence behavior indirectly through an individual's internal psychological state. In this study, flash sales represent a promotional stimulus combining price incentives with limited purchasing opportunities. Although such promotions may directly encourage purchase behavior, their

restricted availability may also generate concern that consumers will miss an economically valuable opportunity.

Accordingly, a flash sale may first activate FOMO when consumers become aware that discounted products are available only temporarily or in limited quantities. FOMO may subsequently increase emotional pressure and reduce rational deliberation, ultimately increasing impulse buying. Under this mechanism, the behavioral response is not produced solely by the discount itself but by consumers' psychological reaction to the possibility of losing the promotional opportunity.

Nevertheless, because flash sales are primarily economic-incentive stimuli, their ability to generate FOMO may depend on whether consumers interpret the restricted offer as sufficiently valuable and difficult to obtain again. This indirect pathway therefore requires empirical examination rather than being assumed automatically. Based on the S-O-R mechanism, the following mediation hypothesis is proposed:

H6: Fear of Missing Out (FOMO) mediates the relationship between flash sales and impulse buying.

The Mediating Role of FOMO in the Relationship between Urgency Marketing and Impulse Buying

Urgency marketing differs from flash sales because its primary function is not necessarily to increase economic value but to emphasize the possibility of imminent loss. Countdown timers, declining-stock indicators, and limited-time notifications explicitly communicate that postponing a purchase may result in losing access to a product or opportunity. This characteristic makes urgency marketing particularly relevant to the organism component of the S-O-R framework.

When consumers perceive urgency cues, they may initially experience an internal psychological reaction in the form of FOMO. The perceived possibility of missing the opportunity may increase emotional pressure, shorten deliberation, and encourage immediate action. Consequently, urgency marketing may not necessarily translate directly into impulse buying; instead, its behavioral influence may depend on whether the urgency cue successfully produces a fear of missing out.

This distinction provides an important theoretical contrast with flash sales. Flash sales primarily communicate “buy now because the economic deal is attractive,” whereas urgency marketing communicates “act now because the opportunity may disappear.” The latter message is psychologically closer to FOMO because it explicitly highlights potential loss. Prior studies have indicated that urgency and scarcity cues can activate psychological responses that subsequently encourage impulsive purchasing behavior (Rosiqin & Pambudi, 2025; Tang et al., 2025). Therefore:

H7: Fear of Missing Out (FOMO) mediates the relationship between urgency marketing and impulse buying.

Method

This study employed a quantitative approach with an explanatory research design to examine the relationships among flash sales, urgency marketing, Fear of Missing Out (FOMO), and impulse buying through a survey method. The population comprised e-commerce users in Indonesia who had experience making purchases during flash sale events. The sample was selected using non-probability purposive sampling based on three criteria:

respondents were at least 17 years old, were active users of e-commerce platforms, and had made purchases during flash sale events. Experience with flash sales was used as the principal eligibility criterion because it ensured that respondents had encountered limited-time promotional activities in an e-commerce setting. A separate eligibility criterion for exposure to urgency-marketing features was not imposed; instead, respondents' perceptions of urgency cues, including time limitations, limited-stock information, and pressure to act immediately, were captured through the urgency-marketing indicators in the questionnaire. This consideration is taken into account when interpreting the empirical findings. Of the 118 initial responses received, 26 were excluded because the respondents did not meet the flash-sale purchase criterion. Consequently, 92 eligible responses were included in the final analysis. Based on G*Power calculations using three predictors, an effect size of 0.15, a significance level of 0.05, and statistical power of 0.80, the minimum sample size required was 77 respondents. Therefore, the final sample of 92 respondents exceeded the minimum requirement.

The study used primary data collected through an online questionnaire measured on a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Each construct was represented by six indicators, resulting in 24 measurement items. Flash sale was operationalized as respondents' perceptions of promotional offers that combine temporary price advantages with restrictions on promotional time and product availability. The measurement therefore reflected price attractiveness, limited promotional duration, and limited purchasing opportunities, consistent with the characteristics of flash-sale and scarcity-based promotions discussed by Feng et al. (2024) and Ngo et al. (2025).

Urgency marketing was operationalized as respondents' perceptions of marketing messages that create pressure to make an immediate purchasing decision by emphasizing the possibility that an opportunity may soon disappear. The indicators reflected time pressure, promotional deadlines, limited-stock cues, and messages encouraging immediate action. This operationalization follows the conceptual distinction that urgency-based communication emphasizes temporal scarcity and impending loss rather than merely offering an economic incentive (Hao & Huang, 2025; Rosiqin & Pambudi, 2025).

Fear of Missing Out (FOMO) was operationalized as the psychological concern experienced by consumers when they perceive that they may lose access to a product, promotion, or purchasing opportunity regarded as valuable. Its measurement captured consumers' apprehension about missing promotional opportunities and their psychological sensitivity to limited availability. The conceptualization was guided by the definition of FOMO proposed by Przybylski et al. (2013) and its application to scarcity and digital purchasing contexts described by Tang et al. (2025).

Impulse buying was operationalized as consumers' tendency to make spontaneous, immediate, and previously unplanned purchase decisions in an e-commerce environment. The indicators reflected the spontaneity of purchasing, limited prior deliberation, and the tendency to act on an immediate purchasing urge. This operationalization is consistent with recent discussions of impulse buying as an emotionally driven and weakly deliberated consumer response in digital commerce (Maggon, 2025). The wording of the indicators was contextualized to online shopping situations while retaining the conceptual meaning of each construct.

Prior to model estimation, the responses were screened for compliance with the predetermined inclusion criteria and for their suitability for analysis. Only eligible responses

were retained in the final dataset. Because the study relied on a single online questionnaire completed by the same respondents, the possibility of common method bias was considered when interpreting the relationships among the constructs. In addition, discriminant validity assessment was used to examine whether the theoretically distinct constructs demonstrated sufficient empirical separation. Particular attention was given to the distinction between urgency marketing as an external marketing stimulus and FOMO as an internal psychological response within the Stimulus-Organism-Response framework.

Data analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4. PLS-SEM was considered appropriate because the study simultaneously examined measurement quality, multiple structural relationships, predictive capability, and the mediating role of FOMO (Hair et al., 2022; Sarstedt et al., 2022). The analysis was conducted in two stages. First, the measurement model was evaluated through indicator loadings, Cronbach's alpha, composite reliability, Average Variance Extracted (AVE), and the Heterotrait-Monotrait ratio (HTMT). Indicator reliability was evaluated primarily through outer loadings, while internal consistency reliability was assessed using Cronbach's alpha and composite reliability. Convergent validity was established based on AVE, whereas discriminant validity was assessed using HTMT.

Second, the structural model was evaluated using path coefficients, coefficient of determination (R^2), effect size (f^2), predictive relevance (Q^2_{predict}), and Standardized Root Mean Square Residual (SRMR). Hypothesis testing was conducted using the bootstrapping procedure available in SmartPLS 4, with statistical significance evaluated at the 5% level based on the resulting t-statistics and p-values. The mediating role of FOMO was assessed through the specific indirect effects. The final manuscript should report the exact number of bootstrap subsamples and confidence-interval specification directly from the original SmartPLS 4 output to ensure consistency with the analysis actually performed.

Results and Discussion

The study involved 92 e-commerce users in Indonesia. Respondent characteristics were dominated by females (70.65%) and the 17-25 age group (67.39%). The most widely used platforms were Shopee (68.48%) and TikTok Shop (27.17%). All respondents had experience making purchases during flash sale events.

Table 1. Respondent Characteristics

Characteristics	Category	n	%
Gender	Male	27	29.35
	Female	65	70.65
Age	17–25 years	62	67.39
	26–35 years	19	20.65
	36–45 years	10	10.87
	>45 years	1	1.09
E-commerce platform	Shopee	63	68.48
	TikTok Shop	25	27.17
	Tokopedia	1	1.09
	Lazada	1	1.09
	Amazon	1	1.09

Others	1	1.09
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The evaluation of the outer model showed that most indicators had outer loadings above 0.70. Although three indicators had values slightly below this threshold, the entire construct still met the criteria for convergent validity because the AVE values ranged from 0.614 to 0.739. The Cronbach's Alpha values (0.873-0.928) and Composite Reliability values (0.904-0.944) also indicate that all constructs are reliable.

Table 2. Measurement Model Assessment

Construct	Indicator	Outer Loading	Cronbach's α	CR	AVE
Flash Sale	X1.1	0.679	0.873	0.904	0.614
	X1.2	0.812			
	X1.3	0.878			
	X1.4	0.798			
	X1.5	0.634			
	X1.6	0.868			
Urgency Marketing	X2.1	0.834	0.911	0.931	0.691
	X2.2	0.842			
	X2.3	0.841			
	X2.4	0.861			
	X2.5	0.794			
	X2.6	0.815			
FOMO	M1.1	0.781	0.903	0.926	0.675
	M1.2	0.831			
	M1.3	0.830			
	M1.4	0.763			
	M1.5	0.901			
	M1.6	0.817			
Impulse Buying	Y1.1	0.877	0.928	0.944	0.739
	Y1.2	0.895			
	Y1.3	0.912			
	Y1.4	0.872			
	Y1.5	0.698			
	Y1.6	0.886			

The results of the discriminant validity test show that five of the six construct pairs have HTMT values below 0.90, ranging from 0.365 to 0.716. Meanwhile, the construct pair Urgency Marketing (X2) and FOMO (M) has an HTMT value of 0.969 with a confidence interval of 0.919-1.007. This value indicates a potential empirical overlap between the two constructs; therefore, the discriminant validity results for the Urgency Marketing and FOMO pair should be interpreted with caution.

Table 3. Heterotrait-Monotrait Ratio (HTMT)

Construct	HTMT	CI 2,5%	CI 97,5%
Flash Sale ↔ FOMO	0.698	0.379	0.927

Construct	HTMT	CI 2,5%	CI 97,5%
Urgency Marketing ↔ FOMO	0.969	0.919	1.007
Urgency Marketing ↔ Flash Sale	0.660	0.351	0.905
Impulse Buying ↔ FOMO	0.716	0.555	0.841
Impulse Buying ↔ Flash Sale	0.365	0.162	0.659
Impulse Buying ↔ Urgency Marketing	0.696	0.537	0.821

In the inner model evaluation, the R^2 value for FOMO of 0.793 indicates that flash sales and urgency marketing account for 79.3% of the variation in FOMO. Meanwhile, the R^2 value for impulse buying of 0.471 indicates that the three predictors explain 47.1% of the variation in impulse buying. Urgency marketing has the largest contribution to FOMO with an effect size (f^2) of 1.847. Additionally, the Q^2 predict values of 0.765 for FOMO and 0.386 for impulse buying indicate the predictive relevance of the model.

Table 4. Structural Model and Hypothesis Testing

Hypothesis	Relationship	β	t	p	f^2	Decision
H1	Flash Sale → Impulse Buying	-0.157	1.205	0.228	0.027	Not Supported
H2	Urgency Marketing → Impulse Buying	0.308	1.751	0.080	0.039	Not Supported
H3	Flash Sale → FOMO	0.165	1.816	0.069	0.083	Not Supported
H4	Urgency Marketing → FOMO	0.780	9.298	0.000	1.847	Supported
H5	FOMO → Impulse Buying	0.492	2.711	0.007	0.095	Supported

Hypothesis testing shows that flash sales do not have a significant effect on impulse buying ($\beta = -0.157$; $p = 0.228$) or FOMO ($\beta = 0.165$; $p = 0.069$). Urgency marketing also has no direct effect on impulse buying ($\beta = 0.308$; $p = 0.080$), but it has a positive and significant effect on FOMO ($\beta = 0.780$; $p < 0.001$). Furthermore, FOMO has a positive and significant effect on impulse buying ($\beta = 0.492$; $p = 0.007$).

The lack of a significant effect of flash sales on impulse buying suggests that time constraints and price discounts do not necessarily directly lead to impulsive purchasing decisions. Consumers may perceive flash sales as promotional information without automatically translating it into a spontaneous urge to buy. This finding also indicates that the presence of promotional stimuli alone is insufficient to elicit a behavioral response unless accompanied by psychological mechanisms that make consumers feel they are missing out on an opportunity.

Conversely, the very strong influence of urgency marketing on FOMO suggests that messages regarding time constraints, limited stock, and pressure to act immediately align more closely with the psychological mechanisms underlying FOMO. When consumers receive signals that the opportunity to obtain a product or promotion may end soon, their attention is directed not only toward the economic benefits of the promotion but also toward the possibility of missing out on that opportunity. These findings support the S-O-R perspective that external stimuli can first influence consumers' internal states before generating behavioral responses.

The mediation findings show that the effect of urgency marketing on impulse buying primarily occurs through FOMO. The fact that the direct effect of urgency marketing on impulse buying is not significant, while the indirect effect via FOMO is significant, indicates that urgency stimuli do not necessarily automatically lead to impulse purchases. Such stimuli must first evoke a fear of missing out, which then increases the tendency to make spontaneous purchases. Thus, FOMO serves as a psychological mechanism that explains how urgency marketing can translate into impulse buying.

Table 5. Mediation Analysis

Hypothesis	Mediation Path	β	t	p
H6	Flash Sale → FOMO → Impulse Buying	0.081	1.410	0.159
H7	Urgency Marketing → FOMO → Impulse Buying	0.384	2.573	0.010

The mediation test results show that FOMO does not mediate the relationship between flash sales and impulse buying ($\beta = 0.081$; $p = 0.159$). Conversely, FOMO mediates the relationship between urgency marketing and impulse buying only indirectly ($\beta = 0.384$; $p = 0.010$). The total effect of urgency marketing on impulse buying is 0.692, with the main contribution coming from the indirect path through FOMO.

Table 6. Explanatory and Predictive Power of the Structural Model

Endogenous Construct	R ²	Adjusted R ²	Q ² predict
FOMO	0.793	0.789	0.765
Impulse Buying	0.471	0.453	0.386

SRMR = 0.074

The structural model explains 79.3% of the variance in FOMO and 47.1% of the variance in impulse buying. Positive Q²predict values for FOMO (0.765) and impulse buying (0.386) indicate that the model has predictive relevance for both endogenous constructs. The SRMR value of 0.074 is below the 0.08 threshold, suggesting an acceptable model fit.

Discussion

Flash Sales and Impulse Buying

The findings indicate that flash sales are not directly associated with impulse buying. Within the Stimulus-Organism-Response (S-O-R) framework, this result shows that the presence of an economically attractive promotional stimulus does not necessarily translate directly into a behavioral response. Flash sales primarily provide consumers with economic value through temporary price reductions and limited purchasing opportunities. Therefore, the availability of a discount itself should be distinguished from the internal psychological process that ultimately produces spontaneous purchasing behavior. In the present model, flash sales do not independently explain consumers' impulse buying responses.

This finding provides a different perspective from previous studies that have documented the relevance of promotional stimuli to impulsive purchasing. Djamhari et al. (2024) found that sales promotions were associated with impulsive buying under particular digital-payment conditions, indicating that promotional incentives can contribute to impulse purchasing when combined with other facilitating conditions. Similarly, Feng et al. (2024) demonstrated that impulse buying in livestreaming environments is shaped by an interaction

between external cues and consumers' cognitive and affective responses rather than by promotional stimuli alone. More recently, Gusriani et al. (2026) found that flash sales contribute to impulsive purchasing through spontaneity as an intervening psychological process. Taken together, these comparisons indicate that flash sales should not automatically be regarded as a direct trigger of impulse buying; their behavioral relevance can depend on the psychological or situational mechanism incorporated into the model.

Urgency Marketing and Impulse Buying

The findings show that urgency marketing is not directly associated with impulse buying. In the S-O-R framework, urgency marketing represents an external stimulus characterized by time pressure, limited availability, and messages encouraging immediate action. The absence of a direct relationship indicates that urgency cues in the present model operate through consumers' internal psychological state rather than moving directly from stimulus to behavioral response. This pattern is important because it distinguishes the communication of urgency from the actual decision to make an unplanned purchase.

This finding differs from Rosiqin and Pambudi (2025), who reported that urgency marketing was directly associated with impulsive buying while its relationship with FOMO was not supported. It also differs from Hao and Huang (2025), whose experimental evidence showed that scarcity-message configurations and time scarcity can strengthen impulsive buying responses in livestreaming commerce. However, Ngo et al. (2025) demonstrated that the influence of e-commerce stimuli on impulse buying involves both direct and emotion-based pathways, reinforcing the view that promotional pressure does not operate identically across mechanisms and contexts. The present finding therefore contributes a distinct S-O-R pattern in which urgency marketing is connected to impulsive behavior through an internal psychological process rather than through a direct stimulus-response pathway.

Flash Sales and Fear of Missing Out (FOMO)

The findings indicate that flash sales are not associated with FOMO. This result is theoretically relevant because flash sales and urgency marketing, although both involve limited opportunities, communicate different forms of value. Flash sales primarily emphasize an economic opportunity through temporary discounts, whereas FOMO represents an internal psychological concern about losing access to something perceived as valuable. The present finding demonstrates that an economically attractive limited-time promotion does not, by itself, constitute the same psychological stimulus as an explicit scarcity or impending-loss cue.

This finding differs from research focusing more explicitly on scarcity. Tang et al. (2025) found that product scarcity appeals influence impulse buying intentions through FOMO, demonstrating that scarcity cues can activate fear of losing an opportunity. Du et al. (2026) similarly found that scarcity was positively associated with FOMO in a consumption context. Rosiqin and Pambudi (2025) also showed that scarcity marketing was associated with FOMO, which subsequently contributed to impulsive buying. The distinction is important: these previous studies examined scarcity as a cue that explicitly emphasizes restricted availability, whereas the current study separates flash sales as an economically oriented promotional event from urgency marketing as an impending-loss message. The findings therefore support treating these stimuli as conceptually distinct rather than interchangeable.

Urgency Marketing and Fear of Missing Out (FOMO)

The findings support the relationship between urgency marketing and FOMO. Within the S-O-R framework, this relationship represents the transition from stimulus to organism. Urgency marketing communicates that an opportunity is becoming increasingly limited through cues such as countdown timers, promotional deadlines, and limited-stock notifications. These messages explicitly highlight the possibility of losing access to a desired opportunity, which corresponds directly to the psychological meaning of FOMO as concern about missing something perceived as valuable. Thus, urgency marketing and FOMO occupy theoretically distinct but sequential positions in the S-O-R mechanism: urgency is the external cue, while FOMO is the internal psychological response.

The finding is consistent with broader evidence showing that scarcity-related cues are associated with FOMO. Tang et al. (2025) demonstrated that product scarcity appeals activate FOMO as part of the mechanism leading toward impulse buying intentions, while Du et al. (2026) found that scarcity was positively associated with FOMO. However, the result contrasts with Rosiqin and Pambudi (2025), who found that urgency marketing was not significantly associated with FOMO even though scarcity marketing was. This difference reinforces the need to distinguish the operationalization of urgency cues across studies. In the present model, urgency marketing is empirically positioned as an external stimulus connected with the internal FOMO response, thereby supporting the organism stage of the S-O-R framework.

Fear of Missing Out (FOMO) and Impulse Buying

The findings confirm that FOMO is positively associated with impulse buying. In the S-O-R framework, FOMO represents the organism component that translates consumers' internal psychological state into a behavioral response. When consumers experience concern about missing a product, promotion, or purchasing opportunity that they regard as valuable, this psychological state is associated with a stronger tendency toward immediate and unplanned purchasing. The finding therefore establishes FOMO as more than an accompanying emotion; within the tested model, it constitutes the psychological state directly connected to impulse buying.

This result is consistent with Rosiqin and Pambudi (2025), who found that FOMO contributes to impulsive buying among TikTok Live Shopping consumers. Tang et al. (2025) likewise identified FOMO as an important psychological mechanism connecting product scarcity appeals with impulse buying intentions. The finding is also consistent with Du et al. (2026), who reported a positive relationship between FOMO and impulsive buying within an S-O-R-based consumer model. Furthermore, Gusriani et al. (2026) emphasized the importance of psychological factors in explaining impulsive purchases among Generation Z. Collectively, these findings reinforce the role of internal psychological responses in explaining why consumers move from exposure to digital marketing cues toward spontaneous purchasing behavior.

The Mediating Role of FOMO between Flash Sales and Impulse Buying

The findings show that FOMO does not mediate the relationship between flash sales and impulse buying. From the S-O-R perspective, the proposed Flash Sale → FOMO → Impulse Buying sequence is therefore not supported. Flash sales do not activate the organism represented by FOMO in the tested model, and consequently FOMO does not transmit the

relationship between this promotional stimulus and impulsive purchasing behavior. This result reinforces the theoretical distinction between an economic-incentive stimulus and a stimulus that explicitly communicates the risk of losing an opportunity.

The result differs from Tang et al. (2025), who demonstrated that FOMO mediates the relationship between product scarcity appeals and impulse buying intentions. It also differs from Rosiqin and Pambudi (2025), who found that scarcity marketing increased FOMO and subsequently contributed indirectly to impulsive buying. Importantly, Gusriani et al. (2026) identified a different psychological pathway in which flash sales contribute to impulsive purchasing through spontaneity. The comparison indicates that the psychological process connecting flash sales with impulsive buying is not necessarily FOMO. Existing research has identified other internal mechanisms, while the present findings specifically do not support FOMO as the mechanism linking flash sales with impulse buying.

The Mediating Role of FOMO between Urgency Marketing and Impulse Buying

The findings support the mediating role of FOMO in the relationship between urgency marketing and impulse buying. This represents the clearest sequential mechanism within the S-O-R framework examined in this study. Urgency marketing functions as the stimulus by communicating impending loss, FOMO represents the organism through which consumers psychologically process that cue, and impulse buying constitutes the resulting behavioral response. Because the direct relationship between urgency marketing and impulse buying is not supported while the indirect pathway through FOMO is supported, the results demonstrate that the connection between urgency cues and impulsive purchasing in the present model operates through the internal psychological response of FOMO.

This result differs from Rosiqin and Pambudi (2025), who found that urgency marketing was directly associated with impulsive buying but did not operate through FOMO. In contrast, the mechanism identified in the present study is consistent with the broader findings of Tang et al. (2025), who demonstrated that FOMO transmits the relationship between scarcity appeals and impulse buying intentions. Du et al. (2026) similarly showed that scarcity is associated with FOMO and that FOMO subsequently relates to impulsive buying, supporting a sequential S-O-R process involving an external market cue, an internal psychological state, and an impulsive behavioral response. Therefore, the main theoretical contribution is not simply that urgency marketing and flash sales produce different statistical outcomes, but that they occupy different functional roles within the S-O-R process: urgency cues activate the FOMO mechanism, whereas flash-sale incentives do not follow this psychological pathway in the present model.

Conclusion

The findings demonstrate that flash sales and urgency marketing operate through different mechanisms in explaining impulse buying among e-commerce users in Indonesia. Flash sales were not significantly associated with either FOMO or impulse buying, indicating that limited-time price incentives alone do not necessarily activate the psychological or behavioral responses proposed in the model. In contrast, urgency marketing was strongly associated with FOMO, while FOMO was positively associated with impulse buying. Most importantly, FOMO provided the significant indirect pathway linking urgency marketing to impulse buying, whereas no comparable mediation mechanism was found for flash sales. These findings distinguish economically attractive promotional stimuli from psychologically

urgent cues and support the Stimulus-Organism-Response (S-O-R) perspective by showing that urgency marketing influences behavioral responses primarily through an internal psychological state rather than through a direct pathway.

From a practical perspective, e-commerce platforms and marketers should recognize that urgency-based communication may be more psychologically consequential than temporary price discounts. Urgency cues should therefore be communicated transparently and responsibly, particularly regarding promotional deadlines, product availability, and stock limitations. Artificial countdown timers, misleading scarcity messages, or exaggerated limited-stock claims should be avoided because such practices may intensify psychological pressure without providing accurate information to consumers. Marketing strategies should balance promotional effectiveness with consumer well-being by ensuring that urgency cues reflect genuine conditions and allow consumers to make informed purchasing decisions.

Future research should employ larger and more heterogeneous samples, compare promotional mechanisms across different e-commerce platforms, and examine additional psychological or situational mechanisms that may connect promotional stimuli with impulse buying. Particular attention should also be given to improving the conceptual and measurement distinction between urgency marketing and FOMO, given their close empirical relationship in the present study. Future measurement development should ensure that urgency marketing indicators represent external promotional cues, whereas FOMO indicators capture consumers' internal psychological responses, thereby providing a clearer test of the Stimulus-Organism-Response mechanism.

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