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Applying The SOR Theory in Encouraging Consumer Impulse Buying Through Flash Sale Quality in E-Commerce

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Abstract: The increasing growth of e-commerce has encouraged business owners to seek various promotional methods, such as flash sale programs, to encourage impulse buying among consumers. This study applies the stimulus-organism-response (SOR) theory in encouraging impulse buying among consumers through flash sale quality. In applying the SOR theory, flash sale quality is considered a stimulus that includes information, visuality, entertainment, and economics, which then influence consumers emotional responses and create brand attitude and encourage impulse buying. The results show that the quality of flash sales, such as information, visuality, entertainment, and economics, triggers consumers emotional responses, including pleasure, arousal, and dominance, which can provide a positive response to brand attitude and ultimately encourage consumers impulse buying behavior. Brand attitude responses and impulse buying behavior are achieved through organisms such as pleasure, arousal, and dominance as organisms and flash sale quality as stimuli, which is in accordance with SOR theory. It is hoped that the results of this study can provide a theoretical contribution to the development of SOR theory in the context of e-commerce and become evaluation material for business owners to optimize effective flash sale programs to encourage consumer impulse buying.

Keyword: SOR Theory, Brand Attitude, Impulse Buying.

INTRODUCTION

The rapid developments in technology and social media platforms have changed the way companies operate, shifting from traditional methods to digital methods, which provide extensive information and a high level of interaction between consumers and producers (Rehman et al., 2025). Conventional e-commerce, which was previously dominated by websites, has now transformed into more socially connected forms, such as social commerce, live streaming commerce, and mobile commerce. This has led consumers to make online shopping a new habit (Min et al., 2022). E-commerce platforms have transformed into the main channel for sellers to manage uncertainty in demand (Li & Shi, 2025). Data shows that the number of people using e-commerce in Indonesia is predicted to increase from 2024 to 2028,

reaching 57.1 million users, which reflects an increase of 41.45%. In 2025, the most popular e-commerce platforms in Indonesia are predicted to be Shopee, Tokopedia, and Blibli (Qonitah & Hayu, 2025).This widespread adoption of technology has triggered a shift in the concept of e-commerce from one that used to focus on commercial relationships between sellers and buyers to a more social and collaborative type. The emergence of e-commerce has significantly changed the way consumers buy goods and communicate with brands (Blanco-Encomienda & Rosillo-Díaz, 2025).

All this change, flash sales have become an important promotional method in offering every product to attract consumers. Although flash sales are an effective promotional method in the digital age to encourage impulse purchases, their influence on consumer perceptions and actions is still largely determined by how well they are implemented, which is reflected in program design, characteristics, and economic benefits (Rafdinal et al., 2025). Although flash sales are widely used as a promotional strategy to increase sales, in-depth research is still needed to identify specific factors to maximize these benefits for all parties involved (Nguyen-Van et al., 2024). The quality of flash sale is very important in creating a sense of urgency among consumers, thereby encouraging impulsive purchases (Rafdinal et al., 2025). This is driven by various interactive tools that have been featured on e-commerce platforms. As a result, it can improve brand attitude because consumers are able to review and analyze information about a brand independently. This is very important because it serves as a benchmark in product selection and also plays a role in increasing market share (Blanco-Encomienda & Rosillo-Díaz, 2025).

The increasing of analyzing reviews easily or information from other consumers due to the development of e-commerce, this study adopts the stimulus-organism-response (SOR) theory, which explains the influence of environmental factors on consumer actions/behavior (Blanco-Encomienda & Rosillo-Díaz, 2025). This study also aims to examine how consumer emotional responses influence consumer perceptions of brand attitude, which in turn affects impulse buying, which is a novelty of this study. Therefore, this study uses the pleasure-arousal-dominance (PAD) model, which specifically focuses on emotion as the organism (O) element in the SOR theoretical framework. The PAD model has been tested with various external stimuli, and previous studies show that this model describes the relationship between stimuli, consumer feelings, and consumer reactions (Nagano et al., 2021). In e-commerce, visual and interactive elements play a crucial role in triggering emotional reactions that can encourage impulse buying behavior (Rafdinal et al., 2025).

The uniqueness of this study lies in the quality of flash sales in e-commerce, which gradually triggers emotions, shapes brand attitude, and ultimately encourages impulse buying behavior. This study not only evaluates the direct impact of flash sale quality as a stimulus, but also sequentially maps the psychological path of consumers. Specifically, this study uses the stimulus-organism-response (SOR) theory by integrating the PAD (Pleasure, Arousal, Dominance) model as an organism that drives brand attitude and impulse buying as a response, all of which are triggered by flash sale quality.

SOR (stimulus–organism–response) was developed by Mehrabian and Russell (1974) to explain how a person reacts to external behavioral stimuli (S), which then changes their internal state (O), and produces an individual reaction (R) (Blanco-Encomienda & Rosillo-Díaz, 2025). In this way, the SOR model explains that when a person faces external stimuli, there will be a 'change within oneself' which then triggers a behavioral response (Kumar Mishra et al., 2022). The final element, response (R), which is also defined as behavior, is determined by an individual's cognitive and emotional state, helping to decide whether to choose approach or avoidance behavior (Khairunnisa et al., 2025; Safeer, 2024; Zhang et al., 2022).

PAD model is a psychological model that functions to describe individuals' emotional reactions in response to elements around them. These dimensions serve to explain and assess emotional experiences related to specific stimuli, whether they are products, environments, or other factors

(Ligaraba, 2024). Emotions are the microfoundations that influence the choices made by consumers. Various studies have examined a number of positive emotions (such as happiness, pleasure) and negative emotions (such as grief, anger, shame, etc.) that arise from mental appraisals (Miocevic, 2022).

METHOD

Research Method

This study uses a quantitative approach with a survey method through questionnaires distributed to the general public using google forms, and only certain respondents will be followed up, namely those who have shopped during flash sales on e-commerce sites. In filling out the questionnaire, it will begin with the characteristics of the respondents as a screening stage, demographic data such as age, gender, education level, income, then continued with indicators in each variable. Each indicator, except for PAD, is measured using a 1 to 5 likert scale (strongly disagree to strongly agree).

Table 1. Respondent characteristics

Category	Indicator	Frequency	%
Gender	Male	84	26.75%
	Female	230	73.25%
Age	18-24	39	12.42%
	25-34	244	77.71%
	35-44	24	7.64%
	≥ 45	7	2.23%
Education	High school	30	9.55%
	Diploma / Bachelor's Degree	260	82.80%
	Magister	24	7.64%
Occupation	Teacher/lecturer	2	0.64%
	Housewife	23	7.32%
	Student	22	7.01%
	Civil servant	44	14.01%
	Private sector employee	199	63.38%
	Entrepreneur	21	6.69%
	Not working	3	0.96%
Monthly income	<3 million	56	17.83%
	3 - 5 million	67	21.34%
	5 - 8 million	62	19.75%
	>8 million	129	41.08%
Most frequently used e-commerce platforms? (may select more than one)	Blibli	15	2.94%
	Lazada	25	5.24%
	Shopee	291	61.01%
	Tiktok Shop	23	4.82%
	Tokopedia	123	25.79%
How many times have you shopped during a flash sale on an e-commerce site in the last 3 months?	1-2 times	155	49.36%
	3-5 times	96	30.57%
	> 5 times	63	20.06%

Source: Authors' own work

Unit Analysis

Each indicator in the questionnaire was taken from previous research related to e-commerce. For the flash sale quality variable, four dimensions were used, such as information, visuality, entertainment, and economics (Rafdinal et al., 2025). Each indicator of brand attitude is adapted from research on consumer attitude evaluation towards brands (Blanco-Encomienda & Rosillo-Díaz, 2025).Then, impulse buying is adapted from research on impulse buying in the context of e-commerce (Rafdinal et al., 2025).

Table 2. Measurement items

Variable	Indicators	Likert scale	Sources

Flash Sale Quality	**Information** 1. Flash sale provides relevant product information 2. Flash sale offers sufficient product descriptions 3. Flash sale presents accurate product details 4. Flash sale delivers the latest product updates **Visuality** 1. Flash sale features visually attractive layouts. 2. Flash sale displays product information appealingly 3. Flash sale has a visually pleasing overall design **Entertainment** 1. Flash sale uses visuals that draw attention 2. Flash sale presents products in a fun way 3. Flash sale offers an entertaining experience 4. Flash sale creates excitement during shopping **Economics** 1. Flash sale captures interest with engaging content 2. Flash sale offers products at affordable prices 3. Flash sale enables lower- price purchases 4. Flash sale helps reduce spending	1 = Strongly disagree 2 = Disagree 3 = Somewhat agree 4 = Agree 5 = Strongly agree	(Rafdinal et al., 2025)
Pleasure	Unhappy - happy Annoyed - pleased Discontent - content	bipolar adjective pairs	
Arousal	Bored - stimulated Dull - bright Calm - excited		
Dominance	Influenced - influential Submissive - dominant Autonomous - guided		
Brand Attitude	1. In general, I think the brand of the product I want to purchase via the e-commerce platform is good 2. In general, I think the brand of the product I want to purchase via the e-commerce platform gives me a good feeling 3. In general, I think the brand of the product I want to purchase via the e-commerce platform is pleasant 4. In general, I think the brand of the product I want to purchase via the e-commerce platform is valuable 5. In general, I think the brand of the product I want to purchase via the e-commerce platform is trustworthy	1 = Strongly disagree 2 = Disagree 3 = Somewhat agree 4 = Agree 5 = Strongly agree	(Blanco-Encomienda & Rosillo-Díaz, 2025)
Impulse Buying	1. My purchase is spontaneous 2. My purchase is unplanned 3. I did not intend to do this purchase before this shopping trip 4. I could not resist to do this purchase		(Rafdinal et al., 2025)

Source: Authors' own work

Data Analysis Techniques

Validity and reliability tests were conducted in this study to ensure the accuracy and consistency of each questionnaire item before testing each hypothesis. The data obtained will be analyzed using structural equation modeling (SEM) with partial least squares structural equation modeling (PLS-SEM) because the model structure is quite complex, with many indicators and constructs (Hair et al., 2017).

Flash sale quality and PAD

Flash sale offer goods at prices lower than normal for a limited time and quantity (Nguyen-Van et al., 2024).When a product is presented with a more attractive visual display, it will have an impact on inner emotions such as arousal and pleasure (Chen et al., 2023). As the main consumer reaction to external stimuli that indicate the level of interest, the level of arousal in flash sale programs is specifically triggered by pricing and products that can satisfy consumer desires (Nguyen-Van et al., 2024). Flash sale quality dimensions such as information,

economics, and entertainment can encourage consumer arousal and pleasure (Lamis et al., 2022). Organized and easy to understand flash sale quality (through clear information and simple navigation) has a positive effect on strengthening the dominance aspect of consumers in PAD model, enabling consumers to make quick decisions under pressure (Rafdinal et al., 2025). Hypothesis proposed:

H1. Flash sale quality is a significant predictor of consumer pleasure.
H2. Flash sale quality is a significant predictor of consumer arousal.
H3. Flash sale quality is a significant predictor of consumer dominance.

PAD and Brand Attitude

Brand attitude is consumers' overall assessment of a brand, which is formed through a comprehensive assessment of all products and brand characteristics (Hwang et al., 2022). Brand attitude plays a crucial role because its influence can change the way people perceive the brand. Therefore, brand attitude shows how much a person likes a brand, and can also be seen through the positive views of customers (Quezado et al., 2022). The positive emotions formed by consumers can encourage a positive attitude towards a brand (Kirkby et al., 2023). The results of research by Blanco-Encomienda & Rosillo-Díaz (2025), found that pleasure and dominance have a positive impact on brand attitude, while arousal has a negative impact on brand attitude.

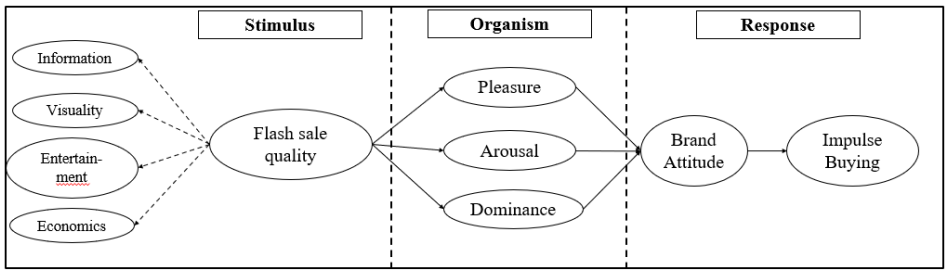
H4. Pleasure significantly enhances consumer brand attitude.
H5. Arousal significantly enhances consumer brand attitude.
H6. Dominance significantly enhances consumer brand attitude.

Brand Attitude and Impulse Buying

Impulse buying refers to any transaction made by customers without prior planning, characterized by sudden and immediate purchases that arise in response to stimuli, and carried out spontaneously, triggered by an urgent, strong, and consistent desire to immediately obtain something, resulting in unexpected shopping behavior (Khoi & Le, 2025; Shao, 2024). A study also shows that when buyers have a favorable view of a brand, this will have an impact on their intention to buy and their willingness to pay a higher price (Anggraini & Sobari, 2023; Blanco-Encomienda & Rosillo-Díaz, 2025). Impulse buying describes the tendency of consumers to make sudden purchases without planning ahead and without considering the possible consequences or engaging in a prior decision-making process. This is derived from interactions influenced by the shopping atmosphere and is fundamentally influenced by information obtained from that environment (Ma et al., 2024; Qonitah & Hayu, 2025). This behavior occurs more often when shopping online than when shopping traditionally because online shopping can encourage impulse buying behavior without considering the consequences of each spontaneous purchase (Qonitah & Hayu, 2025).When shopping online, consumers have internal emotional responses such as pleasure and arousal that impact impulse buying behavior (Chen et al., 2023).

H7. Positive brand attitude contributes to impulse buying

The research model can be seen in Figure 1. This research conceptual framework examines how flash sale quality influences impulse buying. Flash sale quality is measured based on four dimensions, namely information, visuality, entertainment, and economics, which trigger emotional responses in consumers such as pleasure, arousal, and dominance. These consumer emotions can enhance brand attitude and impulse buying behavior. This model assesses that a comprehensive flash sale experience can trigger consumers to make spontaneous purchases or impulse buying.



Source: Authors' own work

Figure 1. Research Model

RESULTS AND DISCUSSION

Validity and Reliability Test

Validity and reliability tests were conducted in this study to ensure the accuracy and consistency of each questionnaire item before testing each hypothesis. Validity was tested by checking outer loadings values above 0.70 to ensure that the indicators in the questionnaire accurately represented the constructs being measured. The test results showed that all indicators passed the validity test, indicating that all indicators had a strong correlation and were considered valid in representing the variables. Meanwhile, reliability was assessed to evaluate consistency by looking at a minimum Cronbach's alpha value of 0.70. The Cronbach's alpha value in the data exceeded the minimum limit, indicating that the indicators in each construct had sufficient consistency and were considered reliable.

Table 3. Validity and Reliability Test

Variable	Variable	Factor Loading	Status	Cronbach's Alpha	Status
Flash sale quality				0.940	Reliable
Information 1	FSI1	0.725	Valid		
Information 2	FSI2	0.710	Valid		
Information 3	FSI3	0.707	Valid		
Information 4	FSI4	0.725	Valid		
Visuality 1	FSV1	0.710	Valid		
Visuality 2	FSV2	0.707	Valid		
Visuality 3	FSV3	0.725	Valid		
Entertainment 1	FSE1	0.740	Valid		
Entertainment 2	FSE2	0.770	Valid		
Entertainment 3	FSE3	0.758	Valid		
Entertainment 4	FSE4	0.750	Valid		
Economics 1	FSEc1	0.748	Valid		
Economics 2	FSEc2	0.708	Valid		
Economics 3	FSEc3	0.726	Valid		
Economics 4	FSEc4	0.707	Valid		
Pleasure				0.849	Reliable
Pleasure 1	P1	0.707	Valid		
Pleasure 2	P2	0.725	Valid		
Pleasure 3	P3	0.710	Valid		
Arousal				0.886	Reliable
Arousal 1	A1	0.891	Valid		
Arousal 2	A2	0.935	Valid		
Arousal 3	A3	0.880	Valid		
Dominance				0.782	Reliable
Dominance 1	D1	0.841	Valid		
Dominance 2	D2	0.869	Valid		
Dominance 3	D3	0.791	Valid		

Brand Attitude				0.944	Reliable
Brand attitude 1	BA1	0.899	Valid		
Brand attitude 2	BA2	0.923	Valid		
Brand attitude 3	BA3	0.920	Valid		
Brand attitude 4	BA4	0.893	Valid		
Brand attitude 5	BA5	0.887	Valid		
Impulse Buying				0.884	Reliable
Impulse buying 1	IB1	0.710	Valid		
Impulse buying 2	IB2	0.707	Valid		
Impulse buying 3	IB3	0.725	Valid		
Impulse buying 4	IB4	0.710	Valid		

Source: Processed by the authors (2025)

Hypothesis Results

Hypothesis testing in this study was conducted to examine the causal relationship between variables formulated in the research model. The significance of the influence between variables was evaluated by considering the T-statistics and P-values, with the criteria that a hypothesis is supported if the T-statistics > 1.96 and P-values < 0.05 at a significance level of 5%.

Table 4. Hypothesis testing results

No.	Hypothesis	Estimate	T-statistics	P-values	Decision
H1	Flash sale quality → Pleasure	0.551	9.469	0.000	H1 Supported
H2	Flash sale quality → Arousal	0.430	6,674	0.00	H2 Supported
H3	Flash sale quality → Dominance	0.430	7,695	0.000	H3 Supported
H4	Pleasure → Brand attitude	0.194	2,496	0.013	H4 Supported
H5	Arousal → Brand attitude	0.451	5.086	0.00	H5 Supported
H6	Dominance → Brand attitude	0.172	2,522	0.012	H6 Supported
H7	Brand Attitude → Impulsive buying	0.413	7.349	0.00	H7 Supported

Source: Processed by the authors (2025)

The results of the hypothesis testing above show that flash sale quality is a significant predictor of pleasure, with a t-value of 9.469 and p-value of 0.000, indicating a strong level of significance. Similarly, flash sale quality is a significant predictor of arousal and dominance, with t-values of 6.674 and 7.695, respectively, and p-values of 0.000. The results of the hypothesis of pleasure, arousal, and dominance on brand attitude show that these emotional responses have a positive and significant effect on brand attitude, with t-values of pleasure (2.496), arousal (5.086), and dominance (2.522) and p-values of pleasure (0.013), arousal (0.000), and dominance (0.012). The results of the final hypothesis testing, namely brand attitude on impulse buying, also show a t-value of 7.349 and a p-value of 0.000, indicating that brand attitude has a positive contribution to impulse buying. Overall, all hypotheses were empirically supported, and through the SOR theory, it was confirmed that flash sale quality acts as a stimulus in influencing consumers' emotional responses such as pleasure, arousal, and dominance, as well as forming brand attitude that can encourage consumers' impulse buying behavior.

Discussion

This study aims to examine the impact of flash sale quality through consumers' emotional responses to brand attitude, which can ultimately encourage impulse buying behavior using the SOR (stimulus-organism-response) theory. To generate impulse buying behavior,

consumers are given something as a stimulus, namely flash sale quality. Flash sale quality consists of several elements to trigger consumers, namely information, visuality, entertainment, and economics. The availability of adequate information, attractive layout, pleasant product display, and economic benefits of flash sales can encourage consumers' emotional responses. Flash sale trigger consumers to make unplanned purchases or impulse buying (Martaleni et al., 2022).

The results of the study found that flash sale quality can significantly stimulate consumers' emotional responses, including pleasure, arousal, and dominance. Based on the data, the emotional response of pleasure showed the strongest correlation among the other emotional responses, followed by dominance and arousal. Flash sale quality provides consumers with a high level of excitement or pleasure during their interactions on e-commerce sites. This also reinforces previous research, which found that when a product is presented with a more attractive visual display, it has an impact on emotions such as arousal and pleasure (Chen et al., 2023). However, in this study, the impact on arousal was weaker than on pleasure and dominance. Flash sale quality provides consumers with a greater sense of happiness and a stronger sense of control than a sense of excitement or enthusiasm. Flash sale quality that is organized and easy to understand (through clear information and simple navigation) has a positive effect in strengthening the dominance aspect of consumers in PAD model, so that consumers can make decisions quickly when under pressure (Rafdinal et al., 2025).

Three emotions (pleasure, arousal, and dominance), they all have a significant response on brand attitude. If previously it was said that the impact of flash sale quality was weaker on arousal than on pleasure and dominance, the results of this study show that arousal has twice as strong an influence on brand attitude compared to the impact of dominance and pleasure. Although flash sale quality has a weaker influence on consumers' sense of urgency and arousal, this sense of urgency and enthusiasm has a stronger response on consumers' assessment of brand attitude than other emotions. This shows that a sense of excitement or pleasure and a strong sense of control in consumers are not enough to change consumers' assessment of brand attitude; a sense of urgency and enthusiasm is also needed. However, overall, the three emotions of pleasure, arousal, and dominance have a significant impact on brand attitude, only at different levels. The level of consumer joy, sense of control, and enthusiasm has a significant and positive impact on brand attitude. This reinforces previous research that positive consumer emotions can encourage a positive attitude towards a brand (Kirkby et al., 2023). Other research findings indicate that pleasure and dominance have a positive impact on brand attitude, while arousal has a negative impact on brand attitude. This may be influenced by consumers' previous experiences with the brand (Blanco-Encomienda & Rosillo-Díaz, 2025). This shows that consumer experiences influence their assessment of the brand they are going to buy and depend on the emotions of consumers at that time. As stated in previous research, attitudes toward a brand can be seen from consumer experiences and the negative emotions felt at the time of purchase (Blanco-Encomienda & Rosillo-Díaz, 2025).

The results of this study also show that brand attitude can encourage strong impulse buying behavior among consumers. Positive consumer perceptions of a brand can encourage impulsive purchases. During flash sales, consumers do not only make impulsive purchases based on emotions such as excitement, a sense of control, and enthusiasm, but can also be influenced by positive attitudes toward the brand being purchased. Positive attitudes toward a brand can further encourage impulse buying behavior among consumers. Other studies show that brand attitude can encourage strong purchase intentions and even be the main trigger for making a purchase (Blanco-Encomienda & Rosillo-Díaz, 2025). Impulse buying describes the tendency of consumers to make sudden purchases without planning ahead and without considering the possible consequences or engaging in a prior decision-making process. This is derived from interactions influenced by the shopping atmosphere and is fundamentally

influenced by information obtained from that environment (Ma et al., 2024; Qonitah & Hayu, 2025).

CONCLUSION

Based on the results of the study, it can be concluded that flash sale quality, which consists of information, visuality, entertainment, and economics, is a significant predictor of emotional responses, including pleasure, arousal, and dominance. Flash sale quality has a significant and strong impact on the level of pleasure, followed by dominance, then arousal. Accurate information, attractive and entertaining displays, and economic benefits that are advantageous to consumers provide a significant level of pleasure. The three emotional responses (pleasure, arousal, dominance) are able to provide a significant and positive response to brand attitude. Consumer arousal has a more significant impact on brand attitude. Positive brand attitude can encourage impulse buying behavior among consumers. This confirms the overall hypothesis that the flash sale quality, such as information, visuality, entertainment, and economics, triggers emotional responses among consumers, including pleasure, arousal, and dominance, which can elicit positive responses to brand attitude and ultimately encourage impulse buying of consumers.

The results of this study indicate that arousal level has the most significant effect on brand attitude. Further analysis is needed to add variables such as previous consumer experience to brand attitude. Then, because arousal is the most significant factor in brand attitude, e-commerce businesses are advised to use time constraints during flash sales, which are more effective in increasing a positive sense of urgency for consumers.

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