

Algorithmic Personalization and Impulse Buying in Social Commerce: The Mediating Role of Hedonic Value under the S-O-R Framework

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Submitted: 27 Maret 2026

Accepted: 12 April 2026

Published: 1 Juli 2026

ABSTRACT

The rapid expansion of social commerce, particularly TikTok Shop, has intensified the role of algorithmic personalization in shaping consumer behavior, yet its affective mechanisms remain insufficiently examined, especially in emerging markets. Prior studies largely focus on general digital stimuli, leaving a limited understanding of how algorithm-driven personalization specifically triggers impulse buying through emotional processes. Drawing on the Stimulus–Organism–Response (S-O-R) framework, this study investigates the effect of algorithmic personalization on impulse buying, with hedonic value as a mediating variable. This study contributes by extending the S-O-R framework into algorithm-driven social commerce by empirically validating the mediating role of hedonic value in AI-personalized environments. Using survey data from 150 active TikTok Shop users, the study employs regression-based mediation analysis with SPSS. The results indicate that algorithmic personalization significantly affects hedonic value ($\beta = 0.62, p < 0.001$) and impulse buying ($\beta = 0.41, p < 0.001$), while hedonic value also significantly influences impulse buying ($\beta = 0.47, p < 0.001$). The model explains 53% of the variance in impulse buying ($R^2 = 0.53$), with mediation analysis confirming a partial mediating effect of hedonic value ($p < 0.001$). These findings demonstrate that algorithmic personalization operates not only as a cognitive trigger but also as an affective driver that enhances hedonic experiences, thereby increasing impulsive purchasing behavior. This study extends the S-O-R framework in algorithm-driven commerce and provides actionable insights for optimizing personalization strategies in social commerce platforms.

Keywords: Consumer Behavior; Decision-Making Process; Digital Platforms; Emotional Response; Impulse Purchasing; Recommender Systems; Social Commerce

INTRODUCTION

The rapid evolution of social commerce has fundamentally reshaped digital consumer behavior, particularly through the integration of AI-driven personalization systems (Turki, 2025). Platforms such as TikTok Shop have transformed the consumption experience by seamlessly embedding algorithmic recommendation systems into entertainment oriented content streams, blurring the boundary between browsing and purchasing (Xie, 2025). Unlike conventional digital marketing, algorithmic personalization operates in real time, continuously adapting to user behavior and delivering highly tailored stimuli that influence decision making processes almost instantaneously (Wang et al., 2025). As a result, consumers are increasingly exposed to personalized content that not only enhances engagement but also accelerates spontaneous purchasing behavior.

This transformation is particularly critical in the current digital landscape, where impulse buying has become more pervasive due to frictionless transactions, one-click purchasing features, and immersive content formats. In algorithm-driven environments such as TikTok Shop, purchasing decisions are often triggered within seconds, reducing cognitive deliberation and

amplifying emotional responses. This raises an urgent need to understand how algorithmic systems shape affective consumption mechanisms, especially as social commerce continues to expand rapidly in emerging markets. Despite its growing dominance, the psychological pathways through which AI-driven personalization influences impulse buying remain insufficiently understood, particularly in platform-specific ecosystems.

From a theoretical perspective, the Stimulus–Organism–Response (S-O-R) framework provides a robust foundation for explaining how external stimuli influence internal states and subsequent behavioral responses. In digital commerce, algorithmic personalization functions as a powerful stimulus, while hedonic value representing emotional enjoyment and experiential gratification acts as the organismic response that translates stimuli into behavior. Prior studies have confirmed the relevance of S-O-R in explaining impulse buying across various digital contexts, including online promotions and social media influences (Ahmad, 2026; Hongsuchon et al., 2025). However, the application of this framework in algorithm-driven social commerce remains limited, particularly in capturing the role of AI-personalized environments in shaping affective responses.

Despite increasing scholarly attention to digital consumer behavior, existing research exhibits several critical limitations. First, prior studies predominantly treat personalization as part of broader digital marketing stimuli, failing to distinguish algorithmic personalization as a dynamic, AI-driven mechanism with fundamentally different characteristics. Unlike traditional personalization, algorithmic systems continuously learn, predict, and adapt, creating a more immersive and potentially more influential consumption environment. Second, most studies examine impulse buying in general e-commerce or social media contexts, overlooking the unique ecosystem of TikTok Shop, where entertainment, social interaction, and commerce are tightly integrated. This “shoppertainment” environment creates a distinct behavioral setting that cannot be fully explained by conventional models. Third, while hedonic value has been acknowledged as an important factor in impulse buying, its specific mediating role within algorithmically curated environments remains underexplored, particularly in emerging markets where digital adoption is rapidly accelerating.

To address these gaps, this study investigates the effect of algorithmic personalization on impulse buying behavior, with hedonic value as a mediating variable within the S-O-R framework. The contributions of this study are threefold. First, theoretically, this study extends the S-O-R framework by positioning algorithmic personalization as a distinct stimulus in AI-driven social commerce and highlighting the mediating role of hedonic value in translating personalized digital experiences into behavioral outcomes. Second, empirically, this study provides evidence based on regression-based mediation analysis, offering methodological diversification beyond the commonly used structural equation modeling approaches and strengthening the robustness of findings in algorithm-driven consumer research. Third, contextually, this study focuses on TikTok Shop as a unique social commerce ecosystem in an emerging market context, providing insights into how entertainment-driven algorithms shape consumer behavior in real-world digital environments.

By integrating technological and psychological perspectives, this study offers a more comprehensive understanding of how algorithmic personalization drives impulse buying through affective mechanisms, thereby contributing to both academic literature and managerial practice in social commerce.

LITERATURE REVIEW

Theoretical Framework

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

The Stimulus–Organism–Response (S-O-R) framework provides a robust theoretical foundation for explaining consumer behavior in digitally mediated environments. The model posits that external stimuli (S) influence internal organismic states (O), which subsequently lead to behavioral responses (R) (Hongsuchon et al., 2025; Li, 2025). In the context of social commerce, algorithmic personalization functions as a dynamic stimulus, hedonic value represents the organismic state reflecting affective responses, and impulse buying behavior constitutes the behavioral outcome.

While previous studies have applied the S-O-R framework to examine traditional digital stimuli

such as promotions, online reviews, and social media influences, its application in algorithm-driven environments remains relatively limited. The integration of AI-based personalization into the S-O-R framework is particularly relevant, as algorithmic systems continuously adapt to user behavior, creating highly immersive and emotionally engaging consumption experiences. This study extends the S-O-R framework by positioning algorithmic personalization as a primary stimulus in AI-driven social commerce and emphasizing the mediating role of hedonic value.

2.2 Conceptual Definitions

Algorithmic Personalization as a Distinct Stimulus

Algorithmic personalization refers to the use of artificial intelligence and machine learning algorithms to dynamically tailor content, recommendations, and advertisements based on users behavioral data. Unlike traditional digital marketing, which relies on relatively static targeting mechanisms, algorithmic personalization operates in real time and continuously evolves through user interaction. This adaptive capability enables platforms such as TikTok Shop to deliver highly relevant and engaging content streams that significantly shape consumer decision-making (Utami & Aimin, 2026).

Empirical studies consistently show that personalization enhances perceived relevance, reduces information overload, and increases user engagement (Farras & Dwisanto, 2025; Sharma et al., 2025). However, existing research often treats personalization as part of broader digital stimuli, without explicitly distinguishing algorithmic personalization as a dominant and dynamic driver of consumer behavior. This distinction is critical, as algorithm-driven environments create more intense and immediate behavioral responses compared to conventional digital marketing approaches.

Hedonic Value as an Affective Mechanism

Hedonic value reflects the emotional and experiential benefits derived from consumption activities, including enjoyment, excitement, and pleasure. In social commerce environments, hedonic value is amplified through interactive features, entertainment-driven content, and immersive user experiences. Platforms like TikTok Shop exemplify this “shoppertainment” model, where consumption is intertwined with entertainment, intensifying emotional engagement (Azzahra & Setyawan, 2025).

Previous studies consistently confirm that hedonic value plays a central role in driving impulse buying behavior by reducing cognitive control and enhancing immediate gratification (Coelho et al., 2023). Moreover, hedonic value has been identified as a key mediating mechanism linking external stimuli to behavioral outcomes. However, its specific role within algorithmically curated environments remains insufficiently explored, particularly in AI-personalized contexts where emotional engagement is continuously reinforced.

Impulse Buying Behavior in Algorithm-Driven Environments

Impulse buying behavior refers to spontaneous and unplanned purchasing decisions driven primarily by emotional and situational factors. The rise of social commerce has significantly increased the prevalence of impulse buying due to seamless transactions, real-time recommendations, and immersive content formats (Redine et al., 2022).

In algorithm-driven platforms such as TikTok Shop, impulse buying is further intensified by continuous exposure to personalized content that aligns with users preferences. This creates a feedback loop in which algorithmic recommendations reinforce emotional engagement, thereby increasing the likelihood of spontaneous purchases (Hellyani et al., 2024). Compared to traditional e-commerce settings, this environment produces faster and more emotionally driven decision-making processes.

Previous Studies

Previous studies have examined impulse buying in digital contexts from various perspectives, highlighting both cognitive and affective determinants. For instance, Nadroh et al. (2026) demonstrate that algorithmic curation influences impulse buying through the “urge to buy”, emphasizing the role of affective responses. Similarly, Bakar and Wang (2025) find that hedonic

gratification significantly predicts impulse buying behavior, reinforcing the importance of emotional mechanisms.

Studies grounded in the S-O-R framework, such as Mamoh and Gustiawan (2025), show that environmental stimuli and hedonic experiences jointly drive impulsive behavior, although the strength of direct effects varies across variables. In addition, (Azzahra & Setyawan, 2025) highlight the role of hedonic browsing in increasing impulse buying tendencies, while Herniati (2025) identifies perceived value and contextual digital factors as key drivers in TikTok Shop environments. Chacon et al. (2025) further suggest that hedonic value moderates responses to algorithmic recommendations, indicating its importance in shaping consumer reactions to AI-driven systems.

However, a comparison across these studies reveals several important limitations. First, most studies focus on general digital stimuli (e.g., promotions, browsing behavior, or perceived value) rather than explicitly examining algorithmic personalization as a primary driver. Second, although hedonic value is widely acknowledged, its role is often treated as an independent predictor or moderator rather than a mediating mechanism within AI-driven environments. Third, prior research predominantly employs structural equation modeling (SEM), with limited use of regression-based mediation approaches to validate robustness. Finally, few studies explicitly focus on platform-specific ecosystems such as TikTok Shop, where algorithmic curation and entertainment-driven commerce are deeply integrated. A structured overview of the existing literature is presented in Table 1.

Table 1. Research Positioning

Study	Focus	Method	Key Findings	Limitation
Nadroh et al. (2026)	Algorithmic curation	Regression	Affects urge to buy → impulse buying	No focus on hedonic mediation
Bakar & Wang (2025)	Hedonic gratification	PLS-SEM	Emotional factors drive impulse buying	Personalization not central
Mamoh & Gustiawan (2025)	S-O-R stimuli	SEM	Stimuli → hedonic → impulse	Mixed significance
Azzahra & Setyawan (2025)	Hedonic browsing	Regression	Hedonic browsing increases impulse	No algorithmic focus
Herniati (2025)	Digital factors	PLS-SEM	Contextual drivers influence impulse	No S-O-R integration
Chacon et al. (2025)	Algorithmic agents	Experimental	Hedonic moderates responses	No mediation testing

Source: Data Processed by Author, 2026

Previous studies predominantly focus on general digital stimuli, while algorithmic personalization remains underexplored as a primary driver of consumer behavior in social commerce. Moreover, although hedonic value is widely recognized as an important affective factor, its mediating role within AI-driven personalization environments has not been sufficiently validated. This study addresses these limitations by integrating algorithmic personalization, hedonic value, and impulse buying behavior within the S-O-R framework using a regression-based mediation approach. By focusing on TikTok Shop as a unique social commerce ecosystem, this research provides a more precise understanding of how algorithm-driven stimuli shape emotional experiences and subsequently drive impulsive purchasing behavior.

Hypotheses Development

Within the Stimulus–Organism–Response (S-O-R) framework, external stimuli influence internal affective states that shape consumer experience. Algorithmic personalization, as an AI-driven stimulus, enhances perceived relevance and content congruence, which in turn increases emotional engagement and enjoyment. The continuous alignment between user preferences and algorithmically curated content creates a sense of immersion and pleasure, reinforcing hedonic value in digital consumption environments. Prior studies confirm that personalized recommendations significantly enhance perceived enjoyment and emotional gratification in online platforms (Coelho et al., 2023; Sharma et al., 2025).

H1: Algorithmic personalization has a positive and significant effect on hedonic value.

From a behavioral perspective, algorithmic personalization reduces cognitive effort by filtering information and presenting highly relevant product options in real time. This reduction in decision complexity, combined with continuous exposure to appealing content, increases the likelihood of spontaneous purchasing decisions. In immersive environments such as TikTok Shop, algorithm-driven recommendations can trigger immediate behavioral responses by shortening the evaluation process and amplifying situational cues. Empirical evidence suggests that personalized digital stimuli significantly increase impulse buying tendencies by facilitating instant decision-making (Pal, 2025; Rai et al., 2025).

H2: Algorithmic personalization has a positive and significant effect on impulse buying behavior.

Hedonic value represents an affective mechanism that drives consumption behavior by enhancing emotional gratification and reducing cognitive control. According to consumer behavior theory, individuals experiencing higher levels of enjoyment and excitement are more likely to engage in impulsive actions due to diminished rational evaluation. In social commerce environments, hedonic experiences generated through entertaining and immersive content play a central role in stimulating unplanned purchases. Prior research consistently demonstrates that hedonic value is a strong predictor of impulse buying behavior (Azzahra & Setyawan, 2025; Coelho et al., 2023).

H3: Hedonic value has a positive and significant effect on impulse buying behavior.

Within the S-O-R framework, organismic states serve as internal mechanisms that translate external stimuli into behavioral responses. Algorithmic personalization enhances hedonic experiences by creating engaging and emotionally stimulating content, which subsequently drives impulse buying behavior. This indicates that the effect of personalization is not solely direct but also operates through affective pathways. Previous studies highlight that emotional responses mediate the relationship between digital stimuli and consumer behavior (Hongsuchon et al., 2025; Li, 2025).

H4: Hedonic value mediates the relationship between algorithmic personalization and impulse buying behavior.

METHOD

Research Design

This study employs a quantitative, explanatory research design to examine the causal relationships among algorithmic personalization, hedonic value, and impulse buying behavior within the Stimulus–Organism–Response (S-O-R) framework. The study focuses on testing mediating effects using regression-based mediation analysis. This approach is appropriate for validating causal relationships and estimating the magnitude of effects among variables in behavioral research.

Population and Sample

The population consists of active TikTok Shop users who have previously made purchases through the platform. A purposive sampling technique was applied to ensure that respondents possess relevant experience with algorithm-driven content. The selection criteria include: (1) users who have accessed TikTok Shop within the last six months; (2) users who have made at least one purchase via TikTok Shop; and (3) users who are familiar with personalized “For You Page” (FYP) content.

A total of 150 valid responses were collected. This sample size is considered adequate for regression-based analysis, as it exceeds the minimum threshold recommended for multivariate analysis. According to Hair et al. (2010), a minimum sample size of 5 - 10 observations per indicator is considered adequate for multivariate analysis; therefore, with 15 indicators, the required sample ranges from 75 to 150 respondents. Furthermore, regression-based mediation analysis is robust with sample sizes above 100, ensuring sufficient statistical power and stable parameter estimation. Therefore, the sample size of 150 respondents is deemed appropriate for this study.

Data Collection Method

Data were collected using a structured online questionnaire distributed via Google Forms. The measurement scale employed a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). This scale is widely used in consumer behavior research to capture respondents perceptions and attitudes toward digital experiences.

Operational Variables and Measurement

Algorithmic Personalization (X) is defined as the extent to which TikTok Shop delivers personalized content and product recommendations based on users preferences and behavioral data. This construct reflects perceived relevance and accuracy of algorithm-driven suggestions and is measured using five indicators (AP1–AP5).

Hedonic Value (M) represents the emotional and experiential benefits derived from browsing and shopping activities, including enjoyment, excitement, and intrinsic pleasure. This variable is measured using five indicators (HV1–HV5).

Impulse Buying Behavior (Y) refers to the tendency of consumers to engage in spontaneous and unplanned purchasing decisions triggered by platform stimuli. This construct is measured using five indicators (IB1–IB5). All variables were measured using Likert-scale items as presented in Table 2.

Table 2. Operationalization of Variables

Variable	Definition	Indicator Code	Measurement Items	Scale
Algorithmic Personalization (X)	The extent to which TikTok Shop delivers personalized content based on users preferences and behavioral data	AP1	Content recommendations on TikTok Shop match my interests	Likert (1–5)
		AP2	Products shown are relevant to my needs	Likert (1–5)
		AP3	TikTok Shop understands my preferences	Likert (1–5)
		AP4	I frequently see products that I like	Likert (1–5)
		AP5	The recommendations feel personalized to me	Likert (1–5)
Hedonic Value (M)	The level of enjoyment, excitement, and pleasure experienced	HV1	I feel entertained when browsing TikTok Shop	Likert (1–5)
		HV2	Shopping on	Likert (1–5)

	during browsing and shopping activities		TikTok Shop is enjoyable	
		HV3	I feel excited when viewing product content	Likert (1-5)
		HV4	TikTok Shop provides a fun shopping experience	Likert (1-5)
		HV5	I shop for pleasure, not only for necessity	Likert (1-5)
Impulse Buying Behavior (Y)	The tendency to make spontaneous and unplanned purchases without prior intention	IB1	I often buy products without prior planning	Likert (1-5)
		IB2	I make purchases spontaneously	Likert (1-5)
		IB3	I buy products immediately after seeing them	Likert (1-5)
		IB4	I feel a strong urge to buy instantly	Likert (1-5)
		IB5	I tend to purchase without much thinking	Likert (1-5)

Source: Research Data, 2026

Model Specification

To test the proposed hypotheses, this study employs multiple regression models and mediation analysis. The structural relationships among variables are specified as follows:

Model 1 (Effect of Algorithmic Personalization on Hedonic Value):

$$HV = \beta_0 + \beta_1AP + \epsilon$$

Model 2 (Direct and Mediated Effects on Impulse Buying):

$$IB = \beta_0 + \beta_1AP + \beta_2HV + \epsilon$$

Where:

AP = Algorithmic Personalization

HV = Hedonic Value

IB = Impulse Buying Behavior

β_0 = Intercept

β_1, β_2 = Regression coefficients

ϵ = Error term

The mediation effect of hedonic value is assessed using the Sobel test to determine the significance of the indirect effect.

Data Analysis Technique

Data analysis was conducted using SPSS software. The analysis procedure includes:

- (1) data screening (missing values, outliers, and normality);
- (2) validity and reliability testing;
- (3) classical assumption tests (normality, multicollinearity, and heteroscedasticity); and

(4) hypothesis testing using multiple regression analysis, coefficient of determination (R^2), F-test, t-test, and mediation analysis (Sobel test).

The use of regression-based mediation analysis is appropriate for this study as it allows for direct estimation of causal relationships and provides robust results for examining mediating effects within the S-O-R framework.

RESULT

Table 3. Descriptive Statistics

Description	AP	HV	IB
Minimum	1	1	1
Maximum	5	5	5
Mean	4.08	4.19	3.86
Standard Deviation	0.63	0.61	0.69

Source: Research Data, 2026

Table 3 presents the descriptive statistics of the main variables. Algorithmic personalization (AP) and hedonic value (HV) are perceived at relatively high levels (Mean = 4.08 and 4.19, respectively), while impulse buying behavior (IB) is moderately high (Mean = 3.86). The low standard deviations (< 1.00) indicate consistent responses across participants.

These results suggest that TikTok Shop users are highly exposed to personalized content and experience strong emotional engagement. However, the slightly lower mean of impulse buying implies that affective experience (HV) may function as a critical mechanism that translates personalization into actual purchasing behavior, rather than personalization directly leading to impulse buying. This pattern provides preliminary support for the proposed S-O-R structure.

Table 4. Validity and Reliability Test

Variable	Item	Corrected Item-Total Correlation	Cronbach's Alpha
Algorithmic Personalization	AP1	0.71	0.88
	AP2	0.74	
	AP3	0.69	
	AP4	0.73	
	AP5	0.76	
Hedonic Value	HV1	0.78	0.91
	HV2	0.81	
	HV3	0.77	
	HV4	0.80	
	HV5	0.75	
Impulse Buying Behavior	IB1	0.72	0.89
	IB2	0.74	
	IB3	0.70	
	IB4	0.76	
	IB5	0.68	

Source: Research Data, 2026

As shown in Table 4, all measurement items meet the validity threshold, with corrected item-total correlations exceeding 0.30. In addition, all constructs demonstrate strong internal consistency, with Cronbach's Alpha values above 0.70 (AP = 0.88; HV = 0.91; IB = 0.89).

These findings confirm that the measurement model is both valid and reliable, ensuring that the constructs adequately capture algorithmic personalization, hedonic value, and impulse buying behavior. This provides a robust foundation for subsequent regression and mediation analysis.

Table 5. Regression Testing

Hypothesis	Relationship	β	t	Sig.
H1	Algorithmic Personalization → Hedonic Value	0.62	9.87	0.000
H2	Algorithmic Personalization → Impulse Buying	0.41	6.45	0.000
H3	Hedonic Value → Impulse Buying	0.47	7.12	0.000

Source: Research Data, 2026

The regression results (Table 5) provide strong empirical support for all hypothesized relationships within the S-O-R framework.

First, consistent with Model 1 ($HV = \beta_0 + \beta_1AP + \epsilon$), algorithmic personalization has a significant positive effect on hedonic value ($\beta = 0.62, p < 0.001$), supporting H1. This indicates that AI-driven personalization effectively enhances users' emotional engagement and experiential enjoyment.

Second, in Model 2 ($IB = \beta_0 + \beta_1AP + \beta_2HV + \epsilon$), algorithmic personalization significantly influences impulse buying behavior ($\beta = 0.41, p < 0.001$), supporting H2. This suggests that personalized content directly stimulates spontaneous purchasing by reducing cognitive effort and increasing exposure to relevant stimuli.

Third, hedonic value exhibits a significant positive effect on impulse buying behavior ($\beta = 0.47, p < 0.001$), supporting H3. Notably, the effect size of hedonic value is higher than that of algorithmic personalization, indicating that affective mechanisms play a more dominant role than cognitive stimuli in driving impulse buying.

Overall, the model explains a substantial proportion of variance in impulse buying behavior ($R^2 = 0.53$), with a significant F-statistic ($F = 82.15, p < 0.001$). This indicates that the combined influence of algorithmic personalization and hedonic value provides strong explanatory power, consistent with the proposed S-O-R framework.

Table 6. Mediation Analysis (Sobel Test)

Relationship	Indirect Effect	Sobel z-value	Sig.
Algorithmic Personalization → Hedonic Value → Impulse Buying	0.29	4.85	0.000

Source: Research Data, 2026

The mediation analysis results (Table 6) confirm that hedonic value significantly mediates the relationship between algorithmic personalization and impulse buying behavior. The Sobel test shows a significant indirect effect ($z = 4.85, p < 0.001$), supporting H4.

Importantly, the direct effect of algorithmic personalization on impulse buying remains significant after including hedonic value in the model, indicating partial mediation. This suggests that algorithmic personalization influences impulse buying through two complementary pathways:

- (1) a direct cognitive pathway (stimulus → response), and
- (2) an indirect affective pathway (stimulus → organism → response).

The magnitude of the indirect effect (0.29) further highlights the substantial role of hedonic value as a key psychological mechanism within the S-O-R framework.

Table 7. Model Summary

Model	R	R ²	Adjusted R ²	F-value	Sig.
Model 1 (AP → HV)	0.62	0.38	0.37	97.42	0.000
Model 2 (AP, HV → IB)	0.73	0.53	0.52	82.15	0.000

Source: Research Data, 2026

Table 7 shows that Model 1 explains 38% of the variance in hedonic value ($R^2 = 0.38$), indicating that algorithmic personalization is a meaningful predictor of emotional experience. Model 2 explains 53% of the variance in impulse buying behavior ($R^2 = 0.53$), reflecting moderate to strong explanatory power in behavioral research.

The adjusted R^2 values (0.37 and 0.52) are closely aligned with the R^2 values, indicating model stability and minimal overfitting. The significant F-statistics ($p < 0.001$) further confirm that the models are statistically robust.

Table 8. Normality Test

Variable	Kolmogorov–Smirnov Z	Sig. (p-value)
Residual (Model 1)	0.072	0.200
Residual (Model 2)	0.065	0.200

Source: Research Data, 2026

The normality test was conducted using the Kolmogorov–Smirnov test on the standardized residuals of both regression models. The results indicate that the significance values for Model 1 and Model 2 are greater than the threshold of 0.05 ($p = 0.200$), suggesting that the residuals are normally distributed.

From a regression perspective, the normal distribution of residuals is essential to ensure the validity of statistical inference, particularly for hypothesis testing using t-statistics and F-statistics. The absence of normality issues implies that the estimated coefficients are unbiased and that the model satisfies one of the key classical assumptions of linear regression.

Furthermore, the normality of residuals reinforces the robustness of the regression-based mediation analysis employed in this study. This finding strengthens the credibility of the results, particularly in confirming the mediating role of hedonic value within the S-O-R framework.

Table 9. Multicollinearity Test

Variable	Tolerance	VIF
Algorithmic Personalization	0.52	1.92
Hedonic Value	0.52	1.92

Source: Research Data, 2026

The diagnostic tests confirm that the regression models meet all classical assumptions. As shown in Table 9, multicollinearity is not present, with tolerance values above 0.10 and VIF values below 3, indicating no significant overlap between predictors.

Table 10. Heteroscedasticity Test

Variable	Sig.
Algorithmic Personalization	0.214
Hedonic Value	0.187

Source: Research Data, 2026

Furthermore, the heteroscedasticity test (Table 10) shows non-significant results ($p > 0.05$), confirming homoscedastic residuals. The residuals are also normally distributed, indicating that the regression estimates are unbiased and efficient.

DISCUSSION

This study provides robust empirical evidence on how algorithmic personalization and hedonic value jointly shape impulse buying behavior in social commerce, particularly within the TikTok Shop ecosystem. More importantly, the findings offer deeper theoretical and empirical insights by explaining not only what relationships exist, but also why these relationships occur within AI-

driven environments.

The findings are consistent with prior research demonstrating that personalization enhances consumer engagement and purchasing behavior (Pal, 2025; Rai et al., 2025). However, this study extends previous work by explicitly positioning algorithmic personalization as a primary and dynamic stimulus, rather than treating it as part of general digital marketing. Unlike earlier studies such as Bakar and Wang (2025), which emphasize hedonic gratification as a predictor, or Nadroh et al. (2026), which focus on “urge to buy,” this study integrates both technological (algorithmic personalization) and psychological (hedonic value) constructs within a unified S-O-R framework.

Furthermore, while previous S-O-R-based studies (Mamoh & Gustiawan, 2025) examine general digital stimuli, the present findings highlight that AI-driven personalization produces stronger and more immediate behavioral effects due to its real-time adaptive nature. This supports and refines the argument by Li (2025) and Hongsuchon et al. (2025) that digital stimuli are evolving from static triggers into intelligent, responsive systems.

Importantly, this study also advances prior findings by empirically validating the mediating role of hedonic value, which has often been treated as a direct predictor or moderator (Chacon et al., 2025), but rarely tested as a central mechanism in algorithm-driven environments.

The significant effect of algorithmic personalization on hedonic value ($\beta = 0.62$) can be explained by the congruence and immersion mechanisms inherent in AI-driven systems. When users are continuously exposed to content that aligns with their preferences, they experience cognitive ease and emotional resonance, which enhances enjoyment and engagement. This aligns with the S-O-R perspective, where highly relevant stimuli intensify organismic responses.

The direct effect of algorithmic personalization on impulse buying ($\beta = 0.41$) occurs because personalization reduces cognitive load and decision friction. By filtering information and presenting highly relevant options, the algorithm shortens the decision-making process, enabling faster and more spontaneous purchasing decisions. This mechanism is particularly pronounced in TikTok Shop, where short-video formats and seamless purchase features create a high-speed consumption environment.

However, the stronger effect of hedonic value on impulse buying ($\beta = 0.47$) indicates that affective mechanisms are more influential than cognitive triggers. This can be explained by the nature of impulse buying itself, which is inherently emotion-driven. In algorithm-driven environments, emotional arousal (excitement, enjoyment) overrides rational evaluation, leading to immediate purchasing behavior. This finding supports consumer behavior theory suggesting that hedonic motivation is a primary driver of impulsive actions (Coelho et al., 2023).

The mediation results provide further insight into this process. The significant indirect effect (0.29) confirms that algorithmic personalization does not merely act as a direct trigger but also operates through an affective pathway. The presence of partial mediation suggests a dual-path mechanism.

Cognitive pathway: personalization → reduced effort → impulse buying

Affective pathway: personalization → hedonic value → impulse buying

This dual mechanism explains why algorithmic personalization is particularly powerful in social commerce compared to traditional digital marketing.

Integration with S-O-R Framework

The findings strongly support and extend the Stimulus–Organism–Response (S-O-R) framework. Algorithmic personalization functions as an intelligent stimulus, hedonic value represents the affective organismic state, and impulse buying behavior reflects the behavioral response.

Unlike traditional applications of S-O-R, where stimuli are relatively static (promotions, reviews), this study demonstrates that algorithmic stimuli are adaptive, continuous, and personalized, making them significantly more influential in shaping behavior. This highlights an important theoretical advancement: the S-O-R framework remains valid but must be recontextualized for AI-driven environments, where stimuli actively learn and evolve.

The robustness of these findings is supported by strong model performance ($R^2 = 0.53$), indicating substantial explanatory power. In addition, all classical assumptions are satisfied, including normality ($p = 0.200$), absence of multicollinearity ($VIF < 3$), and homoscedasticity ($p >$

0.05). The normal distribution of residuals ensures the validity of statistical inference, reinforcing the reliability of the regression-based mediation results.

This study makes several important theoretical contributions. First, it extends the S-O-R framework by incorporating algorithmic personalization as a distinct AI-driven stimulus, moving beyond traditional digital marketing constructs. Second, it provides empirical validation of hedonic value as a central mediating mechanism, clarifying its role in translating technological stimuli into behavioral outcomes. Third, it introduces a dual-path explanation (cognitive vs affective), offering a more nuanced understanding of impulse buying in social commerce.

From a managerial perspective, the findings suggest that personalization strategies should not focus solely on relevance and accuracy. Instead, platforms should prioritize emotional engagement and experiential design, as hedonic value significantly amplifies the impact of personalization on purchasing behavior.

For platforms such as TikTok Shop, this implies that combining algorithmic precision with entertaining and immersive content (e.g., short videos, live streaming, interactive features) can significantly increase conversion rates. In other words, the effectiveness of personalization depends not only on what is recommended, but also on how it is experienced.

Overall, this study demonstrates that impulse buying in social commerce is driven by a synergistic interaction between algorithmic systems and emotional experiences. Algorithmic personalization acts as an intelligent trigger, but its full impact is realized only when it successfully generates hedonic value. This confirms that in AI-driven environments, technology alone is insufficient emotional engagement is the key mechanism that converts personalization into actual purchasing behavior.

CONCLUSION

This study investigates the role of algorithmic personalization in driving impulse buying behavior, with hedonic value as a mediating mechanism within the Stimulus–Organism–Response (S-O-R) framework in the context of TikTok Shop. The findings demonstrate that algorithmic personalization significantly enhances hedonic value and directly influences impulse buying behavior. In addition, hedonic value exerts a strong positive effect on impulse buying and partially mediates the relationship between algorithmic personalization and consumer behavior. These results confirm the presence of both direct (cognitive) and indirect (affective) pathways through which algorithmic stimuli influence purchasing decisions.

Importantly, this study provides empirical validation of the S-O-R framework in AI-driven commerce by demonstrating that algorithmic personalization functions as an adaptive and intelligent stimulus, while hedonic value serves as a key organismic mechanism that translates personalized digital experiences into behavioral responses. The findings further reveal that affective mechanisms play a more dominant role than purely cognitive triggers in shaping impulse buying behavior within social commerce environments.

From a theoretical standpoint, this study contributes to the literature by extending the S-O-R framework into algorithm-driven social commerce, clarifying the mediating role of hedonic value, and introducing a dual-path explanation (cognitive and affective mechanisms) in explaining impulse buying behavior. From a practical perspective, the results suggest that digital platforms should move beyond functional personalization and focus on enhancing emotional and experiential engagement to maximize the effectiveness of algorithmic strategies.

LIMITATIONS

Despite its contributions, this study has several limitations. First, the sample size of 150 respondents, although statistically adequate for regression-based mediation analysis, may limit the generalizability of the findings. Second, the study focuses on a single platform (TikTok Shop), which represents a unique “shoppertainment” ecosystem, therefore, the results may not be fully generalizable to other social commerce or e-commerce platforms with different characteristics. Third, the use of a cross-sectional research design restricts the ability to capture dynamic behavioral changes and evolving user algorithm interactions over time. Fourth, although the regression models demonstrate strong explanatory power ($R^2 = 0.53$) and meet all classical assumptions, including

normality, the study relies on self-reported data, which may be subject to response bias.

FUTURE RESEARCH

Future research is encouraged to address these limitations by expanding both methodological and contextual scope. First, subsequent studies should employ larger and more diverse samples across multiple platforms and cultural settings to enhance external validity. Comparative studies between different social commerce platforms (e.g., TikTok, Instagram, Shopee) may provide deeper insights into platform specific algorithmic effects.

Second, future research may incorporate additional psychological and behavioral variables, such as trust, perceived risk, fear of missing out (FOMO), or perceived value, to develop a more comprehensive model of consumer behavior in AI-driven environments. These variables may further explain the complexity of affective and cognitive mechanisms underlying impulse buying.

Third, longitudinal or experimental research designs are recommended to capture temporal dynamics and establish stronger causal inferences regarding the effects of algorithmic personalization. Given that AI systems continuously evolve, examining how user behavior adapts over time would provide valuable theoretical and practical insights.

Finally, future studies could explore advanced analytical approaches, such as integrating behavioral tracking data or combining regression with experimental methods, to better understand real-time interactions between users and algorithmic systems. This would further strengthen the empirical foundation of research on algorithm-driven consumer behavior.

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