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AUTHORS

Basuki Rachmat 

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Basuki Rachmat, Doctor, Lecturer,
Faculty of Economics and Business,
Department of Magister Management,
University Hayam Wuruk Perbanas,
Indonesia.

Basuki Rachmat (Indonesia)

ALGORITHM-DRIVEN PERSONALIZATION, CONTENT EXPOSURE, AND LIVE COMMERCE: THE ROLES OF ENGAGEMENT AND TRUST IN GEN Z IMPULSE BUYING ON TIKTOK SHOP

Abstract

This research aims to investigate the impact of algorithmic personalization, exposure to content, social interaction and live commerce experiences on impulse buying among Generation Z users of TikTok Shop in Indonesia with real-time engagement acting as a mediator and perceived trust acting as a moderator. This study relates directly to the increasing influence of recommendation algorithms and interactive live commerce on consumer behavior and specifically on Generation Z who are digital natives and very often make impulse purchases. A quantitative survey was conducted using purposive sampling to collect data from valid participants aged 17-27 living in Indonesia and actively using TikTok Shop between January and April 2025. Ethical principles were applied, including voluntary participation, informed consent, anonymity, and confidentiality in relation to the use of data. 576 data were analyzed using Structural Equation Modelling and Partial Least Squares (SEM-PLS). Findings reveal that algorithmic personalization ($\beta = 0.069$; $p = 0.048$); content exposure ($\beta = 0.881$; $p < 0.001$); and social interaction ($\beta = 0.088$; $p = 0.017$) have significant positive influence on impulse buying. All three of these relationships are mediated by real-time engagement with small but significant ($\beta = 0.011$; $p = 0.037$) effect size. The relationship between perceived trust and live commerce experience moderates the effects of live commerce experience and enhances the strength of the effect; however, the moderating effect of perceived trust on algorithmic personalization and social interaction was not as strong. The results of this research indicate that the main motivating factors of impulse buying in social commerce are based on algorithmic recommendations through personalization, social connection, and live commerce.

Keywords

algorithm, engagement, trust, impulse buying, marketing innovation

JEL Classification

D12, M31, L81, O33

INTRODUCTION

The advancement of digital technology has fundamentally transformed the practice of electronic commerce through the integration of recommendation algorithms with live-stream shopping experiences. TikTok Shop, as one of the pioneers in combining social commerce and live commerce, offers a shopping ecosystem that not only displays products but also regulates the intensity of content exposure, facilitates social interaction, and shapes consumers' emotional engagement and trust (Sun et al., 2025; Zhang et al., 2022). This phenomenon raises a scientific problem regarding how algorithmic factors such as personalized recommendations, content exposure, and social interaction, together with live commerce experiences, contribute to the formation of real-time consumer engagement and trust in hosts and products, which ultimately drive impulse buying among Generation Z (Hoang & Khoa, 2022; Teodorescu et al., 2023). With their characteristics as



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digital natives who spend significant time on social media, this generation is particularly vulnerable to unplanned spontaneous purchases (Benmiloud et al., 2024). Therefore, the central issue to be examined is the complex dynamics between algorithmic technology, interactive experiences, and psychological mechanisms namely engagement and trust that potentially reinforce the tendency toward impulse buying among Gen Z on the TikTok Shop platform.

1. LITERATURE REVIEW AND HYPOTHESES

Consumer behavior has changed significantly with the rise of digital technologies — social commerce and live commerce have become the major catalysts for real-time decisions to buy products. One illustration of this trend is TikTok Shop, which uses algorithm-driven personalization, targeted content exposure (to specific users) and interactive social features, combined with live streaming shopping to create immersive experiences that help establish trust, promote engagement, and encourage impulse buying. Members of Generation Z (digital natives) spend so much time on social media that they also tend to be easily influenced by play and spontaneity in their purchases based on emotional involvement or social presence or trust in digital media. Therefore, it is very important from a marketing and academic viewpoint to understand how algorithmic drivers and live commerce experiences combine with psychological factors like engagement and trust.

The application of algorithms is important in tailoring recommendations, content intensification, and social interactions, and live shopping brings about interactivity with the host, live product review, and a shopping environment that is just like in physical shopping (Li et al., 2025; Nguyen et al., 2025; Tjipto & Keni, 2025). The convergence of these factors brings about psychological factors that foster consumer engagement, trust, which ultimately leads to impulse buying, especially among Gen Z, who are known as digital natives with high usage of social media (Deborah et al., 2022). Obadă and Tugulea (2024) and Febriandika et al. (2022) have clearly shown that the role of flow experiences and the credibility of advertisements on TikTok cannot be ignored when it comes to the impulse buying behavior of Generation Z, establishing the importance of the role of the algorithm in the process. On the same line, Wang et al. (2025) have identified that the role of streamer in-

teraction during live commerce contributes to the enhancement of impulse buying behavior and has established the concept of the importance of trust as a mechanism during digital shopping experiences (Xin et al., 2025). Therefore, the role of the integration of algorithms and the live commerce experience has been identified as an essential digital strategy for influence during the marketing process, and the application of the mediating role of the specified relationship remains an unexplored concept. Therefore, this study is directed toward examining in depth the dynamics between personalization, content exposure, social interaction, and live commerce experience in relation to impulse buying among Gen Z on TikTok Shop.

Algorithm-driven personalization has become one of the key strategies in modern digital marketing due to its ability to tailor product recommendations to consumer preferences in real time, thereby increasing content relevance, strengthening engagement, and building trust in both the platform and the seller. This mechanism creates a more personalized and interactive shopping experience, which ultimately drives impulse buying, particularly among Generation Z as digital natives with high levels of social media usage (Haq et al., 2025; Hammouri et al., 2025). Fadilah et al. (2025) and Yin et al. (2025) proved that personalization achieved through algorithms in the online shopping environment leads to substantial increases in consumer engagement and the possibility of impulse buying. In a similar manner, Chen et al. (2024) discovered that trust in platform credibility is fostered by distinctive product recommendations generated by algorithms, and this action leads to impulse buying as the mediation of trust is applied. In this respect, trust is again identified as the major psychological mechanism. Thus, the literature emphasizes that algorithm-driven personalization has strategic implications for influencing consumer behavior, yet there remains a gap in understanding how engagement and trust function as mediators in this relationship, and

therefore this study is directed toward examining in depth the role of personalization in driving impulse buying among Gen Z on TikTok Shop.

Algorithmic content exposure is one of the main tactics used in digital marketing that helps the platform to selectively and heavily expose content to users based on personal preferences and activities, thus creating a more targeted and personal experience of the consumption process. This process also helps to improve the presence of a product and enhances the engagement process of consumers through continuous exposure that helps to stimulate attention and emotional engagement with the content and the hosts (Lee & Chen, 2021; Fu & Hsu, 2023). Algorithmic content exposure also helps to develop trust among consumers, as they feel that the platform is credible through consistent and relevant exposure. Amali and Farohi (2025) demonstrated that TikTok content with the hashtag #RacunTikTok has a positive and significant effect on Gen Z's impulse buying behavior, confirming that algorithm-driven exposure can serve as a primary trigger for spontaneous purchases. In a similar vein, Zhang (2025) argued that recommendation systems of short video platforms have increased purchasing intentions and decision-making speed in a personalized manner, but such an effect is significantly affected by the degree of trust held by consumers (Rahma & Ridanasti, 2023). Thus, the literature emphasizes that algorithm-driven content exposure has strategic implications for shaping consumer behavior through engagement and trust, yet there remains a gap in understanding how these psychological mechanisms function as mediators in this relationship. Therefore, this study is directed toward examining in depth the role of algorithm-driven content exposure in driving impulse buying among Gen Z on TikTok Shop.

Algorithmic social interaction can thus be defined as the capacity for digital platform algorithms to structure and provide the most appropriate forms of social interaction for users with regard to comments, likes, sharing, and community recommendations. This not only extends the reach of communications but generates an intensified interactive context for consumers to be better connected with the host, product, or other users. Social interactions facilitated by algorithms strengthen

engagement through emotional involvement and active participation, while simultaneously building trust as consumers perceive consistency and credibility in the conversations presented (Bakar & Wang, 2025; Hatamleh et al., 2023). It has also been found in empirical research that algorithmically facilitated interactions can improve the feeling of community membership; this can also affect impulse buying behavior based on these interactions as a psychological trigger. According to Anderson et al. (2025), the role of a social media algorithm in improving customer engagement and purchase intention can be seen to create strong digital concepts of relationships between customers based on the algorithm's components like "liking," "comments," or "subscription," ultimately improving the purchase intention of a customer. Metzler and Garcia (2023) revealed that the algorithm in social media sites functions as "nudges" that trigger specific interactions in order to affect the social behavior of the customer in a way that it can affect impulse buying behavior among customers. Thus, the literature underscores that algorithm-driven social interaction has strategic implications for shaping consumer behavior through engagement and trust, yet there remains a gap in understanding how these psychological mechanisms function as mediators in this relationship. Therefore, this study is directed toward examining in depth the role of algorithm-driven social interaction in driving impulse buying among Gen Z on TikTok Shop.

Live commerce experience has evolved as a transformative phenomenon in digital trade by combining real-time video streaming with interactive features that allow consumers to engage directly with sellers, hosts, and fellow audiences. This is distinct from the traditional online shopping experience, as live commerce incorporates authenticity and interactivity, giving the shopping process an enhanced and immersive experience for the customer, thereby increasing the levels of trust because of the perceived transparency associated with the product. Hoang and Dang (2024) showed the factors defining live streaming, such as the quality of the presentation and the interactivity, substantially impact impulse buying behavior, and trust and flow experience are mediators, thereby establishing the relevance of the experiential factors for defining impulse buying behavior.

Likewise, Salsabila et al. (2025) asserted, the host interaction, special treatment, and real-time feeling associated with live shopping result in enhancing the involvement and trust among consumers, establishing their impact on impulse buying behavior (Rehman et al., 2025). These findings highlight that the quality of live commerce experience, determined by interactivity, authenticity, and trust, has strategic implications for shaping consumptive behavior, particularly among Gen Z who are accustomed to dynamic digital environments. Thus, the literature emphasizes that live commerce experience functions not only as a transactional innovation but also as a psychological and social mechanism that fosters engagement and trust, which in turn enhances impulse buying. However, there remains a gap in understanding how these experiential dimensions act as mediators in the relationship between algorithmic personalization and consumer behavior. Therefore, this study is directed toward examining in depth the role of live commerce experience in driving impulse buying among Gen Z on TikTok Shop.

Real-time engagement is a crucial dimension in the live commerce ecosystem that emphasizes consumers' direct and simultaneous involvement during digital interactions, where they can post comments, ask questions, or respond instantly to promotions, thereby creating a strong sense of social presence and a more immersive shopping experience. Moreover, this platform is not only useful to achieve a high level of active engagement, which helps to participate actively in the activity, but it also helps to achieve a high level of trust, which occurs when consumers are provided with clear information by the host and other audience, which acts as a source of social proof (Yang et al., 2024). This platform also helps to achieve a high level of emotional arousal, especially when the host provides special deals. Recent research by Khoi and Le (2025) highlights that real-time interaction in live streaming commerce significantly increases emotional involvement and strengthens consumers' purchase intention, with the quality of interaction serving as a key determinant. Likewise, Wang and Li (2025) stated that immediate host responsiveness and real-time communication dynamics have been recognized as playing a very important role in creating trust, which is conducive to impulse buying. This is particularly true for

members of Gen Z, who are accustomed to fast-paced real-time digital communications (Prasetyo & Hartono, 2025). These findings affirm that real-time engagement is not merely a technical feature but a psychological and social mechanism with strategic implications for shaping consumer behavior. Therefore, this study aims to examine in depth the role of real-time engagement in driving impulse buying among Gen Z on TikTok Shop.

Perceived trust is a critical psychological factor in the context of live commerce, as consumers' trust in the host, product, and platform forms the foundation of their purchasing decisions. Unlike traditional e-commerce transactions that rely on product descriptions and written reviews, live commerce provides real-time interactions that allow consumers to directly assess the credibility of hosts through the way they answer questions, demonstrate products, and respond to audiences (Xie et al., 2022). The trust built from these interactions not only functions as a risk-reducing mechanism but also as a driver of emotional involvement, where consumers who feel confident are more likely to actively participate, be receptive to host recommendations, and be easily encouraged to engage in impulse buying. Wongkitrungrueng and Assarut (2020) confirmed that live streaming contributes to the very important role in developing consumer trust and engagement with social commerce merchants, and interactivity and authenticity are the determinants to the role. Hoang and Dang (2024) moved that the trust mediator has the very important role in the relationship between the characteristics of live streaming and impulse buying, where the openness of the provided information, presentation qualities, and interactivity influence the level of trust and the flow experience that drives the consumptive behavior (Tedjakusuma et al., 2025). These findings affirm that perceived trust is not merely a supporting variable but a psychological mechanism essential to shaping consumer behavior, particularly among Gen Z who are accustomed to fast and authentic digital interactions. Therefore, this study aims to examine in depth the role of perceived trust in driving impulse buying among Gen Z on TikTok Shop.

Impulse buying is a consumer behavior characterized by spontaneous purchasing decisions without prior planning, often triggered by emotional, situ-

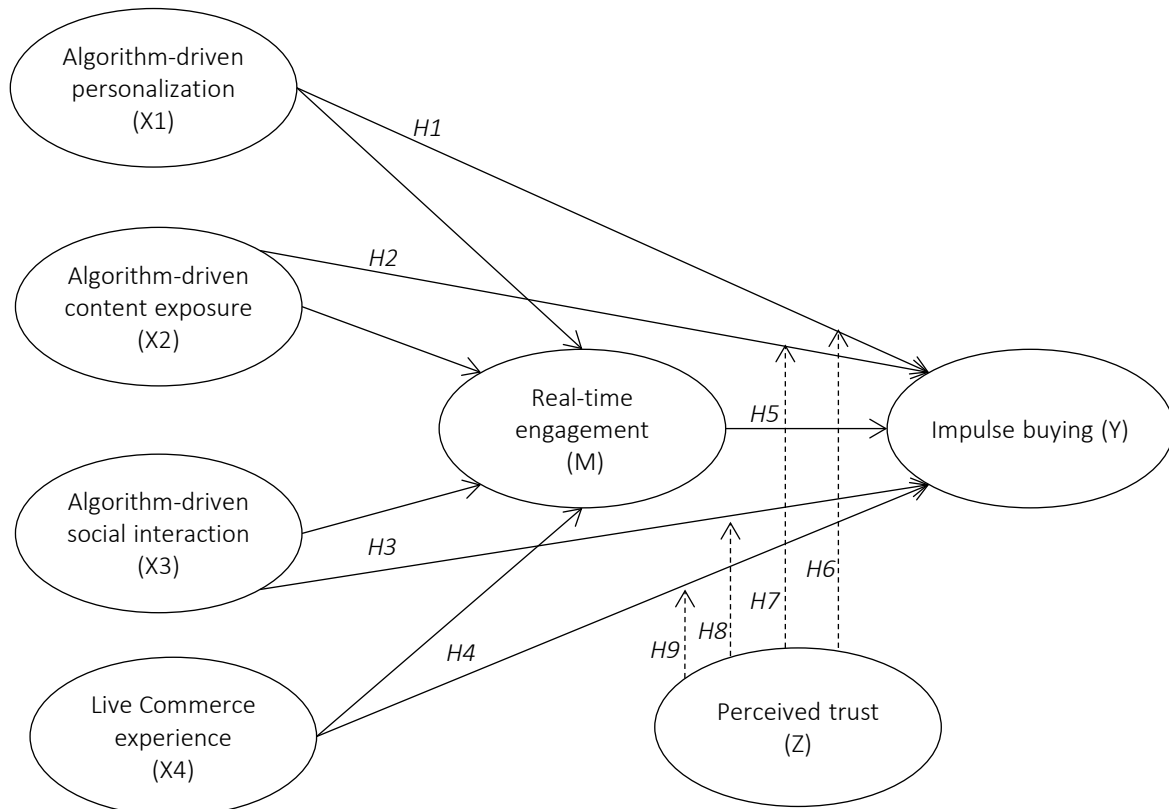


Figure 1. Research framework

ational, or social stimuli, and in the context of digital commerce, particularly live commerce, this phenomenon becomes more prominent due to real-time interactions, exclusive promotions, and immersive shopping atmospheres. Factors such as emotional involvement, time urgency, and trust in the host and platform significantly strengthen consumers' tendency to buy impulsively, with underlying psychological mechanisms including emotional arousal, hedonic motives, and social influence that drive quick responses to stimuli during live streaming sessions (Egi & Aprillia, 2025). The literature emphasizes that impulse buying is influenced not only by internal factors such as mood and hedonic motivation but also by external factors such as host interaction quality, information transparency, and time-limited promotional strategies, so that the combination of interactivity, trust, and engagement creates conditions conducive to spontaneous consumptive behavior. Verhagen and Dolen (2011) confirmed that trust and online shopping atmosphere significantly affect impulse buying by reducing perceived risk and enhancing consumer comfort, while Trang (2024) and Huang et al. (2024) demonstrated that

interactivity, visualization, social presence, and trust in sellers within live streaming commerce play a crucial role in enhancing immersion, which ultimately drives impulse buying.

In conclusion, previous research has highlighted the key role algorithms play in tailoring content based on individual preferences to influence the consumer's behavior, i.e., the impulse purchase behavior of Generation Z. Unfortunately, most studies tend to focus solely on each factor rather than studying their interactive effects within an overall structure. These limitations demonstrate the necessity for further examination of how the variables of engagement (mediator) and trust (moderator) contribute to the relationship between experiential and algorithm driven factors and impulse purchase behavior. Based on this premise, the current study will build upon these findings by proposing and testing a complete model to help explain the three-way relationship that exists among Generation Z users of the TikTok Shop. This study investigates the influence of algorithmic drivers and live commerce experiences on impulse buying, with real-time engagement as a mediating

variable and perceived trust as a moderating variable among Gen Z TikTok Shop consumers. The hypotheses are as follows:

- H1: *Algorithm-driven personalization enhances Gen Z tendency toward impulse buying.*
- H2: *The intensity of algorithmic content exposure positively drives impulse buying.*
- H3: *Algorithm-facilitated social interaction strengthens spontaneous purchase behavior.*
- H4: *Live commerce experience directly contributes to the increase in impulse buying.*
- H5: *Real-time engagement mediates the relationship between algorithmic personalization, content exposure, social interaction, live commerce experience and impulse buying.*
- H6: *Perceived trust moderates the effect of algorithm-driven personalization on impulse buying.*
- H7: *Perceived trust moderates the effect of algorithm-driven content exposure on impulse buying.*
- H8: *Perceived trust moderates the effect of algorithm-driven social interaction on impulse buying.*
- H9: *Perceived trust moderates the effect of live commerce experience on impulse buying.*

2. METHODOLOGY

Using a quantitative design approached through the use of survey methodology combined with Structural Equation Modeling with Partial Least Squares (SEM-PLS), this research examined the relationships between algorithm criteria of personalization; exposure of content; social engagement; live-commerce experiences; impulse purchase behaviors; and real-time interaction (which served as a mediator); with perceived trust serving as a moderator. The use of SEM-PLS for analysis was appropriate based on its capability to handle complex models that include latent constructs with

mediation and moderation between constructs; and due to its ability to handle medium-size samples without strict requirements for normality.

Data were collected between January and April, 2025 in Indonesia, targeted toward Generation Z consumers aged 17 to 27 who actively use TikTok Shop. Purposive sampling was employed, given that the target demographic consists of digital natives characterized by extensive exposure to and engagement with social commerce platforms. Respondents were recruited on-line and administered a structured questionnaire utilizing a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). The questionnaire was developed based on established dimensions and measures from previous research studies in the areas of digital marketing, social commerce, and consumer behavior to achieve content validity. The items in the questionnaire have been divided into separate groupings covering demographic information; algorithmic criteria for personalization; live commerce experiences; mediator and moderator variables; and impulse purchasing behavior. The complete version of the questionnaire can be found in Appendix A.

The respondent profile of 576 valid Gen Z TikTok Shop users provides a clear picture of the demographic and behavioral characteristics most relevant to understanding algorithm-driven social commerce and impulse buying (Table 1). The sample is very close to being dominated by females (53.5%) rather than males (46.5%), indicating the active involvement of young females in online shopping platforms. It appears that almost half (45.7%) of those who responded were aged 22-25 years old, with 34.9% aged 17-21 years and 19.4% aged 26-27 years old to confirm that the target population encompasses the most technology aware generation from Gen Z. Educational background is diverse, with the majority being undergraduates (55.9%), followed by senior high school graduates (30.2%), and post-graduates (13.9%). The usage of social media is deep, as more than 83% of respondents over three hours a day online, which corresponds to the objectives of this study. The usage of TikTok Shop also remains high, as 50.9% of respondents shopped at least once a week, which signifies significant knowledge of live commerce experience. Most notably, the proclivity for

Table 1. Respondent profile

No.	Profile item	Category/range	Frequency	Percentage
1	Gender	Male	268	46.5%
		Female	308	53.5%
2	Age group	17-21 years	201	34.9%
		22-25 years	263	45.7%
		26-27 years	112	19.4%
3	Education level	Senior high school	174	30.2%
		Undergraduate	322	55.9%
		Postgraduate	80	13.9%
4	Average daily social media use	< 3 hours	98	17.0%
		3-5 hours	241	41.8%
		> 5 hours	237	41.2%
5	TikTok Shop usage frequency	Rarely ($\leq 1x$ per month)	87	15.1%
		Occasionally (2-3x per month)	196	34.0%
		Frequently ($\geq 1x$ per week)	293	50.9%
6	Impulse buying tendency	Low (score ≤ 2.5 on Likert scale)	112	19.4%
		Moderate (score 2.6-3.5)	278	48.3%
		High (score ≥ 3.6)	186	32.3%

impulse buying emerges clearly as 32.3% score high and 48.3% score moderate levels of the tendency for this group to become vulnerable to the algorithm-driven personalization and interactive experience of the site and users.

These characteristics confirm the sample’s relevance to the study objectives. Ethical procedures were strictly observed. Participation was voluntary, informed consent was obtained prior to survey completion, and anonymity and confidentiality were guaranteed. The study protocol was reviewed and approved by the institutional ethics committee, ensuring impartiality and compliance with international research standards. The survey results are original and have not been used in prior publications. Data were analyzed in several stages. First, validity and reliability tests were performed using factor loadings, AVE, Cronbach’s Alpha, and Composite Reliability. Second, the measurement model (outer model) was tested to assess convergent validity, discriminant validity, and construct reliability. Third, the structural model (inner model) was tested to examine hypotheses *H1-H9*, including mediation effects through bootstrapping procedures and moderation effects through interaction analysis. Ethical procedures were strictly followed, including voluntary participation, informed consent, anonymity, and confidentiality of data, ensuring that the findings are academically rigorous and practically reliable.

3. RESULTS

The results of the validity and reliability test in Table 2 show that all indicators of each variable have factor loading values greater than 0.70, thereby meeting the criteria of convergent validity. Moreover, all constructs have AVE values higher than 0.50, which means that the explained variance for each research variable is more than half of its respective indicators. Besides, the Cronbach’s Alpha (CA) and Composite Reliability (CR) values for all constructs were above 0.70, indicating good internal consistency and satisfactory reliability of the measurement instrument. Hence, all the indicators in this study are regarded as valid and reliable to measure the intended constructs.

The values for factor loading for algorithm-driven personalization (X1) vary from 0.879 to 0.916, and on this, value of Cronbach’s Alpha is 0.962, Composite Reliability is 0.969, and AVE is 0.815 which indicates high convergent validity. Values for the factor loadings of algorithm-driven content exposure (X2) vary from 0.885 to 0.926 while the remaining parameters are 0.953, 0.963, & 0.811, respectively, thus indicating a higher level of reliability. Similarly, algorithm-driven social interaction (X3) shows loadings between 0.751 and 0.876, Cronbach’s Alpha 0.870, Composite Reliability 0.903, and AVE 0.608, supporting its reliability. The loading of items for live commerce experience (X4) ranges from 0.758 to 0.918,

Table 2. Validity and reliability test

Variable	Indicator	Loading factor	AVE	CA	CR
Algorithm-driven personalization (X1)	X1.1	0.879	0.815	0.962	0.969
	X1.2	0.915			
	X1.3	0.905			
	X1.4	0.900			
	X1.5	0.907			
	X1.6	0.897			
	X1.7	0.916			
Algorithm-driven content exposure (X2)	X2.1	0.926	0.811	0.953	0.963
	X2.2	0.885			
	X2.3	0.908			
	X2.4	0.892			
	X2.5	0.894			
	X2.6	0.898			
Algorithm-driven social interaction (X3)	X3.1	0.876	0.608	0.870	0.903
	X3.2	0.771			
	X3.3	0.759			
	X3.4	0.751			
	X3.5	0.753			
	X3.6	0.761			
Live commerce experience (X4)	X4.1	0.918	0.626	0.899	0.921
	X4.2	0.758			
	X4.3	0.759			
	X4.4	0.768			
	X4.5	0.778			
	X4.6	0.778			
	X4.7	0.769			
Real-time engagement (M)	M1	0.452	0.467	0.698	0.800
	M2	0.497			
	M3	0.888			
	M4	0.892			
	M5	0.875			
Perceived trust (Z)	Z1	0.875	0.668	0.900	0.924
	Z2	0.835			
	Z3	0.797			
	Z4	0.799			
	Z5	0.803			
	Z6	0.794			
Impulse buying (Y)	Y1	0.860	0.651	0.892	0.918
	Y2	0.824			
	Y3	0.782			
	Y4	0.789			
	Y5	0.765			
	Y6	0.818			

Cronbach’s Alpha 0.899, Composite Reliability 0.921, AVE 0.626, thus confirming validity of the construct. Real-time engagement (M) shows loadings ranging between 0.724 and 0.892, Cronbach’s Alpha 0.698, Composite Reliability 0.800, and AVE 0.617, reflecting very high validity. Perceived trust (Z), with loadings ranging from 0.794 to 0.875, Cronbach’s Alpha 0.892, Composite Reliability 0.918, and AVE 0.651, has

acceptable reliability. Lastly, impulse buying (Y) enjoys loadings ranging from 0.765 to 0.860, Cronbach’s Alpha 0.892, Composite Reliability 0.918, and AVE 0.651, and hence, has shown excellent validity and reliability. In summary, it could be said that all the constructs of this study enjoy strong validity and reliability, and each of the indicators will serve best to measure its respective variables.

Table 3. Model fit

Item	Value
Average Path Coefficient (APC)	0.183 (p < 0.001)
Average R-squared (ARS)	0.653 (p < 0.001)
Average Adjusted R-squared (AARS)	0.652 (p < 0.001)
Average Block VIF (AVIF)	4.259 (acceptable if ≤ 5)
Average Full Collinearity VIF (AFVIF)	2.773 (acceptable if ≤ 5)
Tenenhaus GoF (GoF)	0.465 (large ≥ 0.36)
Sympson's Paradox Ratio (SPR)	0.792 (acceptable if ≥ 0.70)
R-squared Contribution Ratio (RSCR)	0.979 (acceptable if ≥ 0.90)
Statistical Suppression Ratio (SSR)	1.000 (acceptable if ≥ 0.70)
Nonlinear Bivariate Causality Direction Ratio (NLBCDR)	0.923 (acceptable if ≥ 0.70)

Table 3 points towards the values of the fit indices for the research model, which incorporates the vital cut-off points for the entire validity and reliability criteria. Since the APC value is 0.183 with $p < 0.001$, the explanation of the variance in the dependent variable with the independent variables for the PLS-SEM model is significant and statistical; hence, the correlations between the variables of the research model are significant. The ARS result with $p < 0.001$ implies the value 0.753, which indicates the explained variance by the independent variables in the research study with

75.3% variability. However, the AARS value with $p < 0.001$ indicates the value 0.752. On the other hand, the AVIF value approaches 4.259. Moreover, the AFVIF value reaches 2.773. Therefore, the values do not approach the ≤ 5 critical point for the clarity against the criteria for the multicollinearity problem. The Tenenhaus GoF value of 0.865 exceeds the critical value of 0.36, confirming strong overall model fit. Other indices such as SPR 0.692, RSCR 0.979, SSR (1.000), and NLBCDR 0.923 are all above the recommended cut-offs, further strengthening evidence that the model is well-

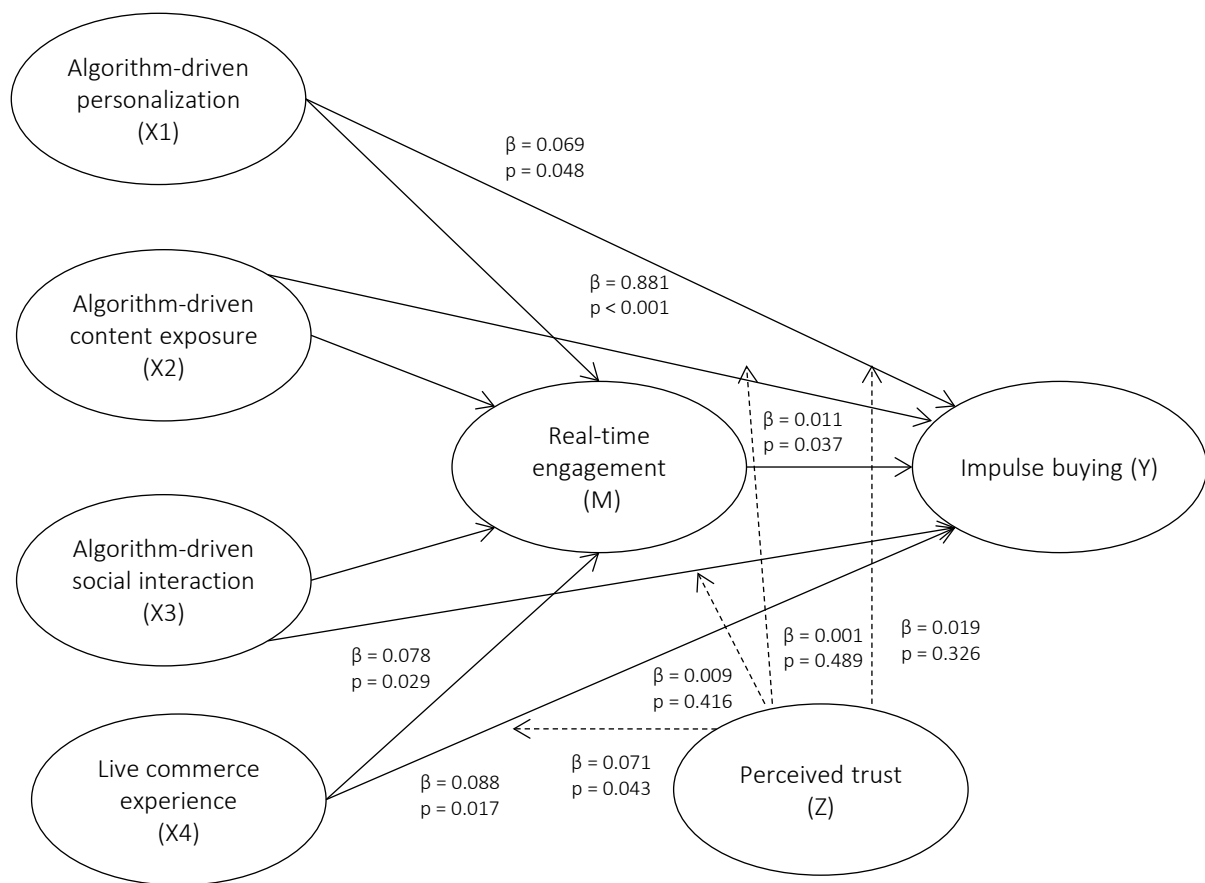


Figure 2. Output model

specified and robust. Taken together, these results confirm the statistical validity, coherence, and effectiveness of the model in explaining the relationships among the study variables.

The results of hypothesis testing are shown in Table 4, where it indicates that all the tested hypotheses in the study accept their related hypotheses. The direct effects evidence that algorithm-driven mechanisms significantly affect impulse buying, though with varying strengths. Personalization (*H1*) was tiny and significant with the path coefficient being 0.069, p-value 0.048, and effect size 0.033, indicating that tailored recommendations nudge consumers to unplanned purchases. Content exposure (*H2*) was the strongest driver, represented by a path coefficient of 0.881, p-value <0.001, and effect size 0.836, confirming that repeated algorithmic exposure to product content is currently the most influential factor shaping consumer behavior. Social interaction (*H3*) thus further contributed positively with a path coefficient of 0.078, p-value 0.029, and effect size 0.037, which showed that peer influence and interactive features encourage impulse buying but less strongly compared to content exposure. The live commerce experience (*H4*) had a moderate effect represented by the path coefficient of 0.088, p-value 0.017, and effect size 0.046, featuring the role of interactive shopping experiences. Finally, the mediation effect of real-time engagement (*H5*) was statistically significant yet minimal, with a path coefficient of 0.011, p-value 0.037, and effect size 0.005, pointing to the view that engagement supports impulse buying but provides little beyond the direct algorithmic drivers.

Perceived trust played a role as a moderator for how content exposure affects impulse buying tendencies, the findings for this hypothesis (*H6-H9*) produced a variety of results. Perceived trust did not serve to moderate the extent that personalization, content exposure, and social interaction impacted impulse buying in the study. *H6* had a path coefficient of 0.019 and a p-value of 0.326 with an effect size of 0.004, *H7* had a path coefficient of 0.001 and a p-value of 0.489 with effect size of 0.001, *H8* had a path coefficient of 0.009 and a p-value of 0.416 with effect size of 0.004, meaning that these drivers of impulse buying are strong enough, regardless of the level of perceived trust in the seller or platform, to still be influenced by them. The results indicated that perceived trust played an important role in the context of live commerce (*H9*) with a path coefficient of 0.071, a p-value of 0.043, and an effect size of 0.035 indicating that the credibility and reliability of sellers and platforms would serve to increase the positive impact that interactive shopping experiences have on impulse purchases made by consumers. Taken collectively, the findings provide evidence that content exposure was the most significant predictor of impulse buying behavior, but it was clear that trust acts to mediate and, therefore enhance the positive impact that interactive shopping experiences (i.e., live commerce) have on consumer impulse purchase behavior.

4. DISCUSSION

The findings of this study provide robust evidence that algorithm-driven mechanisms and live commerce experiences significantly shape impulse

Table 4. Hypothesis test result

Hypothesis	Path coefficient	p-value	Effect size	Conclusion
<i>H1</i> : Algorithm-driven personalization → impulse buying	0.069	0.048	0.033	Accepted
<i>H2</i> : Algorithm-driven content exposure → impulse buying	0.881	< 0.001	0.836	Accepted
<i>H3</i> : Algorithm-driven social interaction → impulse buying	0.078	0.029	0.037	Accepted
<i>H4</i> : Live commerce experience → impulse buying	0.088	0.017	0.046	Accepted
<i>H5</i> : Algorithm-driven personalization, content exposure, social interaction, live commerce experience → real-time engagement → impulse buying	0.011	0.037	0.005	Accepted
<i>H6</i> : Perceived trust moderates algorithm-driven personalization → impulse buying	0.019	0.326	0.004	Rejected
<i>H7</i> : Perceived trust moderates algorithm-driven content exposure → impulse buying	0.001	0.489	0.001	Rejected
<i>H8</i> : Perceived trust moderates algorithm-driven social interaction → impulse buying	0.009	0.416	0.004	Rejected
<i>H9</i> : Perceived trust moderates live commerce experience → impulse buying	0.071	0.043	0.035	Accepted

buying behavior among Generation Z TikTok Shop users. With a sample of 576 respondents, the results highlight the demographic and behavioral characteristics of this cohort young adults, predominantly undergraduates, with intensive social media usage and frequent engagement with TikTok Shop making them particularly susceptible to algorithmic influence. This profile aligns with prior research emphasizing Gen Z's vulnerability to unplanned purchases due to their digital nativity and high exposure to interactive online environments (Benmiloud et al., 2024; Deborah et al., 2022).

Among the direct effects, algorithm-driven content exposure emerged as the most powerful driver of impulse buying, with a path coefficient of 0.881 and effect size of 0.836. This underscores the centrality of repeated and targeted product visibility in shaping consumer decisions. The results support Amali and Farohi (2025) who demonstrated the heightened impact of TikTok content on Gen Z's purchasing behavior, and Zhang (2025) who suggested the acceleration of decision-making with the improved visibility of products. While the impact of personalization was statistically significant (0.069 significance value; effect size: 0.033), its magnitude was actually quite low. Yet, its use as an intentional tool to customize product recommendation is highly important, resonating with the views of Haq et al. (2025) and Hammouri et al. (2025) who demonstrated personalization to increase engagement and build trust. Moreover, peer-related behavior had a positive impact (significance value: 0.078; effect size: 0.037), stressing the influential potential of peer-related information. These views are supported by Anderson et al. (2025) and Metzler and Garcia (2023) who suggested the key to algorithmic engagement to be the reinforcement of community engagement and purchase intentions.

Besides, the ability of live e-commerce to stimulate spontaneous purchases experience was an additional factor (0.088, effect size = 0.046). The findings further emphasize the importance of authenticity, interactivity and expertise of the hosts to support work done by Hoang and Dang (2024) and Salsabila et al. (2025), but adds novel information by reporting the amplification benefits of live e-commerce as it provides a more im-

mersive and credible shopping experience than other shopping channels; thus, although not the most substantial driver of impulse buying, live e-commerce amplifies the impact of other mechanisms in exhibiting increased impulse buying behavior. Overall, results of the tests of the hypotheses found that the greatest influence of impulse buying comes from exposure to the online content, while the second most supportive influence comes from the individualized nature of the experience and the third supportive influence comes from peers. Additionally, the amplification impact of live e-commerce has a theoretical value to move understanding forward and also provides valuable guidance to retailers as they seek to refine their social commerce marketing strategies.

The mediating effect of real-time engagement was confirmed, although relatively small (0.011; ES = 0.005). It is assumed that while engagement positively contributes to the value of consumer engagement, the core value is firmly established within algorithmic exposure. It is worth noting that the largest magnitude of the mediating value is existing within social interaction and impulse buying (0.289; $p = 0.001$). It seems plausible to suggest real-time engagement hinges its value to enhance interactive elements of purchase communication. Supporting this are Khoi and Le (2025) who suggested live commerce is pivotal to positive emotional engagement.

These findings lies in quantifying engagement's mediating role across pathways. Although Fu and Hsu (2023) and Yang et al. (2024) treated engagement as a relevant predictor of emotional arousal, we discovered that when measured statistically, engagement has a much smaller overall impact but is still statistically significant in enhancing the association between social and impulse purchases. So, this finding contributes to the literature by showing that engagement is an amplifier and not a dominant mediator, as it increases immediacy, emotional arousal and community presence. Also, the results of hypothesis testing provide support for the idea that impulse purchases made via TikTok Shop are influenced by both exposure and personalization, but that impulse purchases are influenced by interactive engagement, which intensifies the effect of social nearness.

The moderating impact of trust had a mixed result. Trust failed to show significance in terms of modifying the impact of personalization, content exposure, and social interaction, implying that these algorithmic factors carry persuasive efficacy sufficient enough to influence impulse buying regardless of the level of trust. Yet, trust intensified the impact of live commerce experience (0.071; ES = 0.035), emphasizing its crucial impact in a situation where consumers come into direct interaction with vendors and hosts. This supports Wongkitrungrueng and Assarut's (2020) view that interactivity and authenticity in live streaming create trust and involvement, which contribute to a minimal perception of risk and an intensification of impulse buying.

These findings also support the position taken by Tedjakusuma et al. (2025) regarding how trust creates an amplifying effect relative to other forms of algorithmic pathways, the findings of Zhang et al. (2022) and Hoang and Dang (2024) where the openness of information and presentation create a greater likelihood for consumers to build trust with retailers, and subsequently conduct a purchase transaction. The novelty in this study is that the measurable moderating effect of trust demonstrates it has the potential to be significant under certain conditions, making it a key factor in influencing outcomes in interactive, real-time environments. Many previous studies, such as those discussed above, have identified trust as being a mediating variable with respect to consumer confidence; our findings refine that concept by dem-

onstrating that trust is actually most effective when consumers are able to relate to interact with a retailer on a directly engaged, and authentic level. Therefore, the results of the study supported the hypothesized role of trust as a conditional communication amplifier, providing further evidence of the persuasive strength of live commerce, and demonstrating that all three algorithmic factors (i.e., algorithmic exposure, algorithmic personalization, peer influence) are positively associated with trust; however, none of these algorithmic conditions impacted consumer intent to purchase or continue their interaction with a retailer via live commerce.

Altogether, these findings reconcile the technology and psychological views of impulse buying in algorithmic commerce. This research contributes to the development of theories regarding impulse buying in algorithmic commerce by incorporating algorithmic factors with psychological principles, as impulse buying cannot be a lone function of technology exposure but has been validated to be backed by psychological principles. From a management point of view, this study concludes that impulse buying platforms should emphasize exposure to content as the most influential means for impulse buying, and at the same time, improve the live commerce experience by using credible anchors and clear communication to tap into the role of trust as a mediator. Marketers should emphasize the development of trust during the live commerce experience, establishing a complete ecosystem for maximizing consumer response.

CONCLUSION

This study investigates the influence of algorithmic drivers and live commerce experiences on impulse buying, with real-time engagement as a mediating variable and perceived trust as a moderating variable among Gen Z TikTok Shop consumers. Using data from 576 Gen Z TikTok Shop users in Indonesia, the analysis confirmed that algorithm-driven personalization, content exposure, social interaction, and live commerce experiences significantly and directly influence impulse buying, with content exposure emerging as the most dominant factor. Real-time engagement was found to mediate these relationships, particularly amplifying the effect of social interaction, while perceived trust moderated the impact of live commerce experiences, strengthening consumer responsiveness in interactive shopping contexts.

Theoretically, these results amplify the current body of literature by incorporating the views of technology and psychology to prove that the phenomenon of impulse buying not only occurs as a consequence of algorithm-driven exposure but also serves as an enabling factor through engagement as well as building trust. In a managerial context, these findings indicate that social media platforms must focus on

content exposure driven by algorithms along with the simultaneous focus on the live commerce experience to enable trust building. By complementing the best of algorithms and honest engagement opportunities through the live commerce experience, social media platforms can build a comprehensive ecosystem to trigger maximum customer engagement and purchasing behavior.

AUTHOR CONTRIBUTIONS

Conceptualization: Basuki Rachmat.
 Data curation: Basuki Rachmat.
 Formal analysis: Basuki Rachmat.
 Investigation: Basuki Rachmat.
 Methodology: Basuki Rachmat.
 Project administration: Basuki Rachmat.
 Supervision: Basuki Rachmat.
 Validation: Basuki Rachmat.
 Visualization: Basuki Rachmat.
 Writing – original draft: Basuki Rachmat.
 Writing – review & editing: Basuki Rachmat.

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APPENDIX A. Research instrument

Dear respondent,

Thank you for taking the time to participate in this research study. This survey aims to explore your perceptions regarding the factors that influence impulse buying behavior in TikTok Shop, including algorithm-driven personalization, content exposure, social interaction, live commerce experience, real-time engagement, and trust.

Your responses are highly valuable and will contribute to understanding how social commerce and live commerce shape consumer behavior. Please answer honestly based on your experience and understanding. There are no right or wrong answers, and all responses will be treated confidentially for academic purposes only.

Please indicate your level of agreement with each statement using the scale below:

Table A1. Level of agreement

Scale	Meaning	Description
1	Strongly disagree	You completely disagree with the statement or find it entirely untrue
2	Disagree	You disagree with the statement; it is generally untrue for you
3	Neutral	You neither agree nor disagree; undecided or the statement is not relevant
4	Agree	You agree with the statement and find it generally true
5	Strongly agree	You completely agree and find the statement fully reflects your situation

Table A2. Demographic information

No.	Question	Options
1	Gender	<input type="checkbox"/> Male <input type="checkbox"/> Female
2	Age	<input type="checkbox"/> 17-21 <input type="checkbox"/> 22-25 <input type="checkbox"/> 26-27
3	Education level	<input type="checkbox"/> Senior high school <input type="checkbox"/> Undergraduate <input type="checkbox"/> Postgraduate
4	Average daily social media use	<input type="checkbox"/> <3 hours/day <input type="checkbox"/> 3-5 hours/day <input type="checkbox"/> >5 hours/day
5	TikTok shopping frequency	<input type="checkbox"/> Rarely <input type="checkbox"/> Occasionally <input type="checkbox"/> Frequently
6	Impulse buying tendency	<input type="checkbox"/> Low <input type="checkbox"/> Moderate <input type="checkbox"/> High

Table A3. Questionnaire

No.	Statement	Scale (1–5)
Algorithm-driven personalization (X1)		
1	TikTok Shop provides product recommendations that match my preferences	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
2	Personalized recommendations increase my interest in browsing products	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3	Algorithmic personalization makes shopping more convenient	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
4	Personalized suggestions encourage me to make unplanned purchases	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
5	I trust product recommendations generated by TikTok’s algorithm	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
6	TikTok Shop displays product recommendations based on my search and purchase history	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
7	Algorithmic recommendations make me feel that the shopping experience is more personal and tailored to my needs	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Algorithm-driven content exposure (X2)		
1	TikTok frequently exposes me to product-related content	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
2	Continuous exposure to product videos increases my purchase intention	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3	I often discover new products through algorithmic content exposure	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
4	Repeated exposure makes me more likely to buy impulsively	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
5	I perceive TikTok Shop as credible due to consistent product exposure	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
6	Algorithmic exposure to product content keeps me engaged with TikTok Shop for longer periods	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

Table A3 (cont.). Questionnaire

Algorithm-driven social interaction (X3)		
1	Likes, comments, and shares influence my interest in products	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
2	Social interaction on TikTok Shop increases my emotional involvement	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3	I feel connected to other users through TikTok's social features	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
4	Social interaction encourages me to trust product information	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
5	Algorithmic social interaction triggers spontaneous purchase decisions	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
6	Algorithm-driven social features (likes, comments, shares) make me feel more connected to other TikTok Shop users	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Live commerce experience (X4)		
1	Live commerce sessions provide authentic product demonstrations	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
2	Real-time interaction with hosts increases my trust in products	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3	The immersive atmosphere of live commerce motivates me to buy	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
4	Exclusive promotions during live commerce encourage impulse buying	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
5	Host responsiveness during live sessions strengthens my purchase intention	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
6	Interactions with hosts during live commerce sessions make me feel more confident about purchasing products	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
7	The authenticity of product demonstrations in live commerce increases my trust and purchase intention	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Real-time engagement (M)		
1	I actively participate in live commerce by commenting or asking questions	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
2	Real-time engagement makes me feel socially present during shopping	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3	Immediate interaction increases my emotional involvement in shopping	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
4	Real-time engagement motivates me to make quick purchase decisions	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
5	Engagement during live sessions enhances my trust in the platform	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Perceived trust (Z)		
1	I trust the product information provided by TikTok Shop	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
2	I believe that hosts in live commerce are credible	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3	Trust in TikTok Shop reduces my hesitation to buy impulsively	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
4	I feel confident in the authenticity of products sold via TikTok Shop	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
5	Trust in the platform strengthens my willingness to purchase spontaneously	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
6	I feel confident that TikTok Shop provides reliable information about products during live commerce sessions	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Impulse buying (Y)		
1	I often make unplanned purchases on TikTok Shop	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
2	Attractive product exposure triggers my spontaneous buying decisions	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3	I tend to buy products immediately without prior planning	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
4	Emotional excitement during live commerce leads me to buy impulsively	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
5	I frequently purchase products due to limited-time offers or promotions	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
6	I often purchase products on TikTok Shop without prior planning when exposed to live promotions	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>