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THE IMPACT OF PERSONALIZED RECOMMENDATIONS ON CONSUMERS' PURCHASE INTENTION: A PERSPECTIVE BASED ON PERCEIVED VALUE IN E- COMMERCE LIVE STREAMING

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Abstract:

The essence of e-commerce live streaming is the interactivity in real time. Consumers are more likely to be influenced by emotional and social factors than rational factors when making purchasing decisions. This is quite different from the situation response mechanism in traditional e-commerce scenarios. When the content of e-commerce live streaming is gradually becoming homogeneous, personalized recommendations have become one of the most important sources of platform competitiveness. Most current research focuses on the development of recommendation algorithms and technical optimization, but few studies have discussed the influence on users at the level of perception. The attributes of personalized recommendation (relevance, timeliness, and novelty) are the independent variables affecting consumers' purchasing decision. Still, few studies have explored the influence path of personalized recommendation on consumers' perceived value and the impact of consumers' purchase intention. This study starts from the perspective of consumers' perceived value. It builds the framework of "personalized recommendation - perceived value - consumer purchase intention." The questionnaire was employed to investigate the impact of personalized recommendations on consumers' intention to purchase, along with the mediating role of perceived value. According to the results of this study, personalized recommendations have a significant positive effect on consumers' purchase intention in the e-commerce live streaming environment. Perceived value serves as a key mediating variable in the

formation of consumer behavior. The empirical results show that personalized recommendations influence purchase intention indirectly via perceived value. In addition, this paper suggests that improving the relevance, timeliness, and novelty of recommendation content can effectively increase consumers' perceived value and further promote their purchase intention.

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Keyword:

Consumers' Purchase Intention; E-Commerce Live Streaming; Perceived Value; Personalized Recommendation



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Introduction

As e-commerce applications and internet technology continue to advance, E-commerce live streaming has gradually emerged as a preferred consumption channel for consumers (Xu, Sun, & Jia, 2024). In 2023, China's total transaction volume for E-commerce live streaming reached 4.9 trillion yuan, maintaining a rapid average annual growth rate of 35.2% (iResearch, 2024). Against the backdrop of this rapid development, increasingly intense market competition and severe product homogenization are prompting enterprises to accelerate the adoption of precision marketing strategies. By utilizing big data to mine consumer preferences and designing products and services accordingly, enterprises can effectively enhance their core competitiveness (Han & He, 2024). Therefore, an in-depth study on the role and impact of Personalized recommendation is crucial to help enterprises maintain their competitive edge (Guo & Jing, 2024). Personalized recommendation can improve the relationship between buyers and sellers, thereby enhancing consumer stickiness (Chellappa & Sin, 2005; Zhu & Chen, 2024).

Existing studies indicate that Personalized recommendation can directly optimize consumers' shopping experiences by matching content with user preferences and existing behaviors, thereby increasing user engagement and Consumers' purchase intention. Recent literature has further extended this discussion to broad scenarios within e-commerce platforms. For instance, Han and Zhang (2024) point out that by analyzing users' viewing and purchasing history, platforms can accurately push relevant content, helping users find target products and improving satisfaction. Similarly, Su and Lü (2024) suggest that Personalized recommendation helps uncover users' potential needs, exposing them to more attractive content and optimizing their viewing experience.

Despite these studies examining the impact of personalized recommendation on consumers' purchase intention, notable limitations remain. Unlike traditional e-commerce, e-commerce live streaming purchases are more influenced by emotional and social factors due to real-time interactivity (Han et al., 2024; Li et al., 2022). Although existing studies predominantly focus on algorithmic and technical optimization (Zhou et al., 2023; Kang et al., 2024), few have examined how personalized recommendation influences consumer behavior via perceived value in e-commerce live streaming (Yang & Ren, 2024). As a key psychological factor shaping consumers' overall assessment of products or services, perceived value has not been adequately explored from multiple perspectives in this specific context. Therefore, an in-depth analysis of the unique mechanisms through which personalized recommendation impacts consumers' perceived value and purchase intentions is of significant theoretical and practical importance.

Based on the Stimulus-Organism-Response (SOR) theoretical framework (Mehrabian & Russell, 1974), this study developed a research model suitable for the E-commerce live streaming context. Specifically, this study develops a framework linking Personalized recommendation (relevance, timeliness, novelty) to Perceived value, which in turn influences Consumers' purchase intention. A questionnaire survey was conducted to examine this model, utilizing Partial Least Squares Structural Equation Modeling (PLS-SEM) on a sample of 353 valid responses collected online. Results show that Personalized recommendation significantly enhances Consumers' purchase intention, with Perceived value mediating this relationship. Consequently, enhancing the relevance, timeliness, and novelty of recommendations can increase Perceived value and strengthen purchase intention.

Literature Review and Hypothesis Development

SOR Theory and Consumer Purchase Behavior

The SOR theoretical framework was proposed by environmental psychologists Mehrabian and Russell. This model is grounded in the "stimulus-response" hypothesis put forward by Watson, a pioneer in behaviorist psychology (Liu, 2022; Mehrabian & Russell, 1974). After consumers pass through the value of stimulus information evaluation, they will appear the behaviors of approach or avoidance behaviors according to the SOR theory (Yang and Ren 2024). The approach behaviors include purchase intention, among others (Wang and Chang, 2021).

The SOR theoretical framework explains how individuals convert evaluations of external environmental stimuli into behaviors (Kim et al., 2020). By explaining the formation process of user behavior, the SOR model proves itself versatile and continually evolving (Li and Peng 2024). Donovan and Rossiter were the pioneers who first applied the SOR model to the retail industry; their research examined how various retail environmental stimuli affect customer purchasing behaviors (R.J. & j.r., 1982).

As online shopping and e-commerce live streaming continue to evolve rapidly, more scholars have begun to use the SOR theoretical framework to explore consumers' purchasing intentions (Sun, 2022). Researchers have explored the formation of consumers' psychology and behavior in the live streaming process from different angles. Zhang (2023) believes that e-commerce live streaming service providers should construct accurate consumer profiles based on age, lifestyle, and shopping preferences. By using dynamic tags, they can provide

personalized content to enhance consumers' satisfaction in viewing, purchasing, and after-sales service. Li (2023) believes that the essence of personalization is matching information to audience features. The platform collects users' browsing records and purchasing behaviors, then pushes products and information that better meet their needs. This saves users' search time and increases the possibility of purchasing. Shen et al. (2023) discussed the path between personalized recommendations, users perceived value, and purchasing intentions. Consumers perceptions of platform value and satisfaction have both a mediating and moderating effect in this relationship. When consumers believe the platform accurately grasps their preferences and gives personalized recommendations, their trust—and likelihood of purchasing recommended products—increases.

Moreover, research has extended beyond consumers to other domains. For instance, Wu et al. (2021) discovered that farmers who utilized creative live streaming formats attracted more customers and minimized the costs of intermediate steps. By doing so, these farmers were able to achieve maximum profits.

The Influence of Personalized Recommendation on Consumers' Purchase Intention

Tailored recommendations serve as a powerful marketing approach in live streaming for e-commerce. Through the examination of user activities, including visiting, engaging, and favoriting, platforms are able to better ascertain individual preferences. Research both domestically and internationally indicates that personalized recommendations should be accurate, timely, and provide novel information. Effective recommendations support consumers in making purchasing decisions (Li, 2023). Leng (2022) finds that personalized recommendations rely on analyzing users' browsing, search, purchase history, and interests. This tailored approach increases consumers' perceived value of live-streaming content and boosts their purchase intention (Tian & Yao, 2024).

From the standpoint of relevance, personalized recommendation mechanisms build individual interest profiles on customers' historical habits and preferences. Therefore, the recommended content is more in line with users' needs and is more likely to be accepted by them (Yang & Ren, 2024). When customers receive information that matches their needs and interests, they will feel that they are recognized, and their needs are met. This will increase users' trust and loyalty and make them more willing to purchase (Zhou, 2022). In a situation of information explosion, an abundance of low-quality information will lead to decision fatigue. Research has found that high-quality e-commerce platforms can reduce users' cognitive load through accurate recommendation matching (Leng, 2022). Live streaming commerce platforms show their ability to capture users' interests immediately and push relevant information to users efficiently, which can improve users' acceptance and enhance interaction with the platform. This will further increase users perceived value and purchase motivation (Tian & Yao, 2024). Based on empirical evidence, it is found that users' satisfaction and trust will significantly increase when they believe that the recommended content is highly relevant (Li & Wang, 2024; Bharati & Chaudhury, 2004). Highly relevant information can stimulate users' purchase desire and improve their purchase intention as well as the marketing effectiveness of the platform (Liu & Zhang, 2023). Therefore, the following hypothesis is proposed:

H1a: The relevance of personalized recommendations positively influences consumers' perceived value.

H1b: The relevance of personalized recommendations positively influences consumers' purchase intention.

Timeliness refers to whether the e-commerce platform can deliver the most recent and relevant product recommendations to users. It is usually measured by the frequency and speed of information updating (Leng 2022). In addition, for live streaming or product recommendations, it also focuses on the extent the content recommended by the platform is consistent with the market and users' latest needs (Tian and Yao 2024). Only when the information recommendation is timely, diversified, personalized, and up to date can users be more satisfied with the system's results and trust the timeliness of its recommendations (Chang 2024).

In addition, in the live context, the timeliness of the recommendation information can also be improved by collecting users' online feedback (comments, likes, shares, etc.) in real time and adjusting the content accordingly to provide more accurate and personalized recommendation information (Sun 2023).

From the perspective of perceived value, the high timeliness recommendation information can not only meet consumers' demands for practical information and improve their understanding of the effectiveness of the recommendation system, but also make consumers feel emotionally identified and trusted when the recommended information is highly matched with consumers' context. That is, when consumers recognize the practical significance of the information and the situational appropriateness of the situation where the information is presented, they also acknowledge the practical significance and situational appropriateness of the information presented by the system, which enhances the overall perceived worth of the recommendation system of the platform. Consumers approve of the recommended information presented by the platform and trust the recommended information presented by the platform, and the overall perceived worth of the platform recommendation system increases, which in turn improves the overall purchase intention of consumers (Yang 2024). Therefore, the following hypothesis is proposed:

H2a: The timeliness of personalized recommendations positively influences consumers' perceived value.

H2b: The timeliness of personalized recommendations positively influences consumers' purchase intention.

Novelty is a crucial factor that influences customer reactions. Under the context of personalized recommendations, novelty reflects the level of newness or uniqueness of recommended products in terms of style, design or category that users have not viewed or liked before. Users will be curious and willing to click to view such content, which enhances their attention and interest (Yang, 2024). Users who experience novel and unique recommendations will react positively. This can prevent users from getting bored by playing the same or similar content repeatedly. This will enhance their trust and satisfaction in our recommendation system and attract them to watch more content related to shopping (Leng, 2022). Additionally, novel content can offer more sensory stimulation than traditional content, thereby enhancing user enjoyment and immersion. When users reach this level, they will likely experience more positive feelings and feel a deeper connection with our system and content. This may enhance the purchase propensity of users (Wang et al., 2020). Therefore, the following hypothesis is proposed:

H3a: The novelty of personalized recommendations positively influences consumers' perceived value.

H3b: The novelty of personalized recommendations positively influences consumers' purchase intention.

The Influence of Perceived Value on Consumers' Purchase Intention

Tian and Yao (2024) contend that the core of the perceived value concept's logic involves considering and reconciling the perceived benefits (all favorable attributes of the product or service) with the perceived costs (the associated effort and sacrifices). Ultimately, this balance is directly represented in customers' comprehensive assessment of the product or service. The concept of perceived value refers to the overall assessment and understanding that consumers have regarding a product or service. This encompasses information related to the product (Yang & Ren, 2024; Gong et al., 2019), pricing approaches (Pan, 2022), and functional characteristics (Zhao, 2023). Generally, the perceived value plays a crucial role in shaping consumers' choices when making purchases. Various elements, including individual experiences, cultural contexts, and psychological traits, affect how this perceived value is formed. These factors do not occur independently. Clarifying the path of these factors' operation not only helps us understand the internal logic of consumers' purchase intention but also provides theoretical basis for firms to implement precision marketing strategies (Qing & Jin, 2022).

From the perspective of existing studies, perceived value affects consumers' purchasing behavior and reflects consumers' preferences in the market to some extent (Wu et al., 2014; Tian & Yao, 2024). The evident positive correlation between the two variables suggests that as perceived value rises, so does consumers' intention to make a purchase (Li et al., 2024; Ji et al., 2021). For instance, an increase in the perceived value of a product or service leads to a marked rise in the likelihood of customers making a purchase (Li, 2024). Consequently, the development of analytical models that explore the relationship between purchase intention and perceived value has emerged as a significant area of investigation within consumer behavior studies (Yan et al., 2024). Therefore, the following hypothesis is proposed:

H4: perceived value positively influences consumers' purchase intention.

The Mediating Role of Perceived Value

When customers receive recommendations that meet their expectations, the value they perceive from these recommendations greatly rises (Mei, Wei, and Chen 2023)—such as making them emotionally satisfied, providing informative support in the purchasing process of products, and offering consumers personalized services—these factors can greatly enhance consumers' purchase intention (Zhou and Chang 2023).

Drawing from the live-streaming sales data of 2021, Yan et al. posited that consumers are likely to exhibit favorable purchasing behavior when they perceive the streamer as trustworthy. In the context of live-streaming sales, perceived value serves as a crucial mediating factor linking product attributes to consumer behavior in 2021. Ji et al. (2021) believed that consumers' emotional and practical product impressions are affected by the attributes and context of e-commerce live broadcasting and that this, in turn, affects their purchasing intention. Perceived value is a significant mediating variable. Yang and Zhang (2020) believed that when informational incentives are offered, consumers' perceived value will rise and they will be

encouraged to purchase, which in turn promotes consumer trust. Tian and Yao (2024) believed that consumers' perceived value plays an important role in enhancing the connection between personalized recommendations and purchasing intentions and that it greatly affects this relationship. Therefore, the following hypothesis is proposed:

H5a: perceived value mediates the relationship between relevance and consumers' purchase intention.

H5b: perceived value mediates the relationship between timeliness and consumers' purchase intention.

H5c: perceived value mediates the relationship between novelty and consumers' purchase intention.

Conceptual Model

Although personalized recommendation has been widely examined in conventional e-commerce, its influence mechanism in e-commerce live streaming remains insufficiently understood. Existing studies often conceptualize it as an overall construct, paying limited attention to how distinct information features operate in highly interactive environments to shape consumers' internal evaluations. To fill this research gap, the present study draws on the SOR theoretical framework to develop a research model that connects personalized recommendation—encompassing relevance, timeliness, and novelty—to perceived value, which then exerts an influence on consumers' purchase intention. More specifically, relevance, timeliness, and novelty function as external stimuli that boost perceived value (the organism state), and this enhanced perceived value in turn drives consumers' purchase intention as the corresponding behavioral response (see Figure 1).

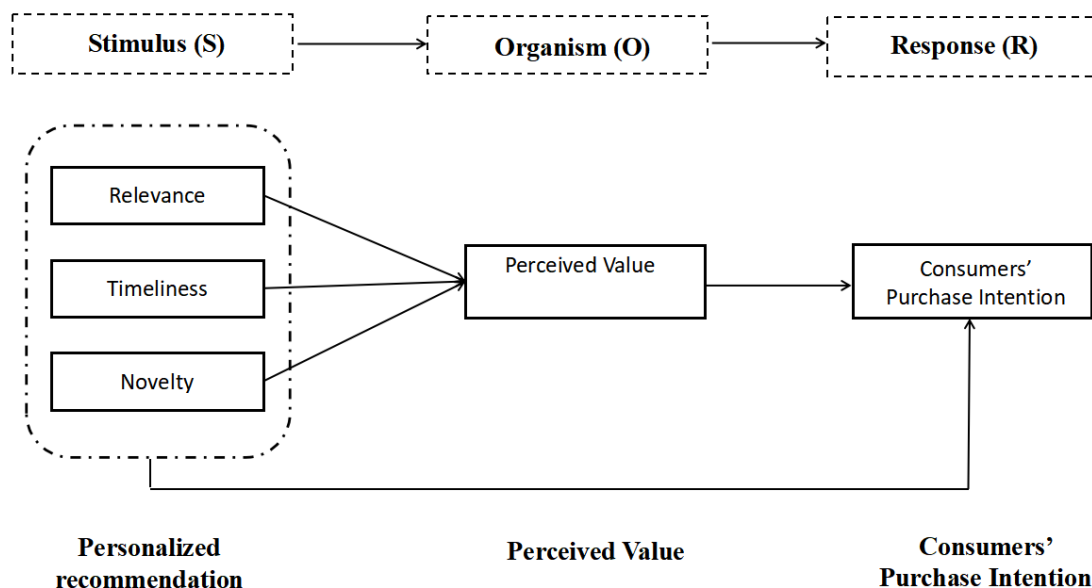


Figure 1: Research Model

Methodology

Questionnaire Design and Measurement

To ensure measurement reliability, this study adopted established scales. The primary constructs were assessed with a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree), where increased scores reflected greater levels of agreement. The evaluation scale for personalized recommendation primarily originated from the validated tools developed by Wang et al. (2020) and Chi (2018). Items measuring perceived value were adapted from Yang and Ren (2024), and the measurement scale for consumers' purchase intention was modified based on Zhou and Chang (2023). After drafting the initial questionnaire, specialists in E-commerce live streaming reviewed it, leading to necessary revisions. Subsequently, a pilot test involving 30 participants was conducted, and the questionnaire was refined based on feedback before formal distribution.

Data Collection and Sample Description

A questionnaire survey was conducted to examine the proposed model. Data were collected via Wenjuanxing, a widely recognized online survey platform in China (Liu et al., 2021). A screening question asking whether participants had previously purchased products through E-commerce live streaming was included, and only those answering affirmatively proceeded with the survey. The survey was distributed via three main platforms: Taobao, Douyin, and Pinduoduo. As these platforms have millions of users from different age groups, regions, and income levels, they provide a fairly diverse and representative sample with broad coverage (Beijing Consumers' Association, 2024). A total of 420 questionnaires were collected. After removing incomplete responses and filtering based on attention checks and response times, a final sample size of 353 valid questionnaires was retained. Partial Least Squares Structural Equation Modeling (PLS-SEM) was subsequently employed to analyze the collected data.

Data Analysis Results

Descriptive Statistics

Table 1 presents the demographic characteristics of the sample analyzed in this study. Findings regarding the age distribution indicate that the highest percentage of participants (42.1%) fell within the 26–35-year age range, with the 36–45-year age range following closely behind at 31.4%. When examining educational attainment, it was found that 68.3% of the participants were either college students or pursuing an associate degree. Most of the participants were employed full-time, and the monthly income was mostly between 4,001 and 6,000 RMB. In addition, regarding the live streaming buying behaviours, most of the participants said that they watched the e-commerce live broadcast five to six times a week when asked about their fresh agricultural items purchasing behavior. We believe that the sample represents consumers who purchase fresh agricultural products via live e-commerce broadcasts.

Table 1: Descriptive Statistics of the Study Sample (N = 353)

Variable	Category	Frequency	Percentage (%)
Gender	Male	166	47
	Female	187	53
Age	Under 18	22	6.2
	18–25	55	15.6
	26–35	148	41.9
	36–45	86	24.4
	46 and above	42	11.9
	High school or below	36	10.2
Education Level	College diploma	95	26.9
	Bachelor's degree	169	47.9
	Master's or above	53	15
Occupation	Student	77	21.8
	Full-time employee	181	51.3
Monthly Income	Freelancer	95	26.9
	2000 RMB or less	60	17
	2001–4000 RMB	76	21.5
	4001–6000 RMB	122	34.6
	6001–8000 RMB	57	16.1
	Over 8000 RMB	38	10.8
	2 times or less/week	23	6.5
Live Streaming Frequency	3–4 times/week	75	21.2
	5–6 times/week	137	38.8
	7 times or more/week	118	33.4
Main Platform Used	Taobao Live	110	31.2
	Douyin Live	144	40.8
	Pinduoduo Live	81	22.9
	Others	18	5.1

Reliability Analysis

Reliability serves as a measure of the internal consistency and precision of measurement for the instrument (with increased reliability correlating to a decrease in measurement error). In survey research utilizing Likert-type instruments, the primary measure of reliability is the Cronbach's alpha coefficient. Based on the findings of this study, the reliability of the scale was deemed satisfactory, as all constructions surpassed the acceptable Cronbach's alpha threshold of 0.7 (refer to Table 2). This indicates that the measurement tools employed demonstrate strong reliability.

Table 2: Reliability Analysis (N = 353)

Variable	No. of Items	Cronbach's Alpha
Relevance (RE)	4	0.852
Timeliness (TI)	4	0.854

Novelty (NO)	4	0.864
perceived value (PV)	4	0.742
Purchase Intention (PI)	4	0.870

Validity Analysis

Convergent legitimacy and discriminant reliability are the two dimensions of validity in general. In other words, convergent validity refers to the degree of significant association between multiple variables that measure the same underlying variable, while discriminant validity indicates the distinctness of different concepts. Convergent validity can be assessed through several measures, including composite reliability (CR), average variance extracted (AVE), and standardized factor loadings in general (Fornell and Larcker 1981). According to the measurement model assessment results presented in Table 3 (or your specific table number), the standardized factor loadings for all items ranged from 0.713 to 0.857, which exceed the recommended threshold of 0.5. The Composite Reliability (CR) values ranged from 0.838 to 0.911, surpassing the 0.70 cutoff. Furthermore, the Average Variance Extracted (AVE) values ranged from 0.564 to 0.719, which are above the 0.50 benchmark. Consequently, all measurement constructs meet the criteria for convergent validity established by Fornell and Larcker (1981).

Table 3: Results of Convergent Validity Analysis

Constructs	Dimensions	Items	Factor loadings	CR	AVE
Personalized Recommendation	Relevance(RE)	RE1	0.835	0.9	0.692
		RE2	0.822		
		RE3	0.826		
		RE4	0.844		
	Timeliness(TI)	TI1	0.845	0.901	0.695
		TI2	0.823		
		TI3	0.831		
		TI4	0.837		
	Novelty(NO)	NO1	0.831	0.907	0.71
		NO2	0.832		
		NO3	0.849		
		NO4	0.857		
perceived value(PV)	PV1	0.713	0.838	0.564	
	PV2	0.757			
	PV3	0.768			
	PV4	0.764			
consumer purchase Intention(CPI)	CPI1	0.84	0.911	0.719	
	CPI2	0.846			
	CPI3	0.856			
	CPI4	0.851			

According to Fornell and Larcker (1981), the criterion for validating a construct is that the square root of its AVE must exceed the correlation coefficient of that construct with others. As

shown in Table 4, the square roots of the AVEs (bolded values on the diagonal) are greater than the off-diagonal inter-construct correlations. Therefore, the requirement for discriminant validity is met.

Table 4: Results of Discriminant Validity Analysis

Constructs	M	SD	RE	TI	NO	PV	CPI
RE	3.28	0.95	1				
TI	3.36	0.94	0.501	1			
NO	3.43	0.95	0.389	0.442	1		
PV	3.35	0.87	0.426	0.486	0.495	1	
CPI	3.44	0.90	0.531	0.528	0.563	0.559	1

Common Method Bias and Multicollinearity Test

Given that there might exist common method variance in single-source questionnaire data inhomogeneously, we systematically applied the Podsakoff et al. (2003) recommended design controls and statistical remedies in the whole research process. This study clearly stated the research goal at the beginning of the questionnaire, did not use ambiguous phrases in measurement items, clarified that all responses were anonymous, and chose participants from different e-commerce live streaming platforms. Furthermore, we utilized Harman's single-factor assessment to identify any possible common method bias through principal component analysis conducted without rotation. In our analysis, we examined all measurement items, revealing that the explained variance of the initial principal component was merely 27.92%, well below the critical threshold of 50% (Chen et al., 2022; Podsakoff et al., 2003). This indicates that common method bias is unlikely to be a major concern in this study.

In a regression model, when the independent variables exhibit high correlation, a condition known as multicollinearity, it may impact the precision of the outcomes. This research shows that all variables possess VIF values under 5, signifying the absence of a significant multicollinearity issue.

Hypothesis Testing

Table 5 displays the route coefficients and the outcomes of hypothesis testing for this investigation. The examination of the structural model's findings indicates that all proposed hypotheses were supported. The analysis reveals that the factors of timeliness, novelty, and relevance significantly enhance perceived value. Specifically, the statistical coefficients indicate that timeliness has a positive influence with a beta value of 0.25 and a t-value of 5.181, which is statistically significant with a p-value of less than 0.001. Similarly, novelty demonstrates an even stronger positive effect, evidenced by a beta value of 0.355 and a t-value of 7.355, again with a p-value below 0.001. Relevance also contributes positively to perceived value, with a beta value of 0.183 and a t-value of 3.685, resulting in a p-value less than 0.001. Therefore, the hypotheses H1a, H2a, and H3a are supported by the data.

Furthermore, the study finds that relevance, timeliness, novelty, and perceived value have significant effects on purchase intention. The statistical findings show that relevance maintains a positive effect with a beta coefficient of 0.136 and a t-value of 2.783, which is significant

with a p-value of 0.005. Timeliness also shows a notable positive relationship, marked by a beta value of 0.208 and a t-value of 3.849, with a p-value lower than 0.001. Novelty contributes as well, possessing a beta value of 0.141 and a t-value of 2.622, leading to a significant p-value of 0.009. Additionally, perceived value has a substantial impact on purchase intention, indicated by a beta value of 0.292 and a t-value of 5.344, with a p-value that is less than 0.001. As a result, the hypotheses H1b, H2b, H3b, and H4 are supported by these findings.

Table 5: Path Coefficients and Hypothesis Testing Results

Path	Estimate (β)	S.E.	T Statistic	P-value	LLCI (2.5%)	ULCI (97.5%)	Hypothesis
RE→PV	0.183	0.05	3.685	0.000	0.085	0.278	H1a:supported
RE→CPI	0.136	0.049	2.783	0.005	—	—	H1b:supported
TI→PV	0.25	0.048	5.181	0.000	0.153	0.344	H2a:supported
TI→CPI	0.208	0.054	3.849	0.000	—	—	H2b:supported
NO→PV	0.355	0.048	7.355	0.000	0.256	0.446	H3a:supported
NO→CPI	0.141	0.054	2.622	0.009	—	—	H3b:supported
PV→CPI	0.292	0.055	5.344	0.000	0.436	0.579	H4:supported

Significance levels: $p < 0.001$, $p < 0.01$, $p < 0.05$.

This research employed a bootstrap approach involving 5,000 samples to investigate the mediating role of perceived value among the variables highlighted in Table 6 (Liu, Zhang, & Chen, 2022; Shi et al., 2011). The analysis revealed that the indirect effects of relevance, timeliness, and novelty on consumers' purchase intentions via perceived value were statistically significant ($\beta = 0.053$, $T = 2.971$, $p = 0.003$; $\beta = 0.073$, $T = 3.877$, $p < 0.001$; $\beta = 0.104$, $T = 4.075$, $p < 0.001$). Notably, the 95% bias-corrected and accelerated confidence intervals (BCa 95% CI) for the three mediating relationships did not include zero, supporting the significance of the mediation effects. Consequently, hypotheses H5a, H5b, and H5c have been supported.

Table 6: Results of Mediating Effect Analysis

Path	Estimate (β)	S.E.	T Statistic	P-value	Hypothesis
CR→PV→CPI	0.053	0.018	2.971	0.003	H5a: supported
TI→PV→CPI	0.073	0.019	3.877	0.000	H5b: supported
NO→PV→CPI	0.104	0.025	4.075	0.000	H5c: supported

Significance levels: $p < 0.001$, $p < 0.01$, $p < 0.05$.

Predictive Relevance Analysis (PLSpredict)

As shown in the earlier section, the outcomes derived from the bias-corrected and accelerated 95% confidence interval (BCa 95% LLCI/ULCI) using the Bootstrapping technique indicated that all mediation pathways are significant. To evaluate the model's predictive validity beyond the sample, this research utilized the PLSpredict approach, implementing 10-fold cross-validation repeated 10 times (Hair et al., 2021). The results revealed that $Q^2_{predict}$ for the endogenous variables perceived value (PV) and consumer purchase intention (CPI) were positive (0.355 and 0.238), indicating that the model has predictive relevance (Hair et al., 2021). Besides that, the power of the model's prediction for PV was medium, whereas the power of CPI was near the medium level. Moreover, the values of RMSE (0.807, 0.877) and

MAE (0.649, 0.756) were relatively low, indicating that the prediction error was small and not overfitting. In summary, the proposed model demonstrates good explanatory power for the in-sample data as well as out-of-sample predictive validity and robustness.

Table 7: Results of Predictive Relevance Analysis (PLSpredict)

Endogenous construct	Q ² predict	RMSE	MAE
Perceived Value (PV)	0.355	0.807	0.649
Consumers' Purchase Intention (CPI)	0.238	0.877	0.756

Discussion

Summary of Key Findings

This research employs the SOR framework to examine purchasing intentions within the context of live streaming in e-commerce. Furthermore, this study extends a structural model which includes three personalised recommendation attributes (relevance, timeliness and novelty) into one's perceived value in influencing purchase intention. Empirical investigation and analysis end this paper.

Findings from the study indicated that these three characteristics impact consumers' purchasing intentions, with timeliness having the most significant effect. This result shows that real-time matching between recommended information and users' needs is very important. Timely information can reduce users' information processing and improve their decision-making process and confidence (Yang, 2025). And for establishing consumers' perceived value, novelty has the greatest impact. This result shows that attractively recommended information can improve consumers' overall value perception of content on the platform. Especially when the information is novel, interesting, and not expected (Yang & Qiao, 2023). The improvement of overall value perception of contents will further improve users' immediate satisfaction and enhance their long-term trust and dependence on the platform, which can further improve platform loyalty and promote consumers' purchasing behaviour (Liu, 2021).

Furthermore, novelty has the most significant indirect influence through perceived value ($\beta = 0.104, p < 0.001$). Improving users' perceptions of content's vibrancy is an important strategy for improving user retention and conversion rate. To streamline these findings, results show that personalized recommendations significantly enhance consumers' purchase intention, with perceived value mediating this relationship.

Comparison with Previous Studies

The findings in this study are consistent with prior research which suggests that timely and relevant information can reduce users' information processing and improve decision-making confidence (Yang, 2025). Similarly, the strong role of novelty in shaping perceived value also aligns with the view that novel, interesting, and unexpected information can enhance consumers' overall value perception of the platform content (Yang & Qiao, 2023). The improvement of overall value perception of contents may further improve users' immediate satisfaction and enhance their long-term trust and dependence on the platform, which can further improve platform loyalty and promote consumers' purchasing behaviour (Liu, 2021).

However, there are also some potential problems in these results. If customers are very dependent on the contents recommended by algorithms, this will reduce their motivation to investigate by themselves and affect their ability to actively analyse and criticise the information about products. This is consistent with the current controversy in digital marketing. Many scholars are concerned that personalised recommendations will cause “information cocoon” and make consumers entrapped in a state of passivity (Liu, 2024).

Management should not only focus on the accurate calibration of the algorithms but also create appealing content for live-commerce streaming websites. This study's findings indicated that content, which is pertinent, current, and original, would affect the intention to purchase. Additionally, content that was relevant, timely, and novel could enhance users' behavioral response by improving their understanding of the usefulness of the recommendations. Therefore, in addition to the algorithms that are logically correct in presenting content to users, appropriate content presentation methods that focus on the users should be used to enhance the accuracy of the recommendation system. These include contextual storytelling, real-time interaction between the live-streaming host and user, dynamic display of product features, etc. These design methods can improve users' views on the usefulness and distinctiveness of recommended content, enhance the correlation between logical value assessment and emotional experience, and further enhance customers' purchasing intent and allegiance to the e-commerce live streaming website.

Theoretical Contributions

This research provides a quantitative perspective on E-commerce live streaming by identifying relevance, timeliness, and novelty as key dimensions of personalized recommendations. Although previous studies examined information characteristics (Yang & Zhu, 2024), consumer immersion (Tian & Frank, 2024), consumption value (Zhang et al., 2024), and personalized services (Leng, 2022), few investigated their specific impact on purchasing behaviors. By applying the SOR model, this study confirms perceived value as a mediating factor. This clarifies the psychological dynamics behind purchase decisions and establishes an empirical foundation for understanding how consumers' purchase intention is formed (Lu & Chen, 2021).

Practical Implications

In e-commerce live streaming, enhancing the relevance, timeliness, and novelty of recommendations can increase perceived value and strengthen consumers' purchase intention. To achieve this, enterprises should analyze browsing habits to align content with actual user needs (Wang et al., 2021). Platforms must also capture real-time signals like comments to update user profiles promptly (Liu, 2024), while appropriately introducing differentiated products to stimulate curiosity. Ultimately, managers should shift from strict technical algorithms to a psychological perception strategy. Utilizing concise language and contextual narratives helps users connect emotionally with recommendations, thereby establishing a win-win business ecosystem (Liu, 2021).

Conclusion

This study concludes that personalized recommendations significantly enhance consumers' purchase intention, with perceived value mediating this relationship. Consequently, enhancing the relevance, timeliness, and novelty of recommendations can increase perceived value and strengthen purchase intention. By applying the SOR model to E-commerce live streaming, this research provides concrete theoretical and practical insights for digital marketing.

However, certain limitations remain. First, cross-sectional design restricts our ability to observe how consumer responses evolve over time. Second, because most respondents were active E-commerce live streaming users, the findings may have limited applicability to broader populations. Finally, this study did not differentiate between specific product categories or recommendation formats. Future research should use more diverse samples, explore additional variables such as trust or satisfaction, and compare different product types to further validate these findings.

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