A study on the mechanism of live streamer's behavior characteristics affecting consumers' impulsive buying: The role of perceived value and social identity

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ABSTRACT

With the development of live-streaming e-commerce, consumer needs have expanded beyond pure consumption to include emotional fulfillment, group belonging, and value recognition. Streamers have gathered fan communities with similar preferences through their distinctive behaviors and language, providing a sense of recognition or belonging for consumers, which in turn influences their perceived experience and leads to impulsive purchasing behavior. Based on the mechanisms of perceived value and social recognition, this study constructs and validates a structural equation model of the impact of streamers' behavior on impulsive purchasing, using data collected through a questionnaire survey. The findings show that the attractiveness, professionalism, interactivity, and uniqueness of a streamer's behavior all have a positive effect on impulsive buying through consumers' perceptions of hedonic and utilitarian value. Furthermore, social recognition significantly and positively moderates the impact of perceived hedonic and utilitarian value on impulsive purchasing behavior. This study not only enriches consumer behavior theory in the field of live-streaming e-commerce but also provides practical guidance for the e-commerce live-streaming industry, helping streamers and platforms better understand consumer behavior and optimize live-streaming strategies.

1. Introduction

According to the 53rd Statistical Report on China's Internet Development, as of December 2023, the number of e-commerce live-streaming users in China reached 597 million, an increase of 82.67 million from December 2022, accounting for 54.7 % of the overall internet user base. In the realm of live-stream marketing, internet celebrities serve as both symbols of value and emotional anchors for their followers, profoundly shaping their purchase intentions (Wang & Niu, 2023). As a result, numerous brands and e-commerce platforms have placed increasing emphasis on nurturing influential live-streamers.

In the Dongfang Zhenxuan livestream, Dong Yuhui captivated a large audience of young viewers with his witty and humorous personality, as well as his ability to use vivid, imagery-rich language in his sales pitches (Song & Mo, 2024). This not only significantly boosted sales for Dongfang Zhenxuan but also garnered him a substantial following. As he famously said, "If the peak cannot be maintained, we will retrace our steps." Similarly, during a live-stream event for the established domestic brand Vigor 28, three streamers—affectionately referred to as

'uncles'—used simple yet sincere interactions to engage consumers, fostering an emotional and value-driven connection with the brand, which led to 5 million yuan in sales within a single night (Li & Yang, 2024). Likewise, Lei Jun, the founder of Xiaomi, engaged consumers with his warm, approachable manner, fostering a sense of sincerity and recognition that resulted in a net increase of nearly 4.75 million followers on Douyin within a month, which positively impacted Xiaomi's brand image and consumer engagement (Zhao, 2024). Numerous studies have shown that a sense of belonging is a key factor in the emotional connection between consumers and online streamers, and it plays an important role in shaping consumers' purchase intentions. In live-streaming sessions, streamers attract fan groups with shared interests through their speaking style and behaviors, enabling consumers to feel recognized or to develop a sense of belonging. This emotional connection, in turn, influences their perceived experience and drives impulsive purchasing behavior.

Research on consumer psychology and behavior in live-streaming e-commerce extends beyond China and has become a significant area of focus in the international academic community. Current academic

research on how live-streaming influences consumer purchase intentions predominantly relies on the S-O-R model, categorizing streamer characteristics as the "stimuli", perceived value and social presence as the "organism," and consumer purchase intention as the "response." As live-streaming continues to evolve, consumer demand has shifted from pure consumption to more nuanced social constructs such as emotional fulfillment, group belonging, and value identification (Zhou & Li, 2023). While there is currently limited research exploring the impact of live-streaming e-commerce on consumers' impulsive buying behavior from a social identity perspective, this study aims to address this gap. Using the S-O-R model as the primary framework, with the theory of perceived value (encompassing both perceived utilitarian value and perceived hedonic value) as mediators, this research systematically reveals the influence mechanism of the streamer 's communicative traits and behavior—namely attractiveness, professionalism, interactivity, and uniqueness—on consumers' impulsive buying behavior. Furthermore, social identity theory is integrated as a moderating variable to examine how consumers' sense of social identity influences the relationship between the streamer's behavior and perceived value, thereby extending the theoretical boundaries. By integrating multiple theoretical perspectives, this study provides a comprehensive analysis of the complex interactions among variables in the live-streaming context, addressing the limitations of a single theoretical framework and enhancing the understanding of consumer behavior. The specific objectives of this study are as follows:

(1)To investigate whether the streamer's communicative traits and behavior, consumers' perceived value, and social identity influence consumers' impulsive buying behavior.

(2)To examine and analyze how these factors affect consumers' impulsive buying intention.

2. Literature review

2.1. Perceived value

The study of perceived value began in the 1990s, and the academic community currently holds diverse interpretations of this concept. Different scholars have emphasized varying aspects in their research. For instance, Grewal et al. (1998), Wood and Scheer (1996), and Dong et al. (1999) have primarily focused on perceived benefits, while Woodruff (1997) and Zhang and Fan (2005) have revealed that consumers assess perceived value based on three levels: consumption context, expectations of service or product, and the outcomes of use.

Due to these differing research emphases, scholars have segmented perceived value into various dimensions. In the context of studying how live-streaming influences consumer purchase intentions, perceived value is often divided into multiple dimensions, including perceived trust, perceived risk, perceived usefulness, perceived utilitarian value, and perceived hedonic value. Drawing on existing research and the mechanisms through which live-stream behaviors impact impulsive consumer purchases, this paper categorizes perceived value into two dimensions: hedonic value and utilitarian value.

Hedonic value refers to the joy and convenience consumers experience during the online shopping process (To et al., 2007). In live-stream sessions, streamers leverage their unique appeal and the interactive social enjoyment of the platform to evoke feelings of pleasure in consumers, enhancing their hedonic experience. Utilitarian value, on the other hand, pertains to the effective information that helps consumers make informed decisions, thereby improving shopping efficiency (Pöyry et al., 2013). During live-streaming, streamers reduce consumers' search and decision-making costs by precisely conveying relevant information and offering accessible, effective content. Terry's research indicates that both perceived hedonic value and utilitarian value influence purchasing decisions (Kim & Eastin, 2011). Furthermore, other scholars have found that perceived value, acting as a mediating variable, significantly impacts consumer purchase intentions. Building on these previous studies,

this paper also considers perceived utilitarian and hedonic value as mediators to explore how streamer traits further affect impulsive consumer purchases through the lens of perceived value.

2.2. Social identity

Ellemers articulated the theory of social identity, highlighting its three core dimensions: cognition, emotion, and evaluation. Cognition refers to an individual's self-positioning within a social group; evaluation pertains to the positive or negative judgments of one's personal identity and the group to which they belong; and emotion involves the pursuit of belongingness and the desire to establish intimate relationships (Ellemers et al., 1999). Both domestic and international research indicates that when consumers' sense of social identity is strongly established, their level of engagement and behavioral intentions are significantly influenced (Song et al., 2024). In this study, social identity refers to the attitude formed toward the streamers and the live-streaming context after consumers' individual needs are sufficiently met. This attitude encompasses three dimensions: cognition, emotion, and evaluation. In the context of live-streaming, consumers spontaneously form a collective, with the streamer serving as the representative of this group. Consequently, the streamer's prominence, the familiarity consumers have with the streamer, and the homogeneity of the live-stream participants all contribute to shaping consumers' social identity (Ashforth & Mael, 1989).

When consumers perceive that their self-image aligns with that of the streamer, they are more likely to experience a sense of identification with the streamer, which, in turn, significantly influences their attitudes toward the brands and products endorsed by the streamer (Cao & Chen, 2012). In live-stream shopping, consumers gather around the streamer out of affection, inherently fostering a sense of identification with both the streamer and the audience. Within the simulated environment created by the social presence of the live-stream, consumers engage in extended interactions with both the streamer and other users, deriving value and emotional satisfaction from these exchanges. This, in turn, fosters a stronger sense of belonging and identification with the streamer and the live-stream community.

In the process by which streamer behaviors affect impulsive purchasing, consumers who possess a strong sense of social identity are more inclined to interact actively with the streamer and extend this sense of identification to the endorsed products. Therefore, this study regards social identity as a moderating variable, proposing that heightened social identification will enhance consumers' perceived hedonic and utilitarian value, ultimately influencing impulsive purchasing behavior.

2.3. Stimulus-organism-response (S-O-R) theory

The S-O-R model evolved from the behaviorist S-R model, proposing that consumers develop motivations through physiological factors and external environmental stimuli, which subsequently drive purchasing decisions.

In 1974, Mehrabian proposed the Stimulus-Organism-Response (S-O-R) model. This framework considers environmental shopping factors as antecedent "stimuli," consumers' psychological motivations as the "organism," and behavioral states as "responses" (Mehrabian & Russell, 1974). With the emergence of internet platforms and mobile apps, the S-O-R model has been widely adopted to study consumer behavior in virtual environments. Hua employed this model to investigate how third-party comments influence impulsive purchase intentions in online settings (Hua, 2005). Meanwhile, some scholars have conceptualized cognitive social presence and emotional social presence as stimuli, with perceived usefulness and perceived trust as organismic mediators when investigating consumers' purchase intentions in live-streaming commerce platforms (Zhou et al., 2021).

Building on these foundations, this study constructs a model

examining how live-streamer's behavior characteristics influence irrational consumption. We position live-streamers' behavior characteristics as stimuli, perceived value as the organismic mediator, and impulsive purchasing as the response, while introducing social identity as a moderating variable.

3. Research model and hypothesis development

3.1. Characteristics of streamer behavior and perceived value

Streamer attractiveness refers to the ability of a streamer to captivate consumers on live-streaming platforms or social media through personal charisma and verbal dexterity. When a streamer's language exhibits a high degree of appeal, their charm draws the attention of consumers, influencing their emotions and inducing irrational thinking, thereby obscuring the consumers' true understanding of product needs (JIANG et al., 2023). As the streamer's attractiveness increases, consumers are likely to experience heightened perceived hedonic value while watching the live stream, concurrently reducing their perception of risk associated with the streamer and enhancing their perceived utilitarian value of the product (Liu et al., 2020). Based on the above research, this paper proposes the following hypothesis:

H1a. The attractiveness of the streamer has a positive effect on consumers' perceived hedonic value.

H1b. The attractiveness of the streamer positively influences consumers' perceived utilitarian value.

Streamer expertise refers to the depth of the streamer's knowledge about the product, as well as the accumulated experience gained from long-term usage and presentation of the product (Meng et al., 2020). In live-streaming, consumers primarily rely on the streamer's professional acumen to gain product insights, and a high level of expertise in the streamer's language reduces consumers' search and time costs, thereby enhancing their perceived utilitarian value. Moreover, consumers tend to develop a strong sense of identification and subjective reliance on expert streamers, allowing them to shop with greater confidence, ease, and pleasure compared to traditional shopping methods, ultimately increasing their perceived hedonic value. Based on the above research, the following hypotheses are proposed:

H2a. Streamer expertise positively influences consumers' perceived hedonic value.

H2b. : Streamer expertise positively influences consumers' perceived utilitarian value.

Streamer interactivity refers to the exchange of information between consumers and the streamer through watching, commenting, and behavioral feedback, which fosters emotional connections (Li, Feng, & Zhao, 2024). During live-streaming, consumers, while interacting with the streamer and other members of the community, may temporarily disengage from reality, forgetting the concerns of their real environment, thereby experiencing a sense of pleasure. High-frequency interactions between the streamer and consumers in the live-streaming room enhance consumer satisfaction by influencing perceived utilitarian value, which in turn stimulates impulsive purchase intentions in a short period (Lin, 2021). Based on the above research, the following hypotheses are proposed:

H3a. Streamer interactivity positively influences consumers' perceived hedonic value.

H3b. Streamer interactivity positively influences consumers' perceived utilitarian value.

Streamer uniqueness refers to the distinctive traits or personalities that set the streamer apart on live-streaming platforms or social media. In live-stream commerce, streamers with different characteristics, when

paired with different products, generate varying perceived values, influencing consumers' purchasing intentions and behavior (Liu et al., 2020). By displaying unique behaviors, streamers provide consumers with a novel sense of pleasure during the live-stream, thereby satisfying the perceived hedonic value of consumers within the same fan community. Additionally, the streamer's distinctive behavior may be trusted and preferred by a specific consumer group, thereby reducing their perceived risk of the product, enhancing its perceived utilitarian value, and further driving impulsive purchasing behavior. Based on the above research, the following hypotheses are proposed:

H4a. Streamer uniqueness positively influences consumers' perceived hedonic value.

H4b. Streamer uniqueness positively influences consumers' perceived utilitarian value.

3.2. Perceived value and impulsive buying

Perceived hedonic value refers to the enjoyment, comfort, and pleasure consumers experience during the product purchasing process. Impulsive buying intention is defined as a sudden and strong urge to purchase a product immediately (Kathuria & Bakshi, 2024), which is closely related to perceived value in the decision-making process (Sun et al., 2023). In the context of live-streaming e-commerce, streamers often utilize their unique personalities, high-quality content, engaging interactions, and entertaining segments to enhance consumer participation and enjoyment, thereby amplifying their perceived hedonic value. When consumers experience emotions such as joy, excitement, and satisfaction while watching live-streams, they are more likely to develop a stronger intention to engage in impulsive purchases (Arruda Filho & Oliveira, 2023). Based on the above research, the following hypotheses are proposed:

H5. Consumers' perceived hedonic value positively influences their impulsive buying intention.

H6. Perceived hedonic value mediates the relationship between streamer behavior and consumers' impulsive buying intention.

Perceived utilitarian value pertains to consumers' evaluation of the usefulness and benefits of the product they intend to purchase (Tan & Li, 2024). Consumers often rationally assess whether a product or service satisfies certain criteria such as cost-effectiveness or time-saving, ultimately completing the purchase task (Chen et al., 2022). Compared to traditional e-commerce platforms, streamers in live-streaming scenarios build more "intimate" relationships with consumers, fostering greater trust and emotional identification. Consumers often link their identification with the streamer to the product being promoted, thereby enhancing their perceived utilitarian value (Liu, 2023). Furthermore, during live-streams, streamers emphasize the product's cost-effectiveness, scarcity, and other features, further strengthening consumers' perceived utilitarian value, which in turn drives impulsive buying behavior. Based on the above research, the following hypotheses are proposed:

H7. Consumers' perceived utilitarian value positively influences their impulsive buying intention.

H8. Perceived utilitarian value mediates the relationship between streamer behavior and consumers' impulsive buying intention.

3.3. The moderating role of social identity

Social identity theory emphasizes individuals' perceptions of their integration within a group, suggesting that individuals form a sense of closeness with the group by subjectively comparing their own characteristics to those of the group (Sokolova & Kefi, 2020). In this study, consumers' social identity is reflected in their identification with the

live-streaming streamer and the broader community, arising from the streamer's unique appeal, real-time interaction, and resonance with the live-stream's cultural atmosphere, all of which foster a strong sense of belonging and identification. Consumers often congregate in live-streaming rooms based on their recognition of the streamer and the community, and research has shown that consumers' impulsive buying behavior increases as the popularity of the live-streaming room rises (Li, Chen, & Zhu, 2024). When consumers possess a high level of social identification with the streamer, they tend to transfer this sense of identification to the product, thereby increasing trust in the product, reducing their search and time costs, and enhancing their perceived utilitarian value, ultimately leading to impulsive buying intentions. Additionally, while watching a live-stream hosted by a streamer they identify with, consumers experience emotions similar to those associated with fan culture, gaining psychological pleasure and heightened perceived hedonic value, which further strengthens their impulsive buying intentions. Based on the above research, the following hypotheses are proposed (Fig. 1):

H9a. Consumers' social identity moderates the relationship between perceived hedonic value and impulsive buying behavior.

H9b. Consumers' social identity moderates the relationship between perceived utilitarian value and impulsive buying behavior.

4. Research design

4.1. Research sample and data collection

Prior to the formal questionnaire distribution, the authors engaged in an immersive observation of various streamers on live-streaming platforms such as Douyin and Kuaishou. Drawing upon measurement scales from multiple scholars, the authors developed the initial questionnaire items. Each variable was measured using a 5-point Likert scale, ranging from "strongly disagree" to "strongly agree."

To ensure the reliability and validity of the questionnaire, the authors conducted multiple pre-tests and revisions before its official distribution. Initially, 20 respondents were selected for a preliminary test, and adjustments were made based on their feedback. Subsequently, another group of 40 respondents was chosen for an in-depth test, leading to further revisions, ensuring that each item accurately reflected the research questions. The final questionnaire, in addition to gathering basic demographic information, included eight measured dimensions: attractiveness, expertise, interactivity, uniqueness, social identity,

perceived hedonic value, perceived utilitarian value, and impulsive buying. These items were designed based on existing research findings and theoretical frameworks (see Table 1), thereby ensuring the study's reliability and validity.

This study focuses on consumers who have engaged in impulsive buying while watching live streams, using a questionnaire survey to collect data. The data was gathered via the widely used and reputable Chinese online platform, Wenjuanxing, between January and June 2024. To enhance participation willingness among the target population and encourage diligent questionnaire completion, the survey emphasized anonymity, while providing assurance of modest monetary compensation upon successful completion of validity checks. A total of 464 questionnaires were received, and after excluding those with excessively long completion times or inconsistent answers, 404 valid responses were obtained, resulting in an effective response rate of 87.1 %. Descriptive statistics of the sample are presented in Table 2.

4.2. Sample distribution

In terms of gender, the proportion of male and female respondents is relatively balanced, indicating a reasonable sample distribution. Regarding age, individuals aged 18 to 40 make up 63.3 % of the total sample, aligning closely with the age distribution of live-stream viewers. The majority of respondents are corporate employees, with a monthly income exceeding 3000 yuan. This suggests that the participants are predominantly young, more inclined to embrace live-stream shopping, and more likely to have engaged in impulsive purchases within live-streaming scenarios.

Table 1
Measurement variables and their sources.

Variables	References
Attractiveness	Li, Chen, & Zhu, 2024
Expertise	
Interactivity	
Uniqueness	Han & Xu, 2020
Social identity	Cao & Chen, 2012
Perceived hedonic value	Bai et al., 2024
Perceived utilitarian value	
Impulsive buying	Ma et al., 2023
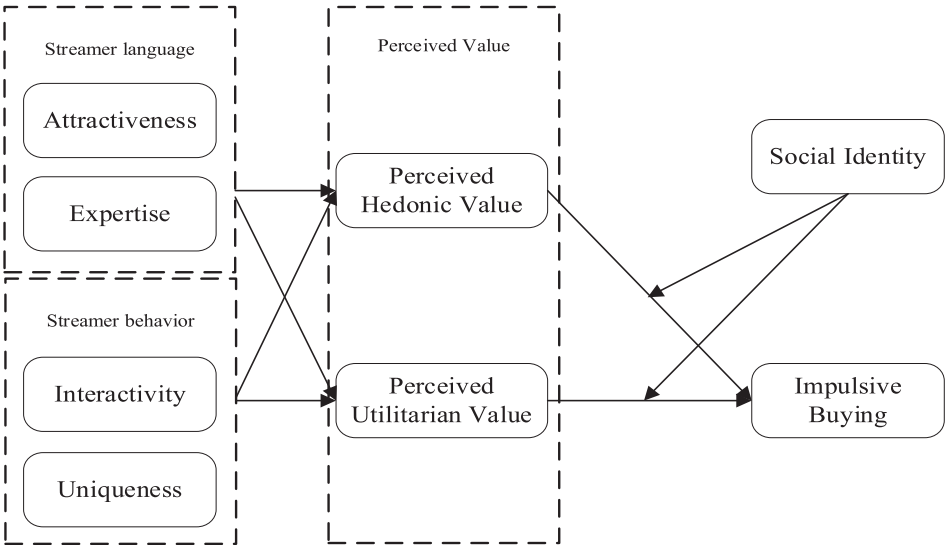
Fig. 1. Research model.

Table 2
Sample distribution.

Variables	Options	Frequency	Percentage
Gender	Male	209	51.7 %
	Female	195	48.3 %
Age	Under 18 years	40	0.10 %
	18–30 years	146	36.1 %
	31–40 years	110	27.2 %
	41–50 years	81	20.0 %
	Above 50 years	27	6.7 %
Monthly income	1000 yuan or below	33	8.2 %
	1001–3000 yuan	52	12.9 %
	3001–5000 yuan	118	29.2 %
	5001–10,000 yuan	140	34.6 %
	10,001 yuan and above	61	15.1 %
Occupation	Student	57	14.1 %
	Corporate employee	183	45.3 %
	Government or public sector employee	107	26.5 %
	Self-employed	39	9.7 %
	Others	18	4.4 %
Viewing frequency	Daily viewer	236	58.4 %
	Frequent viewer	126	31.2 %
	Occasional viewer	42	10.4 %

5. Data analyses and results

5.1. Reliability and validity testing

This study utilized SPSS 23.0 and Mplus software to analyze Cronbach's α coefficients, standardized factor loadings, average variance extracted (AVE), and composite reliability (CR). Exploratory factor analysis (EFA) was conducted to assess the suitability of the data for confirmatory factor analysis (CFA). By identifying the underlying factor structure, the reasonableness of the factor loadings was ensured, and the compatibility of the data with the hypothesized model was validated, setting the groundwork for further confirmatory analysis. The specific results are shown in Table 3. The Cronbach's α values for attractiveness, expertise, interactivity, uniqueness, social identity, perceived hedonic value, perceived utilitarian value, and impulsive buying were 0.850, 0.852, 0.820, 0.818, 0.819, 0.875, 0.853, and 0.802, respectively, all exceeding the threshold of 0.7, indicating good internal consistency of the scales.

Furthermore, an analysis of the standardized factor loadings for each dimension was performed, with all values exceeding 0.7, suggesting a high model fit. The composite reliability (CR) for each variable was above 0.7, and the average variance extracted (AVE) values were all above 0.5, indicating that the scales possess good composite reliability and convergent validity.

After conducting exploratory factor analysis, the obtained KMO value was 0.924, and the Bartlett's test result was significant. Subsequently, confirmatory factor analysis was performed using Mplus software, with detailed results presented in Table 4. The fit indices of the model in this study were all within acceptable ranges, indicating good construct validity.

As shown in Table 5, there are significant correlations among the variables, and the correlation coefficients between these variables are all less than the square root of the AVE values on the diagonal. This indicates that the model possesses good discriminant validity.

5.2. Common method Bias testing

As data for all variables in this study were collected through self-reported measures, potential common method bias could compromise

Table 4
Model fit indices.

Model	χ^2/df	TLI	CFI	RMSEA	SRMR
Test results	1.3	0.979	0.982	0.027	0.029
Fit criteria	<3	>0.9	>0.9	<0.08	<0.08

Table 3
Reliability and validity testing.

Dimension	Item	Unstandardized coefficient	Standard error	Z-value	P	Standardized coefficient	Cronbach's α	CR	AVE
Attractiveness	1	1.000	–	–	–	0.783	0.850	0.851	0.587
	2	0.971	0.065	14.875	***	0.753			
	3	1.008	0.067	15.042	***	0.752			
	4	1.018	0.066	15.454	***	0.777			
Expertise	1	1.000	–	–	–	0.782	0.852	0.852	0.590
	2	0.936	0.063	14.883	***	0.743			
	3	1.012	0.066	15.454	***	0.779			
	4	0.966	0.063	15.335	***	0.767			
Interactivity	1	1.000	–	–	–	0.792	0.820	0.821	0.605
	2	0.927	0.066	14.054	***	0.733			
	3	1.043	0.068	15.338	***	0.807			
Uniqueness	1	1.000	–	–	–	0.770	0.818	0.819	0.602
	2	0.913	0.065	13.996	***	0.741			
	3	1.035	0.069	14.987	***	0.814			
Social identity	1	1.000	–	–	–	0.779	0.819	0.819	0.601
	2	0.985	0.067	14.612	***	0.781			
	3	0.969	0.068	14.314	***	0.765			
Perceived hedonic value	1	1.000	–	–	–	0.818	0.875	0.876	0.638
	2	0.916	0.055	16.621	***	0.769			
	3	0.985	0.055	17.923	***	0.814			
	4	0.927	0.053	17.334	***	0.793			
Perceived utilitarian value	1	1.000	–	–	–	0.780	0.853	0.853	0.591
	2	0.961	0.063	15.214	***	0.764			
	3	0.973	0.063	15.467	***	0.774			
	4	0.956	0.063	15.128	***	0.757			
Impulsive buying	1	1.000	–	–	–	0.781	0.802	0.803	0.576
	2	0.953	0.073	13.136	***	0.742			
	3	0.950	0.069	13.832	***	0.753			

***$P<0.001$.

**$P<0.01$.

*$P<0.05$.

Table 5
Discriminant validity.

	Attractiveness	Expertise	Interactivity	Uniqueness	Social identity	Perceived hedonic value	Perceived utilitarian value	Impulsive buying
Attractiveness	**0.766**							
Expertise	0.414**	**0.768**						
Interactivity	0.370**	0.382**	**0.778**					
Uniqueness	0.426**	0.379**	0.458**	**0.776**				
Social Identity	0.403**	0.412**	0.404**	0.415**	**0.775**			
Perceived Hedonic Value	0.447**	0.465**	0.445**	0.472**	0.416**	**0.799**		
Perceived Utilitarian Value	0.400**	0.419**	0.395**	0.429**	0.410**	0.425**	**0.769**	
Impulsive Buying	0.332**	0.422**	0.282**	0.375**	0.352**	0.377**	0.383**	**0.759**

Note: The values on the diagonal represent the square root of the average variance extracted (AVE), while the values below the diagonal are correlation coefficients, indicating significance at the $P < 0.01$ level.
The bolded value is the square root of the average variance extracted value.

validity. To address this, Harman's single-factor test was conducted using all original items. Exploratory factor analysis revealed that the first extracted factor accounted for 33.7 % of the variance, below the 40 % threshold recommended by scholars. These results indicate no significant common method variance concerns in this research.

5.3. Path hypothesis testing

This study employed Mplus software to construct a structural equation model, with attractiveness, expertise, interactivity, and uniqueness as independent variables, perceived hedonic value and perceived utilitarian value as mediating variables, and impulsive buying as the dependent variable. Analysis of the path coefficients, as shown in Table 6, indicates that all proposed hypotheses are supported.

5.4. Mediation effect testing

After verifying each path hypothesis, the Bootstrap method was

Table 6
Path Hypothesis Testing.

Pathway	Coefficient	Standard Deviation	t-Value	P	Test Results
Attractiveness → perceived hedonic value	0.192	0.060	3.227	**	Accepted
Expertise → perceived hedonic value	0.261	0.057	4.561	***	Accepted
Interactivity → perceived hedonic value	0.180	0.063	2.868	**	Accepted
Uniqueness → perceived hedonic value	0.246	0.065	3.817	***	Accepted
Attractiveness → perceived utilitarian value	0.165	0.064	2.593	*	Accepted
Expertise → perceived utilitarian value	0.244	0.061	3.992	***	Accepted
Interactivity → perceived utilitarian value	0.153	0.067	2.299	*	Accepted
Uniqueness → perceived utilitarian value	0.250	0.069	3.638	***	Accepted
Perceived hedonic value → impulsive buying	0.305	0.061	5.008	***	Accepted
Perceived utilitarian value → impulsive buying	0.338	0.061	5.503	***	Accepted

*** P<0.001.
** P<0.01.
* P<0.05.

employed to test the mediation effects, with a 95 % confidence interval and 5000 bootstrap samples. As shown in Table 7, the confidence intervals do not include zero, indicating that the mediation effects for all pathways are significant.

5.5. Moderation effect testing

This study employed SPSS 23.0 software and a linear regression analysis to examine the moderating effect of social identity on the relationship between perceived hedonic value and impulsive buying. The results are presented in Table 8. First, Model 1 was constructed using perceived hedonic value and social identity as independent variables and impulsive buying as the dependent variable to verify the relationships among perceived hedonic value, social identity, and impulsive buying. Next, Model 2 was developed by adding an interaction term (perceived hedonic value × social identity) as an independent variable based on Model 1.

The results indicated that social identity moderates the relationship between perceived hedonic value and impulsive buying (β = 0.203, $p < 0.01$), enhancing the positive effect of perceived hedonic value on impulsive buying.

According to the slope graph in Fig. 2, as consumers' social identity with the streamer increases, the impact of perceived hedonic value on impulsive buying becomes more pronounced. When the streamer in the live-streaming room has low social identity, consumers with higher perceived hedonic value are more likely to engage in impulsive buying. Conversely, when the streamer has high social identity, the influence of perceived hedonic value on impulsive buying is significantly stronger than under conditions of low social identity.

In testing the moderating effect of social identity on the relationship between perceived utilitarian value and impulsive buying, the same method as outlined above was employed, with results presented in Table 9. The results indicate that social identity has a moderating effect on the relationship between perceived utilitarian value and impulsive buying (β = 0.174, $p < 0.01$), with social identity strengthening the positive impact of perceived utilitarian value on impulsive buying.

As shown in the slope graph in Fig. 3, as consumers' social identity with the streamer increases, the effect of perceived utilitarian value on impulsive buying becomes significantly stronger. Similarly, when the streamer in the live-streaming room has high social identity, the impact of perceived utilitarian value on impulsive buying is markedly greater than when social identity is low.

6. Conclusions and discussion

Based on a review of the literature and theoretical analysis, this study constructs a theoretical model to examine the influence of streamers' behavior characteristics on consumers' impulsive purchase intentions, focusing on the mechanisms through which perceived value and social

Table 7
Mediation effect testing.

Relationship testing	Point estimate	Coefficient product		Bootstrapping			
				Bias-corrected 95 %		Percentile 95 %	
		SE	Z	Lower	Upper	Lower	Upper
Attractiveness → perceived hedonic value → impulsive buying	0.060	0.024	2.470	0.020	0.116	0.017	0.111
Expertise → perceived hedonic value → impulsive buying	0.080	0.027	2.976	0.035	0.141	0.035	0.139
Interactivity → perceived hedonic value → impulsive buying	0.055	0.024	2.285	0.017	0.114	0.012	0.106
Uniqueness → perceived hedonic value → impulsive buying	0.071	0.028	2.593	0.028	0.137	0.026	0.134
Attractiveness → perceived utilitarian value → impulsive buying	0.057	0.026	2.158	0.011	0.116	0.008	0.112
Expertise → perceived utilitarian value → impulsive buying	0.083	0.029	2.883	0.037	0.152	0.033	0.146
Interactivity → perceived utilitarian value → impulsive buying	0.052	0.025	2.045	0.008	0.109	0.005	0.106
Uniqueness → perceived utilitarian value → impulsive buying	0.080	0.031	2.621	0.033	0.154	0.029	0.147

Table 8
Moderation test of social identity on perceived hedonic value.

Variable	Predictor variable: irrational behavior (Model 1)				Predictor variable: irrational behavior (Model 2)			
	β	SE	t	*P*	β	SE	t	*P*
Constant	3.337	0.044	75.418	0.000**				
Perceived hedonic value	0.262	0.047	5.626	0.000**				
Social identity	0.229	0.048	4.788	0.000**				
Interaction term: perceived hedonic value * social identity					0.203*	0.043	4.694	0.000**
R^2	0.188				0.225			
F	46.514**				39.979**			

Note.
* $p < 0.05$.
** $p < 0.01$.

Fig. 2. Moderating effect of social identity on perceived hedonic value.

identity affect this relationship. The study found that the attractiveness, professionalism, interactivity, and uniqueness of streamers behavior characteristics positively influence impulsive buying intentions through consumers' perceived utilitarian value and perceived hedonic value. Additionally, it was verified that social identity significantly positively moderates the relationship between perceived hedonic value, perceived utilitarian value, and impulsive buying intention, indicating that as consumers' social identity with the streamers increases, the impact of perceived hedonic value and perceived utilitarian value on impulsive buying intentions becomes significantly stronger.

The discussion of the results is organized around the research questions and hypotheses to evaluate whether these findings align with previous research or contribute new insights to existing studies.

In live streaming, consumers not only focus on product information but are also influenced by the language and behavior of the streamers (Li, Chen, & Zhu, 2024). When the streamer's attractiveness is high, it not only draws consumers' attention but also affects their emotions, triggering irrational thinking and distorting their true product needs (Wang et al., 2024). Furthermore, as the streamer's attractiveness increases, consumers experience greater pleasure during the live streaming process, which enhances perceived hedonic value (Li, Feng, & Zhao,
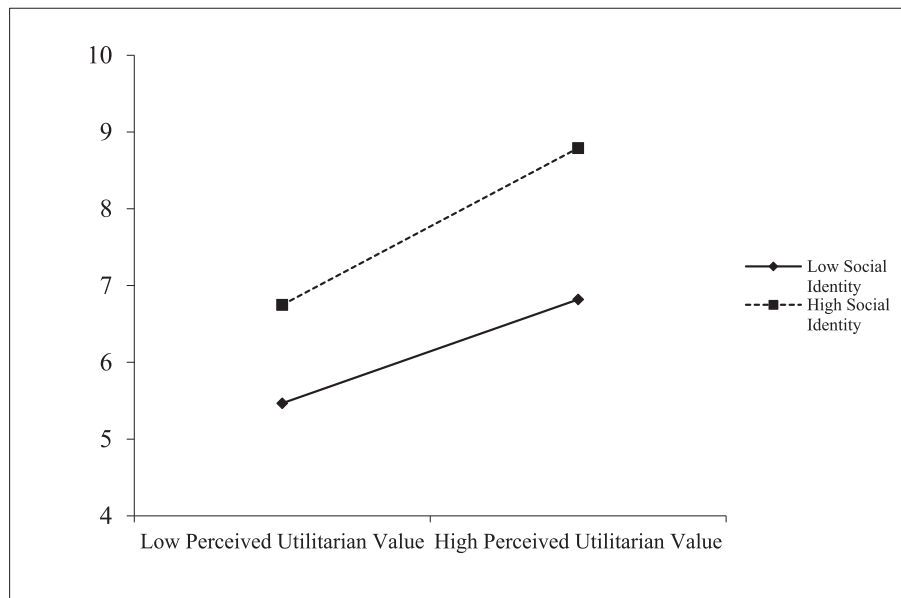
Table 9
Moderation test of social identity on perceived utilitarian value.

Variable	Predictor variable: irrational behavior (Model 1)				Predictor variable: irrational behavior (Model 2)			
	β	SE	t	*P*	β	SE	t	*P*
Constant	3.337	0.044	75.615	0.000**				
Perceived utilitarian value	0.290	0.050	5.823	0.000**				
Social identity	0.227	0.047	4.777	0.000**				
Interaction term: Perceived utilitarian value * social identity					0.174	0.046*	3.793	0.000**
R^2	0.193				0.221			
F	47.805**				37.729**			

Note.
* $p < 0.05$.
** $p < 0.01$.

Fig. 3. Moderating effect of social identity on perceived utilitarian value.

2024), reduces perceived risk, and increases perceived utilitarian value (Liu et al., 2024). In live streaming, consumers' understanding of product information depends on the streamer's professionalism. A highly professional streamers reduces the time and effort required from consumers, increasing their enjoyment, and subsequently affects their perceived utilitarian value and hedonic value. Additionally, research suggests that high-frequency interaction between the streamers and consumers boosts perceived utilitarian value, leading to impulsive buying intentions in a short period (LI, Huang, et al., 2024). In live commerce, streamers with unique styles of product pairing create varying perceived values, influencing consumer purchasing behavior (Gong et al., 2022).

Compared to traditional e-commerce platforms, streamers in live streaming can establish a more "intimate" relationship with consumers, which leads to greater emotional recognition and trust. Consumers then link their recognition of the streamers to the product, enhancing perceived utilitarian value and generating buying intentions (Bai et al., 2024). Streamers habitually use personal traits, high-quality content, engaging interactions, and entertainment elements to stimulate consumer participation and pleasure, thereby increasing perceived hedonic value. If consumers experience pleasure, excitement, and satisfaction (perceived hedonic value) while watching e-commerce live streaming, impulsive buying intentions are likely to emerge (Soomro & Habeeb, 2024).

Furthermore, social identity with the streamers plays a key role in purchasing decisions. Consumers' impulsive buying intentions increase with the streamer's popularity (Zhang et al., 2024). For consumers, high social identity with the streamers enhances trust in the product, reducing the time and cost spent on gathering product information and impacting perceived utilitarian value. When a streamer recommends products, consumers with high social identity experience a sense of pleasure similar to "idol worship," which influences the impact of perceived hedonic value on impulsive buying intention.

The research findings reveal how the streamer's behavior and speech characteristics, perceived utilitarian value, perceived enjoyment, and social identity positive influence consumers' impulsive purchase intentions.

7. Contributions and limitations

This study enhances current research on live-streaming e-commerce

by developing and validating a theoretical model that explains the factors influencing consumers' impulse buying intentions. It contributes to a deeper understanding of the mechanisms driving consumer behavior in the context of live-streaming e-commerce. This paper identifies key factors, including the streamer's linguistic attractiveness, professionalism, the interactivity and uniqueness of their behavior, perceived value, and social identity, as critical elements for increasing consumer purchase intentions. First, this study reveals how the streamer's attractiveness, professionalism, interactivity, and uniqueness positively influence impulse buying through consumers' perceived enjoyment and perceived utilitarian value. The paper also emphasizes the moderating role of social identity, highlighting that as consumers' social identification with the streamers increases, the impact of perceived enjoyment and perceived utilitarian value on impulse buying significantly strengthens. This research not only enriches the theory of consumer behavior in the live-streaming e-commerce field but also provides practical guidance for the industry, helping streamers and platforms better understand consumer behavior and optimize live-streaming strategies.

As the live-streaming e-commerce industry rapidly develops, the number of broadcasts and streamers has surged. In this competitive environment, the streamer's linguistic appeal and professionalism are crucial for standing out. Streamers must focus on building emotional connections, conveying sincerity and enthusiasm during live streams to establish trust and rapport with consumers. For MCN organizations, it is essential to enhance streamers' communication skills training, help them leverage non-verbal elements to reinforce verbal expression, improve their improvisational response abilities, and deepen their understanding of the products and relevant expertise to answer consumers' questions smoothly. Additionally, the interactivity and uniqueness of the streamer's behavior can effectively increase consumers' impulse buying intentions. Streamers should not only have strong communication skills but also present a unique personal style to attract loyal consumers.

On a perceptual level, consumers' perceived enjoyment primarily focuses on the emotional satisfaction and pleasure provided by the product or service, appealing to the affective domain. In contrast, perceived utilitarian value pertains to the product's functionality and practical utility, appealing to the rational domain. Streamers can enhance the entertainment value of live streams by incorporating elements such as music, humor, and interactive games, thereby improving consumers' entertainment experience and boosting their emotional evaluation of the product. Furthermore, during the live stream,

streamers can invite real users to share their experiences, present user feedback, and highlight the product's utility to build trust in the product's effectiveness.

The study shows that social identity positively moderates the influence of perceived enjoyment and perceived utilitarian value on consumers' impulsive buying. Streamers should strengthen their relationships with consumers by establishing personalized connections through live-stream interactions, enhancing trust and a sense of belonging. Streamers should also emphasize shared values and goals with their audience, take on social responsibilities, and increase their social identity with consumers.

However, this study has certain limitations. The research mainly focuses on the live-streaming e-commerce context and may not fully encompass all forms of online consumer behavior. Additionally, while key factors such as perceived value and social identity are considered, other variables such as personal traits and cultural backgrounds, which could also influence impulsive buying behavior, have not been included in the model. Future research can further expand and refine these aspects.

CRediT authorship contribution statement

Li Yu: Writing – review & editing, Supervision, Project administration, Methodology, Conceptualization. **Wenchen Tang:** Writing – original draft, Visualization, Validation, Methodology, Investigation, Data curation, Conceptualization. **Weiheng Gao:** Investigation, Data curation, Conceptualization.

Declaration of competing interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Data availability

Data will be made available on request.

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