

The Impact of Virtual Streamer Live Streaming on Consumers' Purchase Intention: A Perceived Value Perspective

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Abstract: This study focuses on the impact mechanism of virtual anchors on consumers' purchase intentions in the field of e-commerce live streaming. From the perspective of perceived value and based on the SOR theoretical framework, it proposes that the characteristics of virtual anchors influence purchase intentions through trust and social presence, with perceived value being introduced as a boundary condition. A total of 762 valid data were collected through questionnaires, and empirical tests were conducted using methods such as reliability analysis, validity analysis, correlation analysis, and regression analysis. The results show that the professionalism, attractiveness and interactivity of virtual anchors all have positive impacts on purchase intentions, with professionalism having the strongest impact. Trust plays a core mediating role between the characteristics of virtual anchors and purchase intentions, while the mediating effect of social presence is not established. Perceived value has a dual-path moderating effect, with functional value enhancing the promoting effect of professionalism on trust and emotional value strengthening the positive impact of interactivity on trust. Meanwhile, both have an inhibitory effect on social presence. The boundary conditions of purchase intentions are complex. The direct impacts of attractiveness and professionalism are not regulated by value orientation. Functional value only enhances purchase intentions through interactivity, while emotional value drives consumption through professionalism and attractiveness. This study provides precise theoretical coordinates for the design of virtual anchor personas, offers theoretical basis and practical guidance for businesses to use virtual anchors in live streaming, and also contributes to the relevant research in the field of e-commerce live streaming.

1. Introduction

With the rapid development of artificial intelligence and digital technology, virtual anchors have gradually emerged in e-commerce live streaming. With their 24/7 operation, low cost, strong stability and high plasticity of image, they have become one of the important forms of e-commerce live streaming. However, the mechanism by which virtual anchors influence consumers' purchasing intentions remains unclear. In the field of live-streaming e-commerce, consumers' purchasing intentions are usually influenced by both the characteristics of the live-streamer and the perceived value of the product. Factors such as the live-streamer's affinity, professionalism, and interactivity can significantly enhance the purchasing tendency. Meanwhile, consumers' perceived value of the product, including multi-dimensional values such as functionality, emotion, society, cognition, and context, also plays a crucial role in the decision-making process. These perceived values are not only influenced by the product itself, but also closely related to the information conveyed by the host, the live streaming atmosphere and the interactive experience. Virtual anchors, as an emerging form of live-streaming, offer consumers a brand-new shopping experience with their unique image and interactive methods. However, relevant research is still relatively scarce at present. Therefore, this study attempts to explore the path by which virtual anchors influence consumers' purchase intentions through two psychological mechanisms, trust and social presence, from the perspective of perceived value and based on the stimulus-organ-response (SOR) theoretical framework. It also introduces

perceived value as a key boundary condition, aiming to reveal the mechanism of role of virtual anchors in e-commerce live streaming. It provides useful references for business practice and theoretical research.

In recent years, with the widespread use of virtual anchors in e-commerce live streaming, the academic community has begun to explore in depth the mechanism of their influence on consumer behavior. Some studies have pointed out that the social characteristics of virtual anchors can significantly enhance consumers' immersion experience and perceived value, thereby improving their overall shopping experience [1]. However, some scholars believe that although virtual anchors have human-like appearance and behavior, their lack of sensory language and emotional communication still limits their influence [2]. In addition, the "avatar effect" generated by virtual anchors is believed to trigger consumers' psychological identification and sense of participation, thereby positively affecting purchase intentions [3]. In terms of specific mechanisms, virtual anchors stimulate consumers' arousal levels through a variety of persuasive factors and further influence their purchasing behavior through mediating variables [4].

On the theoretical level, the stimulus-organism-response (SOR) model provides an important analytical framework for the above research, emphasizing that external stimuli affect behavioral responses by acting on individuals' internal states (such as cognition or emotion) [5]. In the live e-commerce scenario, trust and interaction have been proven to be important psychological mechanisms that influence consumers' purchasing decisions, and anchor characteristics and live broadcast contexts jointly shape consumers' perceived experience [6]. In addition, explicit disclosure of AI identity significantly affects consumers' trust in the anchor and their purchasing behavior, indicating that human-machine identity recognition is an important factor in the study of virtual anchors [7]. It is worth noting that pseudo-social interaction and perceived value play a dual mediating role in the path of influencing consumer purchase intention, which also provides a new perspective for the study of the influence mechanism of virtual anchors [8].

In summary, the existing literature has preliminarily revealed the influence path of virtual anchors on consumer behavior from multiple dimensions such as sociality, perceived value, cognitive arousal, and trust mechanism, but the interactive relationship between trust, social presence, and perceived value still needs to be further systematically sorted out and empirically verified.

2. Model building and solving

2.1 Research hypothesis and questionnaire design

Based on the unique attributes of virtual anchors in e-commerce live streaming scenarios, this study constructed a theoretical model covering main effects, mediating effects, and moderating effects, as shown in Figure 1 below.

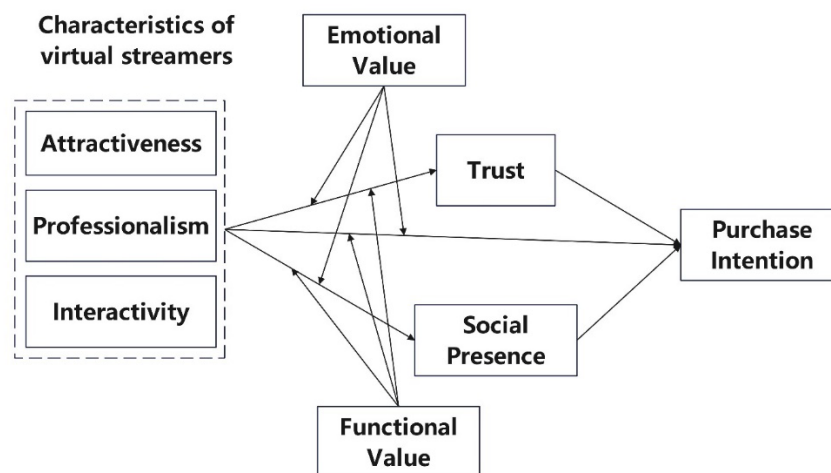


Figure 1 Research Model

First, the characteristics of virtual anchors, such as attractiveness, professionalism, and interactivity, are believed to have a significant positive impact on consumers' purchase intention (H1). On this basis, trust and social presence are introduced as mediating variables to explain how virtual anchor characteristics affect consumers' psychological perceptions and then affect purchasing behavior (H2a, H2b). In addition, considering that consumers' comprehensive evaluation of products or services will affect their decision-making process, the study further introduces perceived value as a moderating variable to explore its moderating role in the relationship between virtual anchor characteristics and purchase intention (H3a) and trust (H3b), thereby constructing a more explanatory influence path mechanism. At the same time, in order to verify the robustness of the model, the study also proposes the hypothesis of the moderating effect of perceived value on the relationship between virtual anchor characteristics and social presence (H3c). The above hypotheses together constitute the core theoretical framework of this study to explore the impact of virtual anchors on consumers' purchase intention.

The questionnaire designed in this paper is shown in Table 1.

Table 1 Questionnaire design

Dimension	Item	Statement
Attractiveness	XY1	The virtual streamer's appearance is attractive to you.
	XY2	The virtual streamer's appearance gives you a strong sense of affinity.
	XY3	The virtual streamer's appearance is highly similar to a real human.
Professionalism	ZY1	The virtual streamer's voice tone is comfortable for you.
	ZY2	The virtual streamer provides professional explanations with strong verbal expression.
	ZY3	The virtual streamer clearly explains product features and functions.
Interactivity	HD1	The virtual streamer's interactive approach feels novel and interesting.
	HD2	The virtual streamer's interactive approach is diverse and rich.
	HD3	The virtual streamer responds promptly to your interactions.
Trust	XR1	The virtual streamer is honest.
	XR2	The virtual streamer is trustworthy.
	XR3	The virtual streamer's statements are truthful.
	XR4	The virtual streamer demonstrates integrity.
	XR5	The virtual streamer acts ethically.
Social Presence	SH1	Watching the virtual streamer's livestream gives you a sense of human contact.
	SH2	You feel acknowledged while watching the livestream.
	SH3	You experience a sense of interpersonal communication.
	SH4	You perceive human warmth during the livestream.
	SH5	You feel accompanied during the livestream.
Emotional Value	QG1	The product promoted by the virtual streamer brings me joy and satisfaction.
	QG2	The product helps me relax and reduce stress.
	QG3	The product sparks my interest and curiosity.
	QG4	The product provides novel and stimulating experiences.
Functional Value	GN1	The product offers good value for money.
	GN2	The product meets my price expectations.
	GN3	The product satisfies my budgetary needs.
	GN4	The product saves me time and effort.
Purchase Intention	GM1	I am willing to purchase the product featured in the livestream.
	GM2	I am willing to spend time watching the virtual streamer's product demonstrations.
	GM3	I am willing to pay for products promoted by the virtual streamer.
	GM4	The livestream increases my purchase intention.
	GM5	I will recommend the featured products to others.

2.2 Data collection and scale analysis

This study adopted a questionnaire survey method and distributed it using the questionnaire star. After removing the questionnaires with less than 90 seconds to answer and those with no knowledge of virtual anchors, a total of 762 valid questionnaires were collected.

Table 2 Sample demographic characteristics

Variable	Category	Count	Percentage
Gender	Male	362	47.51%
	Female	400	52.49%
Age	Under 18	47	6.17%
	18-25 years	126	16.54%
	26-35 years	227	29.79%
	36-45 years	189	24.80%
	46-59 years	147	19.29%
	60+ years	26	3.41%
Livestream Viewing Frequency	≥3 times/week	94	12.34%
	1-3 times/week	204	26.77%
	2-3 times/month	234	30.71%
	Once per 6 months	118	15.49%
	Once per year	64	8.40%
	Never	48	6.30%
Monthly Income	Below ¥3,000	155	20.34%
	¥3,000-4,999	198	25.98%
	¥5,000-6,999	209	27.43%
	¥7,000-10,000	168	22.05%
	Above ¥10,000	32	4.20%

The demographic characteristics of the sample are shown in Table 2. The main factors of this study are measured in the form of scales, so testing the data quality of the measurement results is an important prerequisite to ensure the significance of subsequent analysis.

First, the internal consistency of each dimension is analyzed by the Cronbach coefficient reliability test method. In this analysis, the results of the reliability analysis are shown in Table 3. The reliability coefficients of the overall scales and each secondary dimension are all above 0.6, indicating that the scales used in this study have good internal consistency and good reliability.

Table 3 Scale Reliability Tests

Variable	Cronbach's α	Number of Items
Attractiveness	0.876	3
Interactivity	0.884	3
Professionalism	0.836	3
Virtual Streamer Traits	0.866	9
Social Presence	0.870	5
Trust	0.873	5
Emotional Value	0.869	4
Functional Value	0.830	4
Perceived Value	0.869	8
Purchase Intention	0.848	5

The validity analysis was conducted using exploratory factor analysis. When the KMO value was greater than 0.7 and closer to 1, and the Sig. value of the Bartlett sphericity test was less than 0.05, it indicated that the scale had high validity. As shown in Table 4 below, the KMO value of the virtual

anchor trait was 0.825; the Sig. value of the Bartlett sphericity test was 0.000, indicating that the scale of the virtual anchor trait variable had high validity and was suitable for factor analysis.

Table 4 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.825
Bartlett's Test of Sphericity	Approx. Chi-Square	1190.062
	df	36
	Sig.	.000

The principal component analysis method was used for extraction, and the varimax rotation method was used for factor analysis of the virtual anchor characteristics. The rotation converged after 5 iterations, and the results obtained 3 factors with eigenvalues greater than 1.

Table 5 Rotated Component Matrix

Dimension	Item	Component		
		1	2	3
Attractiveness	XY1			.815
	XY2			.854
	XY3			.833
Interactivity	HD1	.895		
	HD2	.805		
	HD3	.870		
Professionalism	ZY1		.877	
	ZY2		.763	
	ZY3		.828	
Eigenvalue		2.461	2.339	2.301
Cumulative % Variance		27.345	53.331	78.903

As shown in Table 5, the eigenvalues of these three factors are 4.611, 1.416 and 1.074, respectively, and the cumulative variance contribution rate of the three factors is 78.903%. It can be seen that the scale can explain the issues related to the characteristics of virtual anchors to a large extent.

In addition, the items corresponding to each dimension are all in the same factor, and the factor loadings of all items are greater than 0.5, indicating that the item setting is good. The virtual anchor characteristic measurement scale composed of the three dimensions of "attractiveness", "interactivity" and "professionalism" has good stability and internal consistency.

Similarly, the same method was used to conduct scale analysis on perceived value, social presence, trust, purchase intention, etc.

In summary, this study conducted a systematic factor analysis on the scales of four variables: perceived value, social presence, trust, and purchase intention. The results show that all scales have good structural validity and measurement quality. The KMO values of all variables are higher than 0.79, the Bartlett sphericity test is significant, the factor characteristic roots extracted by principal component analysis are greater than 1, the cumulative explanation rate is above 60%, and the factor loading of each item is more than 0.7, indicating that the scale structure is clear, the item setting is reasonable, and it has good convergent validity and discriminant validity. It can be seen that the overall reliability and validity of the questionnaire used in this study is high, the measurement tool is stable and reliable, and it can provide a solid data foundation for subsequent empirical analysis.

2.3 Data analysis and empirical testing

In this study, in order to ensure the reliability of the research results, we conducted a rigorous test for potential common method bias. Common method bias refers to the measurement error caused by the same source in the measurement method or data collection process, which may affect the accuracy of the relationship between variables.

Table 6 Correlation Analysis

		TZ	XR	SH	GN	QG	GM	GZ
TZ	Pearson Correlation	1	.683**	.625**	.654**	.638**	.609**	.739**
	Significance (2-tailed)		.000	.000	.000	.000	.000	.000
XR	Pearson Correlation	.683**	1	.561**	.560**	.551**	.580**	.635**
	Significance (2-tailed)	.000		.000	.000	.000	.000	.000
SH	Pearson Correlation	.625**	.561**	1	.511**	.569**	.512**	.617**
	Significance (2-tailed)	.000	.000		.000	.000	.000	.000
GN	Pearson Correlation	.654**	.560**	.511**	1	.529**	.533**	.880**
	Significance (2-tailed)	.000	.000	.000		.000	.000	.000
QG	Pearson Correlation	.638**	.551**	.569**	.529**	1	.597**	.869**
	Significance (2-tailed)	.000	.000	.000	.000		.000	.000
GM	Pearson Correlation	.609**	.580**	.512**	.533**	.597**	1	.645**
	Significance (2-tailed)	.000	.000	.000	.000	.000		.000
GZ	Pearson Correlation	.739**	.635**	.617**	.880**	.869**	.645**	1
	Significance (2-tailed)	.000	.000	.000	.000	.000	.000	

**p<0.01, *p<0.05

In order to evaluate this bias, we used the Harman single-factor test method. The results of exploratory factor analysis showed that the proportion of variance explained by the first factor was 38.717%, which was lower than 40%, indicating that there was no significant common method bias in the measurement of this study, and subsequent analysis could be carried out.

Then, this study used the Pearson analysis method to conduct correlation analysis and calculated the mean of each latent variable as its representative value, which was named virtual anchor trait TZ, trust XR, social presence SH, perceived value GZ (emotional value QG and functional value GN) and purchase intention GM.

The results of inter-variable correlation analysis are presented in Table 6. Findings indicate statistically significant correlations ($p<.01$, two-tailed) among all constructs: Virtual Streamer Traits(TZ), Trust(XR), Social Presence(SH), Perceived Value(GZ) and Purchase Intention(GM). These results align with the preliminary theoretical model.

Existing research shows that there are significant differences in the willingness to purchase products recommended by virtual anchors among subjects of different genders, ages, product types purchased, and levels of understanding of virtual anchors, and the attractiveness, professionalism, and interactivity of virtual anchors have a significant impact on the subjects' willingness to purchase. Therefore, in order to avoid the interference of these factors, this study uses gender, age, product types purchased, and level of understanding of virtual anchors as control variables, purchase intention as the dependent variable, and the three characteristics of virtual anchors as independent variables for regression analysis.

From the regression results, it can be seen that professionalism ($\beta=0.341$) has the highest influence intensity, indicating that the stronger the professional ability and professional performance of the virtual anchor, the more consumers' willingness to buy will be significantly improved, followed by attractiveness ($\beta=0.339$). Although interactivity ($\beta=0.117$) is significant, the effect is weak. Therefore, H1a, H1b and H1c are all supported.

This study uses the stepwise regression method to test the mediating effect of trust and social presence. The results show that the attractiveness, professionalism and interactivity of the anchor all have a significant positive impact on trust and social presence, and both have a significant positive effect on purchase intention. After the introduction of the mediating variable, the direct effect of the anchor's characteristics on purchase intention decreased significantly, verifying the partial mediating role of trust and social presence (H2a, H2b are established). Further analysis found that the direct effect of the anchor's interactivity on purchase intention was no longer significant after the introduction of the mediating variable, indicating that its influence is completely indirectly achieved through trust and social presence. In summary, the attractiveness and professionalism of virtual anchors can not only directly increase purchase intention, but also indirectly through trust and social presence, while interactivity mainly relies on the mediating mechanism to exert its influence.

This study uses hierarchical regression analysis to test the moderating effects of functional value

and emotional value. The results show that the two have different effects on trust, social presence and purchase intention. At the level of trust, functional value strengthens professionalism, and emotional value enhances the positive effect of interactivity; at the level of social presence, functional value has a positive regulation on attractiveness, but weakens the influence of professionalism, while emotional value positively regulates professionalism and negatively regulates interactivity; at the level of purchase intention, emotional value enhances attractiveness and professionalism, and functional value enhances the influence of interactivity. Due to the inconsistent direction of the moderating effect, H3a, H3b, and H3c were not supported.

This study tested the hypothesis through Bootstrapping, setting 5000 sampling times and 95% bias-corrected confidence interval. The results are shown in Table 7.

As can be seen from Table 7, the direct effect values of attractiveness, professionalism and interactivity on purchase intention are 0.214, 0.251 and 0.081 respectively, which shows that the three characteristics of the anchor's attractiveness, professionalism and interactivity have significant direct effects on purchase intention. Among them, the indirect effects of trust in the path of attractiveness, professionalism and interactivity on purchase intention are 0.195, 0.160 and 0.215 respectively, and the confidence intervals do not contain 0, indicating that trust plays a significant mediating role in the relationship between the above three characteristics and purchase intention. At the same time, social presence also plays a significant mediating role in the relationship between attractiveness, professionalism and interactivity and purchase intention, with effect values of 0.122, 0.101 and 0.143 respectively.

Table 7 Direct and Mediating Effect Test

Effect type	Path	Effect value	Standard error	t	p	Lower limit	Upper limit
Direct Effect	Attractiveness→Purchase intention	0.214	0.038	5.672	0.000	0.140	0.288
	Professionalism→Purchase intention	0.251	0.033	7.645	0.000	0.186	0.315
	Interactivity→Purchase intention	0.081	0.037	2.185	0.029	0.008	0.153
Mediating Effect	Attractiveness→Trust→Purchase intention	0.195	0.029			0.139	0.253
	Professionalism→Trust→Purchase intention	0.160	0.025			0.112	0.212
	Interactivity→Trust→Purchase intention	0.215	0.029			0.159	0.273
	Attractiveness→Social presence→Purchase intention	0.122	0.026			0.072	0.174
	Professionalism→Social presence→Purchase intention	0.101	0.022			0.259	0.143
	Interactivity→Social presence→Purchase intention	0.143	0.026			0.089	0.193

Consumers' perceived value types play a significant moderating role in the process of virtual anchor characteristics affecting purchase intention, and functional value and emotional value show differentiation in the path mechanism. Specifically, functional value significantly strengthens the positive effects of attractiveness, professionalism and interactivity on trust, social presence and purchase intention, especially in the mediating path of "interactivity→trust→purchase intention", indicating that when consumers pay more attention to the practicality of the product, the professional performance and interactive characteristics of virtual anchors are more likely to inspire trust and convert it into purchase intention. In contrast, emotional value mainly regulates the effects of attractiveness and professionalism on social presence and trust, and significantly enhances the conduction effect of "attractiveness/interactivity→social presence→purchase intention", indicating that emotional-oriented users are more likely to generate consumption motivation in the pleasant experience and social presence brought by virtual anchors; but in the path of "interactivity→social presence", the moderating effect of emotional value is not significant. In addition, in the low emotional value group, the direct effect of interactivity on purchase intention tends to weaken. Overall, functional value mainly works through the cognitive trust mechanism, while emotional value

enhances the impact of virtual anchors on consumers' purchasing intention more through the emotional connection mechanism.

In summary, consumers' emotional value mainly enhances the mediating path of interactivity affecting purchase intention through social presence, while functional value mainly enhances the mediating path of interactivity affecting purchase intention through trust. For the attractiveness and professional characteristics of anchors, as well as most other mediating paths, the strength of the mediating effect is not significantly moderated by the level of consumer value.

3. Conclusion

Based on the SOR theory, this study systematically explores the mechanism by which virtual anchor characteristics affect consumers' purchase intention. The results show that professionalism has the most significant direct impact on purchase intention, followed by attractiveness, while interactivity plays an indirect role mainly through trust. Trust plays a key mediating role between the three types of anchor characteristics and purchase intention, while the mediating effect of social presence is not supported, indicating that the anthropomorphic characteristics of virtual anchors are still difficult to stimulate real interpersonal interaction perception. Perceived value shows a dual-path effect in the mediation mechanism: functional value strengthens the role of professionalism on trust, and emotional value enhances the trust brought by interactivity, but both inhibit the impact of virtual anchors on social presence, reflecting the differential impact of different value orientations on psychological mechanisms. In theory, this study enriches the application of SOR theory in the virtual anchor scenario, proposes the core mediating role of trust and the mediation path of perceived value, and reveals the differentiated influence mechanism of anchor characteristics. In practice, it provides theoretical support and empirical reference for the personality design, content operation and consumer relationship management of virtual anchors. Although this study has achieved certain results, it still has limitations such as a single sample and limited variables. In the future, the breadth and external validity of the research can be further improved through multi-method collection and cross-context expansion.

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