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RESEARCH ARTICLE

Exploring How the Application of Live-Streaming in E-Commerce Influences Consumers' Trust-Building

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ABSTRACT The application of live-streaming in e-commerce has garnered substantial attention in recent years, transforming marketing tactics and customer involvement. Grounded on signal theory and presence theory, this study aims to uncover the mechanism of trust-building in live-streaming commerce that concentrates primarily on live-streaming commerce features. This study, which was exploratory in nature, gathered a dataset of 339 responses from China through an online survey. This dataset was then subjected to exploratory factor analysis, confirmatory factor analysis, and covariance-based structural equation modeling to identify and elucidate the relationship between the independent and dependent variables. The study found that the consumer's sense of presence and authenticity in live streaming significantly impacts the consumer's trust. Visual appeal and interactivity influence the consumer's presence and authenticity; however, only interactivity can directly influence consumer trust; visual appeal can only influence consumer trust indirectly through presence and authenticity. This study expands the existing body of research regarding consumer trust in live-streaming commerce. Additionally, this study provides evidence that the consumer's perception of presence and authenticity play mediating roles in the relationship between live-streaming commerce features and consumer trust.

INDEX TERMS Authenticity, interactivity, live streaming, presence, trust, visual appeal.

I. INTRODUCTION

Live-streaming commerce, a new type of social commerce, has garnered substantial attention in recent years, transforming marketing tactics and customer involvement. This inventive method incorporates real-time interactions between merchants, streamers, community members, and customers in live chat rooms, creating an interactive environment for product promotion [1]. The rise of live-streaming commerce has been attributed to its capacity to amplify marketing effectiveness [2]. The emergence of live-streaming commerce has transformed the e-commerce and marketing landscapes, providing a dynamic and interactive platform to promote products and engage consumers.

In particular, live-streaming commerce offers consumers a more interactive and engaging shopping experience, with

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enhanced dimensions of information compared to traditional e-commerce. The platform creates an entirely new shopping experience for users by providing unparalleled real-time and authentic features. These features differentiate live-streaming commerce from traditional e-commerce and enhance consumer engagement and interactivity [3], [4]. While interactivity and visualization are recognized as essential features of live-streaming e-commerce, their specific roles in building trust are not yet fully understood. Further research is needed to elucidate how these elements contribute to trust formation. According to signaling theory and presence theory, these features can potentially affect consumers' trust.

In the competitive e-commerce landscape, trust becomes a differentiating factor. Businesses prioritizing trust-building gain a competitive edge, attracting and retaining loyal customers [5]. Therefore, trust is a crucial component that considerably influences consumer behavior and decision-making

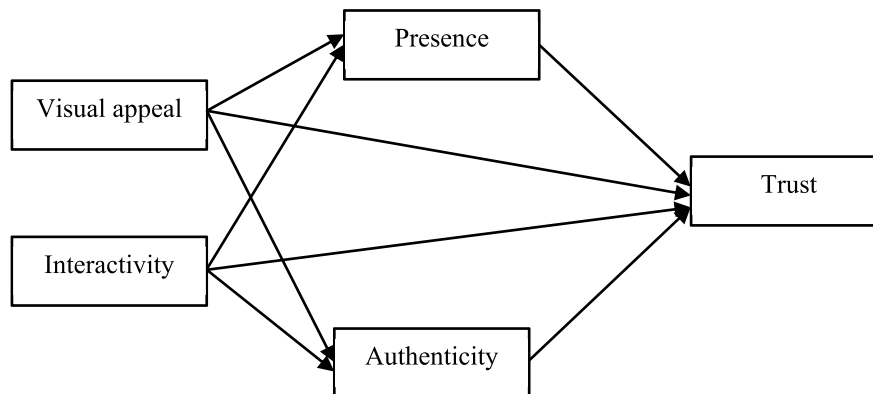


FIGURE 1. Conceptual framework.

in e-commerce. Literature underscores the significance of trust and its effect on consumer adoption of new technology [6], purchasing decision-making in social commerce [7], and personalized online shopping experiences [8]. Furthermore, Liu and Wang [9] have noted that the dearth of trust among consumers poses a hindrance to the advancement of e-commerce technologies.

Despite the growing studies of trust in e-commerce, there is a significant gap in understanding trust-building dynamics in live-streaming commerce. Previous studies have indicated the influence of consumer trust on participation in live-streaming commerce [1], [10]. Trust mediates the impact of tourism e-commerce live-streaming features on consumer purchase intention [11] and the relationship between live-streaming quality and consumer perceived value [12]. The study of trust and impulsiveness has significant implications for the improvement of consumer purchase intention in live-streaming commerce [13]. However, research on the impact of live-streaming commerce features on consumers' trust is scarce despite the extensive exploration of trust in customer behavior and decision-making processes in the e-commerce and online shopping realm. To the best of the author's knowledge, this paper is the first attempt to uncover the mechanism of developing consumer trust in live-streaming commerce that concentrates primarily on live-streaming commerce features and provides comprehensive insights into the intricate mechanism of live-streaming features and their influence on consumer trust.

This paper makes several contributions to the literature. Firstly, it expands on the existing body of research regarding consumer trust in live-streaming commerce. Specifically, this study investigates the impact of live-streaming commerce features on consumer trust utilizing signaling theory and presence theory as the theoretical underpinning. Secondly, this study provides substantial evidence that the consumer's perception of presence and authenticity play mediating roles in the relationship between live-streaming commerce features and consumer trust. Third, in practice, live-streaming commerce vendors can improve their performance by comprehending the mechanism of establishing consumer trust in

live-streaming commerce. Advancing the platform by providing practical guidance and inspiring sellers to establish the authenticity and presence of the live-streaming experience ultimately enhances consumer trust.

The paper's structure comprises the following sections. Section two provides a review of relevant literature and develops hypotheses. Section three outlines the research methods and data. Section four presents the analysis and results. Section five discusses the main findings, while section six presents the conclusions, managerial implications, and limitations.

II. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

A. THEORETICAL FRAMEWORK

Figure 1 displays the study's conceptual framework, summarizing the literature review and its alignment with the presence theory and signal theory. This study investigates the impact of live streaming features, such as visual appeal and interactivity, on shaping consumers' trust. Furthermore, it explores the mediating roles of presence and authenticity in connecting live-streaming features with consumers' trust.

B. CONSUMER TRUST

Consumer trust is a complex concept that encompasses various factors, including credibility, integrity, benevolence, and the expectation that a brand will fulfill its duties [14], [15]. This multidimensionality highlights the importance of trust and its impact on consumer behavior. Previous research has shown that trust is a significant predictor of performance. For instance, trust can increase brand loyalty [16], satisfaction [17], word-of-mouth [18], purchase intention [19], and reduce perceived risk [20] and switching behavior [21], [22], thereby improving performance. Thus, it is vital for marketers to establish trust with consumers.

Scholars are investigating methods to establish consumer trust in e-commerce, revealing that it requires a multi-faceted approach. Social commerce features, such as reviews and influencer marketing, directly influence trust [23]. Meanwhile, robust institutional mechanisms, such as feedback

systems, verification procedures, and data privacy assurances, foster a trustworthy environment [24]. Building customer trust and loyalty requires an engaging social media presence, personalized service, and convenient payment options [2], [25], [26]. Additionally, delivering high-quality e-services, exceeding customer expectations, and using simple online rating formats are crucial [27]. By implementing these mechanisms, e-commerce businesses can create a trustworthy environment that promotes continuous purchases and sustainable growth.

However, live-streaming commerce creates a unique user shopping experience by offering real-time and authentic features. These features distinguish it from traditional e-commerce and increase consumer engagement and interactivity [3], [4], which may impede the interpretation of trust-building in live-streaming commerce. According to Li et al. [2], live-streaming commerce features such as interactivity, authenticity, visibility, entertainment, and customers' perceived presence are positively associated with consumers' trust. Nevertheless, research that uncovers the mechanism of consumer trust-building in live-streaming commerce is scarce.

C. AUTHENTICITY AND SIGNAL THEORY

Authenticity refers to an objective assessment of the genuineness of information [28]. Traditional online shopping may pose a risk of deception due to the static nature of product information displayed through photos and text [29]. On the other hand, live streaming enables real-time and comprehensive display of goods to customers through the camera [1]. It may be more challenging to manipulate the product information since editing it is more difficult [2]. Therefore, the nature of live-streaming enhances the authenticity of live-streaming commerce.

Authenticity in live-streaming commerce encompasses various dimensions, including product information, influencer credibility, and consumer experience [11], [30], [31], [32]. Authenticity is crucial in shaping consumer perceptions and behaviors in live-streaming commerce. For instance, the authenticity of product information presented through live streaming has increased consumer trust and purchase intention [11], [30]. In addition, the credibility and authenticity of influencers and streamers have been identified as influential factors in driving consumer impulse purchases and behavior [31], [32]. Furthermore, the authenticity of the overall consumer experience in live streaming, including a sense of flow and trust, has been linked to increased purchase intention [11], [30].

Signal theory is a vital theoretical perspective for studying consumer trust. Signaling theory is based on the research of information asymmetry of two parties [33]. When one party lacks information the other party possesses, the former will make decisions based on signals sent by the latter. Signalers, such as organizations, are insiders who possess information unavailable to outsiders, such as individuals [34].

As applied in consumer behavior research, signaling theory focuses on how specific signals or cues influence consumer trust [35]. Pfeuffer and Phua [36] delved into cue-based trust and signaling theory to identify and examine the efficacy of content attributes serving as trust cues in online consumer product review videos. This research sheds light on how specific cues in online content can act as signals, impacting consumer trust. Furthermore, Przepiorka and Horne [37] examined the effectiveness of prosocial, pro-environmental, and service-oriented investments as signals of trustworthiness in increasing consumer trust in energy utilities.

According to signaling theory, streamers send signals about products, services, or companies to consumers in live-streaming commerce. Consumers are affected by one or more signals or cues, of which quality signals are the critical factor affecting their attitudes and behaviors [36]. Information quality involves up-to-date, accurate, helpful, and complete content [23]. If consumers evaluate the quality of information highly, they are more likely to trust the quality of the product. Therefore, in line with the signal theory, the authenticity cue may serve as a signal that impacts consumer trust. Hence, the hypothesis is proposed as follows:

H1. Authenticity is positively associated with the consumer's trust.

D. PRESENCE AND PRESENCE THEORY

Information economy researchers believe that digital media communication results in presence, which cannot be ignored [38]. Recently, the presence theory has received significant attention in explaining consumer trust. Presence is the perception of intimacy or closeness to others, reflecting the quality of the media and its ability to improve psychological intimacy and physical proximity. It has two dimensions: social presence and telepresence. Social presence refers to the perception of being psychologically present to communication partners [39], while telepresence refers to the feeling of physical proximity to someone not on the scene [40]. It is easier for people to establish rich interpersonal relationships in a close environment than in a distant one [40]. Therefore, the perception of presence can lead to consumer trust [41].

According to the presence theory, streamers can use live chat rooms to vividly transmit information, creating the illusion of direct communication between two parties [2]. Live streaming is a form of social media that provides a virtual environment for communication. Its social function allows communication partners to interact socially and acquire helpful information and positive experiences. Overall, live streaming has the potential to enhance consumers' sense of spatial proximity and psychological intimacy, which may lead to changes in their attitudes and behaviors. Therefore, in line with presence theory, the hypothesis is proposed as follows:

H2. Presence in live streaming is positively associated with the consumer's trust.

E. VISUAL APPEAL

Visual appeal refers to a visual representation's aesthetic attractiveness and beauty, which can influence an individual's subjective experience and response. It includes characteristics that enhance the enjoyment of browsing a website or viewing a product without necessarily directly supporting a specific shopping goal [42]. Visual appeal serves as a stimulus that affects individuals' cognitive-affective responses [43]. Research has demonstrated that visual appeal is critical in shaping consumers' attitudes, perceptions, and behaviors. For instance, it affects their intention to use technology, talk positively about a product, and make a purchase [44], [45]. Additionally, visual appeal impacts constructs such as perceived usability, satisfaction, pleasure, and trust, ultimately influencing individuals' attitudes and behaviors [46].

In live-streaming commerce, visual appeal pertains to the visual attractiveness of the live streamers, platform, and showcased products. Visual appeal enhances consumer engagement and affective commitment during real-time interactions with live streamers [47], [48]. Therefore, it creates a sense of immersion and perceived reality linked to social presence, telepresence, and para-social interaction, influencing consumers' presence [49]. Furthermore, visual appeal contributes to the authenticity and real-time interaction in live-streaming commerce, increasing the level of customer trust and influencing consumers' perception [1]. An individual is more likely to evaluate showcased products positively when shopping in a visually appealing live-streaming room than a poorly organized one. For example, the live-streaming interface's attractive and comfortable layout can make the deal look more visually appealing, leading to a more positive evaluation of the showcased product in that live-streaming room. In contrast, presenting the same deal in an unattractive or poorly designed live-streaming room may negatively impact consumers' perception of authenticity and lower their trust in the live-streaming room, which could not adequately design its layout. Hence, the hypothesis is proposed as follows:

H3a. Visual appeal is positively associated with the consumers' presence.

H3b. Visual appeal is positively associated with the consumers' authenticity.

H3c. Visual appeal is positively associated with the consumers' trust.

F. INTERACTIVITY

Interactivity in live-streaming commerce refers to the dynamic engagement and interaction between the audience and the streamer [50]. In traditional e-commerce, communication between consumers and sellers depends on instant chat applications and message commenting methods. However, such methods are frequently subject to delays [51]. Live streaming enables consumers to interact directly with streamers via live chat on the live-streaming platform, increasing the efficiency and immediacy of their interactions. Throughout

the live-streaming, streamers participate in promotion initiatives such as sweepstakes, discounts, and giveaways to interact with audiences and enhance the shopping experience, which creates an energized vibe in the live-streaming channel [52].

Given the interactive nature of live streaming, interactivity likely creates a more engaging and immersive experience [1]. It contributes to its overall attractiveness, influencing consumers' willingness to engage and participate in live streaming [2]. Furthermore, interactivity positively stimulates consumers' perceived enjoyment [53]. From the cognitive-affective perspective, the cognitive processes subsequently influence consumers' affective responses, such as perceived pleasure. Suggesting that the interactive elements in live-streaming commerce can influence consumers' cognitive processes, thereby impacting their affective states and overall presence during the live-streaming experience [49]. On the other hand, interactivity can mitigate information asymmetry by providing real-time engagement opportunities, personalized interactions, and enhanced product demonstrations [54], thereby positively impacting consumer presence [2] and authenticity [1]. In addition, streamers and audiences may establish an emotional bond during the interaction, increasing the consumer's trust in streamers [11], [55]. Hence, the hypothesis is proposed as follows:

H4a. Interactivity is positively associated with the consumers' presence.

H4b. Interactivity is positively associated with the consumers' authenticity.

H4c. Interactivity is positively associated with the consumers' trust.

III. METHODOLOGY

A. DATA COLLECTION AND PARTICIPANTS

This study uses a quantitative method to assess the proposed hypotheses and research model. This research gathered data from individuals who engage in live streaming by conducting an online survey utilizing convenience sampling. This approach enabled a broader reach without geographical limitations and reduced both time and cost by utilizing mobile phones and smart devices instead of traditional paper questionnaires. The survey was disseminated through popular social media platforms like WeChat, Weibo, QQ, and live-streaming commerce platforms, resulting in 339 valid responses for further analysis. This approach is advantageous since it eliminates the requirement for data input while expediting the collection of substantial data volumes. If the user inputs incomplete or incorrect information during data collection, the website will display an error message and prompt them to revise their responses before submitting. Additionally, online surveys are more likely to produce accurate results because participants are likelier to decline participation if they do not wish to participate [56].

Table 1 displays the participant profile, comprising 116 males (34.2%) and 223 females (65.8%). The majority of

TABLE 1. Profile of participant (N = 339).

Variables	Frequency (%)
Gender	
Male	116 (34.2%)
Female	223 (65.8%)
Age	
≤ 18	7 (2.1%)
19-25	213 (62.7%)
26-35	110 (32.5%)
36 and above	9(2.7%)
Qualification	
Diploma and below	37 (10.9%)
Bachelor	242 (71.4%)
Master and above	60 (17.7%)

TABLE 2. Measurement item sources.

Constructs	Number of Items	Source
Visual appeal	3	[58]
Interactivity	3	[29]
Presence	6	[50]
Authenticity	3	[28]
Trust	3	[29]

participants, specifically 213 (62.7%), were between 19 and 25 years old, followed by 110 (32.5%) between 26 and 35 years old. There were 9 (2.7%) participants over the age of 36 and 7 (2.1%) who were 18 years old or younger. The majority of participants, specifically 242 individuals (71.4%), held a bachelor's degree as their highest academic qualification.

B. MEASUREMENT AND SURVEY INSTRUMENT

This study employed a pre-determined questionnaire to collect data on the variables of interest and the demographic characteristics of the participants. Scales validated in previous studies were utilized to measure the variables of interest (see Table 2). A 5-point Likert scale, ranging from "Strongly Disagree" to "Strongly Agree," was used for item ratings. Due to the survey's origin in mainland China, the questionnaires underwent translation to Chinese and then back-translation to verify language consistency [57].

To guarantee that the instructions, questions, and scales were clear and easy to understand, we conducted pilot testing during the questionnaire completion process. We gave the questionnaire to ten students from a local university for a pilot test to ensure its clarity and ease of use. Based on their feedback, we made minor adjustments to the wording. We surveyed 50 individuals randomly selected from a

shopping center to assess the reliability of the constructs using Cronbach's alpha. The pilot test of the completed structures confirmed their reliability, with a range of 0.82-0.93.

C. ANALYTICAL APPROACHES

The covariance-based Structural Equation Modeling (CB-SEM) technique was chosen to examine the proposed model due to its complexity instead of using regression analysis. CB-SEM provides a thorough evaluation of complex models and enables the integration of measurement errors in predicting relationships [59]. CB-SEM provides explicit estimation of error variance parameters, a capability absent in traditional multivariate procedures. The CB-SEM analysis implemented a two-stage approach in this study, comprising a measurement model analysis and a structural model analysis. Before the measurement model analysis, we conducted an Exploratory Factor Analysis (EFA) to demonstrate the dimensional structure of the construct. The initial estimation of the measurement model is conducted through Confirmatory Factor Analysis (CFA) in order to assess the reliabilities and validities of the research constructs. The subsequent structural model analysis evaluates the direction and effect size of the proposed relationships between the constructs.

IV. ANALYSIS AND RESULTS

A. MEASUREMENT MODEL ASSESSMENT

Adequate sample sizes are required for conducting factor analysis [60]. Typically, a factor analysis requires a minimum of 300 respondents or 10 respondents per item [61]. Our study meets these criteria, as we collected data from 339 respondents and had only 18 items on the questionnaire (as shown in Table 4). Additionally, the dataset's adequacy was also validated by the results of Bartlett's Test of Sphericity (Chi-Square: 4,930, df: 153, Sig.: 0.000) and Kaiser-Meyer-Olkin (KMO) (0.910) from EFA.

Initially, the study used EFA with varimax rotation [62], [63] to establish the construct's dimensionality. The analysis specified a rotation factor loading threshold of 0.5 and extracted 5 components [64]. Table 4 presents the EFA factor loading, which illustrates the five-factor structure, explaining 79.765% of the total variance. The Goodness-of-fit statistics indicated a satisfactory measurement model: $\chi^2 = 303.381$, $df = 117$, $CFI = 0.962$, $TLI = 0.950$, $IFI = 0.962$, $NFI = 0.940$, $RMSEA = 0.069$. The validity and reliability of the five-factor structure were examined further.

Model reliability was assessed using internal consistency and construct reliability measures [65], [66]. First, internal consistency was measured with a threshold of 0.6 using Cronbach's α [67]. The obtained Cronbach's α values ranged from 0.821 to 0.935, as presented in Table 3. Furthermore, Hair et al. [65] suggested a Composite Reliability (CR) threshold of 0.7 for evaluating construct reliability. The CR scores for all constructs consistently fall between 0.893 and 0.949, indicating a reliable model measurement.

TABLE 3. Reliability and validity measures.

	Cronbach's <i>a</i>	CR	AVE	Discriminant Validity: Fornell-Larcker Criterion				
				Visual appeal	Interactivity	Presence	Authenticity	Trust
Visual appeal	0.904	0.906	0.820	0.916				
Interactivity	0.821	0.893	0.736	0.312	0.858			
Presence	0.935	0.949	0.756	0.654	0.324	0.869		
Authenticity	0.889	0.932	0.820	0.481	0.552	0.563	0.905	
Trust	0.895	0.935	0.827	0.467	0.434	0.679	0.611	0.909

Note: Abbreviations: CR, composite reliability; AVE, average variance extracted

TABLE 4. Scale properties of the measurement model.

Construct	Item	EFA loading	CFA loading	T-statistic
Visual appeal	Visual appeal 1	0.836	0.855	**
	Visual appeal 2	0.818	0.914	21.599
	Visual appeal 3	0.809	0.847	19.487
Interactivity	Interactivity 1	0.797	0.761	**
	Interactivity 2	0.814	0.855	14.049
	Interactivity 3	0.829	0.717	12.503
Presence	Presence 1	0.785	0.738	**
	Presence 2	0.772	0.793	17.218
	Presence 3	0.797	0.832	17.239
	Presence 4	0.750	0.853	15.197
	Presence 5	0.751	0.882	16.285
	Presence 6	0.797	0.891	16.505
Authenticity	Authenticity1	0.741	0.837	**
	Authenticity2	0.844	0.916	19.587
	Authenticity3	0.784	0.890	16.572
Trust	Trust 1	0.724	0.867	**
	Trust 2	0.822	0.866	18.456
	Trust 3	0.758	0.927	18.169

Note: The fit indices for the measurement model: $\chi^2 = 303.381$, $df=117$, $CFI=0.962$, $TLI=0.950$, $IFI=0.962$, $NFI=0.940$, $RMSEA=0.069$.

** = Items constrained for identification purposes

Convergent and discriminant validities were utilized to assess the validity of the model. Initially, we tested the convergent validity with the outer loadings from CFA and the Average Variance Extracted (AVE). Convergent validity is deemed acceptable if all items have an outer loading of 0.6 or greater and AVE values of at least 0.5 [65]. The model's convergent validity was established through the outer loadings in Table 4 and AVE values in Table 3. Additionally, a construct shows discriminative validity when the square root of its AVE is greater than its highest correlation with any other construct [66]. Thus, the constructs exhibit robust discriminant validity, as demonstrated by the Fornell-Larcker Criterion in Table 3.

B. STRUCTURAL MODEL ASSESSMENT

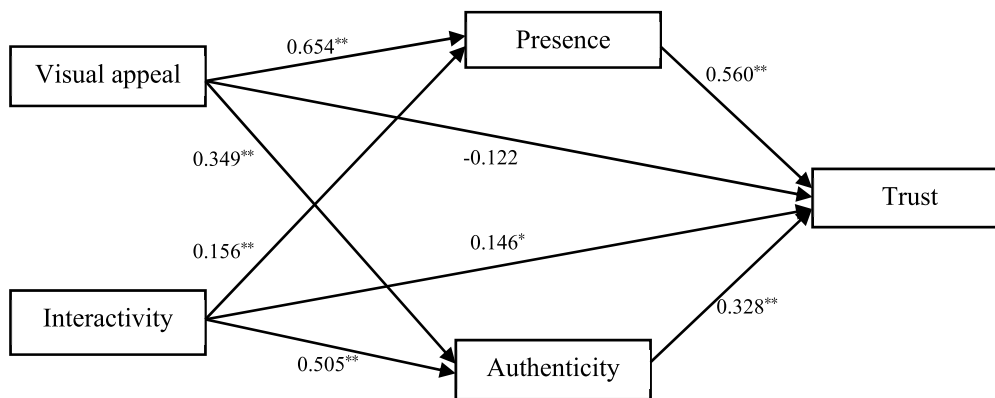
The data indicates a satisfactory fit to the proposed model based on the fit indices: $\chi^2 = 333.033$, $df = 118$, $CFI = 0.956$, $TLI = 0.943$, $IFI = 0.956$, $NFI = 0.934$, $RMSEA = 0.073$. The results of the proposed hypothesis tests are shown in Table 5 and Figure 2. All of these hypotheses were confirmed except for H3c.

Visual appeal and interactivity explain 52.7 percent and 50.6 percent of the variance in presence and authenticity, respectively; the model explains 59.5 percent of the variance in trust. Table 5 shows the results of the path analysis for each hypothesis. The coefficients (0.328, $p<0.001$) between authenticity and trust are positive and statistically significant,

TABLE 5. Path assessment.

Hypothesized Relationship	Standardized Estimates	t-value	Decision
H1: Authenticity→Trust	0.328**	5.297	Supported
H2: Presence→Trust	0.560**	7.992	Supported
H3a: Visual appeal→Presence	0.654**	10.564	Supported
H3b: Visual appeal→Authenticity	0.349**	6.732	Supported
H3c: Visual appeal→Trust	-0.122	-1.867	Rejected
H4a: Interactivity→Presence	0.156**	3.051	Supported
H4b: Interactivity→Authenticity	0.505**	8.480	Supported
H4c: Interactivity→Trust	0.146*	2.506	Supported
Squared Multiple Correlation (R²)			
Presence	0.527		
Authenticity	0.506		
Trust	0.595		
Model Fit Statistics:			
$\chi^2 = 333.033, df=118, CFI=0.956, TLI=0.943, IFI=0.956, NFI=0.934, RMSEA=0.073$			

Note: **p < 0.001, *p < 0.05



Note: **p < 0.001, *p < 0.05

FIGURE 2. Structural model assessment.

thus validating the H1. Shows that consumers' authenticity during live streaming is positively associated with their perceived trust in the products. Furthermore, the coefficient (0.560, p<0.001) between presence and trust is positive and statistically significant, thus validating the H2 of a positive association between consumers' presence and their trust in the products. The correlation between presence and trust is stronger than the correlation between authenticity and trust.

The coefficient (0.654, p<0.001) between visual appeal and presence is positive and significant at the 0.001 level, thus validating the H3a of a positive association between live-streaming commerce visual appeal and consumers' presence

in watching live streaming, and the association is considerably substantial. The coefficient (0.349, p<0.001) between visual appeal and authenticity is statistically significant, thus supporting the H3b of a positive association between live-streaming commerce visual appeal and consumers' perceived authenticity of the products. However, a positive significant association between visual appeal and trust is not observed (-0.122, p = 0.062), rejecting H3c. On the other hand, the coefficients (0.156, p<0.01; 0.505, p<0.001) of interactivity between presence and authenticity are positive and statistically significant, thus validating the H4a and H4b, indicating that the interactivity feature of live-streaming commerce is significantly associated with consumers' presence

during live-streaming and their perceived authenticity of the products. In addition, interactivity is observed to be positively associated with trust (0.146, $p < 0.01$), thus validating H4c.

V. DISCUSSION

A. MAIN FINDINGS

The study revealed a positive correlation between authenticity and the consumer's trust in the live-streaming vendor. The more authenticity the consumer perceives, the more trust the consumer puts in the live-streaming vendor. The finding is consistent with prior research [11], [30], which shows that using live streaming to present product information has increased consumer trust in its authenticity. Authenticity involves objectively assessing the genuineness of information [28]. Hence, high perceived authenticity increases the consumer's trust.

On the other hand, the observed association between authenticity and consumer trust can also be explained by the signal theory. Signaling theory in consumer behavior studies focuses on how specific signals or cues influence consumer trust [35]. Authenticity in live-streaming commerce, which refers to the genuineness of information and interactions, serves as a critical signal of trust. Previous studies have shown that authenticity cues, such as real-time product demonstrations and unfiltered interactions, enhance consumer trust by reducing perceived risks and increasing perceived reliability [30], [31]. This study's finding that authenticity mediates the relationship between live-streaming features and consumer trust aligns with these insights, reinforcing the importance of authenticity as a trust signal in e-commerce.

The study also revealed a strong correlation between presence and consumer trust in the live-streaming vendor, underscoring the significant role of presence in influencing consumer trust, which is consistent with Lu et al. [41]. Presence refers to the perception of intimacy or closeness to others, reflecting the quality of the media and its ability to enhance psychological intimacy and physical proximity. Streamers use live chat rooms to vividly transmit information, providing a virtual environment for communication between two parties [2] and enhancing consumers' sense of spatial proximity and psychological intimacy, leading to changes in their attitudes. Presence has been shown to positively influence trust in various online contexts [39], [40]. This study extends these findings to the context of live-streaming commerce, demonstrating that the sense of presence created by real-time interactions and immersive experiences is crucial for building consumer trust.

Furthermore, the study indicates that visual appeal influences the consumer's presence and authenticity in live-streaming commerce. Visual appeal, which enhances the aesthetic attractiveness and engagement of live-streaming content, has been shown to positively impact consumer perceptions and behaviors [44], [46]. Visual appeal directly impacts the consumer's presence during live-streaming

sessions. When the content is visually engaging, viewers feel more connected and immersed. Visual cues also influence authenticity. Authenticity in live streaming refers to the genuine and unscripted nature of the content [28]. When the visuals appear authentic (e.g., real-time interactions, unfiltered moments), consumers perceive the experience as more genuine. However, a direct association between visual appeal and consumer trust is not observed. Visual appeal can only influence the consumer's trust through presence and authenticity. Trust is a complex psychological process that encompasses cognitive, emotional, and social factors. While visual appeal is undoubtedly important, it alone cannot fully address all of these dimensions. Trust also depends on verifiable information, such as product details, reviews, and ratings, which goes beyond aesthetics.

The study also observed that interactivity is directly associated with the consumer's presence, authenticity, and trust. Interactivity, which facilitates dynamic engagement and real-time communication, has been identified as a critical factor in enhancing consumer trust and reducing information asymmetry [50], [51]. According to Shang et al. [49], cognitive processes have an impact on consumers' affective responses. The interactive elements in live-streaming commerce can influence these cognitive processes, which in turn affect consumers' affective states and overall presence during the live-streaming experience. Furthermore, interactivity can reduce information asymmetry by offering real-time engagement opportunities, personalized interactions, and improved product demonstrations [54]. This, in turn, positively impacts consumer presence [2] and authenticity [1]. Additionally, emotional bonds are established between streamers and audiences during the interaction, which increases the consumer's trust in streamers [11], [55].

B. THEORETICAL CONTRIBUTIONS

This study makes several significant theoretical contributions to the literature on consumer trust in live-streaming commerce. First, this study integrates signaling theory and presence theory to investigate the impact of live-streaming commerce features on consumer trust. Signaling theory, which addresses information asymmetry between buyers and sellers, is crucial in understanding how signals such as authenticity and presence influence consumer perceptions and trust. Previous research has shown that signals are vital in reducing information asymmetry and building trust in online environments [68], [69]. By applying signaling theory to live-streaming commerce, this study extends its application to a new and rapidly growing e-commerce context. Presence theory, which focuses on the perception of intimacy and closeness in digital interactions, is also essential in understanding trust-building in live-streaming commerce. The study's findings that presence significantly impacts consumer trust align with previous research highlighting social presence's importance in online interactions [39], [40]. This integration of presence theory into the study of live-streaming

commerce provides a deeper understanding of how real-time interactions and perceived closeness influence consumer trust.

Second, this study provides substantial evidence that the consumer's perception of presence and authenticity plays mediating roles in the relationship between live-streaming commerce features and consumer trust. This finding is consistent with previous research emphasizing the importance of authenticity and presence in building trust in online environments [28], [41]. By demonstrating the mediating roles of presence and authenticity, this study adds to the existing literature by providing a more nuanced understanding of how live-streaming features influence consumer trust.

C. MANAGERIAL IMPLICATIONS

The study's findings underscore what makes live-streaming commerce more trustful. In particular, consumer presence and authenticity play a crucial role in trust-building. Visual appeal and interactivity can also impact trust through presence and authenticity. As such, several vital implications are related to trust-building in live-streaming commerce. First, live-streaming vendors must emphasize authenticity and presence. Authenticity plays a crucial role in building trust. Live streamers should focus on being genuine, transparent, and relatable to their audience. Authentic interactions create a sense of trustworthiness. Moreover, Live streaming platforms should enhance features that make viewers feel part of the experience. Engaging content, real-time interactions, and personal connections contribute to a stronger sense of presence.

Second, live-streaming vendors should prioritize interactivity. Interactivity directly impacts consumer trust. Encourage viewers to participate actively during live streams - through comments, polls, or Q&A sessions. The more engaged viewers feel, the higher their trust in the streamer and the products being showcased. Implement features that foster real-time communication, such as live chat or interactive product demonstrations. These interactions build trust by allowing consumers to ask questions and receive immediate responses. Third, live-streaming vendors should enhance visual appeal with caution. While visual appeal matters, it indirectly influences trust through presence and authenticity. Striking visuals can capture attention and create a positive impression, but they must align with the overall authenticity of the live stream. Avoid overemphasis on aesthetics if it compromises the genuine nature of the content. Balance eye-catching visuals with substance and transparency.

D. PRACTICAL IMPLICATIONS

Based on the findings of this study, several practical implications can be drawn for live-streaming commerce vendors and marketers to enhance consumer trust and engagement. First, live streamers should focus on being genuine, transparent, and relatable to their audience. Authentic interactions create a sense of trustworthiness. For instance, streamers should provide real-time, unfiltered product demonstrations and share

personal experiences with the products to enhance perceived authenticity [28], [31].

Second, live streamers should encourage viewers to participate actively during live streams through comments, polls, or Q&A sessions. The more engaged viewers feel, the higher their trust in the streamer and the products being showcased [55]. Streamers can also design interactive promotions such as lucky draws, discounts, and giveaways to enhance the shopping experience and create an energized vibe in the live-streaming channel [29].

E. LIMITATIONS AND RECOMMENDATIONS

Although this study provides valuable theoretical and practical insights, it has some limitations that can guide future research. Specifically, the study only examined the interactivity and visual appeal of live-streaming commerce features, neglecting others. Therefore, it would be beneficial to incorporate other essential features into the framework for future research. The study is limited to the Chinese context, which may limit the generalizability of findings to other cultural, geographical, and socio-economic contexts. However, future investigations could include diverse regions to enable cross-cultural comparisons illuminating trust-building nuances and variations in live-streaming commerce.

VI. CONCLUSION

Trust is a crucial component that considerably influences consumer behavior and decision-making in e-commerce. Live-streaming commerce creates a unique user shopping experience by offering unique features that distinguish it from traditional e-commerce, increasing consumer engagement and interactivity and impeding the interpretation of trust-building in live-streaming environments. This study conceptualized a comprehensive model grounded on signal theory and presence theory to investigate trust-building in live-streaming commerce. The study found that the consumer's sense of presence and authenticity in live streaming significantly impacts the consumer's trust. Visual appeal and interactivity influence the consumer's presence and authenticity; however, only interactivity can directly influence consumer trust; visual appeal can only influence consumer trust indirectly through presence and authenticity.

REFERENCES

- [1] J. Guo, Y. Li, Y. Xu, and K. Zeng, "How live streaming features impact consumers' purchase intention in the context of cross-border e-commerce? A research based on SOR theory," *Frontiers Psychol.*, vol. 12, Nov. 2021, Art. no. 767876.
- [2] Q. Li, C. Zhao, and R. Cheng, "How the characteristics of live-streaming environment affect consumer purchase intention: The mediating role of presence and perceived trust," *IEEE Access*, vol. 11, pp. 123977–123988, 2023.
- [3] Y. R. Lim, A. S. Ariffin, M. Ali, and K.-L. Chang, "A hybrid MCDM model for live-streamer selection via the fuzzy delphi method, AHP, and TOPSIS," *Appl. Sci.*, vol. 11, no. 19, p. 9322, Oct. 2021.
- [4] P. Zhu, Z. Liu, X. Li, X. Jiang, and M. X. Zhu, "The influences of livestreaming on online purchase intention: Examining platform characteristics and consumer psychology," *Ind. Manage. Data Syst.*, vol. 123, no. 3, pp. 862–885, Mar. 2023.

- [5] B. Tian, J. Chen, J. Zhang, W. Wang, and L. Zhang, "Antecedents and consequences of streamer trust in livestreaming commerce," *Behav. Sci.*, vol. 13, no. 4, p. 308, Apr. 2023.
- [6] S. Habib and N. N. Hamadneh, "Impact of perceived risk on consumers technology acceptance in online grocery adoption amid COVID-19 pandemic," *Sustainability*, vol. 13, no. 18, p. 10221, Sep. 2021.
- [7] G. Lăzăroiu, O. Neguriță, I. Grecu, G. Grecu, and P. C. Mitran, "Consumers' decision-making process on social commerce platforms: Online trust, perceived risk, and purchase intentions," *Frontiers Psychol.*, vol. 11, p. 890, May 2020.
- [8] I. O. Pappas, "User experience in personalized online shopping: A fuzzy-set analysis," *Eur. J. Marketing*, vol. 52, no. 7/8, pp. 1679–1703, Jun. 2018.
- [9] R. Liu and E. Wang, "Blockchain and mobile client privacy protection in e-commerce consumer shopping tendency identification application," *Soft Comput.*, vol. 27, no. 9, pp. 6019–6031, May 2023.
- [10] A. Wongkitrungrueng and N. Assarut, "The role of live streaming in building consumer trust and engagement with social commerce sellers," *J. Bus. Res.*, vol. 117, pp. 543–556, Sep. 2020.
- [11] X. Liu, L. Zhang, and Q. Chen, "The effects of tourism e-commerce live streaming features on consumer purchase intention: The mediating roles of flow experience and trust," *Frontiers Psychol.*, vol. 13, Aug. 2022, Art. no. 995129.
- [12] C. Qing and S. Jin, "What drives consumer purchasing intention in live streaming e-commerce?" *Frontiers Psychol.*, vol. 13, Jun. 2022, Art. no. 938726.
- [13] X. Wang, N. Aisihair, and A. Aihemaiti, "Research on the impact of live streaming marketing by online influencers on consumer purchasing intentions," *Frontiers Psychol.*, vol. 13, Nov. 2022, Art. no. 1021256.
- [14] D. Louis and C. Lombart, "Impact of brand personality on three major relational consequences (trust, attachment, and commitment to the brand)," *J. Product Brand Manage.*, vol. 19, no. 2, pp. 114–130, Apr. 2010.
- [15] S. S. Alam and N. M. Yasin, "The antecedents of online brand trust: Malaysian evidence," *J. Bus. Econ. Manage.*, vol. 11, no. 2, pp. 210–226, Jun. 2010.
- [16] J. Lee and K. Park, "The effects of hedonic shopping values on loyalty towards small retailers: The moderating role of trust," *J. Retailing Consum. Services*, vol. 76, Jan. 2024, Art. no. 103615.
- [17] Y. Kim and R. A. Peterson, "A meta-analysis of online trust relationships in e-commerce," *J. Interact. Marketing*, vol. 38, pp. 44–54, May 2017.
- [18] Y. Wang, Q. Min, and S. Han, "Understanding the effects of trust and risk on individual behavior toward social media platforms: A meta-analysis of the empirical evidence," *Comput. Hum. Behav.*, vol. 56, pp. 34–44, Mar. 2016.
- [19] C. W. Park, I. Sutherland, and S. K. Lee, "Effects of online reviews, trust, and picture-superiority on intention to purchase restaurant services," *J. Hospitality Tourism Manage.*, vol. 47, pp. 228–236, Jun. 2021.
- [20] M. Siegrist, N. Stampfli, H. Kastenholz, and C. Keller, "Perceived risks and perceived benefits of different nanotechnology foods and nanotechnology food packaging," *Appetite*, vol. 51, no. 2, pp. 283–290, Sep. 2008.
- [21] C. Zhao, A. H. M. Noman, and K. Asiaei, "Exploring the reasons for bank-switching behavior in retail banking," *Int. J. Bank Marketing*, vol. 40, no. 2, pp. 242–262, Mar. 2022.
- [22] C. Zhao, A. H. M. Noman, and M. K. Hassan, "Bank's service failures and bank customers' switching behavior: Does bank reputation matter?" *Int. J. Bank Marketing*, vol. 41, no. 3, pp. 550–571, Apr. 2023.
- [23] S. Kim and H. Park, "Effects of various characteristics of social commerce (s-commerce) on consumers' trust and trust performance," *Int. J. Inf. Manage.*, vol. 33, no. 2, pp. 318–332, Apr. 2013.
- [24] M. He, J. Qin, M. Wen, and W. Chen, "Sustaining consumer trust and continuance intention by institutional mechanisms: An empirical survey of DiDi in China," *IEEE Access*, vol. 9, pp. 158185–158203, 2021.
- [25] M. N. Hajli, "A study of the impact of social media on consumers," *Int. J. Market Res.*, vol. 56, no. 3, pp. 387–404, May 2014.
- [26] D. O. Amofah and J. Chai, "Sustaining consumer e-commerce adoption in Sub-Saharan Africa: Do trust and payment method matter?" *Sustainability*, vol. 14, no. 14, p. 8466, Jul. 2022.
- [27] A. Kostyk, J. M. Leonhardt, and M. Niculescu, "Simpler online ratings formats increase consumer trust," *J. Res. Interact. Marketing*, vol. 11, no. 2, pp. 131–141, Jun. 2017.
- [28] M. B. Beverland, A. Lindgreen, and M. W. Vink, "Projecting authenticity through advertising: Consumer judgments of advertisers' claims," *J. Advertising*, vol. 37, no. 1, pp. 5–15, Apr. 2008.
- [29] X. Ma, X. Zou, and J. Lv, "Why do consumers hesitate to purchase in live streaming? A perspective of interaction between participants," *Electron. Commerce Res. Appl.*, vol. 55, Sep. 2022, Art. no. 101193.
- [30] C. Chen and D. Zhang, "Understanding consumers' live-streaming shopping from a benefit–risk perspective," *J. Services Marketing*, vol. 37, no. 8, pp. 973–988, Aug. 2023.
- [31] L. Liu and J. Yu, "Impact of perceived diagnosticity on live streams and consumer purchase intention: Streamer type, product type, and brand awareness as moderators," *Inf. Technol. Manage.*, pp. 1–14, Sep. 2022, doi: 10.1007/s10799-022-00375-7.
- [32] D. C. Balaban and J. Szabolcs, "A proposed model of self-perceived authenticity of social media influencers," *Media Commun.*, vol. 10, no. 1, pp. 235–246, Jan. 2022.
- [33] M. Spence, "Job market signaling," in *Uncertainty in Economics*. Amsterdam, The Netherlands: Elsevier, 1978, pp. 281–306.
- [34] B. L. Connelly, S. T. Certo, R. D. Ireland, and C. R. Reutzel, "Signaling theory: A review and assessment," *J. Manage.*, vol. 37, no. 1, pp. 39–67, Jan. 2011.
- [35] L. Guo, X. Hu, J. Lu, and L. Ma, "Effects of customer trust on engagement in live streaming commerce: Mediating role of swift guanxi," *Internet Res.*, vol. 31, no. 5, pp. 1718–1744, Nov. 2021.
- [36] A. Pfeuffer and J. Phua, "Stranger danger? Cue-based trust in online consumer product review videos," *Int. J. Consum. Stud.*, vol. 46, no. 3, pp. 964–983, May 2022.
- [37] W. Przepiorka and C. Horne, "How can consumer trust in energy utilities be increased? The effectiveness of prosocial, proenvironmental, and service-oriented investments as signals of trustworthiness," *Org. Environ.*, vol. 33, no. 2, pp. 262–284, Jun. 2020.
- [38] S. Tan and W. Chen, "Building consumer trust in online food marketplaces: The role of WeChat marketing," *Int. Food Agribusiness Manage. Rev.*, vol. 24, no. 5, pp. 845–862, Jul. 2021.
- [39] D. Gefen and D. W. Straub, "Consumer trust in B2C e-commerce and the importance of social presence: Experiments in e-products and e-services," *Omega*, vol. 32, no. 6, pp. 407–424, Dec. 2004.
- [40] C. X. Ou, T. University, P. A. Pavlou, R. M. Davison, and T. University, "Swift guanxi in online marketplaces: The role of computer-mediated communication technologies," *MIS Quart.*, vol. 38, no. 1, pp. 209–230, Jan. 2014.
- [41] B. Lu, Q. Zeng, and W. Fan, "Examining macro-sources of institution-based trust in social commerce marketplaces: An empirical study," *Electron. Commerce Res. Appl.*, vol. 20, pp. 116–131, Nov. 2016.
- [42] D. V. Parboteeah, J. S. Valacich, and J. D. Wells, "The influence of website characteristics on a consumer's urge to buy impulsively," *Inf. Syst. Res.*, vol. 20, no. 1, pp. 60–78, Mar. 2009.
- [43] B. Marder, A. Erz, R. Angell, and K. Plangger, "The role of photograph aesthetics on online review sites: Effects of management-versus traveler-generated photos on tourists' decision making," *J. Travel Res.*, vol. 60, no. 1, pp. 31–46, Jan. 2021.
- [44] T. Lavie and N. Tractinsky, "Assessing dimensions of perceived visual aesthetics of web sites," *Int. J. Hum.-Comput. Stud.*, vol. 60, no. 3, pp. 269–298, Mar. 2004.
- [45] C. Goebert and G. P. Greenhalgh, "A new reality: Fan perceptions of augmented reality readiness in sport marketing," *Comput. Hum. Behav.*, vol. 106, May 2020, Art. no. 106231.
- [46] M. Moshagen and M. T. Thielsch, "Facets of visual aesthetics," *Int. J. Hum.-Comput. Stud.*, vol. 68, no. 10, pp. 689–709, Oct. 2010.
- [47] M. Hu and S. S. Chaudhry, "Enhancing consumer engagement in e-commerce live streaming via relational bonds," *Internet Res.*, vol. 30, no. 3, pp. 1019–1041, May 2020.
- [48] C.-H. Lee and C.-W. Chen, "Impulse buying behaviors in live streaming commerce based on the stimulus-organism-response framework," *Information*, vol. 12, no. 6, p. 241, Jun. 2021.
- [49] Q. Shang, H. Ma, C. Wang, and L. Gao, "Effects of background fitting of e-commerce live streaming on consumers' purchase intentions: A cognitive-affective perspective," *Psychol. Res. Behav. Manage.*, vol. 16, pp. 149–168, Jan. 2023.
- [50] Y. Sun, X. Shao, X. Li, Y. Guo, and K. Nie, "How live streaming influences purchase intentions in social commerce: An IT affordance perspective," *Electron. Commerce Res. Appl.*, vol. 37, Sep. 2019, Art. no. 100886.
- [51] A. Elmorshidy, "Applying the technology acceptance and service quality models to live customer support chat for e-commerce websites," *J. Appl. Bus. Res.*, vol. 29, no. 2, p. 589, Feb. 2013.

- [52] J. W. Sohn and J. K. Kim, "Factors that influence purchase intentions in social commerce," *Technol. Soc.*, vol. 63, Nov. 2020, Art. no. 101365.
- [53] S.-C. Lin, H.-T. Tseng, F. Shirazi, N. Hajli, and P.-T. Tsai, "Exploring factors influencing impulse buying in live streaming shopping: A stimulus-organism-response (SOR) perspective," *Asia Pacific J. Marketing Logistics*, vol. 35, no. 6, pp. 1383–1403, May 2023.
- [54] P. Xu, B.-J. Cui, and B. Lyu, "Influence of streamer's social capital on purchase intention in live streaming e-commerce," *Frontiers Psychol.*, vol. 12, Jan. 2022, Art. no. 748172.
- [55] F. Hou, Z. Guan, B. Li, and A. Y. L. Chong, "Factors influencing people's continuous watching intention and consumption intention in live streaming: Evidence from China," *Internet Res.*, vol. 30, no. 1, pp. 141–163, Jul. 2019.
- [56] T. L. Tuten, *Conducting Online Surveys*. Washington, DC, USA: American Psychological Association, 2010, pp. 179–192.
- [57] R. W. Brislin, "Cross-cultural research methods: Strategies, problems, applications," in *Environment and Culture*. Boston, MA, USA: Springer, 1980, pp. 47–82.
- [58] Y. Liu, H. Li, and F. Hu, "Website attributes in urging online impulse purchase: An empirical investigation on consumer perceptions," *Decis. Support Syst.*, vol. 55, no. 3, pp. 829–837, Jun. 2013.
- [59] J. Collier, *Applied Structural Equation Modeling Using AMOS: Basic to Advanced Techniques*. Evanston, IL, USA: Routledge, 2020.
- [60] J. Pallant, *A Step by Step Guide to Data Analysis Using SPSS*. Crows Nest, QLD, Australia: Allen & Unwin, 2011.
- [61] B. G. Tabachnick and L. S. Fidell, *Using Multivariate Statistics*, 5th ed., Boston, MA, USA: Pearson Education, 2007.
- [62] D. F. Polit and C. T. Beck, *Nursing Research: Generating and Assessing Evidence for Nursing Practice*, 9th ed., Philadelphia, PA, USA: Lippincott Williams & Wilkins, 2012.
- [63] M. Norris and L. Lecavalier, "Evaluating the use of exploratory factor analysis in developmental disability psychological research," *J. Autism Develop. Disorders*, vol. 40, no. 1, pp. 8–20, Jan. 2010.
- [64] H. F. Kaiser and J. Rice, "Little jiffy, mark IV," *Educ. Psychol. Meas.*, vol. 34, no. 1, pp. 111–117, Apr. 1974.
- [65] J. Hair, W. Black, B. Babin, and R. Anderson, *Multivariate Data Analysis: A Global Perspective*, vol. 7. New Jersey, NJ, USA: Pearson, 2010.
- [66] C. Fornell and D. F. Larcker, *Structural Equation Models With Unobservable Variables and Measurement Error: Algebra and Statistics*. Los Angeles, CA, USA: Sage, 1981.
- [67] J. C. Nunnally, *Psychometric Theory*, 2nd ed., New York, NY, USA: McGraw-Hill, 1978.
- [68] T. Mavlanova, R. Benbunan-Fich, and M. Koufaris, "Signaling theory and information asymmetry in online commerce," *Inf. Manage.*, vol. 49, no. 5, pp. 240–247, Jul. 2012.
- [69] T. Mavlanova, R. Benbunan-Fich, and G. Lang, "The role of external and internal signals in e-commerce," *Decis. Support Syst.*, vol. 87, pp. 59–68, Jul. 2016.

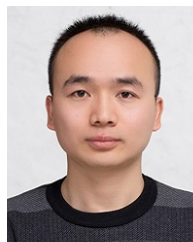


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