



Virtual streamer responsiveness and consumer purchase intention in live streaming commerce: Social presence as a mediator

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This study investigated how virtual streamer responsiveness affects consumers' purchase intention through social presence in the context of live streaming commerce. We recruited 432 consumers who had watched virtual streamers in the context of live streaming commerce, and asked them to complete a survey assessing responsiveness, social presence, and purchase intention. Our findings demonstrated that virtual streamer responsiveness had a positive impact on consumers' purchase intention in live streaming commerce, and that this relationship was mediated by social presence. We discuss the theoretical and practical implications of these results.

Keywords

virtual streamer, live streaming commerce, responsiveness, social presence, purchase intention

Article Highlights

- This research examined the impact of virtual streamer responsiveness on consumers' purchase intention through social presence in the context of live streaming commerce.
- Virtual streamer responsiveness positively influenced consumers' purchase intention in live streaming commerce.
- Social presence played a mediating role in the relationship of virtual streamer responsiveness with consumers' purchase intention in live streaming commerce.

Live streaming commerce is a new online sales model that is based on live platforms and has the characteristics of promoting consumer participation and purchases. Compared to traditional online shopping, it has the advantages of strong interactivity and high sales conversion rates (J. Chen & Liao, 2022; L. Zhang & Liu, 2023). Social interaction through live streaming can enhance the shopping experience, reduce consumer uncertainty, and increase trust in the sellers (Liu et al., 2022; Sun et al., 2019). The flourishing development of live streaming commerce is due to technological advancements and to the crucial role played by streamers (Guo et al., 2022).

In recent years, *virtual streamers*, that is, computer-generated characters powered by artificial intelligence, have been widely used in live streaming commerce (Gao et al., 2023; Wu et al., 2023). Virtual streamers are not limited by human physical constraints and can be programmed to automatically live stream 24/7 at a lower long-term cost (Gao et al., 2023). In addition, it is possible to customize the appearance and voice of virtual streamers based on brand characteristics and use algorithms to program their interactions with consumers; further, these characters exhibit a

stable performance level with high specificity and malleability (Wu et al., 2023). As a result, numerous companies have incorporated virtual streamers into their live streaming shows.

Previous research has explored the role of streamers in live streaming commerce, investigating their impact on consumers' perception and behavior (Liu et al., 2022; L. Ma et al., 2022). While these studies have shed light on live streaming commerce, the specific role of virtual streamers in this context remains poorly understood. Our objective was to investigate the effect of virtual streamers in live streaming commerce, focusing in particular on how their responsiveness affects consumers' purchase intention. We analyzed the impact of virtual streamer responsiveness on purchase intention through the mediator of social presence.

The Current Study

Responsiveness is defined as the ability to address consumers' inquiries and requests promptly (Wongkitrungrueng & Assarut, 2020). In the context of live streaming commerce, it pertains to the speed and effectiveness of streamers' responses to consumers (Xue et al., 2020). The responsiveness of virtual streamers is essential for the success of live streaming commerce, as it allows consumers to instantly access the information they need (M. Zhang et al., 2021). Research has shown that responsiveness can greatly improve perceived usefulness, reduce perceived risk, and minimize psychological distance (Xue et al., 2020). Additionally, it is considered a key indicator of service quality (Y. Ma, 2021) and interaction quality (M. Zhang et al., 2021), highlighting its significance in the interactive nature of live streaming commerce (Wongkitrungrueng & Assarut, 2020). J.-S. Chen et al. (2021) highlighted the positive impact of chatbot responsiveness on the intrinsic value of customer experience, ultimately influencing consumers' purchase intention (Liu et al., 2022). Higher perceived responsiveness of virtual streamers during live streaming can promote consumers' perceived value and comfort in their consumer experience (J.-S. Chen et al., 2021), and its usefulness (Xue et al., 2020), and it can reduce shopping effort and risk (Xue et al., 2020), which is conducive to their purchase intention. Therefore, we proposed the following hypothesis:

Hypothesis 1: Virtual streamer responsiveness will be positively related to consumers' purchase intention in live streaming commerce.

Social presence is defined as the perception of engaging in a warm, sociable, personal, and sensitive interaction with another human being (L. Zhang & Liu, 2023). An increasing number of scholars have applied the concept of social presence in studies of human–computer interaction and have found that interactivity in human–computer interaction affects individuals' sense of social presence (Schuetzler et al., 2020; Xue et al., 2020). For instance, research has shown that in interactions with artificial intelligence, improving the conversational skills of chatbots can enhance the effectiveness of human–computer interaction, leading to a higher sense of social presence (Schuetzler et al., 2020). Virtual streamers, through their prompt response service, assist consumers in effectively resolving issues, potentially creating a perception of warmth and friendliness, thereby diminishing the psychological gap between virtual streamer and customer and reinforcing their bond (Wongkitrungrueng & Assarut, 2020; Xue et al., 2020). Consumers may perceive their interactions with virtual streamers as real-world experiences due to the prompt responses they receive.

A high level of social presence in a live streaming environment indicates that the psychological distance between virtual streamers and consumers has been diminished, facilitating the establishment of a closer relationship between them (Lim et al., 2021; Sun et al., 2019). This fosters a sense of intimacy, familiarity, and contact between them (L. Zhang & Liu, 2023); thereby enhancing the shopping experience. Furthermore, social presence has been shown to have a positive impact on consumers' willingness to watch live streaming (J. Chen & Liao, 2022). L. Zhang and Liu (2023) found that social presence acted as a mediator in the relationship between interactivity and consumers' purchase intention in live streaming commerce. When feelings of social presence are stimulated by a virtual streamer's responsiveness, consumers are more likely to purchase in the virtual streamer's live streaming room (Gao et al., 2023; Sun et al., 2019). Therefore, we proposed the following hypothesis:

Hypothesis 2: Virtual streamer responsiveness will have an indirect positive relationship with consumers' purchase intention via the mediator of social presence.

The study's conceptual framework is depicted in Figure 1.

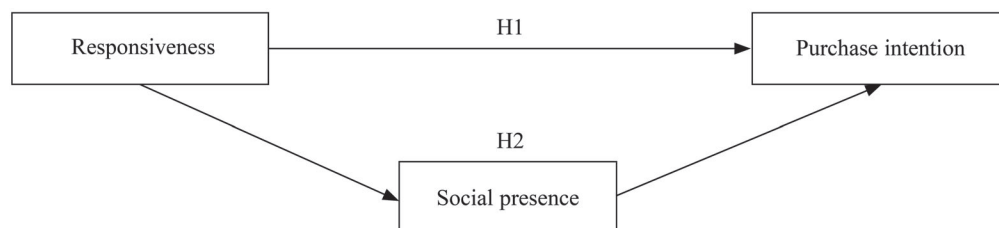


Figure 1. *Conceptual Framework*

Method

Participants and Procedure

We distributed our questionnaires using the Wenjuanxing app, an online platform for surveys, evaluations, and voting (Liu et al., 2022). Approval for our study was obtained from the Ethics Committees of Zhejiang Gongshang University and China Jiliang University. Participants, who had previously viewed virtual streamers in the context of live streaming commerce, were informed about the purpose of the study and provided written consent to participate. Then, respondents who qualified responded to the measures based on their latest viewing experience of virtual streamers in live streaming commerce. Of 483 surveys we received, we excluded incomplete or illogical responses and forms completed in under 1 minute, resulting in 432 valid surveys, for an effective response rate of 89.44%. The sample comprised 235 (54.40%) men and 197 (45.60%) women ($M_{\text{age}} = 20.53$ years, $SD = 1.86$, range = 18–31). As compensation, each participant received CNY 10 (~USD 1.40).

Measures

All constructs were assessed using a 5-point Likert scale, where 1 = *strongly disagree* and 5 = *strongly agree*.

Responsiveness

We sourced three items for responsiveness from Xue et al. (2020), and made some modifications relative to the content of this research. A sample item is “The virtual streamer can respond to my questions or requests in a timely manner.” In our study Cronbach’s alpha was .76.

Social Presence

We adapted three items for social presence from Gao et al. (2023). A sample item is “The virtual streamer’s live streaming room exudes human warmth.” In our study Cronbach’s alpha was .81.

Purchase Intention

We measured purchase intention with three items adapted from Liu et al. (2022). A sample item is “I have the intention to purchase the products that the virtual streamer promotes during live streams.” In our study Cronbach’s alpha was .76.

Results

Measurement Model

As can be seen in Table 1, all composite reliability values were above .70 and average variance extracted values exceeded .50. Additionally, the model fit indices suggested that our theoretical model fit the data well (Liu & Zhang, 2024). Thus, our model demonstrated good reliability and validity.

Table 1. *Validity Analysis Results for Study Constructs*

	<i>M</i>	<i>SD</i>	1	2	3	CR	AVE
1. Responsiveness	3.66	0.57	1			.76	.51
2. Social presence	3.42	0.69	.33**	1		.81	.59
3. Purchase intention	3.60	0.58	.41**	.31**	1	.76	.51
Fit indices	$\chi^2/df = 1.28$, RMSEA = .03, CFI = .99, IFI = .99						

Note. CR = composite reliability; AVE = average variance extracted; RMSEA = root-mean-square error of approximation; CFI = comparative fit index; IFI = incremental fit index.

** $p < .01$.

Hypothesis Testing

To test the hypotheses, we employed structural equation modeling with 95% confidence intervals (CIs) using Amos 21.0. The results supported Hypothesis 1, showing that virtual streamer responsiveness, $\beta = .46$, $p < .001$, positively affected consumers' purchase intention in live streaming commerce.

Further, virtual streamer responsiveness had a significant and positive relationship with social presence, $\beta = .42$, $p < .001$, 95% CI [0.29, 0.53], and social presence had a significant and positive relationship with purchase intention, $\beta = .21$, $p < .01$, 95% CI [0.08, 0.33]. To examine the mediating effect, we utilized a bootstrapping procedure with 5,000 resamples. The indirect effect of virtual streamer responsiveness on purchase intention through the mediator of social presence was .09, 95% CI [0.04, 0.14]. This finding supported Hypothesis 2. The results are shown in Figure 2.

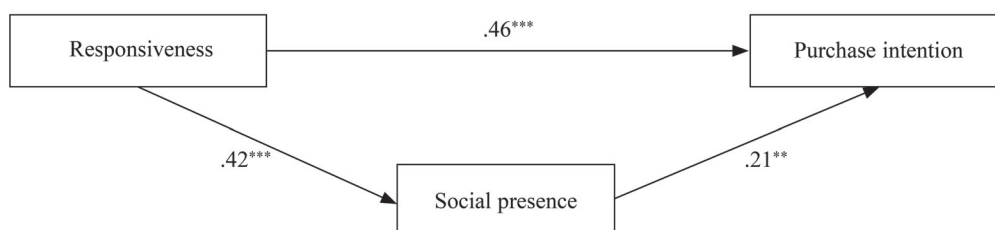


Figure 2. *Path Coefficient Test Results.*

** $p < .01$. *** $p < .001$.

Discussion

In this research we examined the impact of virtual streamer responsiveness on consumers' purchase intention. Our findings demonstrate that virtual streamer responsiveness positively affected consumers' purchase intention in live streaming commerce, with social presence mediating this relationship. As digital personas driven by artificial intelligence, virtual streamers can be programmed by incorporating advanced technologies such as big data technology, natural language processing, and virtual image manipulation to simulate the live performance of human streamers, engaging in real-time interactions with consumers during live streaming commerce (Wu et al., 2023). Higher perceived responsiveness of virtual streamers during live streaming indicates smoother interactive communication between consumers and virtual streamers, which is conducive to consumer purchase decisions (M. Zhang et al., 2021). Additionally, consumers' perception of virtual streamers' responsiveness in live streaming commerce enhances communication effectiveness, creating a sense of interpersonal interaction with virtual streamers and increasing social presence, ultimately boosting consumers' purchase intention (Gao et al., 2023).

Theoretical and Practical Implications

Our study makes two primary theoretical contributions. First, we have enriched research on virtual streamers by empirically exploring their impact on consumer behavior in the context of live streaming commerce. While there is extensive research on consumer behavior in live streaming commerce with human streamers, virtual streamers have received little attention from scholars (Gao et al., 2023). This study empirically examined the effect of virtual streamers, a new type of artificial intelligence in live streaming, on consumers' online purchasing behavior, thereby expanding the scope of research on streamers of live streaming commerce. Second, we introduced responsiveness into the study of virtual streamers, clarifying that virtual streamer responsiveness affects consumers' purchase intention through its impact on social presence (J.-S. Chen et al., 2021). By empirically analyzing consumers' purchasing behavior and cognitive processes from the perspective of virtual streamer responsiveness, this study provides a new perspective for understanding the impact of virtual streamers on consumers' online purchasing behavior based on the theories of perceived responsiveness and social presence.

From a practical standpoint, the positive impact of virtual streamer responsiveness on consumers' purchase intention underscores the importance of developers investing resources in enhancing virtual streamer responsiveness when optimizing virtual streamer design. It is important to note that increasing interactive functions does not always equate to improved perceived responsiveness. Therefore, when upgrading and optimizing virtual streamers, it is essential to enrich the responsiveness functions of virtual streamers from the consumers' perspective, elevating consumers' perceived level of responsiveness to virtual streamers (Wongkitrungrueng & Assarut, 2020). Furthermore, our findings suggest that virtual streamer responsiveness indirectly affected consumers' purchase intention through the mediator of social presence. Hence, firms considering the adoption of virtual streamers should program these streamers to show high responsiveness, which can enhance the illusion of social presence. This can be achieved by ensuring quick and effective responses to consumer inquiries and providing relevant information using advanced artificial intelligence (Xue et al., 2020). Firms should also continuously train virtual streamers to enhance their ability to respond to consumers' questions and requirements by machine learning.

Limitations and Directions for Future Research

There are several limitations to this study. First, the data were collected using a survey method based on consumers' actual perceptions of virtual streamers. In future research, experimental methods could be employed to control virtual streamer responsiveness more effectively and assess its impact. Second, subsequent studies could evaluate our conceptual model and hypotheses in alternative cultural settings to enhance the generalizability of our findings.

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References

- Chen, J.-S., Le, T.-T.-Y., & Florence, D. (2021). Usability and responsiveness of artificial intelligence chatbot on online customer experience in e-retailing. *International Journal of Retail & Distribution Management*, 49(11), 1512–1531. <https://doi.org/10.1108/IJRDM-08-2020-0312>
- Chen, J., & Liao, J. (2022). Antecedents of viewers' live streaming watching: A perspective of social presence theory. *Frontiers in Psychology*, 13, Article 839629. <https://doi.org/10.3389/fpsyg.2022.839629>
- Gao, W., Jiang, N., & Guo, Q. (2023). How do virtual streamers affect purchase intention in the live streaming context? A presence perspective. *Journal of Retailing and Consumer Services*, 73, Article 103356. <https://doi.org/10.1016/j.jretconser.2023.103356>
- Guo, Y., Zhang, K., & Wang, C. (2022). Way to success: understanding top streamer's popularity and influence from the perspective of source characteristics. *Journal of Retailing and Consumer Services*, 64, Article 102786. <https://doi.org/10.1016/j.jretconser.2021.102786>
- Lim, X.-J., Cheah, J.-H., Ng, S. I., Basha, N. K., & Liu, Y. (2021). Are men from Mars, women from Venus? Examining gender differences towards continuous use intention of branded apps. *Journal of Retailing and Consumer Services*, 60, Article 102422. <https://doi.org/10.1016/j.jretconser.2020.102422>
- Liu, X., & Zhang, L. (2024). Entrepreneurial bricolage, business model innovation, and sustainable entrepreneurial performance of digital entrepreneurial ventures: The moderating effect of digital entrepreneurial ecosystem empowerment. *Sustainability*, 16, Article 8168. <https://doi.org/10.3390/su16188168>
- Liu, X., Zhang, L., & Chen, Q. (2022). The effects of tourism e-commerce live streaming features on consumer purchase intention: The mediating roles of flow experience and trust. *Frontiers in Psychology*, 13, Article 995129. <https://doi.org/10.3389/fpsyg.2022.995129>
- Ma, L., Gao, S., & Zhang, X. (2022). How to use live streaming to improve consumer purchase intentions: Evidence from China. *Sustainability*, 14(2), Article 1045. <https://doi.org/10.3390/su14021045>
- Ma, Y. (2021). Elucidating determinants of customer satisfaction with live-stream shopping: An extension of the information systems success model. *Telematics and Informatics*, 65, Article 101707. <https://doi.org/10.1016/j.tele.2021.101707>
- Schuetzler, R. M., Grimes, G. M., & Scott Giboney, J. (2020). The impact of chatbot conversational skill on engagement and perceived humanness. *Journal of Management Information Systems*, 37(3), 875–900. <https://doi.org/10.1080/07421222.2020.1790204>
- Sun, Y., Shao, X., Li, X., Guo, Y., & Nie, K. (2019). How live streaming influences purchase intentions in social commerce: An IT affordance perspective. *Electronic Commerce Research and Applications*, 37, Article 100886. <https://doi.org/10.1016/j.elerap.2019.100886>



Wongkitrungrueng, A., & Assarut, N. (2020). The role of live streaming in building consumer trust and engagement with social commerce sellers. *Journal of Business Research*, 117, 543–556.
<https://doi.org/10.1016/j.jbusres.2018.08.032>

Wu, R., Liu, J., Chen, S., & Tong, X. (2023). The effect of e-commerce virtual live streamer socialness on consumers' experiential value: An empirical study based on Chinese e-commerce live streaming studios. *Journal of Research in Interactive Marketing*, 17(5), 714–733.
<https://doi.org/10.1108/JRIM-09-2022-0265>

Xue, J., Liang, X., Xie, T., & Wang, H. (2020). See now, act now: How to interact with customers to enhance social commerce engagement? *Information & Management*, 57(6), Article 103324.
<https://doi.org/10.1016/j.im.2020.103324>

Zhang, L., & Liu, X. (2023). Interactivity and live-streaming commerce purchase intention: Social presence as a mediator. *Social Behavior and Personality: An international journal*, 51(2), Article e12104.
<https://doi.org/10.2224/sbp.12104>

Zhang, M., Sun, L., Qin, F., & Wang, G. A. (2021). E-service quality on live streaming platforms: Swift guanxi perspective. *Journal of Services Marketing*, 35(3), 312–324.
<https://doi.org/10.1108/JSM-01-2020-0009>