

Optimization Strategies of Virtual Presence on Fashion User Behavior in Live Streaming E-Commerce

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Abstract. The fashion industry has undergone significant changes with the advent of live-streaming technology and virtual platforms. Live streaming of fashion events and live streaming of fashion products has become a popular medium for attracting fashion enthusiasts, showcasing collections, and increasing consumer interest. Virtual presence allows fashion users to immerse themselves in real-time fashion experiences through live streaming platforms and has become a key focus for optimizing live fashion e-commerce. This study uses systematic literature analysis and participant observation research methods to explore the impact of virtual presence on fashion users and delve into optimization strategies of virtual presence on live fashion user behavior to enhance the shopping experience and ultimately increase conversion rates.

Keywords. Virtual Presence, Live Streaming E-Commerce, Fashion Consumer Behavior.

1. Introduction

Live-streaming e-commerce is growing rapidly around the world, with more and more fashion consumers turning to online live-streaming platforms for shopping. covid-19 swept the world, and many physical clothing stores in China suspended their operations, dealing a fatal blow to the marketing of traditional fashion products. With the gradual formation of live-streaming technology and market, live-streaming e-commerce has seen a major explosion, and major e-commerce platforms have been vigorously developing live-streaming. Apparel and beauty products, as important sales categories of mainstream live e-commerce platforms, occupy a large market share in the live e-commerce market [1], and their competition is exceptionally fierce. However, fashion consumers are often active on different live-streaming platforms, with limited attention span, unstable engagement, and generally low loyalty. Coupled with the rising cost of maintaining and acquiring users on public domain platforms, brands, and merchants should not only think

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about how to attract new customers, but also pay attention to improving the stickiness of private domain users, enhancing exclusivity, and improving user operations [2].

As technology advances and consumer preferences evolve, the nature of virtual presence has had a profound impact on fashion consumer behavior. Previous research on live fashion e-commerce has focused more on external factors, such as the factors influencing the traffic of live fashion e-commerce, the characteristics of fashion live streamers, technology adoption, and user experience. However, the inner core needs of fashion users, namely virtual presence, have not been sufficiently analyzed [3]. Indeed, the virtual presence offered by live streaming opens new opportunities for fashion brands to help bridge the psychological distance between buyers and sellers, creating a more immersive and engaging shopping experience. It makes fashion more accessible to a wider range of users, thus driving a closer relationship between fashion users and companies or platforms, revolutionizing the way fashion users experience and consume [4].

2. Development of the concept of virtual presence

Slater, Usoh, and Steed (1994) introduced the concept of presence [5]. Lombard and Ditton (1997) studied the sense of presence in virtual environments [6]. Biocca, Harms, and Gregg (2001) introduced the concept of virtual presence as a "subjective experience of being in a mediated environment" and emphasized the role of technology in creating a sense of presence [7]. Lombard, Reich, Grabe, et al. (2000) emphasize that presence can occur in both physical and virtual environments, while virtual presence refers specifically to the experience of being in a mediated or virtual environment [8]. In recent years, virtual presence has received increasing attention with the iterations of virtual reality (VR), augmented reality (AR), and other immersive technologies.

Live streaming e-commerce is defined as a new type of e-commerce with real-time social interaction. Its most distinctive feature is the sense of virtual presence, which refers to the fact that consumers no longer exist independently of each other and other consumers; it breaks the limitations of physical space and creates a sense of social presence in virtual space, giving a sense of immersion [9]. Enjoying a fascinating shopping experience while having more interpersonal connections creates an exciting atmosphere of collective consumption [10]. The sense of belonging and immersion generated by the act of interacting online, i.e., the degree of feeling embodied and present in a virtual environment, and the perception of the real psychological presence of others.

Fashion is a highly visual industry that is characterized by a fast pace, frequent updates, and personalization. Live streaming e-commerce allows live streamers to showcase the fit, design points, movement, and wearability of fashion products through real-time video. It also enables the ability to quickly and easily showcase the latest products and collections to global consumers, which can be difficult to convey in still images or text. Consumers find personalized expressions of fashion products through virtual live streaming, learn about the products in real-time after pop-up questions, and interact with emotions and needs. Live brands provide potential consumers with more product details and presence, thus influencing the behavior of fashion users [11]. Thus, it is evident that virtual presence not only brings users closer to the all-round deeper link with the fashion industry but also helps e-commerce brands to be clearer on how to create

more immersive virtual experiences that are fashion consumer-centric and more engaging to meet the unique and personalized shopping needs that consumers expect.

3. The effect of virtual presence on fashion user behavior in live streaming

The impact of virtual presence on the behavior of live fashion users is significant and multifaceted. Virtual presence is the feeling of being present in a virtual environment, which affects user engagement, purchase intent, brand loyalty, and interaction with others. Understanding these influences is critical for fashion brands to optimize their strategies and enhance the user experience on live-streaming platforms. Here are the key manifestations of the impact of virtual presence in live streaming on the behavior of fashion users.

- **User engagement:** the virtual presence in live fashion creates a more immersive and interactive experience for users, thus increasing engagement [12]. For example, fashion shows, new product presentations, and exclusive events usually have limited seating capacity, location restrictions, or ticket access requirements. Through the virtual presence of live streaming, fashion brands can extend their reach to a global audience, allowing anyone with an Internet connection to participate in a real-time or on-demand fashion experience. At the same time when users feel connected to the content, live stream hosts, and other participants, it encourages active participation, such as commenting, liking, and sharing. The feeling of being in a virtual environment drives users to stay longer, follow live streams and develop a sense of belonging.
- **Social interaction and community building:** The virtual presence in Fashion Live facilitates social interaction and community building. Users can engage in real-time conversations, share ideas and connect with like-minded people. The feeling of being present together in a virtual space fosters a sense of community [13]. Users can exchange fashion tips, discuss trends, and build relationships with other participants and live hosts, contributing to an overall user experience and encouraging repeat engagement.
- **Purchase intention:** Virtual presence can significantly influence users' purchase intention in a live fashion. When users feel present and engaged, they are more likely to have a positive perception of the displayed product, which increases purchase intentions [14]. For example, the virtual try-on feature allows users to see themselves wearing a fashion item, further enhancing presence and facilitating confident purchase decisions.
- **Brand loyalty:** virtual presence plays a crucial role in fostering brand loyalty among live fashion users. When users feel a presence and emotional connection to a brand, they are more likely to develop a sense of trust, loyalty, and attachment [15]. Brands are more likely to build long-term relationships with their audience if they can effectively create a virtual environment where users can experience the brand's values, stories, and unique offerings.

In short, virtual presence has a profound impact on the behavioral patterns of live fashion users. It can enhance user engagement, influence purchase intentions, foster brand loyalty and facilitate social interaction and community building. Fashion brands should use virtual presence to create immersive and interactive live experiences that resonate with viewers, ultimately driving positive user behavior outcomes and commercial success.

4. Strategies for Optimizing Fashion User Behavior with Virtual Presence in Live Streaming

A review of the literature on virtual presence in live streaming reveals that different scholars have examined the sense of virtual presence from different perspectives. Witmer and Singer (1998) proposed a framework for understanding virtual presence that includes three dimensions: spatial presence (the feeling of being in physical space), social presence (the feeling of being with others), and self-presence (the sense of self-identity) in a virtual environment [16]. Biocca, Harms, and Gregg (2001) extended this framework and introduced additional dimensions such as sensory presence (the feeling of sensory immersion) and co-presence (the perception of the presence of others) [7]. Lee & Park (2014) divided the concept of virtual presence into telepresence and social presence [17]. Xie et al. (2021) divided the factors of virtual presence in live streaming into three dimensions, "coexistence presence", "communication presence" and "emotional presence", to study the impact on perceived hedonic and perceived trust [18]. Ming et al. (2021) divided presence in live streaming into four dimensions: the social presence of the live streaming platform, the social presence of the viewer, the social presence of the live host, and telepresence [19]. Examining how they affect consumer trust and traffic status, it helps live streamers and e-retailers to further understand how to stimulate consumer behavior.

Based on the above scholars, this study classifies the core factors closely related to the virtual presence in live streaming e-commerce from the perspective of user perception into four dimensions: the virtual presence of the live streamer, the virtual presence of live streamer assistant, the virtual presence of user interaction, and virtual presence in the virtual environment, each of which helps explore the path to optimizing fashion consumer behavior.

4.1. Optimize the virtual presence of the fashion live streamer

The live streamer's virtual presence refers to the immersion and sense of presence generated by visualization and real-time interaction between live streamers and fashion consumers in a virtual environment. Live streamers can build trust and good communication with customers through voice, demonstrations, and fighting for special offers [20]. Customers have timely face-to-face-like communication with anchors by sending gifts, sending comments, and connecting with them. As a double advocate of the brand side and the customer side, live streamers need to constantly balance the needs of both sides, think from the customer's perspective, and create a virtual presence with a good atmosphere through live streamers' continuous efforts in the live streaming to influence the positive behavior of fashion users through the following strategies.

- Build a personal IP with authenticity: Encourage fashion live streamers to delve into fashion trends, industry events, emerging designers, and product knowledge. Establish live streamers as reliable fashion authorities by showcasing their unique style, personality, and expertise. It also authentically helps brands to better showcase their fashion items by exporting their fashion views and introducing the unique selling points of their products [21]. It helps viewers to connect with fashion live streamers and enhance their virtual presence.
- Facilitates interaction and participatory communication: Improves fashion live streamers' ability to communicate effectively and interact with viewers,

enabling them to be adept at connecting with viewers, responding positively to comments and questions, creating a conversational atmosphere, creating excitement, and effectively communicating fashion-related messages [22]. Interactive elements such as polls, quizzes, and live Q&A sessions are also incorporated to encourage audience participation and create a sense of dialogue. It is also possible to share personal fashion experiences, style inspirations, or behind-the-scenes stories that resonate with the audience, creating a more immersive experience for the audience.

4.2. Optimize the virtual presence of the fashion live streamer assistant

People who "shout and create an atmosphere" around the streaming during live streaming and work with the live streamer to provide support and excitement for the live streaming are often referred to as helpers [23]. They help live streamers engage their audience and create an enjoyable and dynamic experience by providing enthusiastic comments, encouraging audience participation, and helping live streamers build momentum. A good assistant live streamer can add energy to a live stream through their body language and enthusiasm, bringing extra excitement and engagement to the live stream and helping to create a more immersive and dynamic experience for the audience.

- **Be trained and prepared:** Provide comprehensive training to the live streamer's assistants in areas such as fashion information, product knowledge, presentation skills, effective communication, and interaction with the audience. This ensures that they are well prepared and confident before the live streaming period and can provide valuable fashion insights and product selection advice, enhancing their ability to support the anchor during the broadcast.
- **Personality building and sincere interaction:** Encourage live streamer assistants to show their real personality, actively wear and try on fashion products, and actively interact with live streamers and viewers to help live streamers better explain the features and buying points of fashion products, enliven the atmosphere of the live broadcast, and develop a sense of connection and virtual presence with users.

4.3. Optimize the virtual presence of the fashion user interaction

Fashion users are the disseminators of information in live streaming, and they prefer to maintain a pleasant and active atmosphere in the live streaming room to achieve real-time customer-to-customer interaction through pop-ups, which helps customers learn more about the product and establish a harmonious relationship with others [23] and promotes a sense of virtual presence. At the same time, consumer-to-consumer relationships in real-time communication and interaction, through the identification of the live streamer and products, shopping and at the same time can also make friends with common hobbies and the north and south of the world, greatly exerting the extended value of virtual presence.

- **Promote real-time interaction and social integration:** encourage fashion users to share their experiences, comment and participate in live content in real-time during the live streaming, creating a sense of authenticity and trust [24]. It also links users to the larger fashion community, fostering a sense of community

and engagement by creating dynamic and interactive environments that enhance their virtual presence in the fashion ecosystem.

- Add gamification and interactive experiences: Incorporate gamification elements into virtual fashion experiences or develop interactive features such as virtual fashion events. For example, users can participate in fashion shows, and interact with fashion designers or influencers virtually [25]. This facilitates increased user engagement and creates a more immersive virtual presence, making them feel more connected to the fashion industry.

4.4. Optimize virtual presence in the virtual environment

Virtual environment immersion refers to the creation of an atmosphere for customers on live streaming, even if they are shopping online as if they were shopping in a store so that consumers are immersed and remain engaged. Immersive virtual environments should provide a good user experience [26], focusing on stimulating the user to perceive a higher level of telepresence. Virtual environments with higher interactivity will increase the user's attention to the current activity and improve the user's perception of control skills, which in turn will influence the user's behavior.

- Engaging visual presentation: Pay attention to the appearance, grooming, and fashion sense of the live streamers and assistants. They should present themselves in a visually appealing and stylish manner consistent with the fashion industry. Ensure that the backdrop and set design of the live streaming is visually appealing and relevant to the fashion theme. Create an immersive and engaging virtual presence by enhancing the overall atmosphere and mood with carefully planned visual, auditory, and tactile presentations [27].
- Optimize interactive elements: Include interactive elements in the virtual environment to engage the audience and enhance their virtual presence. This can include clickable objects, interactive menus, or 3D models that users can navigate. Use immersive features such as 360-degree video or virtual reality (VR) experiences to provide a more realistic and immersive virtual presence.

In short, when the environment, live streamer, user, and assistant of a virtual live room complement each other, they will give customers the best virtual presence experience, and a good social experience and the shopping experience will increase customers' trust and satisfaction in the live room, and customers who feel the sincerity will be more willing to actively express their experience, creating quality electronic word-of-mouth, which will increase positive behaviors such as loyalty of old customers and purchase rate of new customers.

5. Conclusion

Through the literature review, we found that although live streamers have used the concept of virtual presence to study user attitudes and behaviors have achieved certain results. However, the research on virtual presence in the emerging and challenging fashion live-streaming e-commerce is still in its initial stage, and there is an urgent need for in-depth research, not only to enrich the scope of virtual presence research theoretically but also to provide some inspiration and strategic guidance to the fashion live brands in crisis. Future research can expand the research object and research content,

and further and more finely explore the transmission mechanism of virtual presence in order to improve the universality of research findings.

Then, the impact of virtual presence on fashion consumers' behavior in live streaming is confirmed. It can help live brands gain valuable insights into fashion consumers' preferences, needs, and pain points, information that can be used to improve products and services, address any questions or concerns, and ultimately provide a better shopping experience for fashion consumers. By gaining insight into the virtual presence of live fashion e-commerce, fashion brands can be more thoughtful in improving the customer experience and building stronger, more loyal relationships with their customers [28].

Finally, the study of strategies to optimize fashion users' behavior through the virtual presence in live streaming found that as fashion consumers' needs escalate, they are more interested in social needs such as emotional, psychological, friendship, and interaction when shopping in virtual space. Therefore, to enhance the virtual presence of fashion consumers in live shopping, increase the inherent social needs such as emotional belonging, communication, exchange, and identification between anchors and consumers, and thus deepen consumers' awareness of anchors, brands, and products. At the same time to create a reliable virtual shopping environment and consumer transaction security, strengthen contact with consumers, focus on consumer purchase feedback and emotional interaction, stand in the consumer's perspective to solve problems, and improve the level of service, in order to achieve consumer super satisfaction and trust, to establish a good electronic word of mouth, in order to strengthen the "stickiness" between the brand and ", enhance the consumer's loyalty to the fashion live brand.

References

- [1] Liu Z . Research on the current situation and future trend of web celebrity e-commerce live streaming industry[C] ICBIM 2020: 2020 The 4th International Conference on Business and Information Management. 2020.
- [2] I Research.[EB/OL] 2021 China Private Domain Traffic Marketing Insights Research report. https://report.iresearch.cn/report_pdf.aspx?id=3848
- [3] Zhang M , Liu Y , Wang Y , et al. How to retain customers: Understanding the role of trust in live streaming commerce with a socio-technical perspective[J]. Computers in Human Behavior, 2021, 127.
- [4] Ye S , Lei S , Shen H , et al. Social presence, telepresence and customers' intention to purchase online peer-to-peer accommodation: A mediating model[J]. Journal of Hospitality and Tourism Management, 2020, 42:119-129.
- [5] Slater M , Wilbur S . A Framework for Immersive Virtual Environments (FIVE): Speculations on the Role of Presence in Virtual Environments[J]. Presence Teleoperators & Virtual Environments, 1997, 6(6):603--616.
- [6] Schubert T , Friedmann F , Regenbrecht H . Embodied Presence in Virtual Environments[J]. Springer London, 1998.
- [7] Biocca F , Harms C , Gregg J . The Networked Minds Measure of Social Presence: Pilot Test of the Factor Structure and Concurrent Validity[J]. interface & network design lab, 2001.
- [8] Lombard M , Reich R D , Grabe M E , et al. Presence and television[J]. Human Communication Research, 2000, 26(1):75-98.
- [9] Steffen J H, Gaskin J E, Meservy T O, et al. Framework of affordances for virtual reality and augmented reality[J]. Journal of Management Information Systems, 2019, 36(3): 683-729.
- [10] Wohn D Y , Guo F , Mclaughlin C . Explaining Viewers' Emotional, Instrumental, and Financial Support Provision for Live Streamers[C]// the 2018 CHI Conference. 2018.
- [11] Wongkitrungrueng A , Assarut N , Business J O , et al. The role of live streaming in building consumer trust and engagement with social commerce sellers[J]. 2020.

- [12] Lv J, Cao C, Xu Q, et al. How Live Streaming Interactions and Their Visual Stimuli Affect Users' Sustained Engagement Behaviour—A Comparative Experiment Using Live and Virtual Live Streaming[J]. *Sustainability*, 2022, 14(14): 8907.
- [13] Ananda A S, Hernández-García Á, Acquila-Natale E, et al. What makes fashion consumers “click”? Generation of eWoM engagement in social media[J]. *Asia Pacific Journal of Marketing and Logistics*, 2019.
- [14] Ma L, Gao S, Zhang X. How to use live streaming to improve consumer purchase intentions: evidence from China[J]. *Sustainability*, 2022, 14(2): 1045.
- [15] Wongkitrungrueng A, Assarut N. The role of live streaming in building consumer trust and engagement with social commerce sellers[J]. *Journal of business research*, 2020, 117: 543-556.
- [16] Witmer B G, Singer M J. Measuring presence in virtual environments: A presence questionnaire[J]. *Presence*, 1998, 7(3): 225-240.
- [17] Lee E J , Park J . Enhancing Virtual Presence in E-Tail: Dynamics of Cue Multiplicity[J]. *International Journal of Electronic Commerce*, 2014, 18(4):117-146.
- [18] xie ying, gao peng, & li chungqing.. Research on Live Broadcast Social Presence: Scale Development and Validity Test[J]. *Nankai Business Review*, 2021, 24(3): 28-38.
- [19] Ming, J., Jianqiu, Z., Bilal, M., Akram, U., & Fan, M. How social presence influences impulse buying behavior in live streaming commerce? The role of S-O-R theory[J]. *International Journal of Web Information Systems*, 2021, 17(4): 300–320.
- [20] Veirman M D , Cauberghe V , Hudders L . Marketing through Instagram influencers: the impact of number of followers and product divergence on brand attitude[J]. *International Journal of Advertising*, 2016, 36(1):1-31.
- [21] Yang J, Cao C. Factors Influencing the Consumer Impulse Buying Behaviour: A Study in the Context of E-Commerce Live Broadcast[J]. 2022.
- [22] Wu R, Liu J, Chen S, et al. The effect of E-commerce virtual live streamer socialness on consumers' experiential value: an empirical study based on Chinese E-commerce live streaming studios[J]. *Journal of Research in Interactive Marketing*, 2023 (ahead-of-print).
- [23] Hu Yuanyuan. Interactive rituals and value creation in online celebrity marketing live broadcast [J]. *Horizon View*, 2020, 000(019):P.1-1.
- [24] Sun Y , Wei K K , Fan C , et al. Does social climate matter? On friendship groups in social commerce[J]. *Electronic Commerce Research and Applications*, 2016, 18:37-47.
- [25] Chou C Y, Chen J S, Lin S K. Value cocreation in livestreaming and its effect on consumer - simulated experience and continued use intention[J]. *International Journal of Consumer Studies*, 2022, 46(6): 2183-2199.
- [26] Tcha-Tokey K , Loup-Escande E , Christmann O , et al. Effects on User Experience in an Edutainment Virtual Environment: Comparison Between CAVE and HMD[C]// *European Conference on Cognitive Ergonomics*. 2018.
- [27] Hartmann J, Holz C, Ofek E, et al. Realitycheck: Blending virtual environments with situated physical reality[C]//*Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*. 2019: 1-12.
- [28] Shin D H , Shin Y J . Consumers' Trust in Virtual Mall Shopping: The Role of Social Presence and Perceived Security[J]. *International Journal of Humancomputer Interaction*, 2011, 27(5):450-475.