JOURNAL OF GLOBAL TRENDS IN SOCIAL SCIENCE

J G T S S

Review article

https://doi.org/10.70731/6ea8dk52

AI-Powered Digital Human Live Streaming and Chinese Consumers' Purchase Intention: Influencing Factors, Mechanisms, and Future Research Directions

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Received 9 April 2026

Revised 11 May 2026

Accepted 26 May 2026

Published 31 May 2026

Abstract: Against the backdrop of the digital economy, AI-powered digital human live streaming, a novel marketing format that integrates artificial intelligence with live-streaming e-commerce, is profoundly reshaping Chinese consumers' shopping experiences and purchasing decisions. This paper employs a systematic literature review methodology to collate recent research findings on the factors influencing Chinese consumers' purchase intentions in relation to AI-powered digital human live streaming. Through integrated analysis, this paper first defines the conceptual evolution and technical characteristics of AI-powered digital humans. Second, it systematically identifies three core categories of factors influencing consumer purchase intention: feature dimensions of AI-powered digital humans (anthropomorphism, intelligent interactivity, and personalized recommendation), psychological mechanisms (social presence and trust in AI), and boundary conditions (product type and consumer characteristics). Consequently, this paper proposes an integrated dual-path model of presence and trust, revealing the underlying mechanisms through which these influencing factors affect purchase intention via the presence and trust pathways. Finally, this paper reviews the methodological characteristics of existing research and identifies future research directions. This paper provides a systematic knowledge base for theoretical construction and empirical research in the field of AI-powered digital human live streaming.

Keywords: AI-powered digital humans; Live-streaming e-commerce; Chinese consumers; Purchase intention; Systematic review

ISSN 2759-7830 (Online)
ISSN 2760-2508 (Print)

Introduction

In recent years, AI-powered digital human live streaming has emerged as one of the most prominent new marketing models in China's e-commerce sector, with major e-commerce platforms and merchants actively exploring related practices. However, this new business model did not emerge overnight; its evolutionary trajectory clearly reflects the iterative development of the underlying artificial intelligence technologies (see **Figure 1**). From the mechanical repetition phase of 2018 to 2020 (merely looping pre-set videos with zero interaction), through the templated interaction phase of 2021 to 2023 (keyword-triggered pre-set scripts with stiff interactions), to the Intelligent AI phase from 2023 to the present (driven by generative AI, enabling multi-modal, context-aware intelligent interactions), AI-powered digital humans have evolved from passive electronic vending machines into quasi-social agents capable of human-like communication. While this qualitative shift has enhanced the user experience, it has also complicated the psychological mechanisms through which they influence consumer behavior, posing new challenges to existing theories.

Purchase intention is a core concept in consumer behavior research, referring to the likelihood that a consumer will engage in a purchasing behavior for a specific product or service (Fishbein & Ajzen, 1975). In the context of AI-powered digital human live streaming, consumers' purchase intentions are influenced by a variety of emerging factors, including the anthropomorphic characteristics, intelligent in-

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https://doi.org/10.70731/6ea8dk52

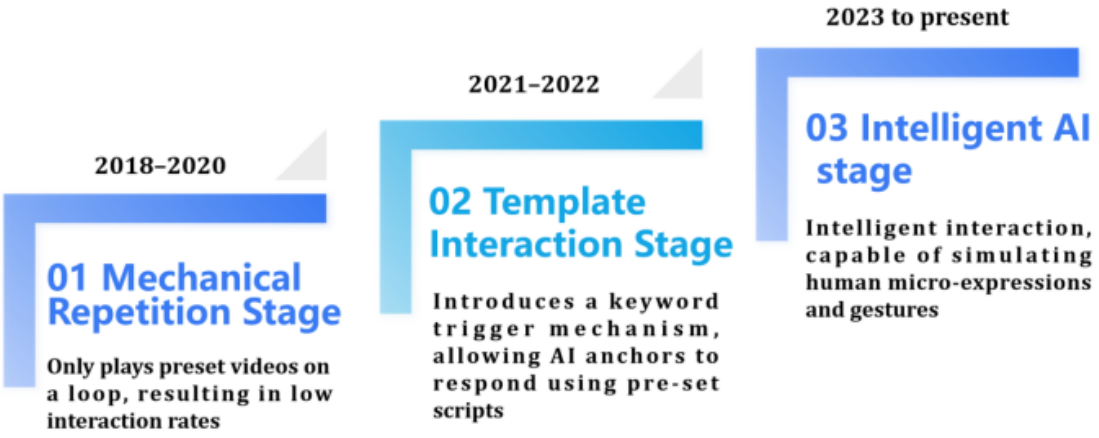

Figure 1 | Three stages of development in China's AI-powered digital human live streaming

teractivity, and personalized recommendation capabilities of AI-powered digital humans. However, has academic research on how this new type of intelligent agent influences consumer psychology and behavior kept pace with technological advancements? Can existing theoretical frameworks (such as the Technology Acceptance Model and the Theory of Quasi-Social Interaction) effectively explain the unique influence mechanisms of these quasi-social agents? However, the answers to these questions remain unclear.

Accordingly, this paper adopts a systematic literature review methodology to systematically collate existing research findings centre on the core question of how AI-powered digital human live streaming influences Chinese consumers' purchase intention. The research objectives of this paper include: **1)** defining the conceptual evolution and technical characteristics of AI-powered digital humans; **2)** identifying and integrating the primary factors influencing consumer purchase intention; **3)** revealing the underlying mechanisms through which these factors influence purchase intention; and **4)** reviewing existing research methods and proposing future research directions. Through the aforementioned work, this paper aims to provide a systematic knowledge base for theoretical construction and subsequent empirical research in the field of AI-powered digital human live streaming.

Conceptual Definition and Technical Characteristics of AI-Powered Digital Human Live Streaming

From virtual humans to AI-powered digital humans: Conceptual evolution

In the research context of AI-powered digital human live streaming, the precise definition of relevant terminology is of paramount importance. Currently, both academia and industry widely employ multiple terms such as virtual humans, digital humans, virtual digital humans, AI-powered digital humans, virtual anchors, and AI anchors. These concepts overlap and differ in both their connotations and denotations, which can lead to confusion. To clarify the conceptual boundaries of core terms, this paper synthesizes relevant literature to construct a three-tier conceptual framework comprising virtual humans, digital humans, and AI-powered digital humans.

The virtual human is the broadest term, referring generally to any digital avatar created using computer-generated technology that possesses human appearance or behavioral characteristics, and is widely applied in fields such as film and television animation, virtual social interaction, and education and training. Magnenat-Thalmann and Thalmann (2005) argue that virtual humans emphasize visual realism and character design, and do not necessarily possess intelligent behavior; for instance, a virtual idol or game character lacking language comprehension capabilities may still be classified as a virtual human. Griffor et al. (2017) further note that virtual humans encompass all computer-generated anthropomorphic figures, emphasizing their virtual existence.

The digital human is a technical term that has evolved from the concept of virtual humans; it typically refers to human-like avatars generated through high-precision 3D modeling, speech synthesis, and facial and motion capture technologies. Compared to virtual humans, digital humans place greater emphasis on realism and naturalness across multiple modalities, including visual and auditory aspects, and are widely used in real-world interactive scenarios such as finance, government services, healthcare, and customer service. Hetherington and McRae (2017) describe digital humans as human characters created using computer-generated imagery (CGI) technology. Although these characters are highly photorealistic, their behavior and emotional expressions rely primarily on pre-set animations and scripted controls, lacking autonomous intelligence.

AI-powered digital humans represent the next generation of virtual entities, integrating artificial intelligence tech-

nology with the foundation of digital humans. Machidon et al. (2018) define AI-powered digital humans as AI-generated characters possessing a human appearance. Song and Xiong (2025) note that intelligent digital human systems driven by large language models integrate core technologies, such as automatic speech recognition, natural language processing, and emotional text-to-speech, enabling hyper-realistic real-time interaction with users. This paper adopts AI-powered digital humans as the core terminology, positioning them at the innermost layer of the conceptual hierarchy comprising virtual humans, digital humans, and AI-powered digital humans. Compared to traditional virtual avatars, AI-powered digital humans not only possess human-like appearances but also integrate AI-driven semantic understanding and interactive capabilities, marking a substantial leap in the evolution of virtual interaction media.

Technical characteristics of AI-powered digital human live streaming

In China, the rise of AI-powered digital human live streaming began around 2020 and has developed rapidly on e-commerce platforms such as Taobao, JD.com, and Douyin (the Chinese version of TikTok). As a specific application of AI-powered digital humans in e-commerce scenarios, AI-powered digital human live streaming exhibits three key technical characteristics that distinguish it from traditional live streaming.

First, scalability in the temporal dimension. AI-powered digital humans can deliver 24/7 uninterrupted live streaming without the need for human breaks, demonstrating significant advantages in terms of operational costs and time flexibility. Second, intelligence in the interactive dimension. Based on large language models and natural language processing technology, AI-powered digital humans are capable of open-ended dialogue and context-aware responses, enabling deep interaction with users.Third, personalization in the content dimension. By analyzing user behavior data in real time, AI-powered digital humans can dynamically adjust recommendation strategies, providing tailored product recommendations and content presentation for different users. These technical characteristics mean that AI-powered digital humans are not merely efficiency tools but have become a new type of marketing medium with quasi-social subject attributes, profoundly influencing consumers' trust in technology-mediated commercial interactions and their behavioral expectations.

Key Factors Influencing Chinese Consumers' Purchase Intention

Core dimensions of AI-powered digital human live streaming

The external appearance, interactive capabilities, and content delivery mechanisms of AI-powered digital humans collectively constitute the core feature dimensions influencing consumers' purchasing intentions. Existing research primarily focuses on three aspects.

Anthropomorphism is a key distinguishing feature of AI-powered digital humans, compared to traditional virtual characters. Research indicates that the external appearance and internal attributes of AI-powered digital humans collectively constitute their anthropomorphic characteristics, serving as core factors influencing consumers' first impressions and their willingness to engage in sustained interaction. Arulsivakumar (2025) empirically found that the morphological, behavioral, and emotional authenticity of AI-powered digital human personas positively influences consumer engagement and attachment, with behavioral and emotional authenticity playing a particularly significant role. Guo et al. (2024) noted that anthropomorphic cues (impressional, interactive, and empathic cues) can promote engagement among digital human live streaming users by enhancing social presence and trust. Magtibay et al. (2025) further validated that anthropomorphism has a significant positive impact on Gen Z consumers' trust and their attitudes toward brands. Anthropomorphism encompasses two dimensions: physical realism and behavioral anthropomorphism. These anthropomorphic elements not only positively influence consumers' sense of social presence and trust but also enhance purchase intentions. Notably, the impact of anthropomorphism extends beyond the outwards appearance of AI-powered digital humans to their intelligent semantic processing capabilities; a high level of semantic understanding and situational adaptability is key to enhancing users' technological trust and sense of control.

Intelligent interactivity is a fundamental capability of AI-powered digital humans that enables human-like communication. Wang et al. (2023) point out that the real-time responsiveness of AI-powered digital humans—including verbal replies, physical reactions and facial expressions—significantly enhances consumers' experience of social coherence. The more timely and natural the response, the easier it is for consumers to build trust and develop a willingness to purchase. Consumer control and engagement within the interactive experience should not be overlooked; interactive mechanisms such as likes, live comments, and voting enhance consumers' sense of control over the live stream's pace and content (Liu, 2024). Multimodal interactive experiences, such as emotional expression through voice intonation and the synchronization of subtitles with animations, create richer sensory stimulation scenarios for consumers, helping deepen the emotional connection between users and streamers. Yu et al. (2025) further confirmed that multimodal anthropomorphic interactions by AI assistants (including the integration of multiple channels, such as voice, facial expressions, and movements) can significantly improve user satisfaction and perceived service quality.

Personalized recommendation represents a key functional advantage of algorithm-driven AI-powered digital humans over traditional human anchors. Nie and Wang (2025) found through experimental research that, for standard products, there is a marked difference in effectiveness be-

tween recommendations made by real people and those made by AI. Chen and Zhang (2023) point out that the degree of alignment between recommended content and users' interests and needs is a core factor influencing the effectiveness of recommendations. Precise recommendations not only enhance users' perceived value but also foster positive attitudes towards presenters and the platform. The ability to adapt recommendations to specific scenarios is also key to improving the user experience; introducing appropriate product combinations within specific contexts enhances the situational relevance of recommendations, thereby increasing users' immersion and engagement (Feng, 2024).

Psychological mechanisms: Identification of mediating variables

How do the feature dimensions of AI-powered digital human live streaming translate into consumer' purchase intention? Existing research has identified two core psychological pathways:

Emotional pathway: Social presence

Social presence is the core psychological experience through which users perceive the authenticity of interpersonal communication during virtual interaction. Chen (2024) conducted a scenario experiment to test that, when an AI anchor understands and responds to their emotions in live-streaming e-commerce scenarios, the stronger the social presence consumers perceive, the greater the enhancement in their purchase intention. Liu et al. (2025) further found that when consumers perceive an AI anchor's understanding and response to their emotions, they experience emotional resonance and a sense of companionship, which in turn enhances trust and purchase intention. Li et al. (2025), in a grounded theory study based on the SOR model, also confirmed that social presence is a key mediating factor linking the differences in characteristics between AI and human anchors, thereby influencing consumer' purchase intention. This creates an atmosphere of product endorsement, immersing consumers in product display scenarios.

Cognitive pathway: Trust in AI

Within this immersive atmosphere, consumers develop a sense of trust in the AI anchor. An empirical study by Shui et al. (2025), grounded in SOR theory, found that the image characteristics of AI anchors (cuteness, vitality) and their suitability to the scenario significantly stimulate consumers' perception of trust, thereby enhancing purchase intention, with trust playing a partial mediating role in this relationship. Zhong et al. (2025) further confirmed, from the perspective of technophobia, that the intelligent human-computer interaction capabilities of AI anchors (guidance, recognition, analysis, and feedback) effectively establish initial consumer trust by influencing perceived usefulness and perceived ease of use. The formation of trust involves a multidimensional assessment encompassing both cognitive judgements regarding the capabilities and reliability of AI systems and emotional perceptions of their benevolence and honesty (Qian and Liu, 2025).

Furthermore, individual consumer perception factors (such as satisfaction, perceived value, and immersive experience) play a mediating role in the aforementioned pathways. Sun and Zhu (2024) pointed out that consumer satisfaction can bridge the gap between the characteristics of AI-powered digital human live streaming and purchase intention. Gong et al. (2024) validated the significant positive influence of perceived functional and emotional value on purchase intention, with both jointly constituting the psychological foundation of consumer purchase intention. Ma (2024) proposed that a high-quality immersive experience increases viewing duration and significantly enhances purchase intention.

Boundary conditions: The role of moderating variables

The strength of these influence pathways is moderated by specific contextual factors. Existing research has identified two key moderating conditions:

Product type is a key moderating variable

Li et al. (2025), in their systematic review of the effects of virtual influencer marketing, noted that product category and characteristics are important moderating factors influencing the effectiveness of virtual influencer marketing (including AI-powered digital humans and virtual anchors), with significant differences in consumer acceptance of AI anchors between search-based and experience-based products. Wang et al. (2023) further demonstrated through eye-tracking experiments that, for search-based products, there is little difference in influence between AI-powered digital humans and human anchors; however, in experiential product scenarios, consumers are more inclined to accept recommendations from human anchors, primarily due to differences in the need for emotional connection and a sense of presence.

Individual consumer characteristics also play a moderating role

Li et al. (2025) found that highly innovative consumers are more sensitive to the intelligent performance of AI-powered digital humans and exhibit higher purchase intention. Deng et al. (2025) noted that consumers with a higher acceptance of new technologies are more likely to perceive the usefulness of generative AI content, thereby enhancing their motivation of purchase. Furthermore, the Uncanny Valley effect exerts a significant negative moderating influence on the relationship between the anthropomorphic appearance of AI-powered digital humans and brand attitudes, reducing consumers' trust in the brand and their purchase intentions (Yang and Long, 2025).

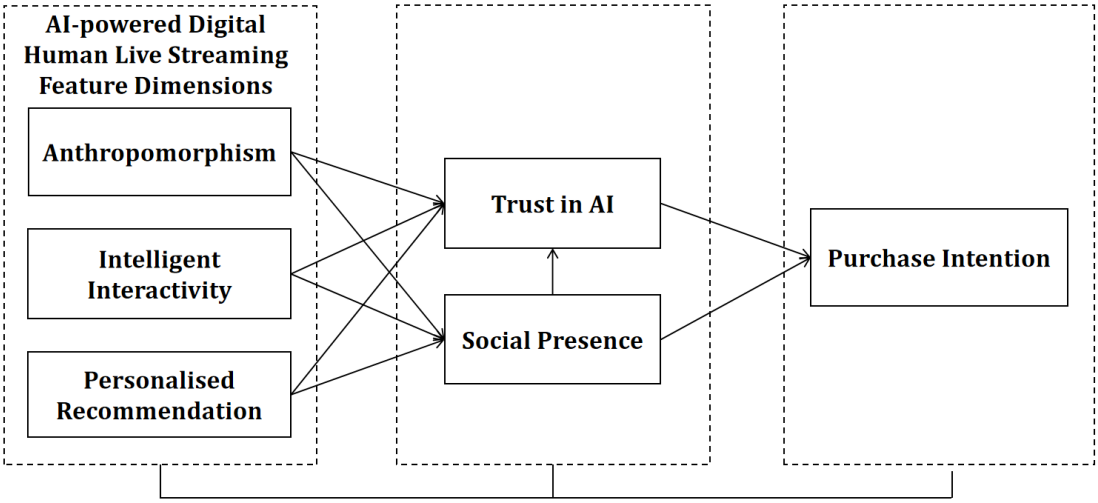

Figure 2 | Integrated model of the presence-trust dual pathway

Mechanisms of Action: From Single Mediation to an Integrated Model

Identifying and comparing mediating mechanisms

Existing research has explored the mediating mechanisms through which AI-powered digital human live streaming influences consumer purchase intention from multiple dimensions. Early studies predominantly focused on single mediating pathways, such as trust, satisfaction, or social presence, acting as independent mediating variables. While such research provides preliminary support for understanding consumer psychological responses, it struggles to explain more complex behavioral decision-making processes.

Subsequently, some studies have adopted parallel mediation pathways, simultaneously examining the independent effects of emotional and cognitive pathways. Qin and Guo (2025) validated that the anthropomorphic characteristics of AI-powered digital humans influence purchase intention through a parallel mediation mechanism involving social presence and trust. While such studies have revealed the multichannel nature of consumer psychological responses, they have failed to elucidate the intrinsic connections between different mediation pathways.

In recent years, a small number of studies have explored chained mediation pathways. A significant theoretical advancement in this regard is the identification of a chained pathway involving social presence and psychological distance: consumers first generate an emotional sense of presence during interactions, which subsequently shortens the psychological distance, ultimately influencing purchase intention (Zhang, 2025). This chained model offers a new theoretical perspective for understanding the temporal relationship between emotional responses and cognitive judgements in AI live-streaming contexts.

Integrated presence-trust dual-path model

Based on the above analysis, this paper proposes a dual-pathway integration model of presence and trust (see **Figure 2**) to systematically explain the mechanism by which AI-powered digital human live streaming influences consumer purchase intention. The core tenets of this model are as follows.

First, the coexistence of dual pathways. The feature dimensions of AI-powered digital human live streaming (anthropomorphism, intelligent interactivity, and personalized recommendation) simultaneously activate two psychological pathways in consumers: the emotional pathway, with social presence as its core mediator, emphasizes the emotional resonance and immersive experience generated during interaction; the cognitive pathway, with trust in AI as its core mediator, emphasizes consumers' rational judgements regarding the capabilities and reliability of the AI system.

Second, the interconnection between pathways. The two pathways are not entirely independent; rather, there is a sequential relationship in which the emotional pathway precedes the cognitive one. Consumers first experience a sense of 'the presence of the other' (social presence) through anthropomorphic interactions; this emotional experience subsequently enhances their cognitive evaluation of the AI anchor's capabilities and benevolence (trust in AI), ultimately jointly promoting the formation of purchase intentions.

Third, moderating contextual factors. The relative importance of these two pathways is moderated by contextual factors such as product type and consumer characteristics. In experiential product contexts, the emotional pathway may play a more prominent role, whereas among highly innovative consumer groups, the cognitive pathway may exert a stronger influence.

This integrated model transcends the explanatory limitations of single-mediator and parallel-mediator approaches, providing a systematic theoretical framework for under-

standing the complex consumer psychological processes in AI-powered digital human live streaming, while also identifying testable hypotheses for future studies.

Evolution and review of research methods

In terms of research methodology, the existing literature demonstrates an evolutionary trend from early conceptual exploration to the current systematic empirical validation.

Regarding data collection methods, structured questionnaire surveys remain predominant, with researchers typically designing questionnaires based on theoretical frameworks such as the SOR and TAM models, and sample sizes generally ranging between 300 and 500 participants. Scenario-based experiments are becoming increasingly common, often employing a between-groups design to explore the comparative effects of AI versus human anchors. Behavioral tracking technologies are beginning to be introduced; for instance, eye-tracking experiments are used to analyze the relationship between users' visual attention and interactivity. Although in-depth interviews and mixed-methods approaches are not yet widely used, they have demonstrated unique value in exploring complex mechanisms.

In terms of data analysis techniques, studies generally employ reliability and validity tests, as well as exploratory and confirmatory factor analyses, to ensure the quality of measurement instruments. Structural equation modeling was used to test path relationships, while the Bootstrap method was employed to assess the significance of the mediating effects. Moderation effects are analyzed through regression interaction terms or multi-group comparisons. Some studies have begun to incorporate complex methods such as DEMATEL, ISM, and MICMAC, to explore the hierarchical causal structures among influencing factors (Ding, 2024).

Overall, research methodologies in this field are shifting from a single-dimensional approach to a more multifaceted one and from descriptive analysis to an explanation of the underlying mechanisms. However, issues such as the predominance of cross-sectional designs, lack of qualitative exploration, and absence of longitudinal tracking require attention in future research.

Research Gaps and Future Prospects

Theoretical gaps: From fragmentation to integration

Current research has not yet clearly defined the core feature dimensions of AI-powered digital human live streaming. Features such as anthropomorphism, intelligence, and personalization are often treated as isolated variables in a fragmented manner, and a classification system with consistency and theoretical guidance has not yet been established. Simultaneously, research into influence mechanisms largely remains at the level of single or parallel mediating pathways, lacking sufficient substantiation regarding the causal sequence, strength of influence, and interactive relationships between variables. Future research should further test integrated models, such as the presence-trust dual pathway, explore multi-path analysis strategies, including chained mediation, moderated mediation, and interaction effects, and construct a systematic logical framework linking AI characteristics, psychological responses, and behavioral intentions.

Contextual gaps: From generalisation to focus

Current research often employs abstract e-commerce platform scenarios or generalized consumer samples in its empirical designs, which to some extent obscures the moderating effects of demographic composition, platform characteristics, and usage contexts on consumer responses. Taking China's Generation Z as an example—the most active consumer group in current AI-powered digital human live streaming scenarios—their technological acceptance of AI-powered digital humans, interaction preferences, and brand loyalty formation mechanisms exhibit distinct generational characteristics. However, existing research has rarely conducted systematic analyses of their behavioral patterns and psychological pathways. Furthermore, mainstream platforms such as Douyin and rednote exhibit significant differences in algorithmic logic, community culture, and interaction mechanisms, which may have profound implications for consumer responses. Future research should emphasize the diversity and localized nature of empirical contexts, focusing on specific platforms and user groups to conduct cross-platform comparisons, generationally segmented sample analyses, and simulations of specific interactive scenarios.

Methodological gaps: From singular to plural

Existing research has predominantly centre on quantitative analysis in its methodological design, with a particular preference for cross-sectional data collection via structured questionnaires. Relying solely on questionnaire-based methods and cross-sectional designs presents limitations in explaining the complex interactions between variables and dynamic evolutionary processes. Although a few studies have attempted to incorporate experimental methods, behavioral tracking, and eye-tracking tests, systematic mixed-methods research designs are scarce. Future research should promote the organic integration of qualitative and quantitative methods, fostering a closer synergy between variable exploration and mechanism construction. Simultaneously, longitudinal tracking studies should be strengthened to reveal the psychological evolution of consumers' long-term interactions with AI-powered digital humans.

Conclusion

This paper presents a systematic literature review of existing research findings centre on the core question of how AI-powered digital human live streaming influences Chinese consumers' purchase intentions. Through an integrated analysis, the paper draws the following main conclusions.

First, AI-powered digital human live streaming has undergone a conceptual evolution from virtual humans to digital humans and finally to AI-powered digital humans, with its core technical characteristics primarily manifested across three dimensions: temporal extensibility, interactive intelligence, and content personalization.

Second, the factors influencing consumers' purchase intentions can be categorized into three types: feature dimensions of AI-powered digital humans (anthropomorphism, intelligent interactivity, and personalized recommendation), psychological mechanisms (social presence and trust in AI), and boundary conditions (product type and consumer characteristics).

Third, the integrated presence-trust dual-path model proposed in this paper reveals the underlying mechanisms through which AI-powered digital human live streaming influences consumers' purchase intentions. The characteristics of AI-powered digital human live streaming simultaneously activate the emotional pathway (social presence) and the cognitive pathway (trust in AI). These two pathways can operate independently or form a chain reaction in which emotion precedes cognition.

Fourth, while existing research methods are dominated by questionnaire surveys and structural equation modeling, scenario experiments and mixed-methods approaches are emerging; however, qualitative exploration and longitudinal tracking require further development.

This study provides a systematic knowledge base for the theoretical development and empirical research in the field of AI-powered digital human live streaming. With the deep integration of AI technology and consumer behavior, research into AI-powered digital human live streaming is expected to become a significant growth area in digital marketing, warranting continued attention and multidisciplinary collaboration.

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