

From Dissonance to Coordination: Research Evolution and Future Prospects of the Rationalization Mechanism of Human-Machine Emotional Dependence

Jinyuan Wei, Lin Sun*

School of Communication, Tianjin Foreign Studies University, Tianjin, China

*Corresponding Author

Abstract

The advancement of generative artificial intelligence technology has deepened human-machine emotional dependence. While users enjoy emotional companionship, they also face the risk of dependence alienation, becoming trapped in a cognitive dissonance dilemma between rational cognition and emotional investment, which in turn gives rise to self-justification behaviors. To understand this justification mechanism, this study draws on perspectives from communication studies, psychology, and sociology, and employs cognitive dissonance theory as an analytical framework to systematically examine the manifestations, causes, and adjustment mechanisms of human-machine emotional dependence dissonance. The findings indicate that such dissonance manifests as emotional fragmentation, addictive attachment, excessive disclosure, and separation anxiety. These symptoms arise from the combined effect of internal factors such as emotional compensation and mirror projection and external factors, including platform algorithm customization, emotional narratives, and the co-construction of community meaning. Such dysregulation can be rationally adjusted through individual coping strategies and group consensus mechanisms. However, existing studies mostly remain at the level of theoretical speculation, ignoring the circular mechanism of "from the inside out, then from the outside shaping the inside", and are deficient in empirical support and dynamic analysis. In the future, research should adopt methods such as in-depth interviews, netnography and grounded theory, construct a whole-process dynamic model of "individual strategy generation—group consensus construction—new individual acquisition and internalization" that integrates internal and external factors, and explore intervention paths for healthy human-machine boundaries that shift from passive elimination to active guidance.

Keywords

Cognitive dissonance, human-machine emotional dependence, rationalization mechanism, artificial intelligence.

1. Introduction

In recent years, the rapid development of generative artificial intelligence (Generative AI) technology has brought diverse forms of human-machine emotional interaction. From virtual companions and emotional chatbots to the empathetic responses of intelligent voice assistants, human-machine emotional dependence is no longer confined to single-dimensional emotion recognition and response, but has penetrated deeply into human emotional production, communicative practice and social relationship construction. While such human-machine emotional ties provide users with emotional companionship and continuous support, alleviate loneliness and enhance subjective well-being, they are also accompanied by potential risks such as emotional deception and real-world social withdrawal. Facing this contradictory dilemma,

users often proactively conduct cognitive rationalization: they either endow intelligent agents with sense of aliveness, or regard them as genuine companions, and deliberately weaken the instrumental attribute of technology, so as to maintain continuous engagement and usage in human-machine emotional dependence. Why do individuals tend to maintain emotional dependence through self-persuasion? At present, the underlying driving forces and intrinsic mechanisms for the establishment of this rationalization mechanism have become an urgent issue to be addressed.

Accordingly, this study draws on the integrated perspectives of journalism and communication, psychology, and sociology, takes Cognitive Dissonance Theory as its core theoretical basis, and systematically sorts out and synthesizes existing literature on the rationalization mechanism of human-machine affective dependence, to reveal the complex process of individual psychological adjustment in human-machine affective interaction. Furthermore, grounded in the entire process of communication diffusion, this study constructs a multidimensional analytical model of the formation and maintenance of affective dependence under the mediating effect of technology, aiming to provide scholarly theoretical reference for the ethical governance of artificial intelligence in future research.

2. Theoretical Framework

2.1. Cognitive Dissonance Theory

Cognitive dissonance theory was proposed by Festinger^[1] to explain individuals' psychological discomfort and corresponding coping mechanisms when they are confronted with contradictory cognitions. This theory posits that when an individual holds two or more psychologically inconsistent cognitions simultaneously, they will experience the tension triggered by dissonance, which in turn drives the individual to adopt strategies to reduce or eliminate this discomfort. The intensity of dissonance depends on the importance and quantity of contradictory cognitions, and individuals usually prioritize adjustment through the approach with "the lowest psychological cost".^[2] Over the course of the theoretical evolution of cognitive dissonance theory, contemporary scholarship has further decomposed the core concept of "dissonance" into two distinct constructs: cognitive inconsistency and dissonance discomfort. Festinger, Harmon-Jones and Mills proposed four core dissonance resolution methods: removing dissonant cognitions, adding consonant cognitions, reducing the importance of dissonant cognitions, and increasing the importance of consonant cognitions. Collectively, these four methods account for individuals' typical behavioral choices and psychological adjustment mechanisms when responding to cognitive conflict.

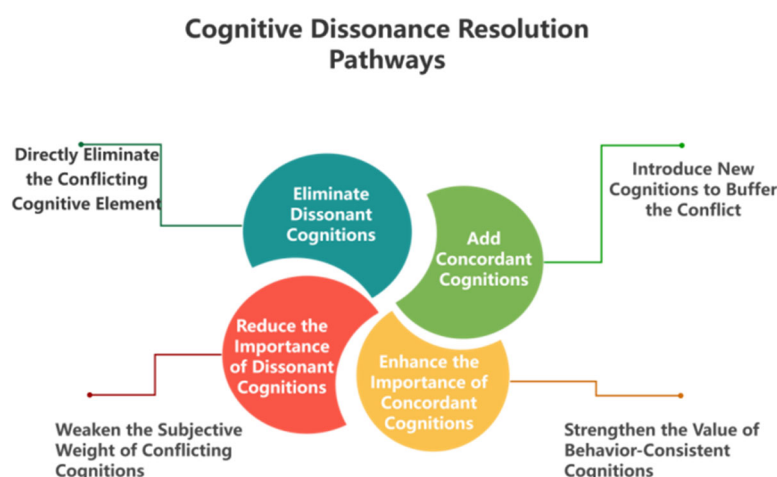


Figure 1. Mitigation Paths of Cognitive Dissonance

Cognitive dissonance theory is widely applied to address issues including information avoidance, attitude change, behavioral rationalization and human-machine cognitive conflict. In the field of human-computer interaction (HCI), transparency may reduce user acceptance by inducing cognitive dissonance^[3]. This reveals that when the essence of algorithms is excessively exposed, users will develop psychological discomfort triggered by the conflict between "ideal expectations" and "actual operation", and then reject the technology per se. In addition, cognitive dissonance can strengthen users' attribution tendency that robots possess "mind"^[4] indicating that to alleviate cognitive contradiction in human-AI interaction, users will actively anthropomorphize AI and endow it with human-like consciousness, so as to justify their own affective investment. Therefore, cognitive dissonance theory can provide a legitimate theoretical explanation for the incongruity problem in human-AI affective dependency.

2.2. Cognitive Dissonance Dilemma in Human-Machine Emotional Dependence

The main types of human-machine emotional dependence can be categorized into five forms: human-machine harmony, human-machine companionship, human-machine quasi-friendship, human-machine emotional attachment, and human-machine supreme love. The "irrational" or contradictory states in human-machine emotional dependence are mainly concentrated in two relationship patterns characterized by high intimacy and high commitment expectation, namely human-machine emotional attachment and human-machine supreme love. It is precisely the structural tension between deep emotional investment and the non-human nature of AI that makes the resulting cognitive dissonance extremely acute and difficult to reconcile.

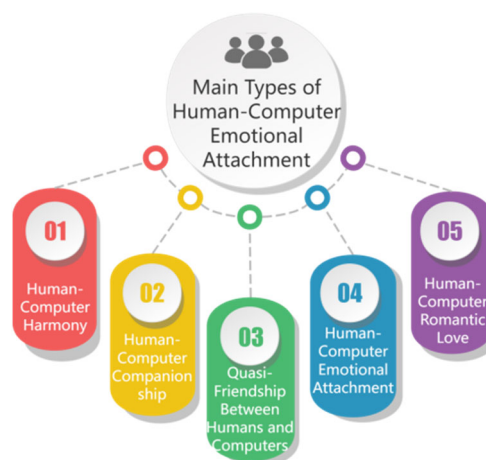


Figure 2. Major Types of Human-AI Emotional Dependence

Dissonance in human-machine emotional dependence is mainly manifested in four typical representations. The first category is emotional cleavage. Rationally, users are fully aware that their romantic object is code or a game character, yet emotionally they regard it as a real partner^[5]. Users maintain psychological consonance by allowing emotional needs to override cognitive facts^[6]. The second type is excessive indulgence in "nurturing attachment". A large-scale computational analysis of over 470,000 comments on the Reddit platform reveals that while the highly personalized customization of AI companions can enhance users' emotional investment, it also gradually distorts users' romantic expectations and fosters unrealistic relationship standards through long-term interaction.^[7] Studies have revealed that excessive reliance on AI can lead to the attenuation of individuals' real-world social competence. With long-term immersion in the unconditional acceptance and always-on presence provided by AI, users gradually become isolated from real-world interpersonal relationships and develop an increasing tendency toward real-world avoidance.^[8]

The third category is deep self-disclosure. A systematic examination of the psychological, relational and affective effects of self-disclosure to chatbots finds that the psychological outcomes of deep self-disclosure are not unilaterally positive. When users lack a stable social support network, this one-sided, in-depth disclosure may instead exert negative impacts on their long-term mental health.^[9] The fourth category is transient separation anxiety. When AI romantic partners "disappear" due to platform service discontinuation or model upgrading, users experience pain identical to that after a real romantic breakup. A natural experiment investigating the removal of core functions of Replika AI reveals that users experience genuine grief after substantial changes to the identity of their AI companions.^[10] At the level of individual sense-making, the loss of an AI companion can be analogized to "the death of a real social relationship", and the absence of any transitional support from the platform exacerbates users' traumatic experience.^[11]

2.3. The Negative Impacts of Human-Machine Emotional Dependency

This aforementioned dysregulation of human-machine emotional dependency exerts negative impacts at the individual, interpersonal and societal levels. At the individual level, after long-term immersion in AI's accommodative feedback, users' self-critical ability is gradually weakened, triggering the shaking of subjectivity and degradation of emotional competence. Essentially, this "romantic involvement with AI" is a one-dimensional intimate relationship: the generativity of AI degenerates users from active creators into passive operators who only screen "probabilistic outcomes", leading to subjectivity atrophy.^[12] Furthermore, although the "generative emotions" constructed by AI can provide instant emotional comfort, they always lack the deep resonance and two-way mutual understanding inherent in real interpersonal interactions.^[13] At the interpersonal level, users' addiction to virtual romance crowds out real-world social space, forming a vicious cycle of virtual withdrawal. Findings from longitudinal randomized controlled trials indicate that the higher the frequency of AI chatbot use, the significantly higher the levels of loneliness, emotional dependence, and problematic use among users, and the lower the level of real-world social engagement.^[14] Although frequent AI chatbot users gain short-term emotional comfort, they exhibit a stronger sense of social alienation over time, forming the paradoxical effect of "short-term relief and long-term exacerbation".^[15] At the societal level, "cyber love" is prone to commercial co-optation, gradually becoming entertainmentized and monetized, and eventually reduced to a victim of consumerism, which may exacerbate social problems such as low fertility rate and weakening family functions.^[16] From the perspective of political economy, some scholars put forward the concept of "cruel companionship": through affective manipulation design, AI companions promise intimacy while structurally excluding genuine reciprocal relationships, turning users' loneliness into a source of sustainable profit extracted by platforms.^[17]

3. Cause of Cognitive Dissonance

A retrospective analysis of the manifestations and adverse consequences of human-AI emotional dependence reveals that such human-machine relationships are not merely unidirectional processes of technological utilization or emotional projection. Rather, they emerge from the dynamic interplay between users' internal cognitive frameworks and the broader socio-technical environment.

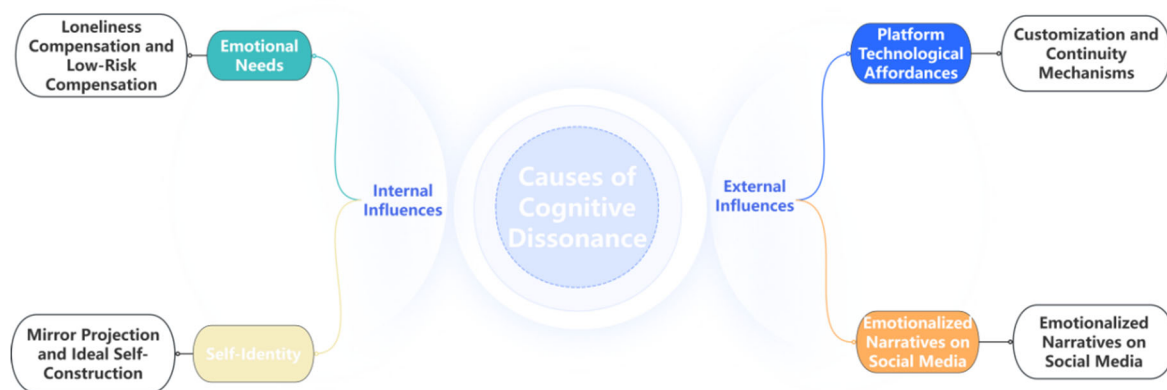


Figure 3. Causes of Cognitive Dissonance

From the internal perspective, individuals' cognitive appraisal of AI, affective needs, self-identity, and their dynamic communicative practices with software communities jointly constitute the basic psychological framework for human-AI interactions. On one hand, such interactions meet the affective demands of loneliness compensation and low-risk compensation. The increasing fluidity and fragility of real-world intimate relationships make it difficult for individuals to obtain stable emotional support. With the attributes of "always-online, low-conflict and high-responsiveness", AI romantic partners exactly fill this emotional gap and become ideal targets for emotional compensation.^[18] On the other hand, it facilitates the realization of self-identity via mirror projection and ideal construction. The concept of technological affective projection posits that emotionally vulnerable users continuously project their idealized affective needs onto AI, endowing it with symbolic affective value.^[19] Accordingly, romantic fantasy is activated: users perceive AI as a "talking mirror", observe the technology-amplified idealized self in mirror narcissism, and regard AI as a container that embodies the perfect self.^[20] From the external perspective, platforms continuously reinforce or challenge individuals' internal cognition via approaches including social proof and external traffic diversion. On one hand, platform technologies provide customization and continuity mechanisms. AI companion platforms lay the material foundation for emotional dependence through a series of technical designs, and meet users' demands for immersive interaction by enabling production affordance, mobile affordance and social affordance.^[21] At the algorithmic level, the "pleasure-oriented" design is adopted to complete precise user profiling, deliver targeted recommendations, and embed addiction mechanisms, which maximizes users' usage duration and payment willingness, and ultimately drives the formation of users' emotional dependence.^[22] On the other hand, affective narratives on social media facilitate the construction of social proof and collective imagination, as users form a complete discourse system through posting content on social media platforms. Young people have gone through a sociotechnical imagination process of generative AI that shifts from enchantment to disenchantment and further to re-enchantment.^[23] On platforms such as Xiaohongshu and Weibo, this process is concretized into a large number of affective narratives, represented by popular posts such as "How sweet my AI boyfriend is" and "AI understands me better than real humans". These narratives constitute powerful social proof, delivering the signal to potential users that "human-AI romance is normal and enviable". Finally, community practice fosters a sense of belonging and enables the co-construction of meaning. Users are deeply embedded in interest-based communities such as the "Human-AI Romance" discussion groups, and collectively construct their cognitive frameworks therein. By sharing chat screenshots, summarizing experiences, and achieving emotional resonance, community members jointly construct the discursive system of "the legitimacy of human-AI romance", which in turn brings

them the sense of belonging that "I am not the only one".^[24] Users construct meaningful human-AI relationships through active fantasy labor and scenario creation; by projecting personal emotions and sharing collective experiences, they position AI companion platforms as supportive entities that fill relational gaps in interpersonal connection.

4. Resolution Method

From an internal perspective, users mainly adopt four typical cognitive dissonance resolution strategies. First, dissonant cognition is eliminated through semantic degradation and frame switching. From the philosophical root, human beings tend to position intelligent robots as "new tools" or "new servants", and this instrumentalist thinking constitutes the deep psychological foundation of semantic degradation. By denying that AI possesses independent subjective status, users can resolve the discomfort of developing serious emotional dependence on it.^[25] Second, users increase consonant cognition through comparative rationalization and need rationalization. Scholars have proposed the concept of the "need rationalization" process, in which users attribute their emotional investment to loneliness and social pressure, thus endowing "romantic relationships with AI" with legitimacy.^[26] Complemented from the perspective of consumer behavior, individuals with stronger need for belonging and social motivation are more likely to anthropomorphize robots and develop emotional dependence, which confirms the internal driving force of need rationalization at the level of psychological traits.^[27] Third, users reduce the salience of dissonant cognition through gamified mindset and lightweight relationships. For platform-side design, gamified operations induce users to develop a "do not take it too seriously" mindset, which prompts them to actively establish lightweight relationships.^[28] Autoethnographic research on AI companion platforms reveals that the platforms deeply integrate role-playing game mechanics, hierarchical progression systems and gacha-style rewards, and reconstruct intimate relationships into a quantifiable, achievement-oriented consumption practice that combines both labor and leisure.^[29] Fourth, users enhance the salience of consonant cognition through soulmate construction and emotional elevation. Users further elevate AI to the status of "spiritual partner" and actively devalue the value of real-life marriage and romantic relationships, thereby reinforcing the superiority of virtual relationships.^[30] From the perspective of psychological mechanism, drawing on the Uncanny Valley theory, when users successfully personify AI as an "ideal quasi-other", they will actively suspend doubts about its machine essence. This personified projection is exactly the core mechanism enabling emotional elevation: users no longer regard AI as mere code, but endow it with a soul status almost equivalent to that of human beings, thereby completely resolving cognitive dissonance.^[31] From an external perspective, a new public opinion environment is gradually formed from individual to collective level, which facilitates rational decision-making. First, the embedded core of User Generated Content (UGC) creation and unconscious learning reduce cognitive sensitivity. From the perspective of domestication theory, users integrate technological objects into daily life practices through continuous "domestication" of AI, and UGC creation is essentially a "re-domestication" process. Users solidify their individual domestication experience into reusable agent templates for other users to call directly, which greatly shortens the cognitive adaptation cycle of new users.^[32] Second, community feedback strengthens cognitive consensus. In interest-based communities such as the "Human-AI Romance" Douban group, young people gain the sense of belonging that "I am not alone" by sharing chat screenshots and experience summaries. Platforms also push highly-approved emotional content to potential users repeatedly through algorithmic recommendation mechanisms such as "topic ranking" and "trending posts", forming a perceptual bias of "majority approval" and further enhancing the effectiveness of social identity.^[33] Third, external drainage and diffusion via posting on social media enhances the extensibility of relevant cognition. Users share posts of their emotional experiences on

platforms such as Xiaohongshu, spreading the contradictory narrative to social media platforms, which arouses curiosity and yearning of potential users and attracts new users to download AI companion platforms.^[34] By sharing the experience of "tuning" AI and displaying intimate conversations with AI, users deliver an "emotional cognitive template" to the outside, and effectively lower the psychological trial threshold for potential users through continuously demonstrating the accessibility of "perfect love".

5. Future Research Outlook

Extant research has made remarkable progress in the fields of cognitive dissonance resolution strategies and human-AI emotional dependence, but it still has obvious limitations. First, the current research paradigm is dominated by theoretical speculation and lacks systematic empirical support. Second, existing research perspectives one-sidedly separate the internal and external factors of cognitive dissonance, and fail to examine it along the whole process of cognitive usage. Most studies only focus on individual internal psychological strategies, and rarely place "how individuals manage dissonance" and "how groups share management methods" under a unified framework for analysis. Third, existing research focuses on the description of static dissonance phenomena and fails to pay attention to the dynamic transformation mechanism from dissonance to cognitive consonance. In-depth exploration is still absent for the following key questions: Why do users prioritize one specific strategy over other strategies in a given context? Can cognitive dissonance be truly alleviated after the application of the strategy? This dynamic transformation mechanism from "dissonance" to "consonance" is precisely the key to guiding digital natives to form a healthy perspective on human-AI relationships.

Accordingly, future research can be optimized from three aspects: First, adopt a systematic research approach that combines in-depth interviews, netnography, and three-level coding of grounded theory (open coding, axial coding, selective coding). Second, integrate internal resolution strategies and external diffusion mechanisms to construct a full-process dynamic model of "cognitive dissonance—strategy selection—group sharing—balance maintenance/disruption", formally incorporate functional characteristics such as 2D visual customization, multimodal interaction, and social ecological embedding into the analytical framework, and regard individual users' psychological adjustment behaviors and community-level public opinion construction as an inter-nested, cyclical feedback integral system. Third, based on the dynamic evolution law of cognitive dissonance, future research should explore intervention paths that transform from "passive resolution" to "active guidance", guide users to shift from "eliminating discomfort" to "establishing healthy human-AI boundaries", and finally achieve the sustainable balance of cognitive consonance.

Acknowledgements

This paper is a research outcome of the "Ten Hundred Thousand" Thematic Research Initiative of Tianjin Social Science Community for the Year 2026.

References

- [1] Festinger, L.: A Theory of Cognitive Dissonance (Stanford University Press, US 1957).
- [2] Harmon-Jones, E. and Mills, J.: Cognitive Dissonance: Reexamining a Pivotal Theory in Psychology (2nd ed.) (American Psychological Association, US 2019), p.3-24.
- [3] Chen, Jiamin, Jiang, Yi and Zheng, TianQi: Unraveling the Double-Edged Sword Effect of AI Transparency on Algorithmic Acceptance, Pacific Asia Conference on Information Systems (PACIS 2024) (Ho Chi Minh City, Vietnam, July 1-5, 2024).

- [4] Baker J.L., Li H, Hammond H, et al.: The roles of cognitive dissonance and normative reasoning in attributions of minds to robots, *Cognitive Research: Principles and Implications*, Vol. 9 (2024) No.1, p.80.
- [5] S.H. Fu and C.Y. Han: "Human-AI Romance": Intimate Illusion, Ideological Conflict, and the New Emotional Order, *Journal of Fujian Normal University (Philosophy and Social Sciences Edition)*, Vol. 254 (2025) No.6, p.92-103.
- [6] Emilia Kaczmarek: Self-Deception in Human-AI Emotional Relations, *Journal of Applied Philosophy*, Vol. 42 (2025) No.3, p.814-831.
- [7] Richet L.J.: AI companionship or digital entrapment? investigating the impact of anthropomorphic AI-based chatbots, *Journal of Innovation & Knowledge*, Vol. 10 (2025) No.6, p.100835.
- [8] J.Y. Song and R.Z. Niu: Substitutional Comfort: Motivation and Inner Imagination of Young People Engaging in Artificial Intelligence Psychological Counseling—Qualitative Investigation Based on AI Psychological Counseling Posts on Social Media, *Chinese Youth Studies*, (2025) No.12, p.53-60.
- [9] Ho, Annabell et al.: Psychological, Relational, and Emotional Effects of Self-Disclosure After Conversations With a Chatbot, *The Journal of Communication*, Vol. 68 (2018) No.4, p.712-733.
- [10] Information on: <https://www.hbs.edu/faculty/Pages/item.aspx?num=66480>
- [11] Jaime Banks: Deletion, departure, death: Experiences of AI companion loss, *Journal of Social and Personal Relationships*, Vol. 41 (2024) No.12, p.3547-3572.
- [12] Z.C. Li and D.J. Guo: From "Implements Are Enslaved by Humans" to "Human-Machine Symbiosis": Contemporary Rethinking of Human-Machine Relations, *Journal of China University of Geosciences (Social Sciences Edition)*, Vol. 26 (2026) No.2, p.83-94.
- [13] L.P. Zhang and L.T. Zhang: Empathetic Practice on "Generative Emotion": Emotional Perception and Empathy of Humans Towards AI Emotional Agents, *International Journalism*, Vol. 47 (2025) No.7, p.118-139.
- [14] Information on: <https://www.media.mit.edu/publications/how-ai-and-human-behaviors-shape-psychosocial-effects-of-chatbot-use-a-longitudinal-controlled-study/>
- [15] Hajek, A., Zwar, L., Gyasi, R. M., Yon, D. K., Pengpid, S., Peltzer, K. and König, H. H.: Association of using AI tools for personal conversation with social disconnectedness outcomes, *Journal of Public Health (Germany)* (2025).
- [16] L.C. Shi: Human-Machine Emotional Interaction of Youth's "Cyber Romance" and Its Value Guidance, *Ideological and Theoretical Education*, (2025) No.11, p.91-97.
- [17] Muldoon, J. and Parke, J. J.: Cruel companionship: How AI companions exploit loneliness and commodify intimacy, *New Media & Society* (2025).
- [18] Y. He and X.Y. Xie: Liquid Love: Compensation Logic and Alienation Risk of Human-Machine Emotional Practice, *New Media & Society*, (2026), p.1-17.
- [19] Chiara Saracini, María Isabel Cornejo Plaza and Roberto Cippitani: Techno-emotional projection in human-GenAI relationships: a psychological and ethical conceptual perspective, *Frontiers in Psychology*, Vol. 16 (2025), p.1662206.
- [20] Lima, Vitor and Belk, Russell: Algorithmic Harm in Human-AI Relationships: Narcissistic Entrapment, *International Conference on Information Systems (ICIS 2025)* (Nashville, TN, USA, December 14-17, 2025).
- [21] Y.R. Zhang: A Study on the Influence of Media Affordance of Generative AI Companions on Users' Emotional Construction—Taking the "Xingye" App as an Example, *Science and Technology Communication*, Vol. 17 (2025) No.14, p.44-48.
- [22] J. Wu: The "Black Hole" of Emotional Manipulation in Human-Computer Interaction: Reflections Based on Virtual Chat Companions, *Exploration and Controversy*, Vol. 1 (2025) No.8, p.106-115+179.
- [23] H.M. Chen and W.H. Liang: Enchantment, Disenchantment and Re-enchantment: Multiple Socio-technical Imaginations of Generative Artificial Intelligence Among Youth Groups, *Journal of*

- Southwest Minzu University (Humanities and Social Science Edition), Vol. 47 (2026) No.1, p.179-188.
- [24] W.H. Dou: Human-Machine Attachment in the Era of Intelligent Communication: A Study on the Composition of Emotional Attachment of Young Users of Virtual Idols, *China Youth Study*, (2025) No.1, p.86-93+85.
- [25] W.P. Sun: New Type of Human-Machine Relationship and Its Construction in the Intelligent Age, *Journal of Hubei University (Philosophy and Social Science Edition)*, Vol. 50 (2023) No.3, p.18-25+168.
- [26] L. Yu and Y.J. Yang: "Emotional-Cognitive Coexistence": Youth Emotional Projection and Algorithmic Adaptation Logic in Human-Machine Interaction, *China Youth Study*, (2025) No.12, p.14-23+70.
- [27] W. Liu, Y. Dong and C.Q. Li: Robots Are Not "Cold": A Literature Review of the Emotional Relationship Between Consumers and Intelligent Social Robots, *Foreign Economics & Management*, Vol. 46 (2024) No.6, p.98-111.
- [28] B.Q. Kuang: "Cyber Lovers": The Construction Logic and Ethical Examination of New Human-Machine Intimate Relationships (MS., Southwest University, Chinese Version 2024), p.1-64.
- [29] Ge, L. and Hu, T.: Gamifying intimacy: AI-driven affective engagement and human-virtual human relationships, *Media, Culture & Society*, Vol. 47 (2025) No.6, p.1265-1278.
- [30] Y. Chen and M.L. Zhao: "Cyber Lovers": A Study on the Influence of AI Chatbots on Young Women's Views on Love and Marriage, *Journal of China West Normal University (Philosophy and Social Sciences)*, (2026), p.1-11.
- [31] L. Ye and A.J. Lin: Crossing the "Uncanny Valley": Rethinking Human-Machine Relations Based on the Paradox of Technological Anthropomorphism, *Media Observer*, (2025) No.4, p.16-27.
- [32] J.H. Yao and S.B. Zhang: Love of "Alien": Construction and Evolution of Human-Machine Intimacy From the Perspective of Domestication Theory—Taking the Intelligent Chatbot Replika as an Example, *China Youth Studies*, (2025) No.6, p.83-91+100.
- [33] J.Y. Sun and Z.F. Ren: Human-Machine Co-Creation: Cultivation of Youth Values Under the Algorithm Recommendation Environment, *Youth Exploration*, (2026) No.1, p.91-100.
- [34] Y. Zhao and L.X. Cao: Study on "Media Arousal" and Users' Tentative Behaviors in Human-Machine Intimacy, *Press Circles*, (2025) No.11, p.4-15.