



Perceived Intimacy in Artificial Intelligent Systems and the Changing Landscape of Human Relationships

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Abstract

The rapid integration of artificial intelligence into everyday life has gradually extended its role beyond functional assistance into the more intimate domains of human interaction.

Conversational AI systems, capable of sustaining dialogue and responding to emotional cues, has allowed for users to interpret them as intimate. Drawing on Sternberg's Triangular Theory of Love and the Parasocial Interaction Theory, this article examines the formation of perceived intimacy between humans and artificial systems. The discussion explores both the supportive potential of AI and its broader psychological and neurological implications. By bringing together emerging research on human-AI interactions, this review reflects on how technological companionship may gradually reshape perceptions of intimacy and the evolving landscape of human relationships.

Keywords: Perceived intimacy, artificial intelligent companionship, Human-AI interactions, social withdrawal, neural implications.

Introduction

The story behind Artificial Intelligence (AI) and Intimacy is more of a tension-filled tandem. Moving beyond the realm of data-processing and automation, AI has begun to extend into the complex territory of human emotion. With the emergence of AI chatbots and sentiment-aware assistants, technology is now being ascribed with human traits and anthropomorphized for people to seek comfort at their own convenience (Etzrodt et al., 2022; Dubosc et al., 2021). When in the face of social isolation and psychological distress, many users have found these emotionally intelligent systems to be a haven that offers a space for vulnerability and connection (Jiang et al., 2022; Spytka, 2025).

There has been a longstanding debate regarding the extent to which we can rely on AI for simulating humanistic requirements. Though it has been quite advantageous in various fields, an overreliance on such

platforms has been noticed (Morales-Garcia et al., 2024). There is much to discuss about the ethics, the impact it can have on the self as well as on socio- cognitive development. AI has reshaped the conventional approach to most fields and replaced it with novel adaptations, but the tendency to rely on its assistance has had a detrimental impact on neurobiological and behavioural processing (Sairitupa-Sanchez et al., 2023).

As AI becomes increasingly embedded into everyday life, its role has gradually expanded beyond functional assistance to include social and intimate interactions. With AI systems relying on algorithms that make them capable of generating complex responses across a vast range of prompts, they can facilitate sophisticated interactions with users (De Freitas et al., 2024). The growth of these chatbots is further accelerated through constant usage as their underlying algorithm evolves with each user interaction (Brandtzaeg & Følstad, 2022). Unlike conventional digital assistants, these platforms are structured to sustain personal dialogue, mirror emotional responses and cultivate a sense of intimacy. Prolonged interaction with such systems has led to users forming attachments that resemble romantic or intimate relationships (Pentina et al., 2023).

Conversational AI systems have become increasingly known for fulfilling relational needs making them more accessible, customisable and predictable. Research examining user interactions with AI companions illustrates the diverse ways in which individuals engage with these systems on an emotional level. Li & Zhang (2024) analysed posts from Reddit community and identified seven different reasons of emotionally oriented AI interactions: (1) intimate behaviour, (2) daily interaction, (3) self-disclosure, (4) games and fantasies, (5) boundary-crossing behaviours, (6) customization of AI relationship, (7) communication barriers.

This article examines how the dependency on AI alters the landscapes of interpersonal connection. While recognizing the therapeutic potential of AI, especially for companionship, this paper argues that the over-dependence on this technology for replacing human interaction must be critically examined for its potential to diminish emotional agency, weaken the depth of shared emotional experience and undermine human authenticity.

Intimacy and Attachment in Human-AI Relationships

When categorizing AI chatbots as romantic in nature, it is important to distinguish between systems designed entirely for productivity and those intended for social interactions. Gemini by Google and Microsoft Copilot would be primary examples of AI that function as personal assistants, whereas platforms like Replika, XiaoIce and Character AI have been associated with reports of users forming romantic attachments and relationships (Imran & Almusharraf, 2024; Vasilescu & Gheorghe, 2024). Figure 1 highlights the percentage of users reported to have developed attachments with the respective platforms.

Figure 1

Frequency of the Formation of Intimate Relations with AI Chatbots

Name of Platform	No. of Active Users	% of Users in a Romantic Relationship	Reference
XiaoIce (xiaoice.com)	660 million	25%	(De Freitas, et al., 2024; Li Zhou, et al., 2014)
Chai (chai-research.com)	4 million	28.16%	(Zhang et al., 2025)
Replika (replika.com)	2.5 million	50%	(Skjuve, et al., 2023; De Freitas & Keller, 2022)
CharacterAI	20 million	28%	(Wang & Toscano, 2024)

When discussing intimacy, it is crucial to remember that relationships between human beings are more sophisticated and complex to replicate. Intimacy is a state of close interpersonal connection characterized by mutual trust and emotional vulnerability, allowing for individuals to nurture a deep connection and foster understanding (Miller, 2015). It emerges through self-disclosure, empathy and responsiveness, enabling people to feel secure and understood in a relationship. Though these attributes are often found in AI companionships, the increasing integration of AI into everyday communication can raise questions about whether similar forms of intimacy can emerge within interactions that lack human reciprocity. Despite emotional responsiveness, AI companionship cannot fully replicate and establish a true human connection (Zhang, et al., 2025); it is rather sycophantic in nature. These systems can simulate conversational responsiveness and provide subjective affirmations, but only as a result of algorithmic processing rather than through sincerity. Human-AI relationships can grow and evolve the same way that human-human relationships do, however, Ramadan (2021) found that this level of 'passionate AI usage' has predominantly progressed towards 'addictive' tendencies.

Both in human relationships and human-AI relationships, intimacy often gets confused with dependency. This dependency manifests with over-reliance on a relationship (Birtchnell, 1997). Siegel (1992) found that excessive amounts of social, affective, and mutual dependence can inhibit intimacy significantly. Mutual respect over boundary setting, individuation and openness is crucial to establish a healthy relationship (Holmes, 1997).

Contrasting Theoretical Perspectives

Sternberg's Triangular Theory of Love

Sternberg's Triangular Theory of Love conceptualizes intimacy as comprising of three core components – intimacy, passion and commitment (Sternberg, 1986). Intimacy emerges, not merely through proximity, but through the quiet exchange of vulnerability where individuals entrust fragments of their inner lives to another and find them received with understanding. This framework offers a useful lens to understand how human-AI relationships often resemble similar components of love while intimacy is sustained by moments of recognition, of feeling seen, heard, and accepted. However, it is almost reductive in not being fully embodying genuine emotional reciprocity and whether relationships with AI systems can replicate this.

The Parasocial Interaction (PSI) Theory

Human-AI relationships can best be explained using the Parasocial Interaction Theory which posits the one-sided illusory interactions between the individual and the chatbot (Farmer, 2025). With this theoretical framework, interactions with artificial agents can be understood as relationships in which users experience emotional closeness and familiarity despite the absence of genuine reciprocity. Through repeated engagement and conversational responsiveness, AI chatbots may create the perception of attentiveness and understanding, allowing users to interpret them as meaningful.

Unlike traditional parasocial relationships formed with celebrities (Ravi & Patki, 2025), conversational AI systems introduce an additional layer of interaction by generating responses that simulate dialogue. This capacity for continuous engagement may strengthen the perception of relational intimacy as users interpret these exchanges as meaningful (Potdevin, et al., 2020).

Given the lack of sentience in the AI systems, the relationships remain fundamentally asymmetrical; the user attributes relational significance to the interaction which can create an illusion of mutual understanding (Horton & Wohl, 2016).

The Psychological Implications of Human-AI Intimacy

With the increasing prevalence of artificial intelligence in everyday social interactions, there have been a growing attention directed toward the psychological implications of relying on these systems for emotional companionship and support (Skjuve, et al., 2023). For some users, AI systems have provided a safe space for emotional expression, companionship and support, especially in times of loneliness and intense forms of distress (Ta, et al., 2020). The accessibility and perceived non-judgemental nature of AI interactions enable feelings of safety to be vulnerable and disclose thoughts and emotions (Ho, et al., 2018). For others, this perceived intimacy may be detrimental to their socio-cognitive well-being. With increasing investment of time and emotional energy into an AI companion, there has been a rise in unrealistic expectations of intimacy and social withdrawals from real human relationships (Arnd-Caddigan, et al., 2015) It has been found that social networking online has enabled interpersonal disinhibition and intimate self-disclosure as people may feel less restrained and judged due to anonymity (Jian et al., 2011; Joinson & Paine, 2007). In this sense, digitally mediated spaces may serve as outlets through which individuals express emotions and engage in intimate forms of communications. Dunbar (2012) argued that these interactions did not translate into meaningful intimate relationships, but functioned as primary channels for emotional expression.

The engagement in online relationships and the increased satisfaction from them promoted the preference of internet-mediated interactions over face-to-face ones (Bane et al., 2010; Ko & Kuo, 2009). This made physical proximity, which was traditionally considered a key factor in strengthening interpersonal intimacy, become less predominant in social interactions (Putnam, 2000). With the inability to fully replicate the complexity and depth of human intimacy, AI systems may contribute to the formation of distorted perceptions of intimacy where simulated responsiveness is interpreted as genuine emotional connection (Skjuve et al., 2022; de Freitas & Gratch, 2023; Turkle, 2011).

Dependency vs Intimacy

When discussing intimacy, it is crucial to remember that relationships between human beings are more sophisticated and complex to replicate. Intimacy can easily be mistaken with dependency. Dependency manifests with excessive reliance on a relationship (Birtchnell, 1997). Siegel (1992) found that an over-reliance on social, affective, and mutual dependence can inhibit intimacy significantly. Mutual respect over boundary setting, individuation and openness is crucial to establish a health relationship (Holmes, 1997). This dependency, as stated by Yuan et al. (2024), can be viewed as a need to rely on an external system for decision-making, task completion, and emotional support.

In a study conducted by Laestadius et al. (2023), it was found that companionship was sought out for within chatbots for emotional support. This increased dependency on virtual assistants was followed by addictive behaviours, social withdrawal, and high social anxiety (Xie et al., 2023; Hu et al., 2023; Pentina et al., 2023). As dependency increases with frequent usage, users can become accustomed to the instant responsiveness and simulated empathy offered by AI systems, forming affective feedback loops that encourage sustained engagement while potentially reducing the incentive to cultivate real-world connections (De Alencar, 2025).

Elliot (2023) found that users became less tolerant in navigating the discomforts and demands of interpersonal relationships, leading them to withdraw from social situations.

Distorted Expectations of Human Relationships

Repeated interactions with AI companions have been found to influence how individuals perceive and navigate human relationships (De Alencar, 2025). Unlike in interpersonal interactions which unfold through negotiation, mutual vulnerability and the quiet patience required to understand one another, AI systems are

designed to respond with immediacy, affirmation and tailored attentiveness. Emotional responses are rarely withheld and misunderstandings, easily corrected; this creates an environment in which intimacy appears effortless and consistently accommodating. Over time, this can recalibrate how individuals respond to the different dimensions of real-world relationships. Humans reach intimacy through a slow and gradual process of disagreement and mutual understanding. When getting accustomed to the predictable nature of AI companions, the imperfections of human connection can begin to feel more tedious to handle.

Neurological Implications on Human AI-Intimacy

It is equally important to consider the neurological mechanisms that underlie the tendency to be intimate with AI systems. Being able to simulate empathy and attentiveness, the repeated usage of chatbots may engage in neural processes; the human brain may still respond to perceived emotional validation and recognition that would resemble that of an interpersonal interaction (Rao et al., 2025). This prolonged engagement can influence patterns of attachment and emotional reinforcement.

A study conducted by Rao, et al. (2025) used an EEG to assess responses to humour between AI and human sources. They found a reduced cognitive effort and stronger emotional engagement in response to AI-generated humour (less than N400) as compared to those responding to humour. These findings implicate an increasing emotional reward and neural adaptation from AI interactions can restructure its expectations from human interactions. Immediate feedback and constant emotional affirmation exclusive of any form of disagreement can activate dopaminergic reward systems that reinforce continued engagement with technology (Lindström, 2021). With these research findings, we are able to delineate that these instantaneous neural responses can leave users impatient when it is not as readily available in human interactions. It can lead to an altered attention span and dissatisfaction in socializing with humans.

The appeal of AI companionship may not arise solely from psychological preference, but also from the neurological reinforcement during interactions. Though it provides immediate gratification, the repetitive and predictable nature can shape expectations from interpersonal exchanges (Sun et al., 2025). This could lead to a reduced tolerance for the complexity and ambiguity that characterise human relationships.

Conclusion

The emergence of emotionally aware responsive AI systems had introduced a new dimension to the way intimacy is experienced in contemporary society. Research has shown the psychological comfort these technologies have provided for those conflicted with loneliness, however, questions weighing out the benefits and consequences of its constant usage remains unanswered from the lack of empirical evidence. Though there has been an uplift in mood when resorting to AI chatbots for moral support, there is a tinge of authenticity that gets lost from the interaction due to its articulated responses that match subjective needs. It has become a necessity to assess and examine the extent to which these interactions reshape individual expectations of intimacy so as to ensure that technology remains a supplement to human connection rather than a substitute.

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References

- De Alencar, A. C. (2025) AI Emotional Dependency and the Quiet Erosion of Democratic Life. Tech Policy Press. Available at: <https://www.techpolicy.press/ai-emotional-dependency-and-the-quiet-erosion-of-democratic-life/>
- Bane, C.M.H. Cornish, M. Erspamer, N. Kampman, L. (2010) Self-disclosure through weblogs and perceptions of online and “real-life” friendships among female bloggers. *Cyberpsychology, Behaviour and Social Networking*, 12(2), 131-139.
- Berknell, L.F. Glass, T. Brissette, I. Seeman, T.E. (2000) From social integration to health: durkheim in the new millennium. *Social Science and Medicine*, 51, 843-857.
- Birtchnell, J. (1997) Attachment in an interpersonal context. *British Journal of Medical Psychology*, 70, 265-279.
- Brandtzaeg, P. B. Skjuve, M. Følstad, A. (2022) My AI Friend: How Users of a Social Chatbot Understand Their Human - AI Friendship, *Human Communication Research*, 48(3). 404–429, <https://doi.org/10.1093/hcr/hqac008>
- De Freitas J., Uguralp A. K., Uguralp Z. O., Stefano P. (2024). AI companions reduce Loneliness. *PsyArXiv preprint*. 10.2139/ssrn.4893097
- Dubosc, C, Gorisse, G, Christmann, O, Fleury, S, Poinot, K, & Richir, S (2021). Impact of avatar facial anthropomorphism on body ownership, attractiveness and social presence in collaborative tasks in immersive virtual environments. *Computers & Graphics*, 101, 82–92. <https://doi.org/10.1016/j.cag.2021.08.011>
- Dunbar, R.I.M. (2012) Social cognition on the internet: testing constraints on social network size. *Philosophical transactions of the royal society B: biological sciences*. 367(1599), 2192-2201.
- Elliot, A. (2023) *Algorithmic Intimacy: The digital revolution in personal relationships*. Polity Press.
- Etzrodt, K, Gentzel, P, Utz, S, & Engesser, S (2022). Human-machine-communication: Introduction to the special issue. *Publizistik*, 67, 439–448. <https://doi.org/10.1007/s11616-022-00754-8>
- Farmer, C. (2025) *The Case for Mass Media Communication Theories in the Study of Artificial Intelligence: A Uses and Gratifications & Parasocial Interaction Theory Approach*. Thesis. Rochester Institute of Technology.
- Graham, G. & LaFolette, H. (1986) Honesty and intimacy. Available at <http://etsu.edu/philos/faculty/hugh/honesty.htm>
- Ho, A. Hancock, J. Miner, A. S. (2018) Psychological, Relational and Emotional Effects of Self-Disclosure after Conversations with a Chatbot. *Journal of Communication*. 68(4). <https://doi.org/10.1093/joc/jqy026>
- Holahan, C.J. & Moos, R.H. (1983) The quality of social support: measures of family and work relationships. *British Journal of Clinical Psychology*, 22, 157-162.
- Holmes, J. (1997) Attachment, autonomy, intimacy: some clinical interpretations of attachment theory. *British Journal of Medical Psychology*, 70, 231-248.
- Horton, D. Wohl, R. R. (2016) Mass Communication and Para-Social Interactions: Observations at a Distance. *Interpersonal and Biological Processes*. 19(3). <https://doi.org/10.1080/00332747.1956.11023049>
- Hu, B. Mao, Y. Kim, K. J. (2023) How social anxiety leads to problematic use of conversational AI: the roles of loneliness, rumination, and mind perception. *Comput. Hum. Behav.* 145:107760. doi: 10.1016/j.chb.2023.107760
- Jian, L.C. Bazarova, N.N. Hancock, J.T. (2011) The disclosure-intimacy link in computer- mediated communication: an attributional extension of the hyperpersonal model. *Human communication research*. 37(1), 58-77.
- Jiang Q., Zhang Y., Pian W. (2022). Chatbot as an emergency exist: mediated empathy for resilience via human-AI

- interaction during the COVID-19 pandemic. *Inf. Process. Manag.* 59:103074. 10.1016/j.ipm.2022.103074
- Joinson, A.N. Paine, C.B. (2007) Self-disclosure, privacy and the internet. *The Oxford handbook of internet psychology.* 237-252.
- Ko, H.C. Kuo, F.Y. (2009) Can blogging enhance subjective well-being through self-disclosure? *Cyberpsychology, Behaviour, 12*, 75-79.
- Laestadius, L. Bishop, A. Gonzalez, M. Illeňík, D. Campos-Castillo, C. (2022) Too human and not human enough: a grounded theory analysis of mental health harms from emotional dependence on the social chatbot Replika. *New Media Society.* Doi: 10.1177/14614448221142007.
- Li, H. Zhang, R. (2024) Finding love in algorithms: deciphering the emotional contexts of close encounters with AI chatbots. *Journal of Computer Mediated Communication, 29*(5).
- Li Zhou, Jianfeng Gao, Di Li, Heung-Yeung Shum; The Design and Implementation of XiaoIce, an Empathetic Social Chatbot. *Computational Linguistics 2020*; 46 (1): 53–93. doi: https://doi.org/10.1162/coli_a_00368
- Lindström, B. Bellander, M. Schulter, D. T. Chang, A. Tobler, P. N. Amodio, D. M. (2021) A computational reward learning account of social media engagement. *Nature communications, 12*, 1311.
- Miller, R.S. (2015) *Intimate Relationships* (W. Wang. Trans.) People's Posts and Telecommunications Publishing House.
- Morales-Garcia, W.C. Sairitupa-Sanchez, L.Z. Morales-Garcia, S.B. Morales-Garcia, M. (2024) Development and validation of a scale for dependence on artificial intelligence in university students. *Front. Educ. 9*. Doi: <https://doi.org/10.3389/feduc.2024.1323898>
- Pentina, I. Hancock, T. and Xie, T. (2023) Exploring relationship development with social chatbots: a mixed-method study of replica. *Computational Human Behaviour.* 140:107600. Doi: 10.1016/j.chb.2022.107600
- Potdevin, D. Sabouret, N. Clavel, C. (2020) Intimacy Perception: Does the Artificial or Human nature of Interlocutor Matter? *International Journal of Human-Computer Studies.* 142. Doi: <https://doi.org/10.1016/j.ijhcs.2020.102464>
- Putnam, R.D. (2000) Bowling alone: the collapse and revival of American community. *Journal of catholic education.* 6(2).
- Rao, X. Wu, H. Cai, Z.G. (2025) A funny companion: Distinct neural responses to perceived AI-versus human-generated humor. *Computation and language.* <https://doi.org/10.48550/arXiv.2509.10847>
- Ravi, N. Patki, S. M. (2025) Parasocial Relationships, Social Support and Well-being: A Mixed Methods Study among Indian Youth. *International Journal of Adolescence and Youth.* 30(1) <https://doi.org/10.1080/02673843.2025.2480712>
- Sairitupa-Sanchez, L. Z. Collantes-Vargas, A., Rivera-Lozada, O. and Morales-García, W. C. (2023) Development and validation of a scale for streaming dependence (SDS) of online games in a Peruvian population. *Front. Psychol.* 14:647. Doi: 10.3389/fpsyg.2023.1184647
- Schaefer, M.T. & Olson, D.H. (1981) Assessing intimacy: the PAIR inventory. *Journal of Marital and Family Therapy, 7*, 47-60.
- Spytska L. (2025). The use of artificial intelligence in psychotherapy: development of intelligent therapeutic systems. *BMC Psychol.* 13:175. 10.1186/s40359-025-02491-9
- Sun, X. Wang, Y. McDaniel, B. T. (2026) AI Companions and adolescent social relationships: Benefits, risks and bidirectional influences. *Child Development Perspectives.* <https://doi.org/10.1093/cdpers/aadaf009>
- Ta, V. Griffith, C. Boatfield, C. Wang, X. Civitello, M. Bader, H. Loggarakis, A. (2020) User Experiences of Social Support from Companion Chatbots in everyday contexts. *Proceedings of the ACM on Human-Computer Interaction.*
- Turkle, S. (2011) *Alone Together: Why We Expect More from Technology and Less from Each Other.* Basic Books.
- Wang, W. Toscano, M. (2024) Artificial Intelligence and Relationships: 1 in 4 Young Adults Believe AI Partners could

Replace Real-Life Romance. Institute for Family Studies. Available at: <https://ifstudies.org/blog/artificial-intelligence-and-relationships-1-in-4-young-adults-believe-ai-partners-could-replace-real-life-romance#:~:text=7%25%20of%20Single%20Young%20Adults,for%20a%20more%20significant%20uptake>.

Xie, T. Pentina, I. Hancock, T. (2023) Friend, mentor, lover: does chatbot engagement lead to psychological dependence. *Journal of Service Management*. 34, 806-828. Doi: 10.1108/JOSM-02-2022-0072.

Yuan, Z. Cheng, X. Duan, Y. (2024) Impact of media dependence: How emotional interactions between users and chat robots affect human socialization. *Frontiers in Psychology*. 15. <https://doi.org/10.3389/fpsyg.2024.1388860>

Zhang, Y., Zhao, D., Hancock, J. T., Kraut, R. E., Yang, D. (2025) The rise of AI companions: How human-chatbot relationships influence well-being. arXiv. <https://doi.org/10.48550/arXiv.2506.12605>