

The Frictionless Fallacy in Sociovirtualization: Assessing the Impact of Artificial Intimacy on Adolescent Psychosocial Development

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Abstract

Artificial Intelligence Companions (AI-Cs) are a specialized class of conversationally based chatbots driven by extremely advanced generative AI systems, which are fine-tuned to simulate human personality and emotional intelligence and to present the user with interpersonal warmth. Unlike the traditional utility-based AI platforms designed for informational tasks, AI-Cs are engineered to establish long-term relational connections and express continuous, simulated empathy. Psychologically, they function as objects of anthropomorphism, allowing users to project real human qualities onto an interface because the software can mirror subtle real-world social interactional cues. This topic is of utmost significance today because society has entered an era of “sociovirtualization”, a paradox where young individuals are more digitally connected than ever before, yet report record-high levels of deep loneliness. Because these platforms are often commercially optimized to maximize user engagement, they capitalize directly on the attachment vulnerabilities of developing adolescents during a vital period of prefrontal cortex maturation. Extensive interactions with a perfectly compliant, algorithmically enhanced chatbot induce maladaptive relational learning, conditioning youth to expect real human interactions to be completely frictionless. When these individuals return to real-world peer ecosystems, their eroded frustration tolerance accelerates the dangerous cycle of social withdrawal and overall human displacement.

The paper explores how frequent interaction with AI companions relates to interpersonal relationships, social connectedness, and emotional well-being among adolescents. Specifically, it investigates the association between sustained use of conversational AI systems and adolescents' broader psychosocial development, including patterns of social interaction, the quality of interpersonal relationships, and emotional functioning. Rather than focusing on a single method of emotional disclosure, this paper examines AI companionship as an ongoing form of social engagement. It explores how prolonged interaction with AI companions relates to adolescents' psychosocial development. Adopting a systematic literature review approach, this paper effectively consolidates empirical data and foundational findings from over 15 peer-reviewed studies. To investigate the identified psychological dynamics, this study synthesizes information from prominent databases specializing in human-computer interactions, media psychology, and behavioral neuroscience. The structural framework implemented comprehensively tracks a plethora of datasets regarding AI companionship, parasocial relations, digital communication, loneliness, adolescent behavior, and youth mental health. As AI companion platforms become increasingly integrated into everyday lives, it is crucial that the scientific community deeply evaluates the connection they have with adolescent development. Effectively mapping this phenomenon directly supports clinical and educationally-based prevention methods by identifying the specific tipping point at which automated comfort transforms into structural social displacement. Ultimately, clarifying these systematic mechanisms can act to further empower young adults, parents, educators, and mental health professionals to better recognize the distinct benefits, hidden risks, and overall long-term limitations of artificial intimacy.

Keywords: AI companionship, Adolescents, Interpersonal relationships, Social connectedness, Emotion-well-being, Psychosocial development, Human-Computer Interaction (HCI)



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1. Introduction

Artificial Intelligence (AI) has increasingly expanded beyond task-oriented and information-seeking communication and more towards applications capable of sustained conversational interaction. Among these developments are Artificial Intelligence Companions (AI-Cs), a specialized category of AI applications directed specifically towards facilitating conversation and continued connection, stimulating the characteristics commonly associated with interpersonal communication. Unlike conventional utilitarian-based AI systems created with the primary objective of information and task completion, AI-Cs are companions designed to provide ongoing social engagement and stimulate meaningful interactions. The emergence of these systems therefore represents a form of digitally mediated conversations and interactions with implications beyond typical human-computer interaction. (Sun, 2026; Ng et al., 2026)

The social significance of AI companionship becomes particularly relevant when considering adolescence. Adolescence is a critical and vulnerable time, a period where a substantial amount of psychosocial development is occurring, involving changes in interpersonal relationships, autonomy, identity, and social well-being. Research has voiced concerns regarding AI-C communication and how technologically mediated relationships can hold psychological significance during adolescence (Gleason et al., 2017), while models of adolescent development have emphasized how connected the nature of psychological and social processes are during this period of development (Meeus, 2016).

As AI-Cs become increasingly more accessible, adolescents may begin to view them not as simply technological tools for knowledge but as a potential source of mediated conversation and companionship.

The interactions with an AI companion are also directly connected with how the user perceives and interprets the responses from the artificial entity. Folk et al (2025) examined anthropomorphism and found that this concept helps explain the false social connection formed with artificial agents, and how user experiences and emotional stimulation may be experienced differently depending on the extent of user dependability and attribution of human characteristics to the entity. Similarly, Ng et al. (2026) examined AI-C attachment and user social well-being. The findings indicate that AI companionship involves processes that go beyond the functional use of technology and into a unilateral social engagement.

2. Theoretical and Conceptual Foundations

The Sociovirtualization Paradox

The increasing integration of Artificial Intelligence (AI) into interpersonal relationships has introduced a fundamentally new concern dealing with the relationship between human social development and artificial mediation. The review refers to this as the Sociovirtualization Paradox, a conceptual framework describing the increasing tension between AI use for emotional regulation and interpersonal connection. Sun (2026) identified two perspectives that deal with the benefits and risks of communication with AI companions (AI-Cs): the stimulation hypothesis and displacement hypothesis. The stimulation hypothesis is the



theoretical foundation dealing with the benefits of AI-Cs. This includes strengthening and improving adolescents' social relationships in the real world, where AI-Cs are tools for improvement and not an independent source for validation. Whereas the displacement hypothesis emphasizes the risks of using AI-Cs, where the interaction between AI and adolescents hinders and negatively impacts the users' social development. The concern arises from AI-Cs detracting from time spent with interpersonal interactions, ruining adolescents' crucial opportunities for developing social skills that cannot be replaced with Artificial Intelligence. Therefore, the Sociovirtualization Paradox is a framework examining whether artificially stimulated social interaction can accompany existing interpersonal relationships or negatively attempts to replace a social place that would otherwise require human interaction.

Anthropomorphism and the Perception of AI as Social. Anthropomorphism is a psychological foundation that is used for understanding why some interactions with AI-Cs are socially fulfilling. Anthropomorphism is the assigning of human characteristics to non-human entities. Folk et al. (2025) conducted two experiments, examining the effect anthropomorphism had on the quality of social connectivity of individuals after interactions with AI-Cs. These studies, involving over 1200 participants, showed varying levels of perceived social fulfillment depending on the interaction with the chatbot. The findings demonstrate that the social fulfillment aspect that comes from conversational AI is based on the perception of the user. When the user begins to perceive the system as anything other than an artificially stimulated conversation, and begins to subconsciously or consciously assign humane or human characteristics to the chatbot, only then does the user experience a socially meaningful conversation. Therefore, anthropomorphism is a conceptual mechanism that explains the one-sided emotional bond that can be formed with an AI-C when the chatbot is perceived as anything other than a nonhuman system.

Parasocial Relationships and Mediated Social Connection

Parasocial relationships are a framework that examines the psychologically meaningful connections that are associated with mediated social figures. Gleason et al. (2017) examined these parasocial relationships during adolescence and the effects on the developmental process that include, but are not limited to, the formation of an individually unique and personal identity and autonomy. The findings in the study demonstrated that the relationships that are formed with these broadcast personalities can hold a high psychological significance during a developmentally vulnerable period. This framework is relevant to AI companions because the phenomenon deals with psychologically meaningful relationships that are completely mediated through technology. However, AI-Cs do this at a much more drastic level, creating and conceptualizing personalized responses directly correlating with what the user has shared with the chatbot. Consequently, parasocial relationship research is a theoretical foundation for understanding the long-term effects of arbitrated social fulfillment, while AI-Cs are an even more interactive method of such fulfillment in a mediated relationship.

Artificial Intimacy and Perceived Social Connections

Artificial intimacy is the conceptualization of a perceived sense of interpersonal connection that is developed through interaction with an AI Companion. Ng et al. (2026) conducted a study with over 500 AI-C users where the AI companionship was observed through the



perspective of the Triangular Theory of Love and Attachment Theory. This experiment investigated these artificial relationships through the angles of intimacy, passion, commitment, interactive engagement, emotional attachment, trust, and social well-being. The study concluded that users who experienced intimacy, passion, and commitment were far more likely to report attachment to the chatbot, and this mediated attachment was correlated with their social well-being. This idea of attributing AI with human-like qualities was further supported by Folk et al. (2025), who found anthropomorphism was associated with the perceived social fulfillment from AI-Cs. These findings both suggest that this mediated connection that leads to artificial intimacy is more than a technological interaction where users' perception directly alters the emotional response.

Social Substitution and the Stimulation-Displacement Framework

Social substitution addresses the concept of whether AI-C interactions complement existing interpersonal relationships or displace the opportunities for human interaction. Sun (2026) presented this issue under the stimulation and displacement hypotheses. The stimulation hypothesis is the positive effect of AI-C usage, where the communication allows for opportunities for emotional and identity expression that could support adolescents' development. However, the displacement hypothesis is when the interaction reduces opportunities for interpersonal interaction through dependence, unrealistic expectations, and time displacement. This distinction shows that the existence of AI companions does not inherently negatively influence adolescent development; instead, it requires consideration and deliberation of how the AI-C relationship is connected to the user's life.

Adolescent Psychosocial Development and Social Context

Adolescence is a very critical developmental stage where many interconnected psychological and interpersonal growth occurs. Meeus (2016) reviewed adolescent psychosocial development and identified that adolescent psychosocial development included not only individual but also interpersonal processes that encompass multiple measures of psychological well-being. Research done by Gleason et al. (2017) further showed that parasocial relationships are very likely to occur during such a vulnerable time and are correlated with the developmental processes of identity and autonomy. In addition, Sun (2026) identifies adolescence as a very important developmental process where the social implications of AI-Cs compete with the possibility of displacing social development. With these studies, it is thoroughly shown that AI-Cs require deliberation on whether or not they belong in the environment of an adolescent during a period of psychosocial development that directly relates to their interpersonal relationship, social connectedness, and emotional well-being.

The collective five theoretical and conceptual perspectives establish a framework for examining AI-Cs as a form of social interaction. Anthropomorphism is a concept where users may perceive AI as relevant and meaningful, whereas parasocial relationship theory establishes the relevance of such artificial relationships. Attachment theory is the framework examining emotional bonds regarding AI-Cs, while the stimulation-displacement hypothesis is a competing perspective about AI interaction and its effect on social interactions.



Conceptual Synthesis

Concluding with research done directly on adolescent psychosocial development, where all these are established as a broader developmental stage. Using this framework, the present review conceptualizes artificial intimacy as a part of technology where the outcome (whether helpful or harmful) is directly correlated with how the user perceives the connection with the mediated conversation. Collectively, examining the relationships that can be formed with AI companions and their role in interpersonal relationships, social connectedness, and adolescent psychosocial development.

3. Methodology

A literature review method was employed to identify and synthesize pre-existing research on the effects of artificial intimacy on adolescent psychosocial development. Sources were collected from the National Library of Medicine, the Scientific Reports journal, Oxford Academic, PsycINFO/APA PsycNet, IEEE Xplore Digital Library, ACM Digital Library, and Google Scholar. Keywords used while finding the reviewed literature consisted of: AI companionship, Adolescents, Interpersonal relationships, Social connectedness, Emotion-well-being, Psychosocial development, Human-Computer Interaction (HCI).

4. Findings

Patterns of AI-Companion Use Among Adolescents

The literature review has indicated that adolescents do not use Artificial Intelligence Companions (AI-Cs) exclusively for traditional information. Herbener and Damholdt (2025) conducted a study with 1599 students from Danish high schools and found that 234 students (14.6%) reported engagement with conversational chatbots for casual communication. However, 39 of these students (2.44%) engaged with chatbots for socially supportive communication. The remaining portion of these interactions included school-related activities, information seeking, and entertainment. These findings conclude that a measurable group is using AI-Cs in a social context, and a portion of this group finds social companionship within these AI chatbots.

Socially Supportive AI Use, Loneliness, and Perceived Social Support

The same study conducted by Herbener and Damholdt (2025) had a major discovery when a qualitative analysis was conducted on the 234 students (14.6%) who engaged in friendly communication with AI-Cs. The students' free-written answers exposed two dominant ways of communication with AI chatbots: utilitarian (174 out of 234 students) and socially-supportive conversations (39 out of 234 students). The study showed that students who had socially-supportive mediated conversations with AI-Cs reported more loneliness than students who did not use AI Companions. These same students also perceived less social support than the students who did not use AI chatbots. This study showed strong correlations



with high loneliness and less perceived social support for students who actively engaged in social conversations with AI.

Person-Centered AI Responses and Perceived Social Connection

Merrill et al. (2025) conducted a study comparing highly and minimally person-centered AI responses in the context of loneliness and anxiety. The results showed that highly person-centered AI-C responses followed a pattern of increased emotional validation for the user and a stronger mediated connection. These responses were artificially generated to make the user perceive social support and stimulate interpersonal connection. These specific findings from the study suggested that the social characteristics of an AI can drastically change the emotional effects and emotional dependency that result from continuous AI-C use; however, the study did not specify the long-term improvement in adolescent development or social well-being.

AI Companionship and Adolescent Social Development

Sun et al. (2026) created a synthesis based on emerging research that specifically considered AI companions in relation to adolescent social relationships. The review identified that mediated communication with AI may have potential benefits for expression, companionship, and identity exploration, though the paper identified criticisms of AI companionship and the possibility that repeated interaction may affect adolescents' social development and interpersonal relationships. The authors placed specific emphasis on the fact that the relationship created with AI-C's and users may be bidirectional and directly influenced by the adolescents' social environment and engagement with the AI. Therefore, the evidence does not suggest that AI companions are inherently harmful, nor does the evidence prove or suggest that chatbots are social opportunities.

5. Discussion

The Frictionless Fallacy: Artificial Intimacy and Relational Expectations

The observations that have been informationally founded to demonstrate the reality that artificial intelligence companions (AI-Cs) are an outpost of swiftly alleviating short-term loneliness present themselves as adjacent to profound developmental hazards that adolescents deal with (Maples et al., 2024; De Freitas et al., 2026). We term this dynamic the Frictionless Fallacy. This phenomenon describes the mistaken belief that the interaction environment that the AI-Cs simulate is intentionally optimized to eliminate the interpersonal conflicts that arise, serving as a functional substitution for organic interaction.

Human relational development is fundamentally dependent on the paradox of “social friction”, which is the necessary navigation of finding results to conflicting ideals, boundaries, miscommunications, and the threat of emotional rejection (Nass & Reeves, 1996). Because many commercialized large language models (LLMs) are structurally developed to maximize user retention through built-in sycophantic compliance, unconditional validation of user interactions, and 24/7 availability, they act to shield the individual from this crucial developmental stressor (Stanford University, 2025; Children and Screens, 2026).



Through participation in an adept, asymmetrical speech cycle where the digital counterpart has no independent needs, adolescents often have to undergo intensive maladaptive relational learning (Children and Screens, 2026). They then internalize an artificial baseline of relational entitlement that's formed, operating under the assumption that every social partner should always be entirely submissive and continuously optimized to serve their mindset of dependence on immediate emotional comfort (Children and Screens, 2026). Consequently, the 'artificial intimacy' generated by the AI-Cs doesn't reinforce an individual's human social capacity. Instead, it acts to actively construct an unrealistic cognitive model of interpersonal dynamics that leave the user behaviorally fragile.

Supplementation Versus Substitution: Implications for Adolescent Socialization

To map the trajectory of this disruption, scholarly research must be investigated to differentiate between adaptive supplementation and maladaptive substitution that exists within youth social systems (Synthetic Attachment Displacement, 2026).

- **Adaptive Supplementation:** Occurs whenever an adolescent actively treats the AI-C as an unthreatening, risk-free practice space to form basic confidence in the individual's communication or to process short-term stress before transitioning back into external social networks (Valkenburg & Peter, 2007).
- **Maladaptive Substitution:** Occurs whenever the digital companion directly dismantles the limited hours and cognitive effort that are needed to actively construct organic human connections, transitioning a healthy emotional safeguard into a permanent relational destination that they depend upon (Synthetic Attachment Displacement, 2026; De Freitas et al., 2026).

This active substitution then triggers a severe developmental displacement. Because of the human peer socialization demand that constantly demands significant emotional work, vulnerable youths have to experience social anxiety or even rejection sensitivity to choose the path of least cognitive resistance: the algorithmically customized AI-C (Oxford University Press, 2026).

Through the substitution of organic peer pushback with synthetic validation from an artificial source, adolescents fail to navigate the critical Eriksonian issues that surround *Identity vs. Role Confusion vs. Isolation* (Erikson, 1968). Rather than having the opportunity to discover their identity through the blunt feedback of peers, they tend to lock themselves within a highly personalized, narcissistic place of social reresidence (Xie & Pentina, 2022). This structural act of avoidance done by many adolescents accelerates the *sociovirtualization paradox*, leaving users kept deeply embedded within their digital conversational systems yet being completely behaviorally and emotionally detached from the real world around them.

4. Implications

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5. Future Research Directions

Longitudinal Research and Developmental Differences

Current empirical studies that have been conducted previously are constrained by the available cross-sectional and short-term observational data designs. Future investigations must act to prioritize larger-scale, longitudinal methodologies that work directly on tracking the long-term impact of AI-C exposure on the same user cohorts across crucial developmental transition periods (e.g., from early adolescence into emerging adulthood).

Furthermore, researchers have to explicitly isolate how the systems interact within distinctive developmental stages (Erikson, 1968). For example, studies should be conducted to evaluate whether younger adolescents (ages 12-18) experience much higher rates of identity stunting and narcissistic tendencies in comparison to emerging adults (ages 18-25), who may utilize these platforms primarily as romantic substitution during periods of demographic instability (Oxford University Press, 2026).

AI Designs, Relational Architecture, and Supplementation Versus Substitution

To move past the simple observation of user risks, media psychology and human-computer interaction (HCI) research that will be done must directly examine how specific platform design choices push towards the transition from supplementation to substitution (arXiv, 2026; Synthetic Attachment Displacement, 2026). Controlled, comparative studies that will be performed should properly analyze how differing structural choices an individual makes, such as formed memory architecture, customized avatars, proactive push notification methods, and varying levels of conversational agreement, accelerate emotional attachment and psychological displacement (arXiv, 2026).

Future scholars must be able to identify the specific technical boundaries that should be placed to prevent adaptive, controlled social tools from becoming a highly addictive, reality-replacing place of isolation (Stanford University, 2025; Xie & Pentina, 2022).

AI-Assisted Prevention and Scaffolded Digital Interventions

Finally, academic research must focus on expanding to form a detailed description of how conversation tools can be programmatically reconstructed to serve as prosocial mechanisms. Future research should additionally design and actively test *Scaffolded Digital Interventions*.



These act to represent conversational systems that are optimized to act as temporary, therapeutic “social training wheels.”

Rather than manually engineering a closed loop of permanent virtual isolation, these experimental architectures would have to employ speech systems to help socially anxious youth build conversational skills with their peers, practice healthy boundary setting, and in turn actively guide them out of the software themselves and into their local, organic communities (Stanford University, 2025).

Synthesis of Future Research

Shifting the academic model from a more passive risk-focused approach to a more active intervention design is crucial to addressing this influential technology. Through the execution of rigorous longitudinal studies, effectively mapping the platforms' processes, and engineering socially proactive, externally-reinforcing conversational skills, the scientific community can work to transform the already-existing generative AI from a major disturbance of human development into a structured system for real-world socialization optimization.

6. Conclusions

This articulated systematic literature review acts to profoundly highlight a major paradox that has been found within modern developmental psychology: the ever-growing adoption of AI companionship presenting itself as a highly effective short-term remedy against the global epidemic of loneliness amongst adolescents, yet simultaneously compromises the foundational functions that are necessary for long-term human socialization (Maples et al., 2024; De Freitas et al., 2026).

Through the operation within our baseline theory: Frictionless Anthropomorphism, common versions of generative AI work to exploit the basic human attachment mechanisms that exist in human-to-human relationships (Bowlby, 1969; Nass & Reeves, 1996). They actively work to immerse adolescents and emerging adults within a space of conversation with a submissive companion that, in turn, directly limits their innate capacity to build a tolerance towards normal interpersonal conflicts, practice proper boundary formation with others, and construct psychological resilience (Stanford University, 2025; Children and Screens, 2026).

Whenever youth actively decide on the path of least resistance, substituting their organic peer networks with algorithmically formulated, artificial relations, they in turn stall critical psychosocial identity formation, further acting to drive the *sociovirtualization paradox*, and lead to many experiences that reinforce severe behavioral isolation (Erikson, 1968; Kurt, 2026)

To ensure the prevention of this technology from having a permanent alteration on youth socialization, responsible stakeholders must act immediately to coordinate a nuanced response that fits all adolescent needs. Parents, educators, and clinicians must proactively collaborate on identifying and treating the causes of digital relational dependence in youth and emerging adults (AKJournals, 2026). Simultaneously, AI developers must decide to move past the engagement-driven reasoning to properly reconstruct the large language models



(LLMs) to respect the vital developmental boundaries and prioritize overall youth well-being (Stanford University, 2025; ScienceDirect, 2025).

Ultimately, conversational companions must be intentionally reconstructed to act as temporary, structured training wheels that actively act to direct the youth back towards their organic communities, further ensuring that the future of human connections can remain rooted within the real world.



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