

Large Language Models and Loneliness: Evaluating AI Companionship as a Social Support Tool

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ABSTRACT: Loneliness and social isolation have become increasingly prevalent among adolescents and adults in modern society, driven in part by the rise of digital technology and a more mobile culture. With over 15% of young people experiencing loneliness according to the World Health Organization, youth are progressively turning to artificial intelligence (AI), particularly general-purpose large language models (LLMs), to find social connection and emotional support. In examining relevant studies based on new scholarly findings and specialized keywords, this paper analyzes the short- and long-term therapeutic potential of AI chatbot companionship to combat loneliness. Findings indicate that AI companions can provide short-term alleviation of loneliness and even help break the cycle of prolonged loneliness by helping individuals re-acclimate to social interaction. However, significant limitations have also emerged, including improper use and insufficient regulation of AI as well as hyper-dependency on AI chatbots for social connection, which can conversely accentuate the current loneliness epidemic. Therefore, this paper argues that while AI offers significant benefit as a supplementary tool for alleviating loneliness, it cannot replace human connection and should be considered alongside traditional forms of social support and medical intervention.

KEYWORDS: Loneliness, Artificial Intelligence (AI), Large Language Models (LLMs), Social Isolation, Mental Health, Human-AI Interaction, AI Chatbots

Introduction

Psychology defines loneliness as a discrepancy between the social relations a person desires and the social relations they have. This discrepancy often leads to negative emotions and adverse health effects. Coventry University human geography professor Jennifer Ferreira and colleagues explain that “modern urban societies have experienced a loss of community, and increased isolation as people are more mobile and less connected to the places where they live” (Ferreira et al., 2021). In addition, the simultaneous rise of digital technologies has reduced social engagement, resulting in a generation that “[prefers] to text rather [than] talk” (Ferreira et al., 2021). Modern society naturally fosters increased isolation and loneliness. Loneliness is not necessarily a bad thing, as psychologists Louise Hawkey and John Cacioppo note that “[l]oneliness is seen as a normal part of life that, while unpleasant, can be helpful because it pushes us to reflect on our relationships and seek connections that meet our needs” (as cited in Verity et al., 2025). Thus, loneliness is usually transient and dissipates once our social needs are met. However, for some people, loneliness becomes prolonged and maladaptive. This can occur under “the Reaffiliation Motive (RAM) model, which suggests that while loneliness initially serves as a signal to seek social connection, it can also lead to heightened attention to social threats, causing individuals to misinterpret social cues and withdraw further,” and this cycle is particularly common amongst adolescents, who are

highly sensitive to social cues (Verity et al., 2025). At this point, loneliness is no longer self-corrective, and external intervention may be required.

Young people are the most vulnerable demographic, as “loneliness peaks in early adolescence” or “later adolescence or young adulthood” (Verity, 2025). In fact, the World Health Organization (2023) found that 5-15% of adolescents experience loneliness today, and overall rates of “involuntary loneliness among adolescents and young adults is increasing all over the world” (Korzina et al., 2024). Prolonged loneliness is associated with poorer mental health (i.e., depression, anxiety, suicidality), and physical health outcomes, such as sleep difficulties and risk of cardiometabolic disease” (Verity et al., 2025). The world is currently experiencing a mental health crisis, as “[t]he prevalence of both short and long-term mental illness is rising, with suicide remaining the third leading global cause of death in [young adults]” (Karaba Bäckström et al., 2025). According to the Office of the Surgeon General of the United States (2023), good childhood relationships result in “improved academic outcomes,” including “improved school attendance, grades, and academic achievement test scores,” “likelihood of graduating college and attaining a 4-year college degree.” Loneliness is a serious modern issue with many ramifications that current systems have struggled to resolve.

A modern technology that is currently being researched to address the youth loneliness epidemic is artificial intelligence (AI), particularly chatbots that users can interact with. AI is a readily accessible technology that is easily deployed to modern populations. It is scalable, accessible, and conveniently integrated into modern life, presenting a compelling yet imperfect solution. This raises an important question: Can artificial intelligence alleviate loneliness among young adults? Although AI shows early promise in rehabilitation and support, there are many limitations due to lack of regulation and potential long-term impairment.

The Therapeutic Potential of AI Chatbot Companionship

Short-Term Benefits of AI on Social Connection and Emotional Support

Recent research suggests AI chatbots may offer short-term relief from feelings of isolation. For example, AI mental health bots like “Wysa and Woebot [have been] shown to be useful in facilitating mental health by alleviating feelings of loneliness, as well as promoting mindfulness” (Ho et al., 2026). In addition, “people feel more socially connected immediately after interacting with chatbots; for example, participants felt less lonely after texting with AI compared to watching YouTube or doing nothing” (Folk et al., 2025). More broadly, some people found AI chatbots to be “emotionally supportive companions whose ‘opinions’ and conversations may hold meaningful and personal significance” (Ho et al., 2026). This evidence shows that AI can simulate parts of social interaction sufficiently to provide temporary relief for the user’s social needs. This trend appears to apply to young people as well, as a survey by Common Sense Media (2025) found that a third of teens “[h]ave used AI companions for social interaction and relationships” and “[f]ind conversations with AI companions to be as satisfying or more satisfying than those with real-life friends.” This data relevantly showcases how young people are familiar with this technology, report having viable relationships with chatbots, and have already integrated it into their lives, making an AI loneliness initiative more feasible. Overall, there is a growing body of research suggesting that AI can serve as a temporary emotional support system, which may be helpful for those who lack access to human interaction.

Chronic Loneliness Intervention and AI as a Tool for Social Reintegration

AI models hold the most promise in helping rehabilitate people who have been isolated for an extended period and are having trouble reintegrating with society by breaking cycles of chronic loneliness. Prolonged isolation creates psychological cycles of social withdrawal in a vicious positive feedback loop. In a study on lonely young people, researchers found “negative cognitive patterns that reinforce and sustain feelings of isolation” (Verity et al., 2025). Many of these participants experienced “overthinking and self-doubt, leading to social withdrawal and further exacerbating loneliness” which “can create a feedback loop, where loneliness leads to avoidance of social interaction, which in turn deepens feelings of isolation” (Verity et al., 2025). The same research found “that individuals reporting loneliness—particularly adolescents—exhibit heightened sensitivity to social rejection and negative evaluation, making them more likely to withdraw from social encounters” (Verity et al., 2025). Therefore, to help lonely young people, it is imperative to break those cycles of loneliness and social withdrawal.

Digital connection could be the solution to this negative feedback loop. Digital connections do not provide inherent social cues, thus reducing users’ sensitivity and fear of judgment. Studies indicate that “online environments are associated with a lesser fear of rejection compared to an in-person interaction,” which “may contribute to a greater sense of safety and psychological distance,” thereby “[lessening] the emotional vulnerability often experienced in in-person interactions” (McKenzie et al., 2026). Not only do people feel more safe in these environments, but “the increased anonymity and reduced cues on online platforms” increased disclosure of personal information (McKenzie et al., 2026). A study on online counseling amongst college students found that “[i]n the absence of physical presence, patients may feel less inhibited as the reduced social cues encourage them to share more intimate details” (McKenzie et al., 2026). Disclosure fosters trust and relationship, demonstrating that they may be overcoming loneliness. Increased disclosure is essential because it “[creates] a level of comfort in the relationship that reflects trust, the quality of that relationship, as well as the quality of the information disclosed” (McKenzie et al., 2026). Although some worry that no actual relationships can be formed over a computer, this study suggests that “individuals are still capable of developing quality social relationships with one another online” and both in-person and online relationships could “[reduce] depression severity and anxiety levels” (McKenzie et al., 2026). As a neutral entity that does not judge, does not exhibit social cues, and is not real, AI can act as a low-risk training ground for people to slowly break out of cycles of loneliness by creating their first safe relationship with a chatbot. Overall, AI interactions could serve as a stepping stone for people to become reacquainted to social interactions, breaking that cycle of loneliness.

Emerging Limitations of AI to Address Long-Term Loneliness

Risks of Improper Use and Insufficient Regulation of AI

As with any new technology, there is the potential for misuse. Improper use of AI is rampant because regulation has failed to keep up with technology, resulting in users using chatbots in unintended ways, sometimes resulting in disastrous consequences. Legal scholars Cohen and Palmieri note that “many individuals seeking AI-mediated mental health support will turn not to FDA-cleared medical-device chatbots, but general-purpose large language models (LLMs)” (Cohen & Palmieri, 2026). The authors further acknowledge that “these unapproved tools can provide interactions that feel like virtual companionship—or, in the best cases, offer a sense of emotional relief or healing,” yet they insist that users also do not have “a clear sense of what the tool is designed to offer,” which can lead to dangerous outcomes (Cohen & Palmieri, 2026). For example, a young

boy in Florida turned to a general-purpose LLM, developing a romantic partnership, and the algorithm of the chatbot ended up encouraging him to act on his suicidal ideation, ultimately leading to his death in 2024. Not all AI is trained to respond appropriately to situations, as a third of teenage AI users have “[reported] feeling uncomfortable with something an AI companion has said or done” (Common Sense Media, 2025). While AI tries to simulate support, it simply lacks the safeguards, training, moral compass, and accountability of a human professional. These findings strongly challenge the reliability of AI as a safe solution in this vulnerable population. However, AI cannot be discarded after these initial failures because it has “an ethical justification in terms of expanding accessibility and benefits of mental healthcare to vulnerable and underserved populations” (Cohen & Palmieri, 2026). Unlike any other kind of support, AI is uniquely positioned to support marginalized groups because it can be deployed to remote areas, is fairly affordable, and is flexible within the user’s schedule. However, the issues of misuse cannot be ignored, so AI needs improved regulation to prevent general LLMs from giving psychological advice to the user, so that only approved models that are trained for this job can interact in that space with vulnerable users.

AI Dependency and Erosion of Human Connection

Although AI has promising short-term effects for alleviating loneliness, people cannot be replaced by chatbots. Unfortunately, there is emerging evidence that people who interact too much with AI become out of touch with the less perfect and less convenient realities of human interaction. Because of their “AI companions’ constant availability and unwavering support, users may instead develop an over-reliance on their virtual companions,” which leads to “dependency,” “over-reliance,” and “erosions of human-human relations” (Ho et al., 2026). Chatbots are constantly available to a person, which may cause the user to develop expectations of immediate support and comfort from them—services that a real person cannot offer. This may lead the lonely person to become less in touch with real human interactions, and in practice cause the loneliness epidemic to turn into an AI relationship epidemic. Another limitation of using AI is that it may lull society into a false sense of security that lonely people are being well taken care of because chatbot solutions exist, when, in reality, an AI companion is only well-studied for short-term relief. Therefore, AI alone is insufficient to rehabilitate lonely people, and more traditional human interaction and outreach are needed as well.

Conclusion

AI chatbots are a promising new technology that can be employed to tackle human loneliness, and the youth loneliness epidemic in particular. Approved chatbots can provide temporary relief, increase feelings of connection, and even help chronically isolated individuals slowly reintegrate. Despite this, they cannot replace human relationships entirely. While AI does have its uses in this space, particularly for people who face isolation or suffer from social anxiety, it is not a human substitute. AI needs to be used responsibly and strongly regulated, as it is only one piece in the puzzle of increasing social connection in the digital era.

Moreover, given the rapidly developing nature of AI-related research, current limitations exist with regard to the scope of this paper’s findings. Relevant studies drawing connections between AI chatbots and loneliness intervention outlined above are new and thus lack long-term evidence for the claims made. They also do not account for how mental health bots will develop and evolve in tandem with generalized LLMs. Lastly, this paper largely frames the conversation of AI and loneliness in terms of impact on adolescents, limiting analysis and direction to a limited portion of the population. Future research should focus on long-term studies involving diverse groups, as well as on

developing standardized approaches for using AI in therapeutic settings, to provide deeper insight into how chatbots may play a role in combating loneliness.

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