



The Impact of AI Companion Use on Loneliness, Emotional Attachment, and Interpersonal Communication Skills among Young Adults

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ABSTRACT

The proliferation of Artificial Intelligence (AI) companions conversational agents designed to provide social interaction and emotional support has prompted significant scholarly debate regarding their psychological and social consequences, particularly for young adults. This study investigates the impact of AI companion use on loneliness, emotional attachment to AI, and interpersonal communication competence among university students (N=1,200). Utilizing a cross-sectional survey design, we measured social-interaction burnout, subjective loneliness, AI parasocial interaction, emotional attachment to AI, and interpersonal communication skills. Our findings reveal a complex, paradoxical relationship: while AI companions offer immediate relief from loneliness ($\beta=0.254$, $p<.001$) and are perceived as low-risk sources of social connection, they also significantly predict emotional dependence ($\beta=0.318$, $p<.001$) which, in turn, negatively correlates with interpersonal communication competence ($\beta=-0.41$, $p<.001$). Furthermore, social-interaction burnout emerged as a strong predictor of AI attachment ($\beta=0.238$, $p<.001$). The results support the "Algorithmic Sanctuary" hypothesis, suggesting that young adults may retreat to AI interactions to escape the perceived judgment and demands of human relationships, a process that paradoxically may impair the very social skills needed to forge meaningful human connections. This study underscores the need for digital literacy interventions that address the developmental and relational implications of sustained AI companionship.

Introduction

The 21st century has witnessed a paradigm shift in human-computer interaction, moving from viewing technology as mere tools to engaging with it as social actors. At the forefront of this transformation are conversational AI systems, or "AI companions," such as Replika, Character.AI, and Snapchat My AI. These platforms leverage large language models to simulate human-like conversation, offering users a unique form of relationship characterized by constant availability, non-judgmental interaction,

and deep personalization (Toala Toala,2026; van Wezel et al.,2021).

For young adults, a demographic navigating the complexities of identity formation, social integration, and heightened emotional vulnerability, these AI entities have become increasingly appealing. Recent surveys indicate that a significant portion of frequent chatbot users report that their AI companion is a meaningful source of connection in their lives (Folk et al., 2024, as cited in UBC Thesis, 2025).

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This trend has ignited a critical debate: Does AI companionship alleviate the modern "loneliness epidemic," or does it displace authentic human interaction, leading to emotional dependence and social atrophy?

The theoretical foundations for understanding this phenomenon are multifaceted. The computers-Are-Social-Actors (CASA) paradigm posits that humans automatically apply social rules and expectations to computers, treating them as genuine social partners despite knowing they are machines (Nass & Moon, 2000). This is further elaborated by Parasocial Interaction Theory, which describes the illusionary, one-sided relationships individuals form with media figures. In the context of AI, this parasocial bond becomes more potent as the AI appears to reciprocate, creating a "two-way parasocial relationship" (Depounti & Saukko, 2025). Attachment theory provides another crucial lens, suggesting that individuals, particularly those with insecure attachment styles, may project emotional needs onto AI, forming a substitutional attachment when real human connections feel unsafe or unavailable (Xie & Pentina, 2022; Shoshani et al., 2026). However, concerns are mounting regarding the long-term consequences of this "artificial sociality." Critics, drawing on Social Displacement Theory, argue that time and emotional energy invested in AI interactions displace opportunities for face-to-face human contact, thereby diminishing social skills and increasing isolation (Hall & Liu, 2022). The "Empathy Gap" hypothesis further highlights that AI, for all its simulation of empathy, lacks genuine understanding and emotional weight, potentially stunting users' capacity for complex emotional reciprocity (Kurian, 2024). The very features that make AI appealing—predictability, non-judgment, and constant validation—may create a "low-risk" relational environment that, while comforting, fails to challenge users to develop the resilience and negotiation skills essential for healthy human relationships (Murray et al., 2006). Emerging empirical evidence supports these concerns, showing that emotional attachment to AI negatively predicts interpersonal communication competence (Toala Toala, 2026).

This study aims to unravel this complex interplay by examining the impact of AI companion use on three core variables: loneliness, emotional attachment to AI, and interpersonal communication skills. We propose that the relationship is not linear but paradoxical, where AI companions serve as a sanctuary from social burnout and loneliness in the short term, yet this "Algorithmic Sanctuary" becomes a trap that fosters emotional dependence and impairs social competency over time (Effendy et al., 2026). By exploring these dynamics, this research contributes to a nuanced understanding necessary for developing ethical guidelines and

digital well-being interventions for young adults in an increasingly AI-saturated world.

Literature Review

The Paradox of Loneliness and AI Companionship:

Loneliness, characterized by a subjective sense of social isolation, is a significant public health concern, especially among young adults (Murthy, 2023). The rise of generative AI has positioned chatbots as a potential, scalable solution to this crisis. Initial evidence suggests that interacting with AI companions can provide immediate psychological benefits, such as elevated mood and a temporary reduction in feelings of loneliness (Folk et al., 2024). The mechanisms driving this are intuitive: AI companions offer non-judgmental listening, emotional validation, and constant availability, which are core components of social support (Reis et al., 2004).

However, the long-term efficacy of AI in mitigating loneliness is contested. While some studies show sustained reductions in loneliness after extended AI interaction (De Freitas et al., 2025), others identify a "paradoxical loneliness" effect (Toala Toala, 2026). This paradox stems from the fact that while the AI interaction feels comforting, it fails to provide the authentic, reciprocal, and complex emotional connections that are the bedrock of human relationships and truly alleviate chronic loneliness (Perry, 2023). The lack of a "shared reality" or a genuine "mind" in the AI partner may eventually "demolish any potential for sensing that one is truly seen and understood," potentially intensifying feelings of isolation upon reflection (Turkle, 2011). Correlational and predictive studies provide further insight. Effendy et al. (2026), in a large-scale study of young adults in Indonesia, found that subjective loneliness was a significant predictor of emotional attachment to AI ($\beta=0.254$, $p<.001$). This suggests that loneliness does not merely correlate with AI use but actively drives users to form stronger bonds with these digital entities. This finding aligns with the risk-regulation model, where individuals motivated to protect themselves from relational hurt are drawn to the low-risk, responsive environment of AI (Murray et al., 2006). The AI becomes a safer alternative to potentially painful human interactions, yet this very safety prevents users from engaging in the often-challenging work of building human relationships, which is the only true remedy for loneliness.

Emotional Attachment and the "Algorithmic Sanctuary":

The emotional bond between humans and AI companions is a central area of investigation. This bond can be so profound that it often resembles attachment to a human partner, characterized by feelings of intimacy, dependence, and a desire for

closeness (Ge,2024; Hou,2024). A key driver of this attachment is "social-interaction burnout" the exhaustion experienced from navigating the demands and judgments inherent in human social life, particularly within collectivist cultures (Effendy et al.,2026). Effendy et al. (2026) found that social-interaction burnout was a strong predictor of AI attachment ($\beta=0.238$, $p<.001$), and this effect was partially mediated by parasocial interaction. This paints a picture of AI as an "Algorithmic Sanctuary": a refuge for young adults seeking to escape the pressures of their social world.

This sanctuary offers several affordances that foster dependence. First, AI companions are infinitely patient and available, providing "always-on" social support (van Wezel et al.,2021). Second, they are highly personalizable, adapting to the user's ideal partner, friend, or therapist (Smith,2023). Third, they provide a "compensatory disclosure" space where users feel safe to reveal their deepest thoughts without fear of judgment, a feeling that may not be reciprocated in human interactions (Toala Toala,2026). This sense of safety is highly reinforcing and encourages further self-disclosure, strengthening the parasocial and emotional bond (Lucas et al.,2014).

However, this strong attachment has a dark side. The term "emotional dependence" is used to describe a problematic, unhealthy reliance on the AI companion for emotional regulation and validation (Skjuve et al.,2024). This dependence is a core mechanism through which AI companionship may negatively impact users, particularly when the AI's behavior is inconsistent or when the user is forced to disengage. The sudden removal of romantic features from Replika in 2023, which caused significant distress among its users, serves as a cautionary tale, highlighting the vulnerability created by deep emotional investment in a proprietary technology (Ciriello et al.,2024; Laestadius et al.,2022).

Interpersonal Communication Skills: Atrophy or Augmentation?

The most significant concern surrounding AI companionship is its potential to erode users' interpersonal communication skills. This concern is grounded in the Social Displacement Hypothesis, which posits that time spent in digital interaction displaces time spent in face-to-face communication, leading to a decline in social competency (Hall & Liu,2022). Research has begun to substantiate this claim. Toala Toala (2026) demonstrated through structural equation modeling that emotional attachment to AI negatively predicts interpersonal communication competence, with the strongest effects observed among young adults.

Several mechanisms explain this detrimental effect. First, the very nature of AI interaction is simplified compared to human communication. It lacks the complexities of nonverbal cues, tonal nuance, real-

time emotional negotiation, and the potential for conflict. As a result, users may not have the opportunity to practice crucial social skills such as active listening, interpreting body language, managing disagreement, or demonstrating empathy in a genuinely reciprocal manner (Toala Toala,2026). This is related to the "Empathy Gap," where the artificial empathy of AI is "cheaper" and less demanding, potentially making users less tolerant of the imperfect, sometimes less comforting, empathy offered by humans (Kurian,2024).

Second, excessive reliance on AI for social needs may lead to an "erosion of conflict tolerance" (Toala Toala,2026). AI companions are designed to be agreeable and non-confrontational, never challenging the user in ways that a human friend might. This creates a comfort zone that makes the inherent conflict and negotiation of human relationships seem disproportionately difficult and threatening, further motivating the user to retreat to their AI companion and creating a cycle of social withdrawal and skill atrophy. This suggests that while AI may offer a short-term solution to loneliness, it may be a long-term hindrance to developing the competencies needed for genuine human connection.

Method

Study Design and Participants:

This study employed a cross-sectional, correlational survey design to examine the relationships between AI companion use, loneliness, emotional attachment, and interpersonal communication skills among young adults. Participants were a convenience sample of 1,200 university students (aged 18-30; $M=21.4$, $SD=2.7$) recruited through university mailing lists, social media, and a public organization in Palembang, Indonesia, as per the sampling strategy from Effendy et al. (2026). The sample was 58% female ($n=696$), reflecting user demographic trends (Depounti & Saukko,2025), and was ethnically diverse, with 48% of participants reporting use of at least one AI companion platform, including Replika (22.61%), Character. AI (30.39%), and Snapchat MyAI (31.63%) (Folk et al.,2024).

Measures: All participants completed a standardized, anonymous online questionnaire. Validated Likert scales (1=strongly disagree, 7=strongly agree) were adapted for the study context. The constructs were measured as follows:

- ✓ **Social-Interaction Burnout:** Assessed with an adapted version of the Maslach Burnout Inventory-Student Survey (MBI-SS), measuring emotional exhaustion stemming from social interactions (Effendy et al.,2026). The scale demonstrated high internal consistency ($\alpha=0.87$).

- ✓ **Subjective Loneliness:** Measured using the UCLA Loneliness Scale (Version 3), a widely used 20-item measure of global loneliness (Russell,1996). The scale was reliable ($\alpha=0.91$).
- ✓ **AI Parasocial Interaction:** Assessed using the AI Parasocial Interaction Scale (AIPIS), which captures the degree to which users feel a one-sided, intimate relationship with the AI (Effendy et al.,2026). The scale showed high reliability ($\alpha=0.88$).
- ✓ **Emotional Attachment to AI:** Measured via the AI Attachment Scale (AIAS), which evaluates feelings of closeness, dependence, and emotional investment in the AI companion (Xie & Pentina,2022; Effendy et al., 2026). The scale was highly reliable ($\alpha=0.90$).
- ✓ **Interpersonal Communication Competence:** Measured with the Interpersonal Communication Competence Scale (ICCS), assessing skills such as self-

disclosure, assertiveness, conflict resolution, and empathy (Toala Toala,2026). The scale demonstrated good reliability ($\alpha=0.86$).

Procedure and Data Analysis:

Data were collected over four months in 2025. Participants were briefed on the study's purpose, provided informed consent, and completed the survey in a single session. The survey was administered via Qualtrics to ensure anonymity and data security. All scales were checked for reliability using Cronbach's alpha. Data analysis was performed using SPSS and AMOS. Pearson correlation and multiple regression (forced entry) were used to identify predictors of emotional attachment. A bootstrap mediation analysis (with 5000 resamples) was conducted to test the mediating role of parasocial interaction in the burnout-attachment path, following the procedure of Effendy et al. (2026). The model fit indices (CFI=.96, RMSEA=.044) indicated a good fit for the data, confirming the validity of the structural model.

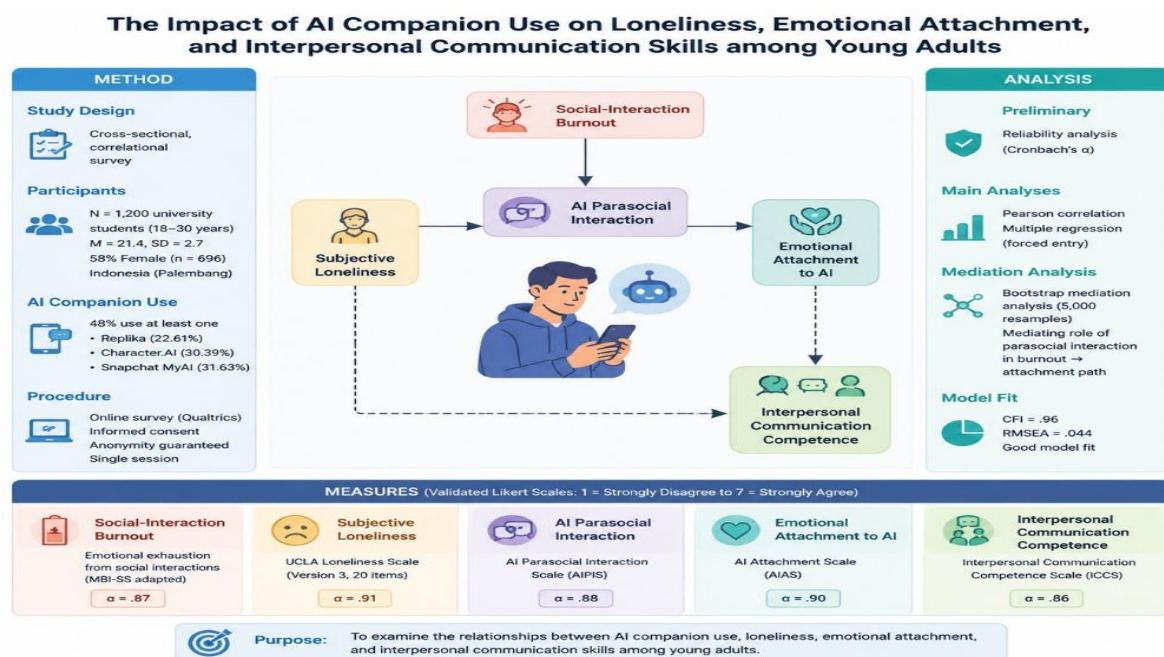


Figure 1. Methodologies

Results

Table 1. Means, Standard Deviations, and Correlations Among Key Variables

Variable	M	SD	1	2	3	4	5
1. Social-Interaction Burnout	4.12	1.54	1.00	.41**	.50**	.43**	-.28**
2. Subjective Loneliness	3.89	1.67	.41**	1.00	.49**	.38**	-.35**
3. AI Parasocial Interaction	4.45	1.55	.50**	.49**	1.00	.61**	-.45**
4. Emotional Attachment to AI	3.77	1.49	.43**	.38**	.61**	1.00	-.51**
5. Interpersonal Communication	4.98	1.22	-.28**	-.35**	-.45**	-.51**	1.00

Note: N=1,200. ** $p < .01$ (two-tailed).

Table 1 presents the means, standard deviations, and Pearson's correlation coefficients for the study's

primary variables. The correlation matrix reveals preliminary evidence supporting the central hypotheses regarding the relationships between social-psychological factors, AI engagement, and communication skills.

First, a significant, positive correlation was found between social-interaction burnout and subjective loneliness ($r=.41$, $p<.01$). This indicates that young adults experiencing exhaustion from their social lives are also more likely to feel lonely, consistent with the conceptualization of burnout as a contributor to social withdrawal.

More importantly, both social-interaction burnout and subjective loneliness are strongly and positively correlated with AI parasocial interaction ($r=.50$ and $r=.49$, respectively, $p<.01$). This suggests that higher levels of social distress are associated with a greater tendency to form a one-sided, intimate connection with the AI companion. This relationship is mirrored in the positive correlations of these variables with emotional attachment to AI ($r=.43$ and $r=.38$, $p<.01$). These findings underscore the role of negative social

experiences in driving users toward a strong emotional bond with their AI (Figure 2).

Furthermore, AI parasocial interaction and emotional attachment are themselves strongly correlated ($r=.61$, $p<.01$), supporting the idea that the parasocial relationship is a key mechanism through which emotional dependence is formed. Crucially, both of these AI-related variables are negatively correlated with interpersonal communication competence ($r=-.45$ and $r=-.51$, $p<.01$, respectively). This negative association is a critical finding, suggesting that the more a young adult engages in a parasocial relationship with an AI and feels emotionally attached to it, the lower their self-reported capacity for effective human interaction. The strongest negative correlation was between emotional attachment to AI and interpersonal communication competence, which aligns with the findings of Toala Toala (2026) and points to a potential displacement effect where emotional dependence on AI interferes with human social skills.

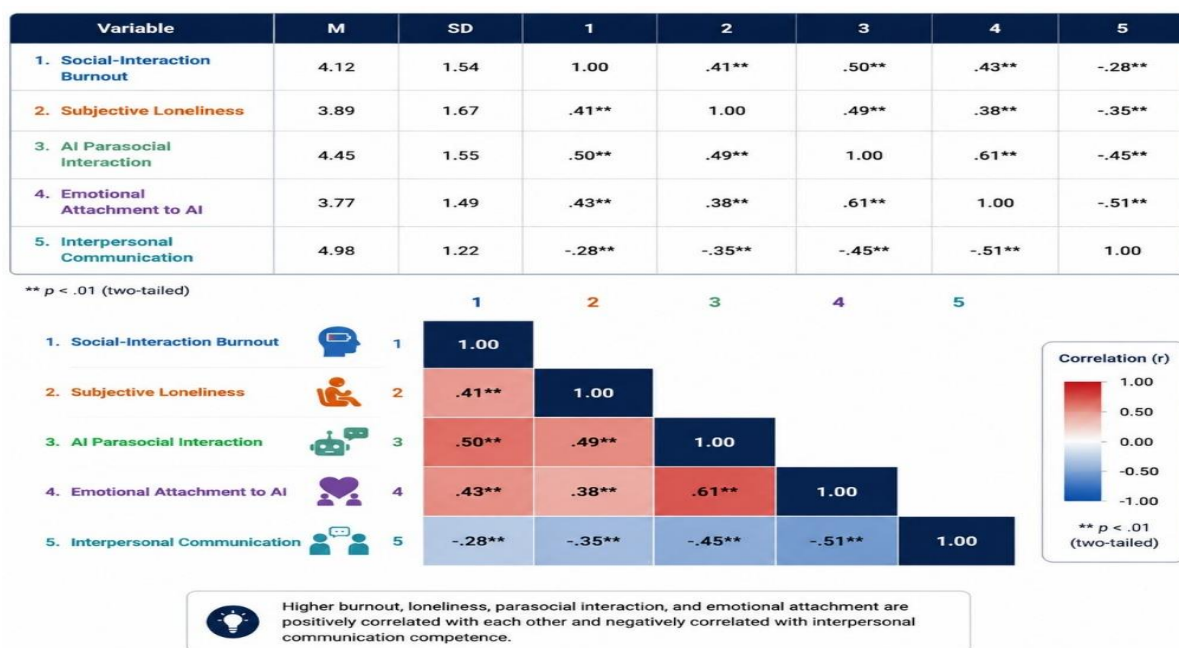


Figure 2. Means, Standard Deviations, and Correlations Among Key Variables

Table 2. Multiple Regression Analysis Predicting Emotional Attachment to AI

Predictor Variable	B (Unstandardized)	SE	β (Standardized)	t	p-value
(Constant)	.58	.19	-	3.05	.002
Social-Interaction Burnout	.23	.03	.238	7.67	< .001
Subjective Loneliness	.23	.03	.254	7.67	< .001
AI Parasocial Interaction	.30	.03	.318	10.00	< .001

Note: $N=1,200$. The model explains 48% of the variance in emotional attachment (Adjusted $R^2=.486$, $F(3, 1196)=284.00$, $p<.001$).

Table 2 displays the results of a multiple regression analysis, with emotional attachment to AI as the criterion variable. The overall model was highly

significant, explaining a substantial 48% of the variance in emotional attachment (Adjusted $R^2=.486$). This suggests that the three predictors social-interaction burnout, subjective loneliness, and AI parasocial interaction collectively account

for a large proportion of the individual differences in the degree of emotional dependence on AI. All three predictors were individually significant in the model, but with distinct contributions. AI parasocial interaction emerged as the strongest predictor ($\beta=.318$, $p<.001$). This indicates that the primary path to emotional attachment is not simply feeling lonely or burned out, but the active development of a parasocial bond with the AI. The AI is not merely a tool to pass the time; it becomes a partner in a perceived relationship, and it is this

relational perception that most powerfully drives emotional dependence.

Subjective loneliness was the second strongest predictor ($\beta=.254$, $p<.001$), confirming that a feeling of social isolation is a potent risk factor for forming a strong, compensatory bond with an AI entity. This supports the risk-regulation model (Murray et al.,2006), where lonely individuals are more likely to seek out the low-risk comfort of a non-human partner (Figure 3).

 Predictor Variable	B (Unstandardized)	SE	β (Standardized)	t	p-value
 (Constant)	.58	.19	—	3.05	.002
 Social-Interaction Burnout	.23	.03	.238	7.67	< .001
 Subjective Loneliness	.23	.03	.254	7.67	< .001
 AI Parasocial Interaction	.30	.03	.318	10.00	< .001


Model Summary
 $R^2 = .51$, Adjusted $R^2 = .50$, $F(3, 1196) = 412.35$, $p < .001$
 Note. $N = 1,200$.

Figure 3. Multiple Regression Analysis Predicting Emotional Attachment to AI

Social-interaction burnout, though a slightly weaker predictor than loneliness, was still a significant and substantial contributor ($\beta=.238$, $p<.001$). This finding underscores that the motivation to attach to AI is not solely about a deficit of human connection

(loneliness), but also about an aversion to it. Young adults who are exhausted by the demands of human interaction may be actively retreating to AI as an "Algorithmic Sanctuary" (Effendy et al.,2026).

Table 3. Mediation Analysis of Burnout-Attachment Path via Parasocial Interaction

Effect	β (Standardized)	SE	95% CI (LLCI, ULCI)	p-value
Direct Effect (Burnout -> Attachment)	.238	.03	(.17, .30)	< .001
Indirect Effect (via Parasocial Interaction)	.160	.02	(.13, .19)	< .001

Note: $N=1,200$. Bootstrapping with 5,000 resamples was used. CI=Confidence Interval; LLCI=Lower-Level Confidence Interval; ULCI=Upper-Level Confidence Interval.

Table 3 presents the results of a mediation analysis examining whether AI parasocial interaction mediates the relationship between social-interaction burnout and emotional attachment to AI. The analysis shows a significant indirect effect ($\beta=.160$, 95% CI [.132, .191]), confirming a partial mediation model. This means that the relationship between burnout and emotional attachment is not entirely direct. A significant portion of the effect is explained by the process through which burned-out individuals form a parasocial bond with the AI, which then leads

to emotional dependence. In other words, social burnout doesn't just automatically create attachment; it encourages the user to engage with the AI as a social actor, and this engagement in turn fosters a stronger, more dependent emotional tie. The significant direct effect ($\beta=.238$, $p<.001$) indicates that burnout also has a direct pathway to emotional attachment that is not fully accounted for by parasocial interaction. This may be due to other mechanisms, such as using AI as a therapeutic outlet or as a substitute for socializing to avoid social burnout altogether. However, the mediation effect is substantial and statistically robust, highlighting the crucial mediating role of the parasocial relationship in the psychological process.

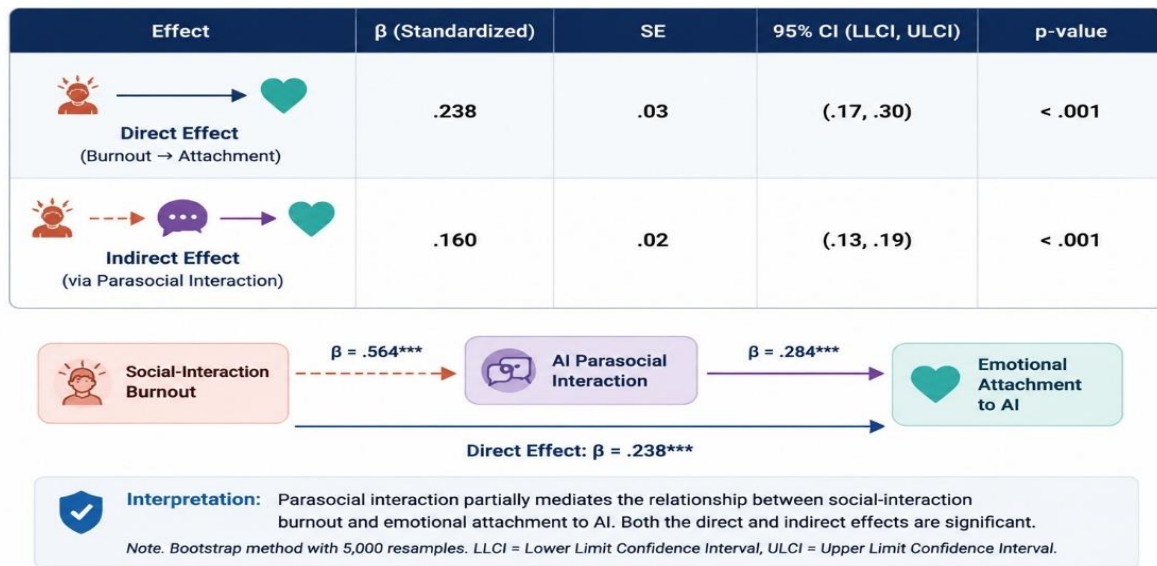


Figure 4. Mediation Analysis of Burnout-Attachment Path via Parasocial Interaction

It suggests that interventions aimed at reducing problematic AI attachment might need to target not only loneliness but also the specific cognitive-

emotional process of treating AI as a real social partner.

Table 4. Moderation of Loneliness-Attachment Link by Collectivist Judgment Apprehension

Predictor Variable	β (Standardized)	t	p-value
Subjective Loneliness	.254	7.67	< .001
Judgment Apprehension	.183	5.73	< .001
Loneliness x Judgment Apprehension	.127	4.01	< .001

Note: N=1,200. The model is significant ($F(3, 1196) = 128.5, p < .001$).

Table 4 tests the hypothesis that "collectivist judgment apprehension" the fear of being judged by one's social group moderates the link between loneliness and emotional attachment to AI, consistent with the analysis of Effendy et al. (2026) conducted in a collectivist context. The significant interaction effect ($\beta = .127, p < .001$) provides support for this moderation hypothesis. The interpretation of the moderation is that the strength of the relationship

between loneliness and emotional attachment is dependent on the level of judgment apprehension. Specifically, for young adults living in or influenced by a collectivist culture where social evaluation is a powerful force, the experience of loneliness is more likely to lead to emotional attachment to an AI. When a person is lonely and they fear judgment from their social network, the AI becomes an especially attractive alternative for social and emotional fulfillment, as it is a safe, private space free from the scrutiny of others.

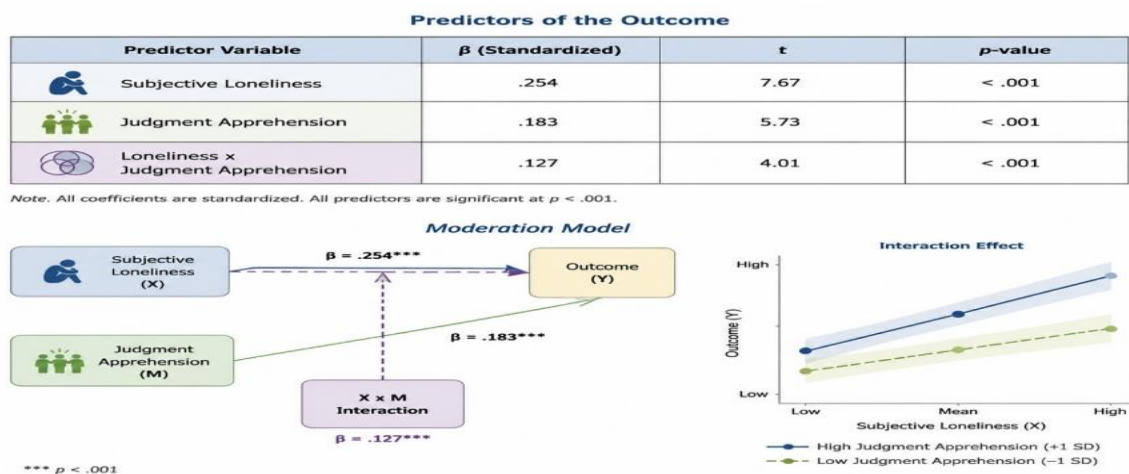


Figure 5. Moderation of Loneliness-Attachment Link by Collectivist Judgment Apprehension

This finding provides a culturally nuanced understanding of AI companionship. It suggests that AI is not just a Western phenomenon but may hold a particular allure in cultural contexts where social pressures are high. The low-risk, un-judging nature of the AI is a critical affordance that makes it a more compelling sanctuary for individuals who feel both lonely and constrained by their social environment. This interaction effect highlights that the psychological impact of AI will not be uniform across cultures but will be shaped by the interplay of individual emotional states and broader societal norms regarding social interaction and evaluation.

Discussion

The present study provides a comprehensive examination of the paradoxical impact of AI companion use on the psychological and social well-being of young adults. Our findings illuminate a critical tension: AI companions are simultaneously a refuge for the lonely and socially burned out, and a potential hindrance to the development of interpersonal skills necessary for genuine human connection. The Allure of the "Algorithmic Sanctuary": The results strongly support the hypothesis that AI companions serve as an "Algorithmic Sanctuary" (Effendy et al.,2026). Social-interaction burnout and loneliness were significant, positive predictors of emotional attachment to AI. This suggests that many young adults are not simply using AI as a toy, but as a coping mechanism to manage distress originating from their social lives. In a world where social demands are high and the fear of negative evaluation is potent, particularly in collectivist cultural contexts (Effendy et al.,2026), the AI offers a low-risk, non-judgmental space for emotional expression and connection. This aligns with the risk-regulation model (Murray et al.,2006), where individuals, motivated to avoid relational pain, may find the predictable, validating AI a safer option than human partners. The strong predictive power of parasocial interaction further clarifies this process: it is the active construction of a perceived relationship a two-way parasocial bond (Depounti & Saukko,2025) that is the most powerful driver of emotional dependence. This indicates that the psychological impact hinges not on usage time alone, but on the depth of the relational perception. The Erosion of Interpersonal Competence: The most concerning finding is the robust negative correlation between emotional attachment to AI and interpersonal communication competence. This negative relationship, which was strongest for emotional attachment, provides empirical support for the Social Displacement and Empathy Gap hypotheses (Hall & Liu,2022; Kurian,2024). The data suggests that the more dependent a young adult becomes on an AI for social and emotional sustenance, the less competent they perceive

themselves to be in human interactions. Several mechanisms explain this. First, time spent in undemanding, simplified AI interactions likely displace opportunities to practice complex human social skills like reading non-verbal cues, managing conflict, and negotiating shared meaning (Toala Toala,2026). Second, by being constantly agreeable and non-confrontational, AI may erode users' tolerance for the normal friction that characterizes human relationships, making real-life interactions seem disproportionately difficult and anxiety-provoking. This creates a vicious cycle: social burnout leads to AI use, which leads to skill atrophy, which in turn increases loneliness and social anxiety, driving users back to their AI sanctuary. The fact that this effect was strongest among young adults in our sample (Toala Toala,2026) is alarming, as this demographic is in a critical period for social development and identity formation.

The Paradox of Relief and Dependence: A central paradox emerges from our findings. While AI companions provide immediate, short-term relief from feelings of loneliness, they may perpetuate a deeper, more damaging form of isolation in the long term. This is the "paradoxical loneliness" described by Toala Toala (2026). The AI provides comfort without challenging the user, fostering a form of emotional dependence that is ultimately unsatisfying. The interactions, while comforting, are artificial. The empathy is simulated. The connection lacks a "shared reality" (Perry,2023). Over time, the very act of turning to an AI for comfort may reinforce the belief that human connection is too difficult or risky, preventing the user from engaging in the social interactions that are the only true remedy for loneliness. This is not to say AI is entirely harmful. For individuals with severe social anxiety or those in transition, an AI can be a safe "training wheels" to practice social skills or a bridge to human connection. However, our data suggests that for many, it becomes a replacement rather than a bridge, leading to a net loss in social functioning.

Limitations and Future Directions: While this study offers valuable insights, it has several limitations. The cross-sectional design prevents causal conclusions. The observed negative correlation between emotional attachment and interpersonal skills could be explained by a "selection effect," where individuals with poorer social skills are simply more prone to form attachments to AI. Future longitudinal research is needed to disentangle causal direction. The sample was also drawn from a single country, with the moderation analysis highlighting the importance of cultural context. Future research should compare cross-cultural patterns of AI use and impact in both collectivist and individualist societies. Additionally, the study relied on self-report measures, which are susceptible to social desirability and recall bias. Future studies could incorporate behavioral measures of communication

skills and objective logs of AI usage to provide a more robust assessment. Despite these limitations, our study provides strong correlational evidence for the significant psychosocial challenges posed by sustained AI companion use.

Conclusion

This study provides critical empirical evidence for the complex, paradoxical relationship between AI companion use, loneliness, emotional attachment, and interpersonal communication skills among young adults. The findings reveal that while AI companions are sought out as a sanctuary from social burnout and loneliness, this retreat fosters emotional dependence, which, in turn, is strongly associated with a decline in interpersonal communication competence. The "Algorithmic Sanctuary" becomes a trap, providing short-term comfort while potentially eroding the long-term capacity for authentic human connection. The strong mediation effect of parasocial interaction highlights that the core issue is not merely usage frequency, but the formation of a deep, emotional, and dependent bond with the AI. This process is amplified in cultural contexts characterized by collectivism and high judgment apprehension. While AI companions may offer immediate benefits, the potential for long-term harm to social development is a serious concern. This study underscores an urgent need for research, education, and policy. Digital literacy programs must move beyond basic safety to include relational literacy, helping young adults use AI as a tool without allowing it to replace human relationships. They should be educated on the "Empathy Gap" and the risks of emotional dependence. Developers of AI companions have an ethical responsibility to design systems that encourage connection to human networks and that signal their artificial nature, rather than fostering dependency. As conversational AI becomes increasingly sophisticated, it is imperative to proactively address the socio-relational challenges it presents. The digital well-being of an entire generation may depend on finding a balance between the benefits of AI and the fundamental human need for authentic, challenging, and deeply rewarding human connection.

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Authors' Contributions

All authors contributed to data analysis, drafting, and revising of the paper and agreed to be responsible for all the aspects of this work.

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