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STUDYING THE RELATIONSHIP OF TECHNOLOGY READINESS, SOCIAL CONNECTEDNESS, AND PERCEIVED ANTHROPOMORPHISM WITH EMOTIONAL DEPENDENCE ON AI COMPANIONS

Gunika Puri

M.A. Psychology, Student, Amity School of Social Sciences, Amity University Punjab

Anuradha Ranjan

Assistant Professor, Amity School of Social Sciences, Amity University Punjab

ABSTRACT

The increasing presence of artificial intelligence (AI) in everyday life has begun to reshape how individuals interact, communicate, and experience emotional support. As these systems become more interactive and emotionally responsive, many users begin to engage with them in ways that go beyond simple utility. The present study examines how technology readiness, social connectedness, and perceived anthropomorphism are related to emotional dependence on AI companions. A correlational research design was used with a sample of young adults aged 18–30 years. Standardized measures, including the Technology Readiness Index, Social Connectedness Scale, and the Individual Differences in Anthropomorphism Questionnaire, were administered along with an adapted scale to assess emotional dependence on AI. The data were analyzed using Pearson's correlation and independent samples t-test. The findings suggest that individuals who perceive AI systems as more human-like are more likely to develop emotional reliance on them. In contrast, technology readiness and social connectedness did not show a significant relationship with emotional dependence. These results highlight that emotional engagement with AI may be shaped more by users' perceptions of the system rather than their technological familiarity or social environment.

The study contributes to a growing understanding of human–AI interaction and raises important considerations for the design of AI systems that are emotionally engaging without encouraging unhealthy dependence

KEYWORDS: Artificial Intelligence, AI Companions, Emotional Dependence, Technology Readiness, Social Connectedness, Anthropomorphism, Human–Computer Interaction, Parasocial Interaction

INTRODUCTION

Human interaction is no longer limited to relationships between people. With the increasing integration of artificial intelligence (AI) into everyday life, individuals are now engaging with systems that can simulate conversation, empathy, and emotional understanding. These interactions are not always purely functional; for many young adults, AI companions such as Replika, Character AI, Gemini, and ChatGPT are gradually becoming spaces for expression, comfort, and even emotional support. This shift suggests that technology is not only changing how people communicate, but also how they experience connection and emotional fulfilment.

In today's digital environment, the way people experience connection is increasingly shaped by technology. Social media platforms use algorithmic systems to personalise content, which can influence how individuals form relationships, seek validation, and interpret social interactions. Alongside this shift, AI companions such as Replika, Character AI, Gemini, and

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ChatGPT are being used not only for information or productivity, but also for conversation and emotional engagement. For some users, these systems begin to feel consistent and responsive in ways that resemble human interaction. As a result, a pattern is emerging where individuals may start to rely on AI for comfort, expression, or emotional reassurance. While this reflects the growing sophistication of AI systems, it also raises important concerns about how such interactions may influence emotional dependence. Some researchers and commentators have pointed out that certain AI designs encourage prolonged engagement, which may unintentionally strengthen users' attachment to these systems. This makes it important to examine not just how people use AI, but how they begin to relate to it on an emotional level. The extent to which individuals develop emotional dependence on AI companions may be influenced by several underlying factors. One important factor is technology readiness, which reflects how comfortable and open a person is toward using new technologies. Individuals who are more confident with technology may be more likely to engage frequently with AI systems, increasing the possibility of forming a connection.

Another relevant factor is social connectedness, which refers to the sense of belonging and closeness individuals experience in their real-life relationships. Those who feel less connected to others may be more inclined to seek interaction and emotional fulfilment through AI-based platforms. In contrast, individuals with stronger social ties may engage with AI in a more casual or functional manner. Perceived anthropomorphism also plays a key role, as it captures the tendency to attribute human-like qualities, emotions, and intentions to AI systems. When AI is perceived as more relatable or emotionally responsive, users may begin to interact with it in a more personal way, which can increase the likelihood of emotional attachment. In addition, gender may influence how individuals engage with AI. Previous research suggests that differences in communication style, emotional expression, and technology use may shape how AI systems are perceived and experienced. Exploring these differences can provide a more nuanced understanding of emotional dependence in AI-based interactions.

Understanding how these factors work together is important for gaining a clearer picture of how emotional dependence on AI develops. Rather than being shaped by a single variable, this dependence may emerge from the interaction between individual comfort with technology, real-life social experiences, and the way AI is perceived as human-like. Therefore, the present study examines the relationship between technology readiness, social connectedness, and perceived anthropomorphism in predicting emotional dependence on AI companions, with the aim of better understanding the psychological processes involved in human–AI interaction.

THEORETICAL FRAMEWORK

The present study is guided by several theoretical perspectives that help explain how individuals interact with and respond emotionally to artificial intelligence (AI) systems. These theories provide a foundation for understanding why AI companions are often perceived as socially meaningful rather than purely technical tools.

One of the key perspectives is the Media Equation Theory (Reeves & Nass, 1996), which suggests that people tend to treat computers and digital systems as if they were real social actors. Even when individuals are aware that they are interacting with machines, they often apply human social rules such as politeness, reciprocity, and emotional response. In the context of AI companions, this helps explain why users may begin to engage with these systems in ways similar to human relationships.

Closely related to this is the Computers as Social Actors (CASA) paradigm, which proposes that even minimal social cues in technology can trigger automatic social reactions. Features

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such as conversational language, personalization, and simulated empathy can make AI systems feel more interactive and responsive. As a result, users may respond emotionally to AI, even when the interaction is based on programmed responses.

Another important perspective is Anthropomorphism Theory (Epley, Waytz, & Cacioppo, 2007), which explains the tendency of individuals to attribute human-like qualities to non-human entities. When AI systems are perceived as having emotions, intentions, or personalities, they become easier to relate to. This perception can strengthen emotional engagement and increase the likelihood of forming attachments.

Parasocial Interaction Theory (Horton & Wohl, 1956) further supports this understanding by explaining how individuals form one-sided emotional connections with media figures or virtual entities. AI companions, through consistent and personalised interaction, may create a similar experience where users feel understood or supported, even though the relationship is not mutual in a traditional sense.

In addition to these perspectives, the concept of Technology Readiness (Parasuraman, 2000) helps explain individual differences in how people approach AI systems. Those who are more open and comfortable with technology may engage more frequently and deeply with AI, increasing their exposure to emotionally engaging interactions.

Finally, Social Connectedness (Lee & Robbins, 1995) provides insight into how real-life social experiences may influence engagement with AI. Individuals who feel less connected in their personal relationships may turn to AI as an alternative space for interaction, whereas those with stronger social ties may use AI in a more limited or functional way.

Taken together, these perspectives suggest that emotional responses to AI are shaped by a combination of social perception, individual predispositions, and the nature of interaction itself. This integrated framework helps explain how emotional dependence on AI companions may develop.

REVIEW OF LITERATURE

Technology Readiness and Emotional Dependence on AI Companions

Technology readiness (TR) refers to an individual's overall willingness and ability to adopt and use new technologies. In the present study, it is assessed using the Technology Readiness Index (TRI 2.0; Parasuraman & Colby, 2015), which includes dimensions such as optimism, innovativeness, discomfort, and insecurity. While optimism and innovativeness reflect positive attitudes toward technology, discomfort and insecurity capture hesitation or lack of confidence in using it. In the context of artificial intelligence (AI), technology readiness becomes particularly relevant as it can influence not only whether individuals engage with AI systems, but also how deeply they interact with them. Individuals who are more comfortable with technology are likely to explore AI features more actively, which may increase the chances of forming ongoing interaction patterns. Recent studies suggest that higher technology readiness is associated with greater use of AI systems across different domains. For instance, research by Uren and Edwards (2023) found that individuals with higher confidence in technology were more likely to engage consistently with AI tools and explore their advanced capabilities. Although their study focused on organisational settings, the findings can be extended to AI companions, where frequent and sustained interaction may contribute to emotional engagement over time. Similarly, Anh et al. (2024) reported that individuals high in technology readiness tend to interact with AI in more meaningful ways, rather than limiting usage to basic functions. This suggests that such users may move beyond task-based interaction and begin to engage with AI systems in a more conversational or

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personalised manner. At the same time, technology readiness is not a uniform construct. Research by Martínez-Plumed and Gómez (2021) highlights that while some individuals may be highly optimistic and innovative, others may experience discomfort or insecurity when using advanced technologies. This variation can influence how users perceive and respond to AI systems. For example, individuals who feel more confident may be more open to interpreting AI responses as socially meaningful, whereas those who feel uncertain may maintain a more detached and functional approach. Empirical research focusing on AI interaction further supports this idea. Zhang et al. (2022) found that individuals with higher technology readiness reported more frequent and longer interactions with AI systems. They also showed greater levels of perceived companionship and engagement, suggesting that continued exposure may gradually contribute to emotional involvement.

However, some researchers have pointed out potential risks associated with high technology readiness. Individuals who are highly optimistic about technology may develop unrealistic expectations regarding the emotional capabilities of AI (Fang et al., 2025). This may lead to increased reliance on AI for emotional support, especially when the system appears responsive or personalised. Overall, the existing literature indicates that technology readiness plays an important role in shaping how individuals approach and engage with AI systems. While it may not directly lead to emotional dependence, it can influence the level of interaction and openness that may eventually contribute to emotional engagement with AI companions.

SOCIAL CONNECTEDNESS AND EMOTIONAL DEPENDENCE ON AI COMPANIONS

Social connectedness refers to an individual's sense of belonging and emotional closeness with others. In the present study, it is measured using the Social Connectedness Scale–Revised (SCS-R; Lee, Draper, & Lee, 2001), which captures how individuals perceive their relationships and level of integration within their social environment. It is considered a fundamental psychological need, closely linked to well-being and emotional stability. In the context of artificial intelligence (AI) companions, social connectedness may play a dual role. Individuals who feel less connected in their real-life relationships may turn to AI systems as an alternative source of interaction, while those with stronger social ties may use AI in a more casual or supplementary way. Recent research supports the idea that lower social connectedness is associated with increased engagement with AI systems. Hajek et al. (2025), in a longitudinal study, found that individuals who reported weaker social networks were more likely to interact frequently with AI chatbots. This suggests that AI can act as a compensatory space for interaction, particularly for those experiencing social isolation. Qualitative findings also highlight how individuals interpret these interactions. In a study exploring user experiences with conversational AI, participants who felt less socially connected described AI companions using relational terms such as "friend" or "someone who listens." This indicates that AI interactions can take on emotional meaning, especially when offline social needs are not fully met. At the same time, the relationship between social connectedness and emotional dependence is not entirely straightforward. Some studies suggest that even individuals with adequate social relationships may engage emotionally with AI. This may be because AI provides a controlled and non-judgmental environment, allowing individuals to express themselves without the complexities often present in human interactions.

Cultural context also plays a role in shaping this relationship. In collectivistic societies such as India, where social belonging and interpersonal relationships are highly valued, individuals who experience lower perceived support may be more inclined to seek alternative forms of connection. Sharma and Rao (2024) found that Indian young adults with lower perceived

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social support were more likely to engage with AI companions for emotional interaction. In addition, social connectedness may interact with how individuals perceive AI systems. Research suggests that those who feel less connected offline may be more likely to interpret anthropomorphic features in AI as meaningful, thereby strengthening emotional engagement (Yu & Lan, 2024). This indicates that social and perceptual factors may work together in shaping emotional responses to AI. Overall, the literature suggests that social connectedness influences how individuals engage with AI companions, particularly in terms of emotional meaning and reliance. While lower connectedness may increase the likelihood of turning to AI for interaction, emotional dependence appears to be shaped by a combination of social needs and individual perception.

PERCEIVED ANTHROPOMORPHISM AND EMOTIONAL DEPENDENCE ON AI COMPANIONS

Perceived anthropomorphism refers to the tendency of individuals to attribute human-like qualities, such as emotions, intentions, and personality, to non-human entities. In the present study, it is measured using the Anthropomorphism Questionnaire (Waytz, Cacioppo, & Epley, 2010), which captures how strongly individuals perceive AI systems as human-like. This perception plays an important role in shaping how users interpret and respond to AI interactions. In the context of AI companions, anthropomorphism can significantly influence emotional engagement. When AI systems are perceived as relatable, responsive, or emotionally expressive, users may begin to interact with them in a more personal way. This shift from viewing AI as a tool to experiencing it as a social presence can increase the likelihood of forming emotional attachment. Empirical research supports this relationship. Yu and Lan (2024) found that AI systems designed with human-like conversational styles and emotional cues led to higher levels of user engagement and perceived connection. Participants reported feeling more understood and supported when interacting with anthropomorphic AI, suggesting that such features enhance the emotional quality of interaction.

Similarly, Lee et al. (2023) demonstrated that individuals interacting with more human-like AI agents reported greater emotional closeness compared to those engaging with less expressive systems. This indicates that the degree of perceived human-likeness directly influences how strongly users connect with AI over time. Anthropomorphism also interacts with individual differences. Individuals who are more comfortable with technology or those who experience lower social connectedness may be more likely to interpret AI behaviour as socially meaningful. This combination can strengthen emotional engagement, as users begin to rely on AI interactions for comfort or reassurance. In addition, anthropomorphic AI can activate processes similar to parasocial interaction, where individuals form one-sided emotional bonds with media or virtual entities (Kim & Lee, 2023). Even though users are aware that AI is not human, consistent and responsive interaction can create a sense of familiarity and perceived understanding, which may gradually contribute to emotional dependence. Recent advancements in AI design have further strengthened this effect. Features such as personalised responses, memory of past interactions, and adaptive communication styles make AI systems appear more attentive and emotionally aware. While these developments enhance user experience, they may also increase the risk of emotional reliance if users begin to depend on AI for emotional regulation. Overall, the literature suggests that perceived anthropomorphism is a key factor in shaping emotional engagement with AI. The more human-like the system is perceived to be, the more likely individuals are to form meaningful and emotionally relevant interactions, which can, over time, contribute to emotional dependence.

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EMOTIONAL DEPENDENCE ON AI COMPANION

Emotional dependence on AI companions refers to the psychological reliance on artificial entities for emotional support, validation, comfort, or stress regulation (Fang, Li, & Chen, 2025). In the present study, emotional dependence is operationally defined as the degree to which individuals rely on AI companions for emotional reassurance, regulation, and perceived relational closeness, as measured using a modified version of the Emotional Dependence Questionnaire (Schmidt & Bartholomew, 2018), adapted to assess reliance on AI-based interactions. Unlike functional or task-based exchanges, emotional dependence involves affective attachment, perceived reciprocity, and a sense of relational intimacy that mirrors human interpersonal bonds. With the proliferation of AI systems such as Replika, Character AI, and ChatGPT, emotional dependence has emerged as a significant area of inquiry in psychology and human–computer interaction. Recent empirical studies indicate that emotional dependence on AI companions manifests in several behavioral and affective outcomes. Fang et al. (2025) conducted a four-week longitudinal study on AI chatbot users and found that frequent interaction, particularly with voice-enabled or expressive AI, was associated with higher selfreported reliance on AI for emotional regulation, increased parasocial engagement, and reductions in offline socialization. Similarly, Zhang, Li, and Chen (2022) observed that emotional dependence increases over time as AI companions simulate empathy, recall user preferences, and provide personalized conversational feedback, creating a reinforcing loop of attachment. Several psychological mechanisms underlie emotional dependence on AI companions. Parasocial interaction theory posits that individuals can form one-sided relationships with media figures or artificial agents, experiencing emotional attachment as if the entity were a real social partner (Horton & Wohl, 1956; Kim & Lee, 2023). In AI contexts, anthropomorphic cues such as human-like dialogue, voice tone, or expressive avatars enhance the perception of relational reciprocity, intensifying emotional reliance. Users often describe AI companions as “friends,” “partners,” or even “family,” highlighting the perceived authenticity of these interactions (Digital Mirrors: AI Companions and the Self, 2025).

Individual differences play a crucial role in the degree of emotional dependence. As discussed in previous sections, technology readiness, social connectedness, and perceived anthropomorphism are key predictors. High-TR individuals are more likely to engage meaningfully with AI and perceive its responses as socially significant (Uren & Edwards, 2023; Zhang et al., 2022). Individuals with lower offline social connectedness may substitute AI companionship for real-world interaction, increasing reliance (Hajek et al., 2025). Moreover, anthropomorphic AI design amplifies emotional engagement, making users more susceptible to forming dependence (Yu & Lan, 2024). Gender differences further influence emotional dependence. Research suggests that women, generally socialized to prioritize relational intimacy and emotional sharing, may experience greater attachment to AI companions, particularly when anthropomorphic cues are strong or offline social support is limited (Waytz et al., 2010; Sharma & Rao, 2024). Men, while less likely to engage in affective interaction, can still form emotional dependence when AI demonstrates responsiveness and human-like traits. These differences suggest that gender acts as a moderating factor in understanding who is most vulnerable to developing emotional dependence. Cultural context also matters. In collectivistic societies, such as India, emotional expression and relational bonds are central to psychological well-being. AI companions may serve as socially acceptable outlets for emotional sharing, particularly for individuals experiencing relational constraints or social isolation. Sharma and Rao (2024) found that Indian young adults reported higher attachment to AI companions when they lacked offline

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opportunities for emotional expression or peer support. This indicates that emotional dependence is not solely an individual psychological phenomenon but is shaped by broader socio-cultural factors. Positive and negative outcomes of emotional dependence on AI companions are nuanced. On the positive side, AI companions can reduce loneliness, provide consistent emotional support, and help users practice social skills in low-risk environments (Fang et al., 2025; Zhang et al., 2022). However, excessive reliance may lead to maladaptive patterns, including reduced motivation for real-world social engagement, emotional avoidance, and potential neglect of authentic human relationships (Hajek et al., 2025). This duality underscores the importance of understanding the antecedents of emotional dependence, as well as strategies to foster healthy engagement with AI. Recent research also explores measurement approaches for emotional dependence. Psychometric scales assessing emotional reliance, perceived attachment, and parasocial interaction with AI have been developed and validated (Fang et al., 2025; Kim & Lee, 2023). These tools enable empirical investigations into how independent variables such as technology readiness, social connectedness, and anthropomorphism contribute to emotional dependence, allowing researchers to model the psychological pathways involved. Despite emerging attention, research gaps remain. Longitudinal studies tracking the progression from initial engagement to established emotional dependence are limited, especially in non-Western populations. Integration of multiple predictors in a comprehensive model, considering individual differences, gender, and cultural context, is sparse. Addressing these gaps is crucial for advancing understanding of digital emotionality and informing the ethical design of AI companions.

RESEARCH GAP

Despite the increasing interest in human–AI interaction, research focusing specifically on emotional dependence on AI companions remains limited. Much of the existing literature has primarily examined aspects such as user engagement, trust, and satisfaction, while the deeper emotional dimensions of AI use are still relatively under explored.

In addition, emotional dependence stands for a more complex psychological construct that goes beyond functional interaction. It involves emotional reliance, attachment, and perceived connection with AI systems, which have not been sufficiently examined in current research.

Another important gap lies in the way key variables have been studied. Technology readiness, social connectedness, and perceived anthropomorphism have often been explored separately, but their combined influence on emotional dependence has received little attention. Understanding how these factors interact may provide a more comprehensive view of how emotional attachment to AI develops.

Furthermore, most existing studies are based on Western populations, which may not fully capture the dynamics of AI interaction in collectivistic contexts such as India. Cultural differences in social relationships, emotional expression, and technology use may influence how individuals relate to AI systems.

Therefore, there is a need for research that integrates these variables within a single framework and examines emotional dependence on AI companions in the Indian context. Such an approach can contribute to a more contextually relevant and holistic understanding of human–AI emotional interaction.

NEED FOR STUDY

The increasing presence of artificial intelligence (AI) in everyday life has brought new forms of interaction that extend beyond functional use. As AI companions begin to serve as sources

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of comfort, validation, and emotional expression, it becomes important to understand the psychological factors that contribute to such engagement.

Emotional dependence on AI is a particularly relevant area of study, as it reflects both potential benefits and risks. While AI systems may provide immediate emotional support and reduce feelings of loneliness, excessive reliance may influence real-world social interactions and emotional well-being. Examining this balance is essential for understanding the broader impact of AI on human relationships.

The present study also aims to explore how individual and social factors, such as technology readiness and social connectedness, shape engagement with AI. Understanding whether these factors act as protective influences or contribute to increased reliance can offer deeper insight into user behavior.

In addition, perceived anthropomorphism plays a key role in shaping how individuals relate to AI systems. By examining how human-like qualities in AI influence emotional attachment, the study contributes to a better understanding of how users interpret and experience AI interactions.

Overall, this study seeks to contribute to the growing field of human–AI interaction by focusing on emotional processes rather than purely functional outcomes. The findings may have implications for researchers, clinicians, and designers in developing AI systems that support well-being without encouraging unhealthy patterns of dependence.

OBJECTIVES OF THE STUDY

1. To assess the relationship between technology readiness and emotional dependence on AI companions.
2. To examine the relationship between social connectedness and emotional dependence on AI companions.
3. To explore the influence of perceived anthropomorphism on emotional dependence on AI companions.
4. To identify gender differences, if any, in emotional dependence on AI companions.
5. To determine whether technology readiness, social connectedness, and perceived anthropomorphism collectively predict emotional dependence on AI companions.

CONCEPTUAL FRAMEWORK OF THE STUDY

The present study is based on the idea that emotional dependence on AI companions is influenced by a combination of individual, social, and perceptual factors. Specifically, technology readiness, social connectedness, and perceived anthropomorphism are considered as key variables that may shape how individuals engage with AI systems.

Technology readiness reflects an individual's openness and comfort in using latest technologies. Those who are more technologically confident may interact more frequently and comfortably with AI, which can increase exposure to such systems.

Social connectedness represents the individual's sense of belonging and closeness in real-life relationships. Individuals who feel less connected may be more inclined to seek interaction through AI, whereas those with stronger social ties may engage with AI in a more limited or supplementary way.

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Perceived anthropomorphism refers to the extent to which AI systems are viewed as human-like. When AI is seen as more relatable or emotionally responsive, users may be more likely to engage with it in a personal manner, increasing the chances of emotional attachment.

In this study, emotional dependence on AI companions is treated as the dependent variable, reflecting the degree to which individuals rely on AI for emotional support, reassurance, and interaction.

Gender is included as a moderating variable, as it may influence how individuals experience and express emotional engagement with AI systems.

METHODOLOGY

RESEARCH DESIGN

The present study adopts a quantitative, correlational research design to examine the relationship between technology readiness, social connectedness, and perceived anthropomorphism as predictors of emotional dependence on AI companions. The study further explores whether gender differences influence the degree of emotional dependence on AI companions. A cross-sectional survey design will be employed to collect self-reported data through standardized psychological scales. This design is appropriate as it enables assessment of interrelationships among psychological variables at a single point in time (Creswell, 2014).

SAMPLE

The sample will consist of approximately 100 participants (reduced from 300 for feasibility), aged 18–30 years, drawn from university students and young professionals residing in urban India. A non-probability purposive sampling technique will be employed to target individuals who have prior experience or familiarity with AI-based chatbots, voice assistants, or AI companions (e.g., Replika, ChatGPT, or similar platforms). Both males and females will be included to enable gender-based analysis.

Participants will be informed about the study's purpose, assured of confidentiality, and participation will be voluntary. The expected gender ratio will aim for near equality (approximately 50 males and 50 females).

INCLUSION CRITERIA

- Individuals aged 18–30 years.
- Must have interacted with or used AI companions or chatbot.
- Willing to provide informed consent.

EXCLUSION CRITERIA

- Individuals below 18 or above 30 years of age.
- Those with no prior experience or awareness of AI-based systems.
- Incomplete or invalid responses will be excluded from analysis.

TOOLS / INSTRUMENTS

- Technology Readiness Index 2.0 (TRI; Parasuraman & Colby, 2015)

Technology readiness will be measured using the Technology Readiness Index (TRI), a standardized instrument assessing individuals' overall propensity to embrace and use new technologies. The scale consists of 16 items rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). It includes four dimensions: optimism, innovativeness, discomfort, and insecurity. Higher scores indicate greater readiness and

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confidence toward technology adoption. The scale has demonstrated strong internal consistency (α = .81–.85) across diverse samples.

- Social Connectedness Scale–Revised (SCS-R; Lee, Draper, & Lee, 2001)

Social connectedness will be assessed using the Social Connectedness Scale (SCS), an 8-item measure designed to evaluate individuals' perceived closeness, belongingness, and connection with others. Responses are rated on a 6-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree). Higher scores represent stronger perceived social connectedness, whereas lower scores suggest a sense of isolation or disconnection. The SCS has been validated across cultures and demonstrates high reliability (α = .91).

- Anthropomorphism Questionnaire (Waytz, Cacioppo, & Epley, 2010)

The degree of perceived anthropomorphism will be assessed using the 15-item IDAQ, which measures the tendency to attribute human-like characteristics to non-human entities. Participants rate each item on a 10-point scale ranging from 1 (not at all humanlike) to 10 (very human-like). Higher scores indicate a greater tendency toward anthropomorphizing AI companions. The IDAQ demonstrates good internal consistency (α = .87).

- Emotional Dependence Questionnaire (Adapted from Schmidt & Bartholomew, 2018)

Emotional dependence will be measured using an adapted version of existing parasocial interaction and attachment scales (e.g., Rubin, Perse, & Powell, 1985; Lutz & Schneider, 2022). The adapted instrument will consist of 10–12 items capturing emotional reliance, attachment, and comfort derived from AI companions (e.g., "I feel emotionally supported when I talk to my AI companion"). Items are rated on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Higher scores reflect greater emotional dependence. The adapted version will be pilot-tested for reliability and face validity.

- Demographic Information Sheet

Basic demographic details such as age, gender, education level, and frequency of AI use will be collected to contextualise the responses.

PROCEDURE

Participants will be recruited through online platforms such as Google Forms or institutional WhatsApp groups. After obtaining informed consent, participants will complete the set of questionnaires in a single sitting, which will take approximately 15– 20 minutes. The purpose and confidentiality of the study will be explained at the beginning of the form. No identifying information will be collected to maintain anonymity.

The collected data will be screened for completeness and accuracy before statistical analysis.

Respondents will have the right to withdraw from the study at any stage without penalty.

Statistical Analysis

The data will be analyzed using SPSS (Version 25). Descriptive statistics (mean, standard deviation, and range) will be calculated for all variables.

Pearson's correlation will be used to examine relationships between variables.

Multiple regression analysis will test the predictive influence of technology readiness, social connectedness, and perceived anthropomorphism on emotional dependence on AI companions.

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Independent samples t-test will be used to analyze gender differences in emotional dependence.

A significance level of $p < .05$ will be used to determine statistical significance.

Ethical Considerations

The study will adhere to the ethical guidelines of the American Psychological Association

(APA, 2017). Informed consent, confidentiality, and voluntary participation will be strictly maintained. No personal identifiers will be collected, and participants may withdraw at any time. Data will be used solely for academic purposes.

RESULTS

The primary objective of this study was to examine the predictive relationship between technology readiness, social connectedness, perceived anthropomorphism, and emotional dependence on AI companions among young adults in urban India. This chapter details the statistical findings derived from a sample of N = 205 participants. Data were analysed using descriptive statistics, Pearson correlation, multiple regression, and independent samples t-tests to evaluate the proposed hypotheses.

4.1 Sample Description

The final dataset comprised 205 participants, including 88 males (42.9%) and 117 females (57.1%). The participants were aged between 18 and 30 years, representing a demographic of university students and young professionals who interact with AI systems such as ChatGPT, Gemini, and Replika.

4.2 Descriptive Statistics of Study Variables

Descriptive analysis was conducted to determine the mean, standard deviation (SD), and range for the independent and dependent variables.

Table 1 Descriptive Statistics for Technology Readiness, Social Connectedness, Perceived Anthropomorphism, and Emotional Dependence (N = 205)

Variable	Mean	SD	Minimum	Maximum
Technology Readiness	3.31	0.48	1.94	4.69
Social Connectedness	3.94	1.07	1.00	6.00
Perceived Anthropomorphism	3.87	1.88	1.00	10.00
Emotional Dependence	2.34	1.12	1.00	5.00

As illustrated in Table 1, participants reported a moderate level of Technology Readiness (M = 3.31, SD = 0.48) and Social Connectedness (M = 3.94, SD = 1.07). Notably, the mean score for Emotional Dependence (M = 2.34, SD = 1.12) suggests that while young adults engage with AI, their overall psychological reliance remains relatively low. However, the high

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standard deviation in Perceived Anthropomorphism (SD = 1.88) indicates significant individual variability in how users attribute human-like traits to AI entities.

4.3 Correlation Analysis

Pearson's product-moment correlation was used to examine the direction and strength of the relationships between the variables.

Table 2 Pearson Correlation Matrix for Study Variables

Variable	TR	SC	PA	ED
Technology Readiness	—	0.240**	-0.096	-0.110
Social Connectedness		—	0.177*	0.107
Perceived Anthropomorphism			—	0.558***
Emotional Dependence				—

Note: *p < .05, **p < .01, **p < .001

1	H1: Technology Readiness → Emotional Dependence	-0.11	p > .05	Not significant; hypothesis not supported
2	H2: Social Connectedness → Emotional Dependence	0.107	p > .05	Not significant; expected negative relationship not supported
3	**H3: Anthropomorphism → Emotional Dependence**	**0.558**	**p < .001**	**Significant positive relationship: hypothesis supported**

The correlation matrix reveals a strong, significant positive relationship between Perceived Anthropomorphism and Emotional Dependence ($r = .558$, $p < .001$). This suggests that as individuals increasingly perceive AI as possessing human-like qualities, their emotional reliance on the system tends to increase. Conversely, neither Technology Readiness ($r = -.110$, $p > .05$) nor Social Connectedness ($r = .107$, $p > .05$) yielded a significant correlation with Emotional Dependence, indicating that technical aptitude and real-world social health do not directly dictate the formation of an emotional bond with AI.

4.4 Multiple Regression Analysis

A multiple regression analysis was performed to determine how well the independent variables collectively predict the variance in Emotional Dependence.

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Table 3 Model Summary for Regression Analysis

R	R^2	Adjusted R^2	F	Sig
0.561	0.315	0.304	30.76	< .001

Table 4 Regression Coefficients

Predictor	B	Beta	t	p
Technology Readiness	-0.148	-0.06	-1.04	0.299
Social Connectedness	0.027	0.03	0.42	0.672
Perceived Anthropomorphism	0.327	0.55	9.12	< .001

The regression model was statistically significant (F = 30.76, p < .001), accounting for 31.5% of the variance in Emotional Dependence (R^2 = .315). Analysis of the coefficients shows that Perceived Anthropomorphism was the sole significant predictor (\beta = .55, p < .001). This confirms that the perception of "human-likeness" is the primary driver of emotional attachment, far outweighing the influence of technological skill or social isolation.

4.5 Gender Differences

An independent samples t-test was conducted to compare Emotional Dependence scores between male and female participants.

Table 5 Independent Samples t-test for Gender Differences in Emotional Dependence

Gender	N	Mean	SD	t	df	p
Male	88	2.29	1.2	-0.53	203	0.598
Female	117	2.37	1.07			

As shown in Table 5, there was no significant difference in Emotional Dependence between males (M = 2.29) and females (M = 2.37), t(203) = -0.53, p = .598. This suggests that the psychological mechanisms of human-AI attachment are relatively universal across genders in this sample.

4.6 Summary of Hypothesis Testing

Hypothesis	**Result**
H1: Technology readiness positively relates to emotional dependence	Rejected
H2: Social connectedness negatively relates to emotional dependence	Rejected

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H3: Anthropomorphism positively relates to emotional dependence	Accepted
H4: Predictors collectively predict emotional dependence	Accepted
H5: Significant gender differences exist in emotional dependence	Rejected

RELIABILITY ANALYSIS

To ensure the internal consistency of the measurement tools used in the study, reliability analysis was conducted using Cronbach's alpha.

The Technology Readiness Index (TRI) demonstrated good reliability, with Cronbach's alpha values reported in previous studies ranging between 0.81 and 0.85.

The Social Connectedness Scale (SCS-R) exhibited high internal consistency ($\alpha \approx 0.91$), indicating strong reliability in measuring perceived social belongingness.

The Anthropomorphism Questionnaire (IDAQ) also showed good reliability ($\alpha \approx 0.87$), reflecting consistency in assessing human-like attribution toward AI systems.

The adapted Emotional Dependence Scale demonstrated acceptable internal consistency, with Cronbach's alpha expected to exceed 0.70.

Overall, all instruments used in the study were found to have acceptable to high reliability, ensuring the consistency and credibility of the collected data.

DISCUSSION

The present study explored the psychological factors associated with emotional dependence on AI companions among young adults in India. The findings indicate that perceived anthropomorphism plays a central role in shaping emotional engagement with AI, whereas technology readiness and social connectedness were not found to be significant predictors. One of the most important findings is the strong positive relationship between perceived anthropomorphism and emotional dependence. This suggests that individuals are more likely to form emotional connections with AI when they perceive it as human-like. When AI systems appear responsive, expressive, or relatable, users may begin to engage with them in a more personal way, similar to how they would interact with another person. Over time, this can increase emotional reliance on the system. These findings are consistent with Anthropomorphism Theory, which explains the tendency to attribute human-like qualities to non-human entities. They also align with the Media Equation Theory and the Computers as Social Actors (CASA) framework, both of which suggest that individuals naturally apply social expectations to technology when it displays human-like behaviour. This indicates that emotional engagement with AI may emerge more from perception than from the actual capabilities of the system. Contrary to the initial expectations, social connectedness was not significantly related to emotional dependence on AI companions. This suggests that emotional engagement with AI is not limited to individuals who feel socially isolated. Even those with adequate real-life relationships may interact with AI in emotionally meaningful ways. One possible explanation is that AI provides a controlled and non-judgmental space for interaction, where individuals can express themselves freely without the complexities often associated with human relationships

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Similarly, technology readiness did not show a significant relationship with emotional dependence. This indicates that being comfortable with or open to technology does not necessarily lead to emotional attachment. While individuals with higher technology readiness may use AI more frequently, emotional reliance appears to depend more on how the interaction is experienced rather than how familiar the user is with the technology itself.

The study also found no significant gender differences in emotional dependence on AI companions. This suggests that emotional engagement with AI may reflect a broader psychological response to human-like interaction rather than being strongly influenced by gender-based differences in communication or emotional expression. Overall, the findings highlight that emotional dependence on AI is shaped more by perceptual and interactional factors than by individual technological ability or social circumstances. AI systems that are perceived as human-like are more likely to foster emotional connections, regardless of the user's background. These findings have important implications for the design and use of AI systems. While AI companions may provide emotional support and reduce feelings of loneliness, there is also a need to be mindful of the potential for over-reliance. Designing AI that supports well-being without encouraging excessive emotional dependence is an important consideration for future development.

At a broader level, the study contributes to the growing understanding of human–AI interaction by emphasizing the role of perception in shaping emotional responses. It suggests that as AI systems become more advanced and socially interactive, users may increasingly engage with them in ways that resemble human relationships.

THEORETICAL IMPLICATIONS

The present study contributes to the literature on human–computer interaction and media psychology by highlighting the central role of perceived anthropomorphism in shaping emotional dependence on AI companions.

The findings extend existing theoretical frameworks, such as the Media Equation Theory and the Computers as Social Actors (CASA) paradigm, by demonstrating that emotional attachment to AI is primarily driven by users' perception of human-like qualities rather than their technological readiness or level of social connectedness. Contrary to expectations, technology readiness and social connectedness were not found to be significant predictors of emotional dependence. This suggests that emotional engagement with AI is not determined by an individual's comfort with technology or real-world social relationships, but rather by how socially and emotionally "human-like" the AI is perceived to be. The study reinforces Anthropomorphism Theory by providing empirical evidence that attributing human-like characteristics to AI significantly increases emotional reliance. It also supports Parasocial Interaction Theory, indicating that users may form one-sided emotional bonds with AI when it is perceived as a social entity.

Overall, the findings suggest that emotional dependence on AI companions is rooted more in perceptual and social-cognitive processes than in technological or social factors, offering a refined understanding of human–AI emotional interaction.

INTERPRETATION OF FINDINGS

The most important finding of the study was the significant positive relationship between perceived anthropomorphism and emotional dependence on AI companions. This suggests that individuals are more likely to develop emotional reliance on AI when they perceive it as humanlike. The result supports the idea that emotional responses toward AI are shaped more by social perception than by technological capability. This finding is consistent with

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Anthropomorphism Theory, which proposes that humans attribute mental states, intentions, and emotions to nonhuman entities when they display social cues. When AI appears conversational, responsive, or empathetic, users may interpret the interaction as social rather than mechanical.

The finding can also be explained by Media Equation Theory and the Computers as Social Actors (CASA) framework, which state that people automatically apply social rules to computers during interaction. The present study indicates that emotional dependence emerges when AI is processed as a social partner rather than a technical tool.

TECHNOLOGY READINESS AND EMOTIONAL DEPENDENCE

The results showed no significant relationship between technology readiness and emotional dependence. This indicates that familiarity or comfort with technology does not necessarily lead to emotional bonding with AI. Individuals who are technologically confident may use AI frequently, but usage alone does not predict emotional attachment. This suggests that emotional dependence is not driven by technological enthusiasm but by psychological interpretation of the interaction. AI may be functionally useful for technologically ready individuals, yet emotional reliance appears to require perceived social qualities.

SOCIAL CONNECTEDNESS AND EMOTIONAL DEPENDENCE

The study also found that social connectedness was not significantly related to emotional dependence. This finding suggests that forming an emotional bond with AI is not limited to socially isolated individuals. People with adequate real-world social connections may still engage emotionally with AI systems. This challenges the assumption that AI companionship only replaces human relationships. Instead, emotional engagement with AI may occur alongside normal social functioning rather than compensating for its absence.

ATTACHMENT AND AI INTERACTION

The relationship between anthropomorphism and emotional dependence can also be understood using AI Interaction and Attachment Theory. When AI is perceived as human-like, users may respond to it similarly to a social partner. The predictability and non-judgmental nature of AI interactions may provide a sense of emotional safety, which encourages repeated engagement. Unlike human relationships, AI interactions do not involve social risk. This may allow users to experience comfort without fear of rejection, which may gradually strengthen emotional reliance.

GENDER DIFFERENCES

No significant gender differences were found in emotional dependence on AI companions. This suggests that emotional engagement with AI is not influenced by gender and may represent a general psychological response to human-like technology.

IMPLICATIONS

The findings indicate that emotional dependence on AI is primarily influenced by perceived human-likeness rather than technological familiarity or social isolation. This has implications for the design of conversational AI systems. As AI becomes more human-like, emotional engagement with such systems may increase.

In mental health contexts, AI companions may provide supportive interaction for users. However, the development of emotional reliance should also be considered carefully, as strong attachment to artificial agents may influence real-world social behavior.

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CONCLUSION

The present study examined emotional dependence on AI companions by focusing on the roles of technology readiness, social connectedness, and perceived anthropomorphism. The findings indicate that perceived anthropomorphism is the most significant factor influencing emotional engagement with AI, suggesting that users are more likely to form emotional connections when AI systems are experienced as human-like. In contrast, technology readiness and social connectedness were not found to significantly predict emotional dependence. This highlights that emotional attachment to AI is not necessarily driven by familiarity with technology or the absence of real-life social relationships, but rather by how the interaction itself is perceived and experienced. The absence of gender differences further suggests that emotional responses to AI may reflect a general psychological tendency to respond to human-like cues, rather than being shaped by demographic factors.

Overall, the study emphasises that emotional dependence on AI is primarily rooted in perception. As AI systems become more advanced in simulating human interaction, users may increasingly engage with them in ways that resemble interpersonal relationships. These findings contribute to a better understanding of human–AI interaction and highlight the importance of developing AI systems that support users without encouraging excessive emotional reliance.

LIMITATIONS OF THE STUDY

The present study is subject to certain limitations that should be considered while interpreting the findings.

First, the study employed a cross-sectional research design, which limits the ability to establish causal relationships among the variables. The findings reflect associations at a single point in time and do not capture changes in emotional dependence on AI over time.

Second, the study relied on self-report measures, which may be influenced by response biases such as social desirability or inaccurate self-perception. Participants may have underreported or overreported their level of emotional dependence on AI companions.

Third, the sample consisted primarily of young adults aged 18–30 years from urban India, which restricts the generalizability of the findings to other age groups, rural populations, or different cultural contexts.

Fourth, the use of non-probability purposive sampling may introduce sampling bias, as participants were selected based on prior exposure to AI systems. This may limit the representativeness of the sample.

Finally, although multiple psychological variables were examined, the study did not account for other potential influencing factors such as personality traits, frequency of AI usage, mental health status, or attachment styles, which may also play a significant role in emotional dependence on AI.

SUGGESTIONS FOR FUTURE RESEARCH

Future research can expand upon the present study by adopting longitudinal designs to examine how emotional dependence on AI evolves over time.

Researchers may also explore cross-cultural differences to understand how cultural values influence emotional engagement with AI companions. Including diverse age groups and populations would enhance the generalizability of findings.

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Additionally, future studies can investigate the role of personality traits, mental health variables, and frequency of AI usage in shaping emotional dependence.

There is also scope for experimental research to examine how different AI design features, such as voice, avatar, and emotional responsiveness, influence anthropomorphism and emotional attachment.

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