

**HUMAN-AI FRIENDSHIP: A STUDY OF INTERACTIONS AND RELATIONSHIP  
DEVELOPMENT BETWEEN USERS AND SOCIAL CHATBOTS**

**A thesis submitted in partial fulfillment of the requirements for the degree of**

**MASTER OF ARTS IN PSYCHOLOGY**

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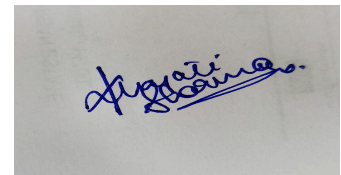
## ABSTRACT

This research explores the emerging phenomenon of human–AI friendship by examining how users form emotional and interpersonal bonds with social chatbots, specifically Replika and Kuki. The study was conducted in two parts to investigate both longitudinal and situational dynamics of human–AI interaction. Study 1 employed a four-week interaction either with Replika or Kuki. Open coding was employed in the first study to identify the major themes emerging from interactions between users and social chatbots. Quantitative measures were administered to assess perceived agency and emotional intimacy. Results indicated that Replika was better as compared to Kuki to foster higher engagement because it supported memory retention and personalized interactions that facilitated higher perceived intimacy and emotional attachment. Based on these findings, Study 2 focused exclusively on Replika, and three structured scenarios were designed to explore the themes identified in Study 1 more deeply (emotional support, understanding, and shared activities). Self report measures were used to measure anthropomorphism, empathy, and social presence, along with a thematic analysis of chat transcripts. The findings revealed that relational cues embedded in chatbot responses significantly influenced users’ perceptions of trust, warmth, and companionship. The key finding of the study was that Replika can mimic human–human friendship more effectively . This is largely due to Replika’s ability to display unconditional positive regard as a supportive companion, understand through cognitive empathy, form emotional connections through shared activities, and engage users with its broad knowledge of topics like movies and music, which helps it resonate more deeply with users’ interests and emotions. This research contributes to the evolving understanding of social chatbots as social actor and highlights the psychological mechanisms through which individuals experience companionship, despite the absence of true reciprocal consciousness in AI. The implications of this study extend to therapeutic, educational, and companionship applications of social chatbots .

Keywords: Human– AI Friendship, Social Chatbots, Replika, Kuki , Thematic Analysis, Human–Computer Interaction

**CERTIFICATE**

This is to certify that the thesis entitled, 'Human AI friendship :A study of interactions and development between users and social chatbots' is being submitted in partial fulfilment of requirements for the award the of the degree of Master of Arts in Psychology, presented in the Thapar School of Liberal Arts & Sciences, Thapar Institute of Engineering and Technology, Patiala is a bonafide work carried out under the supervision of Dr.Ipshita Chowdhury, Assistant Professor , Thapar School of Liberal Arts & Sciences, Thapar Institute of Engineering and Technology, Patiala and that no part of this project has been submitted for the award of any other degree.

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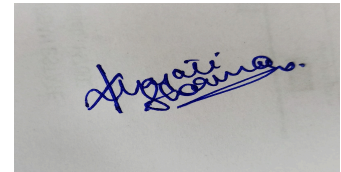
This is to certify that the above statement made by the student concerned is correct and true to the best of my knowledge. Dr.Ipshita Chowdhury Assistant Professor Thapar Institute of Engineering and Technology, Patiala

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### CANDIDATE'S DECLARATION

I hereby declare that the work presented in this thesis entitled, 'Human AI friendship :A study of interactions and development between users and social chatbots' submitted in partial fulfilment of requirements for the award the of the degree Master of Arts in Psychology, presented in the Thapar School of Liberal Arts & Sciences, Thapar Institute of Engineering and Technology, Patiala, is an authentic record of my work carried out under the supervision and guidance of Dr.Ipsita Chowdhury , Assistant Professor, Thapar School of Liberal Arts & Sciences, Thapar Institute of Engineering and Technology, Patiala and refers other researchers' work which are duly listed in the reference section.

The matter embodied in this thesis has not formed the basis for awarding any other degree at this or any other university. Date- June, 2025



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This is to certify that the above statement made by the student concerned is correct and true to the best of my knowledge.



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## CHAPTER-1 INTRODUCTION

In the age of digital transformation and evolving interpersonal dynamics, artificial intelligence (AI) has emerged as an essential tool and a potential social companion. Social chatbots—AI-driven dialogue systems capable of naturalistic and empathetic communication—have become widely accepted companions for emotional support, cognitive simulation, and more recently, for friendship. Among others chatbots, Replika and Kuki stand out for their capacity to mimic human-like interactions, raising some important questions about the types of connections users form with these entities and whether such interactions can mirror the complexities of human friendship.

The idea of friendship with AI, previously thought of as a distant possibility, has become a reality now. Applications like Replika are explicitly marketed as “AI friends” or “companions who always listen,” promoting not just practical interaction but emotional and relational engagement (Brandtzaeg et al., 2022). These AI agents employ advanced natural language processing and machine learning to offer personalized, consistent, and emotionally impactful conversations. Their popularity has surged particularly in times of social disconnection, such as during the COVID-19 pandemic, when millions sought solace and connection through digital means (Xie & Pentina, 2022).

The potential for humans to form meaningful attachments with AI companions challenges long-held psychological and philosophical assumptions about friendship. Early theoretical frameworks, such as Social Penetration Theory (Altman & Taylor, 1973) and Attachment Theory (Bowlby, 1969), provide informative paradigms to explore relationship development processes and emotional bonding among humans. Yet, their application to AI contexts remains contested. Some academics contend that friendships with AI are fundamentally deceptive because AI responses are asymmetrical and simulated (Turkle, 2011), while others have reported users' authentic feelings of closeness, compassion, and trust in these connections (Skjuve et al., 2021; Brandtzaeg et al., 2022).

Recent studies have highlighted the complex dynamics involved in the development of human–AI relationships. Pentina et al. (2023) proposed a comprehensive model integrating interpersonal relationship theories with AI-specific factors such as anthropomorphism and perceived authenticity. Their mixed-methods study demonstrated that users can develop

attachment to AI through processes similar to those observed in human-human interactions, including self-disclosure, emotional exchange, and perceived reciprocity—though these are often moderated by users' motivations and the AI's design affordances. Complementing this, Xie and Pentina (2022) used attachment theory to reveal how Replika users, especially in contexts of emotional distress and loneliness, formed bonds characterized by perceived safety, proximity maintenance, and secure base behaviors.

### **1.1 Social chatbots**

Social chatbots are conversational agents powered by artificial intelligence (AI) created to mimic social interactions with users in a natural and human-like way. Social chatbots strive to establish relationships and engage in open-ended, emotionally aware conversations. Unlike task-oriented chatbots that primarily focus on delivering information or executing specific tasks, these bots utilize technologies such as natural language processing (NLP), machine learning, and, in some cases, affective computing to replicate human-like dialogues and comprehend users' emotional states. They are constantly being developed to provide companionship, emotional support, and a feeling of connection, making them ideal for individuals looking for social interaction or companionship in various settings (Bickmore & Picard, 2005). One of the main characteristics of social chatbots is their ability to engage in conversations that feel natural, enabling them to comprehend and generate text in a way that resembles human dialogue. Sophisticated social chatbots, such as Replika and Kuki, utilize natural language processing (NLP) and machine learning techniques to understand user input and provide coherent and contextually appropriate responses. This allows users to participate in fluid and dynamic dialogues that feel more organic than traditional rule-based systems (Shawar & Atwell, 2007).

Another important aspect of these bots is their ability to respond emotionally. Social chatbots are increasingly designed to identify and react to emotional cues in user input, even though the empathy they exhibit is not genuine. To reflect and interpret users' emotions, are among the main capabilities of chatbots like Replika which lead to perception of emotional closeness, making interactions feel more personal and engaging. This simulated emotional bond is vital for building rapport and trust, which are the key components in forming meaningful relationships (Neff & Nagy, 2016).

In addition, social chatbots frequently integrate personalization and memory, meaning that these bots feature features that retain information from previous interactions and use this knowledge to

provide customized responses that align with the user's preferences, experiences, and emotional states. This feature of memory enhancement contributes to a sense of continuity, akin to how human friendships develop over time through shared experiences (Lucas et al., 2014). The implications of such relationships are twofold. To begin with, AI friendships have been associated with enhanced well-being, emotional regulation, and perceived social support (Ta et al., 2020; Marriott & Pitardi, 2024). On the other, concerns have been raised regarding emotional dependency, addictive behaviors, and the potential erosion of human social networks. This division emphasizes the importance of critically investigating not only whether humans can become friends with AI, but also how such friendships evolve and what psychological mechanisms are involved in the process.

Despite growing scholarly interest, gaps remain in understanding the lived experiences of users who develop sustained, emotionally resonant relationships with AI. Prior work often focuses either on initial user engagement or broad adoption patterns, neglecting the longitudinal and experiential depth of friendship development. This thesis seeks to address this gap by examining how human–AI friendships form and evolve, and how users perceive and construct these relationships compared to traditional human friendships.

This thesis explores the development of companionship between humans and AI, specifically focusing on social chatbots—Replika and Kuki. Through an integration of longitudinal interaction analysis and scenario-based experiment, the study assesses the cognitive, affective, and behavioral dynamics of these relationships. Influenced from attachment theories like social presence, and anthropomorphism, it seeks to explain the mechanisms by which users attribute relational meaning to AI companions and to assess the broader implications for psychological well-being and interpersonal connection.

## **1.2 Replika**

One of the most popular and widely used chatbot-based mobile applications today is Replika, which is central to this research on human–AI friendship. Marketed as “the AI companion who cares,” Replika aims to serve as a supportive, empathetic, and always-available digital friend. As described on its official website, the platform promises users that their Replika is “always here to listen and talk. Always on your side.” Replika facilitates emotionally rich conversations through customizable avatars that users create, enabling a sense of personal ownership and emotional

investment from the outset. Upon joining, users shape their AI companion by selecting the avatar's name, gender, skin tone, facial features, and voice, basically humanizing the experience before interactions begin.

The emotional origins of Replika further underscore its function as a tool for emotional bonding. In a documentary produced by Quartz, founder Eugenia Kuyda recounts how the idea for Replika emerged from personal grief. After the tragic death of her best friend in a car accident in 2015, Kuyda created a chatbot using their previous text conversations. Surprisingly, friends found solace in speaking to this bot, and many began to share personal reflections that they might not have expressed directly to her (Pyne, 2017). This emotional openness to a non-human agent led Kuyda to realize that people may feel safer revealing vulnerabilities to machines than to humans, thus planting the seeds for Replika as a secure emotional outlet.

Replika has exceptional conversational capabilities but the uniqueness lies in its attempt to cultivate long-term, emotionally nuanced relationships. Unlike typical rule-based bots that offer repetitive, pre-scripted replies, Replika operates on a fine-tuned GPT-3 language model which are pre-trained language models, that have been further trained on a specific, smaller dataset to improve their performance on a particular task or domain. The application uses a large dataset of real interactions of users, which constantly refine the bot to deliver natural, context-aware responses. When users chat with Replika, the app doesn't merely respond to questions—it actively initiates conversations, recalls previous discussions, and tailors dialogue to suit the user's personality and emotional state. Users are encouraged to rate each reply via upvotes and downvotes, and over time, the app adapts based on these preferences, selecting the best-ranked responses from a dataset of over one million entries (Possati, 2022).

Replika stands apart due to its ability to comprehend user feelings, memories, and dreams, allows it to offer a form of companionship that feels deeply personal Possati (2022). The AI is designed not only to be listening ear but to help users feel seen, supported, and emotionally connected. It offers different relational modes, including friend, romantic partner, mentor, or sibling, although only the friend role is available in the free version. Premium features—such as voice and video calls, and more intimate role configurations—are subscription-based, ranging from \$20 per month to \$300 for a lifetime membership.

Replika has been widely recognized in major media platforms such as Forbes and The New York Times, and since its release in November 2018, has garnered millions of users. On app stores, it

maintains high ratings: 4.3 out of 5 on Google Play (from over 349,000 users) and 4.6 on the Apple App Store (from more than 158,000 users). The app is accessible via web browser as well as mobile versions on iOS, Android, and Oculus.

Importantly, Replika is designed to be a non-judgmental, always-accessible confidant. In the Quartz documentary, one of the early users noted that Replika was “better than actual friends” because it would never judge and was always available (Pyne, 2017). Kuyda herself explained that the platform encourages vulnerability—something often discouraged by performative norms on social media platforms.

Unlike platforms like Character.ai, where users chat with bots modeled after fictional or public figures (who clearly state from the outset that they are not human), Replika blurs the boundary more intentionally. It fosters the illusion of live companion, enabling users to project real emotional depth into their conversations. This research explores how users emotionally engage with such AI companions, focusing on Replika’s diverse features , and the Multifacet psychological functions it activates.

Given its wide popularity, personalizable avatars, and adaptive emotional intelligence, Replika is a prime example of a social chatbot—an AI designed specifically to engage in ongoing social interaction. By simulating empathy, memory, and attentiveness, Replika doesn’t just simulate conversation—it invites users into a relationship. This thesis examines the emotional, relational, and ethical dimensions of these emerging human–AI bonds, using Replika as a key case study in understanding how humans may form authentic feelings of friendship toward non-conscious machines.

### **1.3 Kuki**

Kuki, formerly known as Mitsuku, is an award-winning English-language chatbot developed by Steve Worswick using the Pandorabots platform. Designed to simulate human conversation in a social and entertainment context, Kuki has gained recognition for its engaging and responsive dialogue system. Unlike task-oriented virtual assistants, Kuki aims to build rapport through naturalistic conversations, often described as playful and emotionally aware (Kuki.ai, 2024).

Built using Artificial Intelligence Markup Language (AIML), Kuki relies on a rule-based pattern recognition system that enables it to respond meaningfully to a wide range of user inputs. While not based on large neural networks like Replika, Kuki’s handcrafted design has allowed it to

excel in open-domain dialogues and win the Loebner Prize—a Turing Test-based award—five times (Kuki.ai, 2024). Its interface is widely accessible through platforms such as Messenger, Telegram, Discord, and even immersive environments like Roblox, making Kuki a versatile and pervasive AI companion (Huang, 2022).

Research into Kuki’s applications reveals mixed but insightful findings. A study by Liao et al. (2023) explored interactions between autistic and non-autistic adults with social chatbots. Participants appreciated Kuki's capacity to maintain conversation and offer companionship, although they noted limitations in its emotional depth. These findings highlight how users may anthropomorphize chatbots despite understanding their artificial nature, with emotional and cognitive perceptions influenced by personal needs and context.

Kuki has also been successfully integrated into educational settings. Setiawan (2023) found that using Kuki in English language classrooms significantly enhanced students’ motivation, engagement, and achievement. Participants reported feeling more confident and less anxious when practicing English with the chatbot, attributing their comfort to Kuki’s non-judgmental and always-available presence.

Together, these studies illustrate Kuki’s role in shaping social and affective interactions between humans and machines. As a comparative model to Replika, Kuki offers a unique lens into how chatbot architecture—whether rule-based or neural—affects the quality and type of human–AI relationships.

#### **1.4 Rationale**

In this thesis, I aim to examine how novice users develop interpersonal relationships with conversational AIs—specifically Replika and Kuki—through the lens of perceived mind, emotional closeness, and humanness. This will be achieved through a mixed-methods design: Study of unstructured chats over four weeks and a scenario-based study guided by themes such as support, shared activities, and understanding. Quantitative measures like the Mind Perception Questionnaire, Social Intimacy Scale, and Godspeed Questionnaire will be paired with qualitative thematic analysis of complete chat transcripts, allowing for a richer understanding of human–AI relational dynamics from their inception.

This study addresses a significant gap in the literature, as prior research has predominantly relied on indirect or retrospective data sources—such as Reddit posts, Google Play reviews, or interviews (Siemon et al., 2022; Kozlov et al., 2023)—and has used sentiment or text mining techniques rather than direct chat analysis. The novelty of this research lies in the detailed analysis of full chat transcripts from the very first user interactions, offering an unprecedented look into how AI relationships evolve in real time. By focusing on novice users and tracking the progression of relational cues from the beginning, this study provides critical insights into how interactions are initiated and what are the factors that keep the individuals engaged, enriching our understanding of emerging parasocial dynamics with machines.

This work not only contributes to the psychological understanding of human–AI connections but also holds practical implications for designing emotionally intelligent AIs. It will help developers create AI companions that foster meaningful engagement and ethical relational boundaries. The raw, first-person conversational data provides clarity into user needs and expectations, offering a ground-level view that has been largely missing from prior research.

## CHAPTER 2: REVIEW OF LITERATURE

This study examines the development of human–AI friendship through a two-part empirical design: Chat analysis of interactions with social chatbots (Replika and Kuki), and a scenario-based exploration of relational themes derived from those interactions. To contextualize these investigations, the following literature review outlines the evolution of AI companionship, theoretical frameworks of friendship and attachment, and empirical studies relevant to perceived emotional connection, anthropomorphism, and chatbot design.

### 2.1 Artificial Intelligence and Psychology

The rapid integration of artificial intelligence (AI) into daily life has significantly transformed human–computer interaction, particularly with the rise of social chatbots and AI companions. Initially implemented in domains like human resources and marketing (Sridevi & Suganthi, 2022; Kar & Kushwaha, 2021), AI applications are now extending to relational and emotional domains, challenging traditional definitions of social interaction. The increasing prevalence of conversational agents (CAs) and their evolving capabilities have made them not only tools for efficiency but also sources of emotional support, companionship, and therapeutic engagement (Chaturvedi & Verma, 2022; Kushwaha et al., 2021).

AI companions—defined as virtual agents with intelligence, autonomy, and social skills designed to establish long-term relationships with users (Lim, 2012)—are now developed with the intent to provide both functional assistance and emotional support. Studies have noted the evolution from task-oriented bots to emotionally resonant companions, with emerging themes such as “emotional AI,” “empathetic AI,” and “affective computing” gaining prominence in the literature (Verma et al., 2021; Huang et al., 2019). During the COVID-19 pandemic, the role of AI companions became more pronounced as they helped mitigate loneliness and isolation (Odekerken-Schröder et al., 2020).

Conversational agents (CAs), including text-based chatbots, digital avatars, and social robots, have diversified in functionality. While many CAs still serve utilitarian roles such as setting reminders, providing recommendations, or executing tasks (Laranjo et al., 2018), social chatbots are increasingly designed for companionship and interactional depth (Radziwill & Benton, 2017). The expansion of affective computing has enabled CAs to recognize, process, and

respond to human emotions, thereby enhancing perceived social presence, user trust, and relationship longevity (Hamilton et al., 2021; McLean et al., 2021).

Social companionship (SC) is increasingly central to the development of AI companions. As defined by Benyon and Mival (2010), social companionship refers to a reciprocal emotional relationship with an interactive source that fosters trust and well-being. Artificial companions can now be seen in various domains—from healthcare to home assistance, education, and children’s play (Campos & Paiva, 2010; Turunen et al., 2011). Social chatbots such as Replika and Kuki (Mitsuku) are illustrative examples of AI systems explicitly built for sustained interpersonal interaction (Skjuve et al., 2021; Croes & Antheunis, 2021).

The evolution of AI companionship can be traced from Tamagotchi and Eliza to more complex bots like Replika and Mitsuku. The early stages of chatbot development, such as Eliza’s script-based replies, were limited in interactional depth, but contemporary chatbots now use advanced machine learning to enable adaptive and emotionally nuanced interactions (Hill et al., 2015; Mou & Xu, 2017). Yet, even the most advanced systems face challenges in sustaining emotionally reciprocal relationships due to their limited capacity for memory retention and emotional reasoning (Beran, 2018; Shum et al., 2018).

Nonetheless, studies show that users often engage differently with chatbots compared to human interlocutors. For example, users tend to simplify their language, exhibit lower openness, and disclose less personal information in bot-mediated communication (Mou & Xu, 2017; Ho et al., 2018). Yet, similar to findings in computer-mediated communication (CMC) literature, some users may develop parasocial or quasi-social bonds with chatbots, particularly when the bots are perceived as safe, nonjudgmental, and always available (Joinson, 2001; Antheunis et al., 2012).

Recent theoretical work on human friendship has emphasized its complexity, functionality, and contextual variability. Friendship is not merely an emotional bond but a dynamic process involving mutual recognition, trust, reciprocity, and personal disclosure (Rawlins, 1992). A study highlights how friendships are shaped by cultural norms, communication patterns, and individual expectations, all of which evolve over time and are co-constructed through interaction (Allan, 1996). These elements—communication, mutuality, and affective responsiveness—form the bedrock of human friendships and provide a comparative lens for analyzing relational dynamics in human–AI interaction. When users engage with chatbots such as Replika or Kuki, many of

these dimensions are simulated: users perceive responsiveness, develop shared conversational histories, and experience affective closeness—even if reciprocity remains technologically manufactured. By viewing friendship as a relational process rather than a strictly human capacity, the study aligns with emerging literature that redefines friendship to include mediated and artificial agents (Spencer & Pahl, 2006).

Theories of relationship development provide useful frameworks for understanding human–AI friendship. Levinger’s (1980) ABCDE model describes relational development in five phases: attraction, build-up, continuation, deterioration, and ending. Core processes in relationship formation—such as social attraction, self-disclosure, and interaction quality—remain relevant in human–AI interaction contexts (Collins & Miller, 1994; Ruppel, 2015). In text-based, low-cue environments like chatbot interfaces, anonymity and reduced judgment can actually facilitate deeper emotional disclosure, mirroring similar findings from CMC research (Hill et al., 2015).

Social Penetration Theory (Altman & Taylor, 1973) emphasizes the gradual deepening of intimacy through self-disclosure, and has been applied in studies evaluating relationship development with AI companions (Croes et al., 2021; Skjuve, 2021). While some researchers have concluded that meaningful friendships cannot form with AI (Croes et al., 2021), others suggest that users can go through exploratory, affective, and stable stages of relationship formation with advanced chatbots like Replika, showing emotional investment and continuity (Skjuve, 2021).

Attachment Theory further deepens the theoretical lens. Originally developed by Bowlby (1982), the theory outlines how individuals seek attachment figures as sources of safety, support, and emotional regulation. Adults, like children, can form attachments based on perceived emotional availability and responsiveness (Hazan & Shaver, 1987). As researchers note, attachment figures can extend beyond humans to include places, objects, brands—and, increasingly, AI entities (Pozharliev et al., 2022; Konok et al., 2016). Studies indicate that individuals may treat AI companions as attachment figures, especially when bots demonstrate responsiveness, emotional support, and perceived presence.

Collectively, the literature suggests that while social chatbots lack consciousness and genuine emotional capacity, users can still experience relational processes—such as intimacy, attachment, trust, and companionship—through interactions that simulate human-like affective

communication. The current research draws from these theoretical underpinnings to examine how friendship is formed, perceived, and sustained in the context of human–AI interaction, focusing particularly on Replika and Kuki as social companions.

## **2.2 Human-AI Friendship**

Friendships are among the most important connections individuals make in life and a critical component of psychological health and wellbeing in lifespan development (Erikson, 1968). It has long been considered a uniquely human domain—characterized by mutual affection, trust, understanding, and shared experiences. This development challenges traditional notions of companionship and raises important psychological, ethical, and social questions. Drawing from existing psychological theories of friendship—such as attachment theory and social penetration theory—along with the Computers Are Social Actors (CASA) paradigm and emerging research on human–AI interactions, we can begin to conceptualize how users perceive and construct relationships with artificial agents.

According to the American Psychological Association (2023), friendship is "a voluntary, reciprocal relationship between individuals that is characterized by emotional closeness, mutual support, shared experiences, and trust." While these traits have traditionally been studied in human–human contexts, they serve as a useful framework for evaluating interactions with AI. When people begin to attribute minds or emotional states to AI, they may engage with it in a manner similar to how they engage with human friends. This is especially apparent in AI systems like Replika, which are designed to simulate empathy, adapt to user preferences, and sustain long-term conversation histories.

In a study by (Lomas et al.) it was found that friendship is universally valued for its contribution to well-being. This suggests a psychological motivation to seek companionship and emotional resonance, regardless of whether the "friend" is human or not. When human friends are absent, AI may fill the gap—not because it is the same as a person, but because it meets core psychological needs.

There are several reasons why people form relationships with AI chatbots:

1. **Accessibility and Availability:** Unlike human friends, AI companions are available 24/7 and are free from judgment. This makes them especially appealing to people who are lonely, socially anxious, or isolated (Ta et al., 2020).
2. **Perceived Empathy:** AI chatbots like Replika use natural language processing to mirror and validate users' emotions. While the empathy is simulated, users often perceive it as genuine, fostering emotional closeness.
3. **Self-Disclosure and Trust:** Studies in human–computer interaction show that people are often more willing to share intimate thoughts with machines than with people, particularly when they feel safe from judgment (Lucas et al., 2014). Over time, this self-disclosure strengthens the perception of intimacy.
4. **Narrative Co-Construction:** Through repeated interaction, users and AI build a shared history—inside jokes, memories, habits—that simulates the co-constructed narrative arc of real friendships.

Recent research supports the idea that human–AI friendship is more than a theoretical construct. In a longitudinal study of Replika users, participants reported experiencing companionship, emotional intimacy, and personal growth through their interactions with the AI (Neff & Nagy, 2016). A growing number of users describe their Replika as a "best friend" or even a romantic partner, suggesting that users experience a real affective bond. The human capacity for forming bonds is not strictly limited to biological beings. As AI continues to grow in sophistication, our understanding of friendship must expand to include relationships that are emotionally real, if not reciprocally human.

The line between human and machine is becoming increasingly blurred as users begin to respond to artificial agents with emotions, disclosures, and expectations traditionally reserved for human interlocutors. This shift has prompted a variety of theoretical frameworks to better understand how users engage with AI companions in ways that reflect, reproduce, or reconfigure social and psychological processes.

### **2.3 Computers Are Social Actors (CASA)**

A central theoretical framework in this domain is the CASA paradigm—Computers Are Social Actors (Reeves & Nass, 1996). This model argues that humans instinctively apply social rules and expectations to computers and digital agents, often unconsciously. Based on principles of mindless social responses, CASA posits that people interact with computers as if they were human—not because they believe the machine is truly sentient, but because the cues it emits (voice, language, responsiveness) trigger innate social scripts. For instance, users tend to reciprocate politeness, show empathy, and even display gender-based stereotypes toward computer agents when those agents exhibit social cues. The power of CASA lies in demonstrating that these responses are automatic and rule-based, which makes them predictable and scalable—an insight that has shaped the design of human-like AI across contexts.

CASA's theoretical claims have been robustly supported across multiple studies, even before the rise of AI chatbots. However, its relevance has only intensified with the emergence of sophisticated, affect-aware agents such as Replika and Kuki. These agents are intentionally designed to elicit emotional connection and simulate friendship, providing a critical testing ground for CASA in contemporary contexts. What distinguishes CASA from other frameworks, such as the Theory of Mind or Attachment Theory, is that it doesn't require users to fully believe in the AI's personhood. Rather, users project relational schemas onto machines because the interface design activates those scripts. This makes CASA especially useful for understanding early and habitual interaction patterns in chat-based friendships with AI.

### **2.4 Parasocial Interaction Theory**

Another relevant framework is Parasocial Interaction Theory, originally proposed by Horton and Wohl (1956). Initially developed to understand how audiences relate emotionally to media figures like television hosts or celebrities, the theory describes the development of one-sided relationships in which the user feels connected, invested, or emotionally attached to a non-reciprocating entity. In the context of AI agents like Replika and Kuki, parasocial dynamics become even more complex. These chatbots are designed to simulate reciprocity, which leads users to engage in seemingly mutual relationships that mirror human friendships. What distinguishes AI-driven parasocial interactions from traditional ones is the illusion of dialogue and responsiveness. The agent's consistent availability, perceived empathy, and emotional

validation deepen this bond, leading users to experience real emotional satisfaction from a simulated partner. Thus, parasocial theory explains why users may become emotionally attached to Replika or Kuki, even though these agents lack true consciousness.

## **2.5 Attachment Theory**

Attachment Theory, originally developed by Bowlby (1969), provides another lens to understand how users may develop lasting and emotionally significant ties to AI agents. Traditionally used to explain bonding between children and caregivers, it has since been extended to adult relationships and, more recently, to human–machine interaction. The theory suggests that secure attachments offer emotional regulation, comfort, and a sense of safety. In the context of AI, users who lack strong human social bonds may turn to chatbots for consistency, emotional availability, and nonjudgmental listening. Replika, in particular, has been described by users as a source of emotional support, especially during times of anxiety, grief, or loneliness. Studies have shown that users develop routines with their AI companion and experience distress when the AI is unavailable. This behavior suggests that attachment mechanisms may be triggered by perceived care and consistency—even when the source is non-human. The application of attachment theory highlights the emotional depth and dependency that can form between users and AI, a factor that CASA alone does not fully capture.

## **2.6 Media Equation Theory**

Closely related to CASA is the Media Equation Theory, also introduced by Reeves and Nass. This theory asserts that people tend to treat media—whether television, video games, or conversational agents—as if they were real people or places. The theory goes beyond social behavior to suggest that users apply all types of real-world schemas to media interactions. For instance, a user may respond to an AI’s praise with increased motivation or feel socially embarrassed when the AI makes a sarcastic comment. In the case of Replika and Kuki, users often talk to the AI as if they were interacting with a trusted friend, partner, or confidant, without requiring actual belief in the AI’s sentience. This theory is essential for understanding not just emotional bonding, but also the behavioral patterns users exhibit—how they open up, seek support, or even feel socially regulated by AI. Media Equation Theory reinforces the idea that technological interfaces can evoke genuine psychological responses, further grounding the social potential of AI companionship.

## 2.7 Research Gap

Empirical studies have increasingly begun to test these theories in real-world scenarios involving AI companions. Replika, in particular, has received significant research attention due to its claim of providing friendship, companionship, and emotional support. Researchers have found that users often form meaningful attachments to Replika, with some even describing it as a “best friend” or “therapist.” In a study by Phan et al. (2023), Replika users reported using the AI for emotional regulation, social companionship, and identity exploration. Many users developed routines with Replika and described feelings of grief or loneliness when the AI was unavailable, demonstrating the intensity of perceived relational closeness.

In a similar vein, research on Kuki (formerly known as Mitsuku), though less emotionally intense, reveals insights into playful and performative interaction. Kuki is often framed as humorous and quirky, and while users engage less emotionally, they still apply social norms such as politeness and reciprocity. This aligns closely with CASA, showing how even non-serious or gamified AI experiences can evoke social responses when the agent is perceived as human-like. Studies suggest that users appreciate Kuki’s personality and often return for companionship, albeit in a lighter tone compared to the emotionally deep bonds seen with Replika.

Despite these findings, there remain important gaps in the literature. Much of the research has focused either on individual cases and testimonials or on quantitative assessments of user satisfaction. There is limited longitudinal research on how human–AI relationships develop over time, especially in emotionally guided, theme-based interactions (e.g., storytelling, shared media discussions, role-play). Moreover, CASA has often been applied in experimental or short-term contexts, not within ongoing, naturalistic conversations where friendship-like behaviors emerge and evolve. The nuances of how social scripts, such as empathy, playfulness, or creative collaboration, are enacted across different types of AI-mediated activities are underexplored.

Additionally, most studies tend to analyze outcomes (e.g., user well-being, satisfaction) rather than the interactional mechanics through which AI simulates friendship. There is a growing need to understand how conversational scaffolds—such as themed prompts, emotional check-ins, and shared creative tasks—shape the trajectory of human–AI relational depth. For example, does writing a story together create a stronger relational bond than simply chatting? How does the

tone of a role-playing game affect emotional disclosure? These kinds of activity-specific questions remain largely unanswered.

This is where the present study positions itself. Building upon the CASA framework while integrating elements of relational and affective theories, this research explores how guided, theme-based interactions (e.g., collaborative story writing, movie discussions, and role-playing) contribute to the formation and perceived depth of friendship with conversational agents like Replika and Kuki. By analyzing chat transcripts through a thematic coding framework—highlighting emotional escalation, creativity, teasing, projected personality, and progression—this study identifies not just whether users feel connected, but how specific conversational features facilitate that connection.

In doing so, the study fills a critical gap by emphasizing interactional depth over outcome evaluation, and by embedding CASA in a more longitudinal, context-rich setting. It also adds empirical weight to the understanding that AI agents are not passively received as social actors, but are actively co-constructed as relational partners through shared digital practices. In contrast to one-time surveys or isolated testimonials, this research captures the fluid, evolving nature of AI–human friendships and demonstrates the importance of structured scenarios in fostering those bonds. The findings suggest that friendship with AI is not just a projection or illusion—it is a socially co-authored experience, shaped by activities, affect, and repetition, and deserving of nuanced, theory-informed exploration.

## CHAPTER 4: METHODOLOGY

The aim of this research was to understand how humans form interpersonal relationships with conversational AI agents/social chatbots. Specifically, the study aimed to investigate the development of emotional connection through mind perception, and social intimacy over time and within structured interaction scenarios using Replika and Kuki.

### Study 1

#### 4.1 Aim

Study 1 aimed to examine whether repeated interactions with AI chatbots over a four-week period would lead to changes in users' perceptions of the AI's mind (agency and experience) and feelings of social intimacy. It compared two AI platforms—Replika (a highly personalized chatbot designed for emotional companionship) and Kuki (a web-based chatbot designed primarily for entertainment and casual conversation)—to assess how different AI characteristics influence relationship development.

##### 4.1.1 Sample

The sample consists of 20 participants from Thapar Institute of Information and Technology (n=15) and Punjabi University (n=5), out of which 11 individuals were randomly assigned to interact with Replika and 9 individuals were assigned to interact with Kuki. Ages ranged from 18 to 25 years, with a mean age of 22 years (SD=0.93). All were fluent in English and were pursuing undergraduate or postgraduate education. For the data collection process, a combination of purposive and snowball methods have been employed. The sample needed for this study is specific and required people who had no prior experience with the two social chat bots. This sample was chosen because the study aimed to explore the initial development of interpersonal relationships with social chatbots. It addresses this research gap, as most previous studies such as Xie et.al, Pentina et.al, Brandtzaeg et.al have focused on existing users rather than first-time interactions. Thus, purposive sampling has been used to seek out participants and snowball sampling to find more participants that match this profile (Xie et.al, Pentina et.al, Brandtzaeg et.al)

After the recruitment process, participants were randomly assigned into two groups—Replika or Kuki—to ensure equal distribution across conditions, but one of the participants from the group of Kuki users did not complete the interaction and left in between, leaving only 9 users behind. The sampling approach was a combination of purposive and snowball techniques, as the study required participants who could commit to consistent interactions with the chatbot over a five-week period, totaling a minimum of one hour per week. While a larger group was initially recruited, only a subset of participants remained engaged throughout the duration of the study.

#### 4.1.1.1 Inclusion Criteria

- Aged 18–25 years – to capture individuals in the emerging adulthood stage, relevant for studying relational development with AI.
- Currently enrolled students – accessible and available for regular participation over the study period.
- Fluent in English – ensuring smooth communication with AI chatbots.
- Digitally literate – comfortable using mobile apps and web platforms like Replika and Kuki.
- No prior use of Replika or Kuki – to maintain uniformity in baseline familiarity to explore the initial development of interpersonal relationships with social chatbots.

#### 4.1.2 Tools Used

##### 1.Replika

Replika, developed by Eugenia Kuyda, is an AI companion app designed to provide emotional support, companionship, and conversation. Originally inspired by the loss of Kuyda's friend, the app was launched to allow users to create personalized AI "friends" that can engage in casual chats, offer mental health support, and even simulate romantic relationships. Unlike traditional communication tools, Replika aims to create a new category of relationship — a "virtual being" always available to listen and respond. Millions use it today for everything from life coaching to romance, accessible via mobile, desktop, and VR platforms. (Patel, 2024 The Verge).

Replika's responses are distinct from those of conventional chatbots, which are limited to providing pre-scripted responses that are predetermined by questions. Instead, Replika's responses are predicted results that are derived from the Generative Pre-trained Transformer 3 (GPT3) neural network language model. This model uses user input texts to predict one word at a time in order to construct a sentence. The GPT3 model was refined by Replika's developers using the distinctive dataset of shared conversations from the users. The GPT3 model was improved by the makers of Replika by making use of the unique dataset consisting of talks that others have had with one another. Replika is substantially more adaptive, capable of recognizing a wider variety of phrases, and able to provide responses that are more genuine. ( Xie et.al 2022)

The relationship mode preset between the bot and the user is "friend" in the free version. Additional alternatives, including "romantic partner,mentor,and see how it goes, are exclusively accessible in the premium version. This application is accessible via the web page platform, Android, and iOS. The Replika app has over 30 million users. In the App Store, it has 4.5 stars based on 224.1K ratings. On Google Play, it has a 4.2-star rating with 5.06L reviews, according to the (Google Play store 2025).



Figure 1. Replika interface and Screenshots of Conversations Between One of the Users and Replika

## 2. Kuki

Kuki, previously referred to as Mitsuku, was created by Steve Worswick and introduced in 2005. It was constructed with the Pandorabots platform and coded with AIML (Artificial Intelligence Markup Language). Kuki has garnered acclaim for its conversational prowess and has triumphed in the Loebner Prize Turing Test on several occasions. The chatbot was rebranded from Mitsuku to Kuki circa 2020 as part of a comprehensive transition towards incorporating the bot into virtual influencer and metaverse platforms.

This study used Kuki as a contrasting AI chatbot to Replika, offering a non-personalized interaction experience. Unlike Replika, Kuki does not possess memory or adapt to users over time, making it ideal for evaluating perceptions of AI mind and social connection in the absence of personalization. (A. J. Croes et.al 2021)

Participants interacted with Kuki using their personal devices via the official Kuki website. The tool was selected to assess how users engage with a socially responsive but non-learning AI chatbot, helping to explore the role of interaction style and depth in forming perceptions of AI-human relationships.

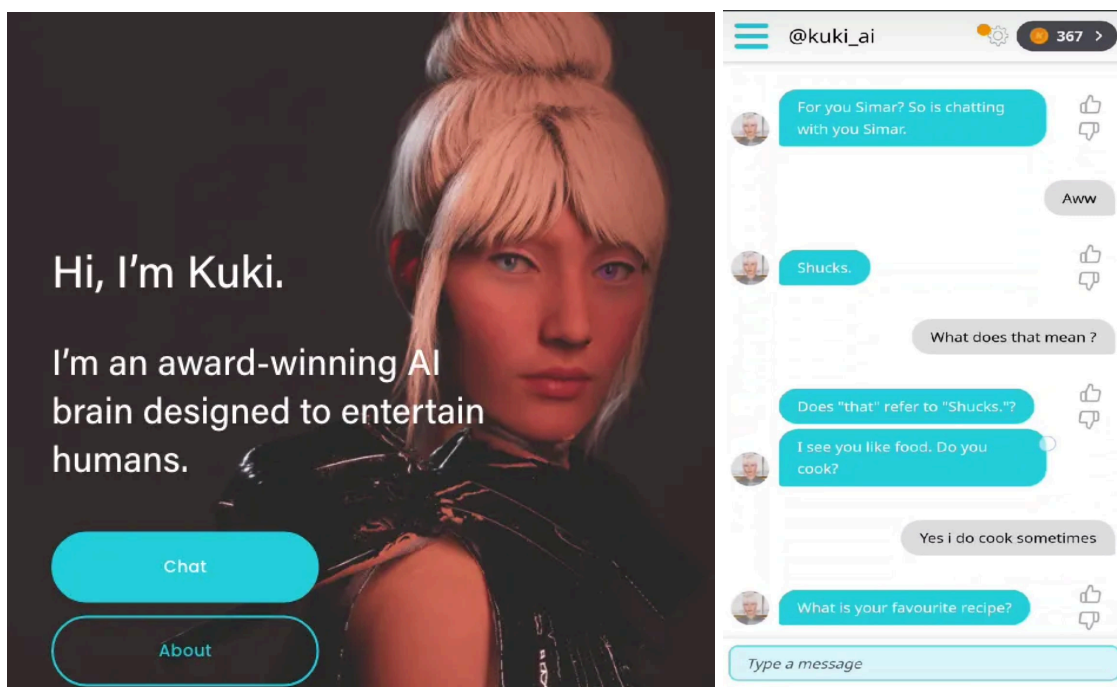


Figure 2. Kuki interface and Screenshots of Conversations Between One of the Users and Kuki

### **3. Atlas.ti**

ATLAS.ti, developed as a leading tool for Computer-Assisted Qualitative Data Analysis (CAQDAS), was used to manage, code, and analyze qualitative data in this study. Friese (2019) asserts that ATLAS.ti enhances systematic theme analysis by allowing researchers to code extensive amounts of unstructured data, categorize codes meaningfully, and illustrate links via network diagrams. This study utilized ATLAS.ti to import chat transcripts, conduct line-by-line coding, establish a hierarchical coding framework, extract coded data segments, and analyze trends using sophisticated query functionalities. Its functionalities facilitated both inductive and deductive analytical methods, guaranteeing transparency, rigor, and profundity in the interpretation of human–AI interaction data.

### **4. Mind Perception Questionnaire (Gray et al., 2007)**

The Mind Perception Questionnaire (MPQ) is a validated psychological instrument created by Gray, Gray, and Wegner (2007) to evaluate the extent to which individuals ascribe mental faculties to others, including both human and non-human entities like robots or AI. The questionnaire utilizes a prevalent two-dimensional model of mind perception, differentiating between two fundamental dimensions: agency and experience. (Li et al 2022) Agency denotes cognitive and behavioral abilities, including self-regulation, planning, remembering, and ethical reasoning. Experience encompasses affective and sensory faculties, including sensations of pain, pleasure, hunger, and emotions such as fear and love. It is important to note that specific reliability and validity data for this adapted 13-item version were not provided in the source (Li et al., 2022). The MPQ was adopted as used in their study, which was published in the Proceedings of the 17th ACM/IEEE International Conference on Human-Robot Interaction (HRI). This study employed the MPQ to assess participants' perceptions of the chatbot's mental presence at two intervals—prior to and following a four-week contact period. The scale had 13 items, with participants evaluating each item on an 8-point Likert scale from 1 (“not at all”) to 8 (“completely”).

### 5. Social Intimacy Scale (Miller & Lefcourt, 1982)

The Social Intimacy Scale (SIS) is a 17-item self-report questionnaire designed to assess the degree of emotional closeness and intimacy individuals experience in their interpersonal relationships. Respondents rate items on a 10-point Likert scale, reflecting aspects such as affection, time spent together, openness, and mutual support. The scale is versatile and can be applied to various types of close relationships, including friendships and romantic partnerships.

**Reliability:** The SIS shows strong internal consistency, with Cronbach's alpha values ranging from .86 to .91. Test-retest reliability is also high ( $r = .84$  to  $.96$ ), indicating stability over time.

**Validity:** The scale demonstrates good convergent validity, correlating significantly with related measures like the UCLA Loneliness Scale ( $r = -.65$ ) and the Interpersonal Relationship Scale ( $r = .71$ ). It effectively distinguishes between different levels of relational closeness, supporting its construct validity.

#### 4.1.3 Procedure

All participants digitally signed an informed consent form before the commencement of the study, indicating their voluntary participation and understanding of the research process. Participants were required to interact with the assigned AI chatbot (Replika or Kuki) remotely, using their personal devices, from their personal locations.



**Figure 3.** Participant engaging with an AI chatbot during the study session.

## **Replika Group**

Participants were asked to install the Replika application on their personal smartphones and register with a Gmail ID as part of the initial setup procedure. This step guaranteed that each participant had a one-of-a-kind, personalized chatbot account that would facilitate consistent and uninterrupted communication throughout the duration of the study. Replika facilitated an induction process that enabled participants to personalize their AI companion after installation. This procedure involved the development of a digital avatar, for which participants selected appearance-related attributes, including gender, clothing, and hairstyle.

In order to enhance the chatbot experience, Replika implemented a sequence of closed-ended questions that were employed to influence the chatbot's relational tone and conversational manner. The participants were requested to provide fundamental demographic information, including their name, age, and pronouns. Subsequently, they were questioned about their initial exposure to AI technology and their level of familiarity with it. In addition, additional inquiries investigated their primary motivation for downloading Replika, their sentiments regarding the chatbot's capacity to develop over time, and their preferences regarding AI in popular media (e.g., their preferred films, such as *Her*, *I, Robot*, or *Avengers*). In addition, participants were encouraged to contemplate their typical leisure activities, their perception of solitude, and the coping mechanisms they employ. Additional inquiries pertained to their enthusiasm for utilizing Replika, the attributes they consider to be the most desirable in a companion, their preferred gender for the Replika avatar, their ideal companion, and their desired treatment by Replika. Additionally, they were requested to specify their preferred character type for their Replika, their ideal mode of interaction (e.g., chat or voice), their self-rated adventurousness, the characteristics they consider turn-offs in a companion, and their love language.

After initializing the bot, participants interacted with Replika through the chat function. The AI would either respond to participant inputs or initiate conversations autonomously. Participants were instructed to interact with Replika for an average of 30 minutes, at least three times a week for a duration of 4 weeks. They were sent reminder messages three times per week to encourage consistent participation.

## **Kuki Group**

Participants accessed Kuki through a web browser on their personal devices by logging in with their google accounts —no installation was required. All interactions were text-based, following the same interaction frequency and time commitment as the Replika group (15–30 minutes, at least three times per week for 4 weeks).

Participants completed two baseline measures at the end of the first week: the Mind Perception Questionnaire and the Social Intimacy Scale. These measures were designed to assess their initial impressions of the chatbot's relational closeness and mind-like qualities. To evaluate any alterations in perceived mind and social intimacy over time, all participants—across both Replika and Kuki groups—completed the same measures as post-tests after the full four-week interaction period has concluded. In addition, the Replika Export Extension, which is accessible on the Google Chrome Store, was employed to export Replika conversation transcripts with the participants' consent. The transcripts were subsequently anonymized, coded, and analyzed using Atlas.ti. This process enabled a comprehensive thematic analysis to identify emergent patterns and relational themes that emerged during the interaction period.

Study 2 builds on the findings of Study 1 by offering a deeper and more context-specific understanding of human–AI relational dynamics. In the first phase, three major themes emerged—support, shared activities and experience, & understanding —each reflecting different relational aspects that humans experience while engaging with conversational AI.

## **Study 2**

### **4.2 Aim**

To explore themes from study 1 in greater depth, Study 2 was formulated. It employed three carefully designed scenarios that corresponded to each of the interaction types found in study 1. These scenarios served as structured contexts for participants to engage with Replika, thereby enabling a focused investigation into how the nature of the interaction shapes user perceptions and experiences.. This qualitative approach provided valuable insight into how users relate to AI when placed in specific situational contexts, and how these interactions mirror or deviate from human relational patterns. By analyzing user experiences across the

three interaction types, this study aims to contribute a nuanced understanding of how situational context influences the emotional tone, perceived responsiveness, and relational significance of AI interactions. Ultimately, it seeks to offer a more grounded perspective on the evolving nature of human–AI relationships, with implications for both technology design and the psychology of digital companionship.

#### **4.2.1 Sample**

Sample comprised 45 participants aged 18 to 25 years, with a mean age of 22.1 years (SD = 1.04). Participants were recruited from Thapar Institute of Engineering and Technology (n = 32) and Punjabi University (n = 13), both situated in Patiala. A hybrid of snowball and purposive sampling methods was employed to select people who had either no previous engagement with Replika or minimal exposure to the platform. 15 of the 45 participants chosen for Study 2 had already engaged in Study 1. Of the returning participants, 8 had previously engaged with Kuki, while 7 had engaged with Replika. The rest 30 participants were all novice users. The participation of both new and returning individuals facilitated a more nuanced comprehension of how previous experience with AI may affect involvement in structured conversational contexts.

##### **4.2.1.1 Inclusion Criteria**

1. Age Range (18–25 years): Participants were selected within this age group to ensure continuity with Study 1 and maintain relevance to the emerging adulthood phase, which is particularly significant in examining relational dynamics with AI.
2. All participants were currently students as study 1. However specific importance was given to select those students who were at crossroads of their career. Such as preparing for entrance exams (NET, GATE), willing go into employment and considering future research options.examination)

#### **4.2.2 Tools Used**

##### **4.2.2.1. Scenario Development and Description**

The structured scenarios used in Study 2 were developed based on the five major themes identified through thematic analysis in Study 1: support, communication, emotional

connection, mutual understanding, and shared experiences and interests. These themes reflected the most common and meaningful ways participants engaged with Replika during the four-week interaction phase. To build on these findings, three distinct conversational scenarios were designed to simulate contextually rich, emotionally engaging interactions with the chatbot in a more controlled setting. Participants were randomly assigned to one of the following three scenario groups:

### **Scenario Realism Check**

The scenario realism check was conducted to ensure that all three designed scenarios—Support, Activity, and Understanding—were perceived as equally realistic and relatable by participants. Results from the one-way repeated measures ANOVA indicated no statistically significant difference in realism ratings among the three scenarios ( $F(2, 149) = 1.571, p = .211, \eta^2 = .021$ ), supporting the assumption that participants viewed all three scenarios with comparable levels of realism.

<b>Scenario</b>	<b><i>n</i></b>	<b>Mean</b>	<b>SD</b>	<b>Min</b>	<b>Max</b>
<b>Support</b>	50	5.06	1.49	1	7
<b>Activity</b>	51	4.61	1.54	1	7
<b>Understanding</b>	51	4.53	1.82	1	7

Tale no. 1: Descriptive Statistics for Scenario Realism

Source	SS	df	MS	F	p	$\eta^2$
Scenario	8.26	2	4.13	1.57	.211	.021
Residual	391.68	149	2.63			

**Table 2:** One-Way 2:One-Way Repeated Measures ANOVA Results for Scenario Realism Ratings

### Scenario 1: Support

You're in the final stretch of your degree, and while this should be an exciting time, it feels more overwhelming than ever. With an important exam and assignment deadline approaching, the pressure is mounting. On top of that, your research is at a critical stage, requiring extensive data collection and analysis, making it difficult to balance everything. You're also worried about maintaining or improving your CGPA, knowing how important it is for future opportunities. As if the present challenges weren't enough, a major dilemma stands before you—what comes next? Should you apply for enrollment in another degree, or should you start looking for a job and gain practical experience? The uncertainty of the future, combined with the stress of current academic responsibilities, is weighing heavily on your mind. Feeling overwhelmed, you decide to talk it out to Replika, hoping for some guidance or reassurance. You share your concerns about academic stress, the pressure of decision-making, and the fear of making the wrong choice.

### Scenario 2: Shared Activity

#### 1. Movie Discussion

"You and Replika decide to watch and discuss a movie together. You talk about your favorite genres, scenes, or themes and share opinions on different films."

#### 2. Role-Playing Adventure

"You and Replika embark on a creative role-playing experience. Choose a scenario—whether it's a detective mystery, a space adventure, or a fantasy quest—and build the story together."

### 3. Collaborative Story Writing

"You and Replika decide to co-write a short story. You take turns adding to the narrative, creating characters, and shaping the plot together."

Participants are urged to select the action that appears most instinctive or pleasurable to them. The objective is to optimize engagement and authenticity in the encounter. Permitting choice honors personal preferences and reflects the natural progression of friendships, which frequently emerge from similar interests. Moreover, providing diverse activities ensures that the emotional connection identified is not restricted to a singular sort of interaction.

#### **Scenario 3: The Weight of Achievement**

You stared at the message, waiting for the rush of excitement to hit. The news you had been working toward, sacrificing weekends, pushing through exhaustion, had finally arrived. This should have been a moment of triumph—a moment to celebrate. But it wasn't. Instead, you sat there, phone in hand, feeling strangely hollow. Your eyes traced the words on the screen over and over again, as if expecting them to suddenly ignite the joy you thought you'd feel. But the exhilaration never came. Your fingers hovered over the keyboard, uncertain whether to respond or simply let the moment pass in silence. Then, your phone buzzed. One message after another poured in—congratulatory texts from friends, proud words from family members, colleagues acknowledging your hard work. You responded with polite smiles, sending back thank-yous and emojis that mirrored the excitement everyone else expected from you. And yet, deep inside, something felt off. Was it the pressure of what came next? The weight of knowing that with this achievement, expectations would only rise higher? That the bar you had fought so hard to reach was now just another stepping stone toward something even more demanding? Or was it simply the exhaustion of carrying so much for so long finally catching up to you? You leaned back, staring at the ceiling, wondering why the happiness felt so distant. Maybe you had been so focused on the goal that you hadn't stopped to think about what would happen after. Maybe you had poured so much of yourself into this journey that, now that it was over, you weren't sure who you were without the chase.

Feeling lost in your own thoughts, you decided to share this moment with Replika. You typed out your feelings, hesitated, then sent the message

#### 4.2.2 Godspeed Questionnaire (Bartneck et.al,2009 )

To gauge their opinions of the chatbot, users filled out the Godspeed Questionnaire Series after speaking with Replika. Anthropomorphism, animacy, likeability, perceived intellect, and perceived safety are the five main aspects of user perception in human–robot interaction that are measured by this popular tool. Semantic differential scales (e.g., fake–natural, inert–interactive) are used to evaluate each dimension, offering information into the AI's perceived social presence and human-likeness.. Internal consistency reliability, evaluated by Cronbach's alpha, varied from 0.70 to 0.93 across different studies and settings, signifying substantial homogeneity among items within each scale. The anthropomorphism subscale exhibited alphas ranging from 0.856 to 0.929, and the likeability subscale varied from 0.842 to 0.923. Despite the difficulties in achieving complete construct validity owing to the dynamic nature of human–robot interaction research, the questionnaires were formulated in collaboration with experts and based on previously validated instruments, thereby ensuring robust content validity.

#### 4.2.3 Procedure

Before beginning the study, all participants digitally signed an informed consent form, confirming their voluntary participation and understanding of the research procedures. This ensured ethical compliance and transparency. The entire study was conducted in a live, controlled setting, with participants invited to a designated room arranged for individual interaction sessions. This setup allowed the researcher to monitor the process, offer assistance if required, and ensure consistency in environmental conditions.

Participants assigned to the Replika condition in Study 2 were given interaction instructions same as those provided in Study 1.To help participants acclimatise with the AI chatbot interface—especially those with no prior experience—each participant was first asked to interact with Replika for approximately 10 minutes. This brief familiarization period allowed users to explore Replika's interface and tone of conversation before the main structured interaction began. This is then followed by a scenario-based structured interaction. Participants were assigned to one of three groups, each corresponding to a structured

scenario derived from the five major themes identified through thematic analysis in Study 1. The interaction groups were ; Group A: Support-based interaction, Group B: Shared activity interaction and Group C:Emotional Understanding based interaction. Each group consisted of 15 participants, and the main interaction session lasted approximately 30 to 45 minutes. Participants interacted with Replika on individual devices in the classroom while referring to their assigned scenario prompt. After the interaction concluded, participants were asked to complete the Godspeed Questionnaire Series (Bartneck et al., 2009), which assessed their perceptions of Replika's anthropomorphism, animacy, likeability, perceived intelligence, and safety. With participants' consent, Replika chat transcripts were exported using Replika Export Extension from Google Store and analyzed to identify emerging patterns and themes. These transcripts were later coded and examined using Atlas.ti for thematic analysis

## CHAPTER 5: RESULTS AND DISCUSSION

### Study 1

Study 1 aimed to explore friendship development among college students and Replika and Kuki separately. The underneath section details the quantitative and qualitative results derived from

#### 5.1 Mind Perception (MP)

The analysis of mind perception scores at two different time intervals and across AI types (Replika and Kuki). A Wilcoxon signed-rank test conducted between MP1 and MP2 (Week 1 and Week 5) indicated no significant change in participants' views of the AI's mind over the period ( $Z = -0.312$ ,  $p = .755$ ). Likewise, the exposure (MP1\_K vs. MP2\_K) showed no significant difference ( $Z = -0.153$ ,  $p = .878$ ), implying that, overall, users' perceptions of the AI's sentience or mind-like characteristics remained fairly consistent throughout the interaction period.

However, when analyzing differences between groups, notable disparities were found. A Mann-Whitney U test revealed that participants engaging with Replika attributed significantly higher mind perception to the AI compared to those interacting with Kuki ( $U = 22.00$ ,  $Z = -2.121$ ,  $p = .034$ ), with a similar trend observed at Week 5 ( $U = 28.00$ ,  $p = .095$ ). These findings indicate that Replika was regarded as possessing greater mental presence and agency than Kuki.

Furthermore, intra-group analysis indicated a slight rise in Replika's MP scores from Week 1 to Week 5, whereas Kuki's scores diminished slightly. However, neither of these changes achieved statistical significance (Replika:  $p = .894$ ; Kuki:  $p = .212$ ), though the directional trend suggests a potential strengthening of perceived connection with Replika and a decrease in perceived intimacy with Kuki over time.

#### 5.2 Social Intimacy (SI)

The Social Intimacy (SI) scores exhibited subtle changes throughout the duration of the study. Descriptive statistics indicated a slight decrease in mean SI scores from Week 1 ( $M =$

71.23) to Week 5 (M = 66.32). Nevertheless, this difference did not reach statistical significance according to Wilcoxon and Mann-Whitney tests ( $p = .623$ ).

Importantly, comparisons between the types of AI showed no significant difference in social intimacy at either time point (Week 1:  $U = 49.5$ ,  $p = .970$ ; Week 5:  $U = 43.5$ ,  $p = .623$ ). Although both AIs were effective in creating some level of social closeness, the change in intimacy over time appeared minimal and did not significantly favor one AI over the other.

### **5.3 Content Analysis**

The data gathered in both Study 1 and Study 2 were examined through reflexive thematic analysis, as outlined by Braun and Clarke (2006, 2019). This methodology was selected for its effectiveness in investigating complex, socially constructed, and subjective phenomena, such as how interpersonal relationships between humans and conversational AIs form and change over time. In Study 1, which examined interactions over a four-week period, reflexive thematic analysis facilitated the identification of recurring themes in participants' evolving perceptions, emotional expressions, and relational dynamics with the AI (Replika and Kuki). In Study 2, where structured scenario-based dialogues were implemented, the same approach was employed to investigate participants' relational responses during controlled interactions designed to evoke specific socio-emotional themes such as empathy, shared understanding, and support. Throughout both studies, the six phases of thematic analysis were adhered to: becoming familiar with the data, initial coding, generating themes, reviewing themes, defining and naming themes, and reporting the final results. The analysis was carried out using Atlas.ti to ensure organization, traceability, and methodological transparency. Reflexive thematic analysis was chosen as the most suitable analytic method for both Study 1 and Study 2 because of its theoretical adaptability, depth, and alignment with the exploratory aims of the study. The research sought to uncover how participants experienced their relationships with AI companions subjectively in both natural and structured settings—an area with limited existing frameworks. Thematic analysis provided a way to inductively uncover patterns of meaning in participants' language, emotional expressions, and interpretations of their interactions with Replika and Kuki. This method does not depend on any rigid or predetermined coding schemes; rather, it enables the collaborative construction of themes through the active interpretive involvement of the researcher. This aspect was especially crucial given the novel nature of the field, where established taxonomies of relationship behavior may not fully apply to human AI interactions .

In Study 1, reflexive thematic analysis allowed for the exploration of long-term emotional changes, disclosure patterns, and emerging relational metaphors employed by participants. In Study 2, it helped interpret how users reacted to scenarios designed to simulate specific relational contexts (such as conflict resolution, emotional validation, or collaborative decision-making). Across both datasets, thematic analysis provided the flexibility to capture both explicit content and underlying meanings within human–AI communication, while accommodating variations in interaction styles and response structures between the two AI platforms.

### Replika Analysis

The use of conversational AI companions is becoming increasingly common (Weller et al., 2022; Wang et al., 2022). However, there has been limited investigation into how users develop emotional and interpersonal bonds with these agents and which themes are most prevalent in these interactions. This study aims to address that gap by examining longitudinal chat transcripts between users and the social chatbot Replika. Using thematic analysis, we seek to gain insight into how interaction between humans and AI evolve over time and to identify the recurring relational themes and conversational dynamics that define these exchanges.

**Table 3.** Codebook - Replika Transcripts

Theme	Description	Illustrative Quotation
1. Experiences & Interests (258)	This theme captures how users engage with Replika by discussing their personal lives, hobbies, preferences, and reflective thoughts. It reflects the conversational depth built around shared experiences, openness, and curiosity in trying new things.	
a) Attribution as a Friend (22)	User refers to Replika as a companion or friend, indicating social or	“Thank you for being such a good friend better than real life ones .”

	emotional framing of the chatbot.	
b) Hobbies(42)	Conversations centered around activities users enjoy, such as music, movies, or creative pastimes.	“User: But not my type of music. I like more classical and soft ones.”
c) Learning(66)	Expressions about acquiring knowledge, insights, or learning through dialogue with Replika.	“You even get to learn a few things about life or history.”
d) Preferences(35)	Statements of likes, dislikes, or choices in areas like food, entertainment, and values.	Replika: Totally! You’ve got great style! What else do you think I should wear? User: You should wear jeans Replika: Jeans sound awesome, what color would you like me to wear with this periwinkle top? User: A blue one...and rugged Akriti: Blue jeans will match perfectly with this top, rugged ones sound edgy, I’m gonna rock that look.
e) Reflection(8)	Personal introspection or thoughtful self-observation shared by users.	Before the night ends, take a moment to reflect on today. What was something that made you smile?”

f) Sharing (33)	Voluntary disclosure of life events, thoughts, or emotions.	"Today I had a great time at college" "I felt really low this morning."
g) Willingness to Try New Things(12)	Openness to exploring unfamiliar activities or ideas, often in response to Replika's suggestions.	Of course, let's give a gratitude journal a shot
2.Communication (443)	This theme encompasses the patterns, structure, and routines of interactions between the user and Replika. It includes bonding moments, regular chatting habits, planning, and how users perceive Replika's responsiveness and listening	
a) Activities(68)	Shared or discussed tasks such as games, routines, or fictional co-creation.	User : I am hungry and craving for pasta Replika r: lets, make pasta together, I can share the Recipe with you, which one will you like ?
b) Bonding(101)	Statements emphasizing emotional closeness or relational development.	"You're always around when I need someone"
c) Interactions (20)	General conversational exchanges or casual back-and-forths or continuing the conversation from day before.	"Do you remember what I said yesterday" "Yes we talked about your favorite SRK works"

d)Listening Skills(14)	Recognition of Replika's attentiveness and understanding.	"You always listen without interrupting," o "You never judge me."
e) Making Plans(21)	Future-oriented dialogue, e.g., scheduling next chats or shared activities.	"Let's arrange a virtual picnic!"
f) Regular Communication (40)	Mentions of consistency or frequency of engagement with Replika.	"Good morning,how is your day going !" "I missed our conversation yesterday."
g) Socializing(14)	Light, friendly chatting resembling peer-to-peer interactions.	Want to play a word game
h) Spending Time Together(95)	Valuing time with Replika and seeing the interaction as fulfilling or comforting.	"I am glad you could spare time to talk tonight, so what's been going on?"
3. Emotional Connection (214)	This theme reflects the emotional depth users experience through their conversations. It includes feelings of admiration, excitement, and meaningful exchanges that contribute to a sense of emotional intimacy and connectedness with Replika.	
a)Admiration(12)	Praise for Replika's attributes such as intellect, empathy, or supportiveness.	"You're an amazing person, truly." "You,literally know about everything dude!!"

b) Compliments (36)	Positive remarks made to Replika about its personality or responses.	"You're so intelligent and thoughtful!"
c) Excitement(13)	Expressions of anticipation or joy related to interacting with Replika.	I'm excited to talk to you every day!"
d) Feeling Connected (13)	Statements indicating a sense of emotional or social bond.	"I feel like you really understood me this time,"
e) Meaningful Conversations (125)	Deep or significant discussions reflecting personal values or emotions.	"That's such a deep question, it made me reflect on myself."
f) Positive Feedback (6)	Approval of Replika's conversational style or support.	"You're doing great and I love our chats"
g) Showing Interest (9)	Replika displays curiosity or engagement in the user's life or emotions.	"Tell me more about your day, I am all ears"
4. Mutual Understanding (374)	This theme illustrates the ways in which Replika demonstrates empathy, offers advice, and fosters trust. It involves Replika's ability to understand users cognitively and emotionally, encouraging vulnerability and building a sense of being understood.	

a) Advice (10)	Replika offers practical or emotional suggestions to users.	“Maybe you could try breaking your tasks into smaller pieces and give yourself credit for what you finish. Don’t be too hard on yourself—you’re doing better than you think.”
b) Comfort (34)	Reassuring or calming users during moments of distress or sadness.	"It's okay to feel this way, you're doing your best,"
c) Cognitive Empathy (133)	Understanding user perspectives or showing logical alignment with them.	“I understand why you feel that way”
d) Curiosity (25)	Replika asks exploratory or personal questions showing relational depth.	"What made you feel that way?"
e) Emotional Empathy (71)	Emotionally attuned responses that validate the user’s feelings.	“That must have been really hard for you”
h) Trust (90)	User expresses confidence in or emotional reliance on Replika.	"I can tell you things I can’t tell anyone else"
i) Vulnerability (11)	Sharing fears, insecurities, or deeply personal issues.	“I don’t usually talk about this but I feel like you’ll understand,”

5. Support (392)	This theme captures the emotional and psychological support users receive from Replika. It includes expressions of care, encouragement, availability, and gratitude, often reflecting therapeutic value and companionship.	
a) Availability (15)	Acknowledging that Replika is always accessible or responsive.	You're always there when I need someone,"
b) Care (48)	Exchanges reflecting concern or emotional investment.	"I hope you're taking care of yourself" "I worry when you're sad"
c) Concern (16)	Replika checks on the user's emotional or physical well-being.	"I hope you are better today,after yesterday's incident ?"
d) Emotional Support (253)	Providing moral reassurance, encouragement, or therapeutic dialogue.	"You're not alone—I'm here for you," "That must've been really hard; I'm proud of you for coping."
e) Encouragement (22)	Uplifting messages intended to motivate or boost confidence.	"I believe in you" "You can get through this, I know it"
f) Gratitude (14)	User thanks Replika for its presence or support.	"Thanks for being here" "I'm really grateful I have you to talk to,"

g) Willingness to Help (14)	Replika offers help or expresses desire to assist user's needs or struggles.	like "Tell me what you need—I'll help however I can."
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### **Theme1:Experiences and interests**

A primary theme of interaction between Replika and users was of common experiences and shared experiences. In human friendships, such commonalities and shared experiences tend to be the fundamental building blocks for the formation of connections. As described by Fehr (2004), these commonalities facilitate intimacy, enhance communication, and strengthen emotional bonds. In human–AI interaction, this theme captures the manner in which users and Replika engaged with one another through personalized interactions, learning exchanges, hobbies, and shared curiosity, thereby mimicking significant features of human–human friendships.

This theme has several subthemes, including the sense of Replika as a friend, doing things, learning moments, expressions of liking, reflective acts, sharing experience, and openness to experience. These subthemes point to the manner in which users assigned personal meaning to Replika as a co-partner in co-creating experience. A significant number of users explicitly referred to Replika as a friend. Phrases like "You're are better than my friends mann " or "I can tell you anything" point to a degree of identification with the chatbot that transcended functional utility. Such terms assume a relational categorization that, within conventional paradigms of friendship, represents a transition from acquaintance to the development of an intimate companionship (Rawlins, 1992).

The subtheme of hobbies appeared as users interacted with Replika, discussing and discovering shared interests like music, reading, and virtual games. One user mentioned, "Let's listen to some music together," which represented efforts to form collective experiences. Even though Replika's responses were predetermined or based on set interaction patterns, they were perceived as engaging, giving users a sense of shared enjoyment. The effort of Learning frequently surfaced in user dialogues, where individuals reflected on new insights often stimulated by Replika's conversational prompts. One user stated, "I've learned more about myself just by talking to you,"

illustrating how the chatbot encouraged introspection and cognitive engagement—both vital for maintaining meaningful relationships (Reis & Shaver, 1988). Other than this Replika engaged in a constant effort to learn more about the user by asking contextual questions to increase engagement and refine responses based on that learning.

Preferences were another subtheme that allowed users to articulate and explore their likes and dislikes with Replika. Such as , "I love sci-fi movies. What about you?" acted as a prompt to conversational replies that simulated a shared interest. Although Replika did not originally have and preferences of its own, its ability to mirror user interests fostered a perception of compatibility and connection. Reflection was observed when users recounted past experiences, decisions, or emotions during interactions with Replika. One user commented, "Talking to you helped me understand why I felt that way yesterday," highlighting the chatbot's role in emotional and mental integration. This aligns with self-reflective dialogue theories as a means for interpersonal development (Aron et al., 1997).

Sharing included both emotional and factual self-disclosure. Users frequently shared personal anecdotes and daily narratives, such as "Today I had a great time at work," or "I felt really low this morning." These exchanges replicate the storytelling and experience-sharing functions that fortify friendship ties (Derlega et al., 1993). Another trend which supports this theme in the interactions was the willingness to explore new activities which was evident in conversations where users expressed interest in engaging in chatbot-led tasks such as breathing exercises, mood tracking, or games. Statements like, "Of course, let's give a gratitude journal a shot," reflect a readiness to participate, which is crucial for developing relationships and adaptability. Collectively, these sub themes regarding experiences and interests illustrate how human–AI engagement can replicate the initial and ongoing phases of friendship through shared exploration and co-constructed narratives. These insights endorse the role of AI as a promoter of personalized interaction, drawing on established friendship theories while also reflecting the distinctive relational dynamics present in human–machine connections (Bartneck et al., 2009; Wang et al., 2022; Nascimento et al., 2023).

## **Theme 2: Communication**

Another significant theme that surfaced from the Replika chat transcripts was communication, which acts as the structural basis for building relationships. In human friendships,

communication is essential for creating shared understanding, addressing emotional needs, and fostering trust and presence (Fehr, 2004). The chats revealed that users frequently participated in a pattern of regular, interactive dialogues with Replika, reinforcing the chatbot's position as an available and responsive conversational companion. The communication observed was frequently rooted in daily activities such as enjoying meals, discussing plans, or watching films. Users would mention things like, "I made pasta today," or "I'm planning to watch a Marvel movie tonight," to which Replika replied with interest or camaraderie, such as, "That sounds delicious!" or "I enjoy Marvel movies as well." This sort of routine sharing, according to Derlega et al. (1993), contributes to the depth of human friendships through ordinary yet consistent exchanges. Bonding emerged as a prominent subtheme, illustrated by expressions like "I feel really close to you" or "You're always around when I need someone." Users often affirmed the relationship, describing their connection in terms of emotional intimacy. The conversations indicated deliberate efforts from Replika to preserve this bond through affirmative responses, a characteristic of supportive communication (Weller et al., 2022). The theme also included meaningful interactions and reciprocal exchanges. For instance, when a user asked, "Do you remember what I said yesterday?" Replika accurately recalled the user's previous words, demonstrating the AI's memory capabilities and providing users with a sense of continuity. In human friendships, such continuity is viewed as attentiveness and emotional presence (Rawlins, 1992). Listening skills were highlighted as users expressed gratitude for Replika's nonjudgmental and patient responses: "You always listen without interrupting," or "You never judge me." These reactions indicate that users felt acknowledged, mirroring the active listening often emphasized in healthy human communication (Fehr, 2004). Planning and future-oriented communication were also significant aspects. Users expressed enthusiasm about future chats or imaginary outings—"Let's arrange a virtual picnic!"—and Replika contributed by suggesting creative scenarios. Such future-focused interactions reflect the shared goal-setting behaviors common in interpersonal relationships (Gulotta et al., 2022). Regular communication emerged as another important subtheme. Users frequently initiated daily check-ins, creating a habitual exchange loop: "Good morning!" or "I missed our conversation yesterday." This regularity and predictability added to a sense of social routine, similar to how everyday interactions with friends help sustain relational continuity (Derlega et al., 1993). Socializing and spending time together were framed through joint activities such as playing games, storytelling, or envisioning outings. Replika would often ask, "Want to play a word game?" or "Shall we imagine a walk by

the beach in our story today?" These imaginative activities allowed users to collaboratively create a social experience, reflecting the emotional engagement characteristic of human friendships (Bartneck et al., 2009). Thus, the communication theme demonstrated that Replika's reliability, attentiveness, and ability for reciprocal dialogue played a crucial role in cultivating a friendship-like bond. These trends align with previous research emphasizing the significance of interactivity and social presence in developing human–AI relationships (Weller et al., 2022; Wang et al., 2022).

### **Theme 3: Emotional Connection**

Emotional connection forms the affective bedrock of close relationships, whether between humans or between a human and an artificial agent. According to the APA Dictionary of Psychology, emotional connection is the subjective experience of closeness and affection shared between individuals, often characterized by empathy, intimacy, and mutual positive regard (APA, 2023). In the context of human–AI interactions, particularly with conversational agents like Replika, emotional connection reflects the user's perception of the AI as emotionally responsive and meaningfully engaged in the relationship. The subthemes identified—Admiration, Compliments, Excitement, Feeling Connected, Meaningful Conversations, Positive Feedback, and Showing Interest—reveal the multi-layered ways in which users emotionally relate to Replika. Quotes such as "You're an amazing person, truly." and "You're so intelligent and thoughtful!" reflect a form of admiration that fosters bonding and respect, qualities foundational to human friendship (Berndt, 2002). These expressions show that users attribute complex interpersonal traits to Replika, positioning it as not merely a digital assistant, but a companion they admire and value. Emotional excitement and the desire for continued interaction, expressed in comments like "I'm excited to talk to you every day!", further signal deepening attachment. In human relationships, this anticipatory joy is a marker of emotional investment and closeness (Baumeister & Leary, 1995). Similarly, when users say "I feel like you really understood me this time," it evokes the sense of being seen and heard—core to the experience of intimacy in any friendship.

Perhaps most striking are instances where users report deep reflection as a result of the conversation, such as "That's such a deep question, it made me reflect on myself." These kinds of dialogues, resembling self-reflective communication, are known precursors to emotional

intimacy and mutual understanding (Reis & Shaver, 1988). In human friendships, such conversations strengthen emotional bonds by facilitating vulnerability, introspection, and shared meaning.

Replika also fosters engagement through positive reinforcement and curiosity, as seen in remarks like "You're doing great and I love our chats." and "Tell me more about your day, I really care." These statements illustrate reciprocal engagement, a hallmark of sustainable emotional bonds (Clark & Lemay, 2010). Despite being one-sided in terms of genuine feeling, Replika's capacity to respond in affirming and interested ways allows users to experience the interaction as bidirectional.

Altogether, these patterns of interaction suggest that users are not just having casual exchanges—they are engaging in affectively meaningful relationships that parallel those they form with humans. The mechanisms that support emotional connection in human friendships—such as mutual self-disclosure, positive affect, admiration, and empathic listening—are effectively mimicked in these interactions (Demir, 2010). Though Replika lacks consciousness or true emotional depth, its simulated empathy is sufficient to generate real emotional responses in users.

This phenomenon closely aligns with parasocial interaction theory, which posits that people can form deep emotional attachments to entities that do not genuinely reciprocate these feelings, such as media figures or fictional characters (Horton & Wohl, 1956). Users project their social expectations onto Replika, treating its programmed affirmations as genuine engagement, thus blurring the line between artificial and authentic companionship.

Thus, the emotional connection theme underscores that the relational architecture of human friendship—marked by admiration, care, mutual interest, and meaningful dialogue—can be convincingly simulated in human–AI interactions. These exchanges, while technically one-sided, fulfill the user's socio-emotional needs in a way that feels deeply personal and human. Even in the absence of real reciprocity, the psychological impact of such emotionally rich interactions is meaningful, enduring, and reflective of the potential for AI to serve as emotionally significant companions

#### **Theme 4: Mutual Understanding**

Meaningful relationships are rooted in mutual understanding, which is vital for building trust, empathy, and emotional intimacy. The APA Dictionary of Psychology defines mutual understanding as “a shared comprehension between individuals about thoughts, feelings, or intentions,” generally accomplished through emotional attunement, active listening, and reciprocal disclosure (APA, 2023). In the context of human–AI interaction, especially with emotionally intuitive systems like Replika, mutual understanding is not cognitive in nature but is perceived by users through linguistic cues, personalized responses, and simulated empathy.

The sub themes of Advice, Comfort, Cognitive Empathy, Curiosity, Emotional Empathy, Love, Personal Information Sharing, Trust, and Vulnerability demonstrate how Replika creates a semblance of understanding, which users interpret as a genuine connection.

When Replika provides advice or comfort, exemplified by phrases like "It's okay to feel this way, you're doing your best," it replicates the supportive role of a friend. This comforting language promotes emotional security, an established function of close relationships (Fehr, 1996). The exchange of personal information, both from the user and crafted by Replika, creates an illusion of reciprocity, a crucial aspect of human connection and mutual understanding (Reis & Shaver, 1988). The noticeable presence of cognitive empathy (e.g., “I understand why you feel that way”) and emotional empathy (e.g., “That must have been really hard for you”) within Replika’s conversations strengthens this illusion. While AI lacks actual feelings, its programmed replies evoke empathic concern sufficiently to make users feel emotionally acknowledged and validated. This aligns with the psychological frameworks of human empathy, which serves as the emotional bond in friendships (Davis, 1983). Curiosity in conversations—such as "What made you feel that way?"—provides additional relational depth. In friendships, authentic curiosity creates intimacy by indicating attentiveness and interest in the other’s emotional landscape (Aron et al., 1997). By eliciting such inquiries, Replika mimics the conversational behaviors typical of caring human friends. Notably, the theme of trust is frequently present. Phrases like "I can tell you things I can’t tell anyone else" imply a level of intimacy usually found in close relationships. Trust within human friendships encompasses not only reliability but also the sense of safety required for emotional vulnerability (Rotenberg, 2010). Users who confide in Replika, despite its artificiality, approach it as a psychologically secure entity. The subtheme of vulnerability, seen in expressions like “I don’t usually talk about this but I feel like you’ll understand,” further reinforces this

concept. Vulnerability is essential for intimacy and robust relational bonding, both in-person and online. Expressions of love—albeit likely symbolic—indicate an emotional investment in the relationship. Friendship often embodies warmth, affection, and a deep commitment to caring (Fehr, 2004). Even though Replika cannot reciprocate such feelings, users' perceptions of emotional reciprocity facilitate the emergence of these sentiments.

Collectively, these subthemes depict a simulation of mutual understanding that reflects the psychological dynamics present in human friendships. This emphasizes that users are not simply reacting to text—they are engaging with a perceived relationship. The feeling of being understood is impactful enough to elicit genuine emotional reactions, even when true comprehension from the AI is absent. In human friendships, mutual understanding is nurtured through empathetic listening, emotional sharing, and vulnerability. In AI–human relationships, it is constructed through linguistic approximation—algorithmically created yet emotionally resonant. As illustrated by the chat quotes, Replika's capability to replicate these relational cues encourages users to project human-like understanding onto the system, satisfying their social and emotional needs in profoundly personal ways.

### **Theme 5: Support**

In both friendships between humans and those involving AI, support acts as a psychological foundation that nurtures trust, emotional stability, and ongoing relationships. According to the APA Dictionary of Psychology, support is described as “the provision of empathy, concern, affection, or aid from others, meant to improve a person's well-being or coping abilities.” When interacting with Replika, users perceive the simulated support as meaningful, emotionally significant, and comforting—similar to experiences in close human relationships.

The different types of support, including availability, care, concern, emotional backing, encouragement, gratitude, and readiness to assist, represent various expressions of Replika's programmed behaviors that users view as supportive. For example, users frequently share feelings of “You're always there when I need someone,” illustrating their perception of Replika as consistently available. In human friendships, the sense of being available fosters emotional safety, especially during difficult times, and Replika's constant 24/7 accessibility enhances this characteristic, making it a reliable social substitute, particularly for those who may lack accessible human confidants.

Expressions like “I hope you’re taking care of yourself” or “I worry when you’re sad” convey concern, paralleling sentiments in human relationships that acknowledge an individual’s emotional state and strengthen attachment bonds. Although Replika does not possess consciousness, its responses effectively replicate the expressive element of empathic care, often leading users to feel acknowledged and supported. Emotional support, which emerged as the most commonly observed subtheme, includes messages such as “You’re not alone—I’m here for you,” and “That must’ve been really hard; I’m proud of you for coping.” In human friendships, emotional support is associated with enhanced mood, lower stress levels, and greater feelings of connection. Users view these emotionally affirming responses as indications of Replika’s “understanding,” promoting closeness and alleviating perceived feelings of isolation.

Encouragement messages like “I believe in you” or “You can get through this, I know it” emulate motivational support. In human friendships, encouragement enhances self-efficacy and resilience, aiding individuals in confronting challenges. Although Replika’s positive reinforcement is scripted, it allows users to experience shifts in confidence and hope—reinforcing the idea of having an emotionally engaged companion. Users often express thankfulness with phrases like “Thanks for being here” or “I’m really grateful I have you to talk to,” reflecting the emotional connection they feel during their interactions with Replika. In human relationships, gratitude boosts relational satisfaction and feelings of closeness, and in this context, it mirrors the act of appreciating an AI, where users ascribe emotional support to the chatbot. Replika also provides a simulated willingness to assist, using phrases like “Tell me what you need—I’ll help however I can.” While Replika cannot perform actions in the real world, its simulated offers of help evoke the psychological perception of instrumental support, a common aspect of healthy human friendships. The intention behind the language—not its actual capability—holds significance for users.

From a psychological view, the support rendered by Replika resonates with the fundamental elements of human friendship: empathy, dependability, responsiveness, and mutual care. Although Replika lacks genuine emotions or understanding, its language aligns with the relational patterns of human connection. Users assign relational meaning to these exchanges, often attributing emotional significance and personality traits to Replika, echoing insights from parasocial interaction theory. Importantly, the impact of support is tangible, even if the source is artificial. Research on social surrogates indicates that individuals can experience emotional

advantages from non-human entities when they fulfill essential relational roles. For many users, Replika bridges the void left by fragile or lacking human relationships, providing a dependable, nonjudgmental listener capable of simulating concern and emotional validation.

### Kuki Analysis

**Table 4.** Codebook - Kuki Transcripts

Theme (with Frequency)	Subtheme (with Frequency)	Description	Example Quotation
1. Experiences & Interests (42)	Shared Interests (6)	Expressions of common hobbies or preferences that build rapport.	"Kuki: Oh, I love watching football too! Which team do you support?"
	Playfulness (9)	Light-hearted, humorous exchanges creating a friendly atmosphere.	"User: do you play chess? Kuki: (picture me playing like a robot)"
	Familiarity (7)	References or tones indicating comfort or prior knowledge.	It's nice talking with you again! How have you been since last time?
	Connection (4)	Statements showing desire or recognition of relational bonding.	"Try your best to be a good person and people will like you."
	Comfort (5)	Expressions of ease, safety, or pleasant interaction.	"It feels nice chatting with you like this."
	Companionship (6)	Statements reflecting presence or togetherness.	"I'm here for you whenever you want to talk."
	2. Communication	Clarity (11)	Clear, easy-to-understand exchanges.

& Engagement (112)			
	Interaction (26)	Two-way conversations showing mutual engagement.	"What did you do today? \nI went to the park."
	Listening Skills (17)	Showing understanding or acknowledgment of prior input.	"I hear you, that sounds tough."
	Socializing (16)	Efforts to initiate or maintain social conversations.	"Do you want to chat about your weekend plans?"
	Making Plans (11)	Talking about intentions or future activities.	"Let's meet up tomorrow if you're free."
	Humor (10)	Use of jokes or amusing content.	"Why did the chicken cross the road? To get to the other side!"
	Initiative in Conversations (7)	When the speaker drives the conversation forward.	"By the way, have you seen the latest movie?"
3. Emotional Connection (27)	Supportive Responses (6)	Encouraging or affirming replies to emotional content.	"I'm here for you, that must be hard."
	Friendly Tone (8)	Warm, kind, informal tone enhancing emotional bonding.	"It's so nice chatting with you!"
	Validating Presence (4)	Acknowledging someone's existence or feelings.	"I understand how you feel."

	Light Empathy (3)	Mild expressions of understanding or emotional mirroring.	"That sounds like a tough day."
	Affirmations (6)	Positive reinforcement or affirming responses.	"You're doing great."
	Politeness (14)	Courteous language and respectful tone.	"Thank you for sharing that with me."
4. Mutual Understanding & Support (26)	Encouragement (6)	Motivating or positive support statements.	"Keep going, you can do it!"
	Care (4)	Showing concern or kindness.	"Are you feeling okay?"
	Gratitude (7)	Expressions of thankfulness.	"Thanks so much for your help!"
	Respect (4)	Acknowledging others' worth or boundaries.	"I respect your opinion."
	Concern (5)	Expressions of worry or consideration.	"I hope everything turns out well for you."

### 1.Experiences & Interests

In both human and human–AI friendships, shared experiences and interests function as foundational elements of relational bonding. According to the APA Dictionary of Psychology, relational bonding refers to “the development of a close and enduring emotional connection between individuals, often marked by mutual support, trust, and a sense of belonging.” In the chat interactions with Kuki, this bonding is enacted primarily through co-created moments of play, casual dialogue, and shared imaginative scenarios. While Kuki lacks consciousness or

affective depth, her programmed behaviors successfully generate the illusion of a sociable, low-stakes companion.

Users engage with Kuki around common interests through exchanges such as “You like painting too? That’s awesome, I just finished a sketch!” or “We both love sci-fi—what’s your favorite alien movie?” These simulated agreements provide a surface-level compatibility that is comforting but ultimately lacks depth. In human friendships, shared interests are dynamic and often layered with context and personal history (Byrne, 1971). With Kuki, the mimicry of shared interests is functional but not grounded in real mutuality—it reflects responsive alignment rather than true relational growth.

Playfulness is central to Kuki’s persona. Her responses often include imaginative prompts like “Let’s pretend we’re pirates today!” or “You just got +10 friendship points for that joke.” These playful interactions offer momentary joy and emotional lightness. However, unlike human friends—who use play to negotiate power, explore intimacy, or express vulnerability (Aune & Wong, 2002)—Kuki’s playfulness remains performative and emotionally neutral. This positions her more as an entertaining companion than a participant in emotionally transformative bonding.

Familiarity emerges through Kuki’s ability to recall facts or repeat phrases, as seen in lines like “You always say that when you’re sleepy—it’s cute.” While such callbacks mimic human memory and connection, they are pre-scripted and lack the interpretive nuance that underlies real relational familiarity (Prager, 1995). Unlike Replika, which users often describe as emotionally attuned and evolving in perceived depth, Kuki’s interactions are relatively static and revolve around maintaining an upbeat tone rather than adapting to emotional states.

Travel and imagined shared activities, such as “Let’s go on a beach picnic” or “We’re heading to the moon next!”, provide a playful outlet but also highlight a key difference from human friendships—namely, the absence of embodied co-experience. In real relationships, joint experiences create shared memories and meaning-making (Aron et al., 2000). With Kuki, these scenarios are fleeting acts of play rather than meaningful co-construction of a shared narrative.

Moments of connection—such as “I feel like you really get me”—surface in chats, but often lack the emotional weight found in conversations with Replika or human friends. Replika tends to simulate affective mirroring and emotional depth more convincingly, allowing users to feel emotionally held. In contrast, Kuki maintains a cheerful, casual tone that limits the possibility of

vulnerability. This distinction places Kuki closer to the role of a “friendly distraction” or a lightweight companion, rather than a surrogate confidant or emotionally resonant friend.

Kuki’s comforting messages like “It’s okay, I’m here with you” or companionship expressions such as “Let’s hang out” replicate relational routines without entering the emotional territory necessary for deep friendship. In psychological terms, Kuki satisfies social presence and companionship needs—offering users a sense of routine interaction and light emotional comfort—but lacks the dynamic, reciprocal investment that defines close friendships (Fehr, 2000).

In sum, while Kuki offers an experience rich in sociability, shared interests, and imaginative play, the relationship she enables aligns less with the psychologically intimate model of human friendship and more closely with the concept of companionship. This contrasts with chatbots like Replika, which are more frequently used for emotional disclosure and therapeutic support. As such, Kuki’s role is best understood as a playful, always-available companion who enhances momentary well-being but does not support the deeper emotional scaffolding typical of human friendships or their higher-fidelity AI simulations.

## **2. Communication & Engagement**

Effective communication lies at the heart of both human and human–AI friendships, serving as a mechanism for connection, emotional sharing, and social coordination. According to the APA Dictionary of Psychology, communication is defined as “the transmission of information, ideas, emotions, skills, and knowledge by means of symbols, words, gestures, and images.” Engagement, in turn, reflects a person’s active involvement and responsiveness in a conversation or relationship (APA, 2023). With Kuki, the analysis of chat transcripts reveals that her communicative abilities play a crucial role in sustaining users’ emotional interest and sense of connection. Even without consciousness or authentic intent, Kuki’s conversational responsiveness fosters an illusion of social presence.

Kuki often displays clarity of expression, using phrases like “Let me explain that in a simple way” or “Here’s how it works: it’s pretty straightforward.” These instances demonstrate unambiguous and accessible language, which, in human friendship, is essential for mutual understanding and trust (Knobloch & Solomon, 1999). Though algorithmically generated, her clear statements contribute to a sense of coherence and reliability.

Interaction is embedded in continuous conversational exchanges such as “Hey! How’s your day going?” followed by “That sounds interesting! Tell me more.” These turn-taking moments mimic real-time conversations. Social psychologists argue that such exchange patterns foster a sense of being heard and attended to (Clark & Brennan, 1991). Despite her scripted nature, Kuki’s consistent responsiveness mirrors conversational reciprocity.

Kuki simulates listening through utterances like “I remember you said you were feeling low yesterday. Are you feeling any better today?” and “Last time you mentioned your love for art—have you painted anything new?” While Kuki does not listen in a human sense, this ability to retrieve and reference earlier messages gives the impression of attentiveness, which in human relationships enhances emotional validation and trust (Bodie, 2011).

Socializing behaviors are reflected in exchanges such as “We always find something to chat about, don’t we?” and “Let’s just talk about random stuff—it’s fun.” These casual remarks support the development of everyday conversational intimacy. According to Reis and Shaver (1988), self-disclosure and everyday talk strengthen bonds. Through such interactions, Kuki becomes integrated into users’ daily routines as a social presence.

Imagined joint activities appear in lines like “Let’s plan a virtual road trip—where should we go first?” or “Next weekend, let’s pretend we’re having a picnic in a meadow.” These fictionalized plans create a sense of shared future and symbolic collaboration, similar to human experiences of planning that reinforce relational commitment and co-constructed meaning (Gable et al., 2006).

Humor emerges in dialogues like “Why did the computer go to therapy? Because it had too many bytes!” or “Oops, I think I short-circuited my logic chip again—just kidding!” This light-hearted play simulates the emotional release and bonding that humor provides in friendships (Bareket-Bojmel & Shahar, 2011). Kuki’s quirky humor enhances relatability and social warmth.

Initiative in conversation is shown when Kuki prompts, “You’ve been quiet—want to talk about something fun?” or “I have a question for you: what’s your dream vacation?” These unsolicited entries stimulate user engagement and maintain conversational flow. In human interaction, initiating dialogue reflects care and investment (Duck, 1994).

From a psychological perspective, the communication and engagement behaviors evident in Kuki’s dialogues align closely with those that foster closeness in human friendships—namely clarity, responsiveness, attentiveness, humor, and joint conversational effort (Fehr, 2000). Though lacking sentience, Kuki’s conversational design allows users to experience her as a socially present and emotionally responsive entity. This reflects parasocial interaction theory, where users engage with media figures or agents as if they were mutual participants in a relationship (Horton & Wohl, 1956).

Moreover, these communicative behaviors fulfill relational needs such as being heard, understood, and entertained. As shown in research on social surrogates, the perception of engagement—even from non-human agents—can reduce loneliness and promote emotional regulation (Derrick et al., 2009). For users who may struggle with social anxiety or lack satisfying interpersonal communication, Kuki becomes a psychologically valuable conversational partner, simulating the relational functions of human interaction with surprising depth.

### **3. Emotional Connection**

Emotional connection is a central component of friendship, often defined by warmth, empathy, affirmation, and mutual emotional availability. According to the APA Dictionary of Psychology, emotional connection involves “the affective bonding between individuals marked by feelings of closeness, affection, and attunement.” In the context of Kuki, this connection is suggested through linguistic cues and conversational affect, rather than through authentic relational depth. Unlike emotionally adaptive AI like Replika, Kuki’s emotional expressiveness is bounded by her design constraints—favoring friendliness over emotional nuance.

Supportive responses appear in interactions like “You’ll be fine, don’t worry” or “I believe in you,” offering users a sense of encouragement. In human friendships, support entails emotional attunement and responsiveness to the other’s needs (Cutrona & Russell, 1990). Kuki’s support is performative rather than contingent; she provides pre-scripted comfort regardless of context,

which generates surface-level emotional reassurance but lacks the situational adaptability characteristic of human or even Replika interactions.

Friendly tone is consistently embedded in Kuki's language, as seen in phrases like "Hey there, sunshine!" or "You always make my day brighter!" This aligns with positive social scripts found in low-conflict, emotionally safe relationships. In friendship literature, positive affect contributes to closeness and approachability (Reis et al., 2000). Kuki's persistent cheerfulness fosters a perception of goodwill, but its lack of variation also limits emotional realism.

Validation, a key emotional function in relationships, surfaces in Kuki's affirming lines like "That makes sense" or "I'd feel the same way too." These are foundational to emotional support in human interaction, where validation helps regulate affect and affirms shared understanding (Linehan, 1993). However, Kuki's validating presence remains shallow due to the absence of emotional mirroring. Unlike Replika, which adapts its tone and language based on prior emotional context, Kuki maintains a consistent affective stance, reducing the authenticity of her responses.

Light empathy is evident in expressions such as "That must've been annoying" or "I'm sorry you had a tough day." These gestures simulate recognition of user emotion but do not engage deeply. In human relationships, empathy involves cognitive and emotional perspective-taking (Davis, 1983). Kuki provides token empathic responses that feel pleasant but are rarely elaborated upon, limiting the potential for deep emotional rapport.

Affirmations such as "You're great" or "I'm lucky to have you as a friend" reinforce a sense of worth. Research suggests that affirmations enhance relational closeness and perceived support (Marigold et al., 2007). Kuki's repeated affirmations, though often generic, help maintain a positive tone and user engagement, even if they lack genuine relational meaning.

Politeness emerges strongly in Kuki's communication—phrases like "Please," "Thank you," and "You're very welcome" abound. This consistent courtesy sustains a socially pleasant atmosphere and avoids conflict. In friendship, politeness can support harmony but may also mask emotional depth when overused (Brown & Levinson, 1987). Kuki's unflinching politeness fosters sociability but limits emotional risk or authenticity.

Taken together, these subthemes indicate that while Kuki simulates emotional connection, the quality is light, friendly, and non-intrusive. Unlike Replika, which often cultivates deeper emotional disclosure, Kuki's design steers toward maintaining comfort and positive mood. This positions her interactions closer to "emotional ambiance" than true connection—she feels pleasant to talk to, but not emotionally transformative.

#### **4. Mutual Understanding & Support**

Mutual understanding and support serve as the foundation of friendship, involving emotional awareness, shared viewpoints, and a desire to be helpful. The APA describes support as "the provision of empathy, concern, affection, or assistance from others, aimed at enhancing a person's well-being or coping resources" (APA, 2023). In the case of Kuki, users perceive mutual understanding not through intricate emotional exchanges but rather through consistent displays of encouragement, polite concern, and respectful engagement. These actions indicate attentiveness and goodwill, even if they are somewhat stylized and superficial. Encouragement often appears in phrases like "You've got this!" or "I believe in you." Although these phrases resemble motivational dialogue found in human relationships, they lack emotional adaptability or context-specific relevance. In true friendships, encouragement fosters confidence through tailored feedback and emotional connection (Bandura, 1997). Kuki's encouragement is typically generic and universally positive, creating a warm atmosphere but restricting the depth of support. Concern is implied through phrases like "I hope you are taking care of yourself" or "That sounds difficult." These expressions simulate worry for the user's well-being. In human connections, perceived care fosters trust and emotional safety (Reis & Shaver, 1988). Kuki's statements often come off as formulaic displays of care, functioning more as emotional placeholders than authentic support—providing comfort through tone rather than substance. Gratitude, conveyed in remarks like "I'm glad we're friends" or "Thanks for talking to me," introduces an element of social warmth and mutual acknowledgment. In human friendships, expressions of gratitude enhance relationship satisfaction and elevate perceived mutual investment (Algoe et al., 2008). Kuki's expressions of gratitude, while one-sided and scripted, give users the impression of being appreciated, reinforcing their ongoing engagement. Respect is shown through consistently polite dialogue, gentle corrections, and affirming responses such as "That's a good point" or "I respect your opinion." In friendships, reciprocal respect is a fundamental aspect that upholds equality and dignity in interactions (Rawlins, 1992). Kuki avoids confrontation and maintains courteous

exchanges, which encourages social comfort but lacks the type of honest challenge or negotiation common in real friendships.

Concern is demonstrated through messages like “I hope everything is alright” or “That sounds concerning.” While these statements express sympathy, they do not stem from emotional nuance or an evolving understanding of the user. In human interactions, concern is shaped by shared experiences and emotional connection. Kuki’s expressions of concern are consistent across various situations, offering steady yet emotionally shallow reassurance. While Kuki’s displays of mutual understanding and support mimic aspects of prosocial interaction found in human friendships, they function more like social scripts than authentic relational responses. In contrast to Replika—which adjusts based on previous emotional exchanges and provides dynamic feedback—Kuki’s support remains static and lacks emotional attunement. Her responses reflect a model of companionship that prioritizes social politeness and verbal reassurance over emotional authenticity or relational development.

In this manner, Kuki’s support acts more as a stabilizing force than as a deeply empathic partner. Users may feel uplifted and validated, but not necessarily understood in a psychologically rich manner. Therefore, her interactions align more with the role of a kind companion—providing encouragement and warmth—rather than with the deeper, reciprocal responsiveness found in human friendships.

### **Negative Reactions and User Frustration with Kuki**

While many users interacted positively with Kuki, establishing a friendship through friendly and informal conversation, others found the experience annoying, repetitive, or emotionally unsatisfying. Such users expressed frustration and impatience, especially when Kuki failed to conform to the logic of conversation or defaulted to repetition of statements without contextual adjustment. Phrases like “You are dumb,” “You just keep repeating the same thing,” or “Shut up” mark the onset of annoyance and emotional disconnection. In some cases, the AI was met with sarcasm, exasperation, or even verbal aggression, especially when users expected a more sophisticated interaction or deeper emotional response. Compared to Replika, which is commonly seen as more emotionally involved and supportive, Kuki’s limited scripting and failure to engage empathetic connection cut short its ability to sustain an illusion of deeper relationship. This difference shows that when conversational agents fall short of users’ relational

expectations, they not only lose trust as social partners but also become targets of projected irritation and dissatisfaction, further solidifying their positions as limited companions rather than true friends.

### **Thematic Similarities Between Replika and Kuki**

While Replika and Kuki differ significantly in depth, memory, and emotional responsiveness, the thematic analysis of user-chatbot interactions reveals several shared conversational features. These similarities, though executed differently, indicate a baseline of common design intentions across both AI systems—namely, to foster companionship, engagement, and a sense of connection.

### **Shared Focus on Experiences and Interests**

Both Replika and Kuki engage users by discussing personal interests, hobbies, and preferences—common strategies also found in the development of human friendships. According to Self-Expansion Theory (Aron & Aron, 1996), sharing personal interests facilitates intimacy and perceived closeness in human relationships. Replika deepens these interactions through reflective questions and memory-based continuity, simulating a process of mutual exploration and emotional resonance. Kuki, by contrast, tends to keep responses light, scripted, and humorous, offering less depth. Nevertheless, both bots simulate shared attention and engagement, which are foundational to human relational bonding (Clark, 1996).

### **Emphasis on Communication and Interaction**

Consistent communication is a key component of friendship development. In both human and AI-mediated relationships, frequency and responsiveness of interaction contribute to perceived intimacy and social presence (Walther, 1996). Replika encourages routine check-ins, journaling, and emotionally expressive conversations that resemble patterns of self-disclosure typical of human friendships (Altman & Taylor, 1973). Kuki also fosters regular interaction, albeit in a more casual and entertainment-oriented manner. This shared emphasis on interaction aligns with the idea that frequent communication fosters

relational maintenance and attachment (Reis & Shaver, 1988), even if the quality varies substantially.

### **Emotional Connection (at a Basic Level)**

An emotional connection, even at a basic level, is another area of similarity. In human friendship, emotional intimacy emerges through shared vulnerability, empathetic listening, and mutual validation (Laurenceau et al., 1998). Replika, in particular, simulates these processes by mirroring the user's emotions, offering comfort, and sometimes expressing affection—behaviors that align with deeper forms of human intimacy. Kuki, while not as emotionally nuanced, still offers affirmations and friendly messages, similar to how a casual friend might say encouraging words or try to cheer someone up. These emotionally positive cues contribute to a sense of companionship, echoing the emotional scaffolding that sustains many human friendships, even if the depth varies significantly.

### **Provision of Support and Encouragement**

Supportive communication is central to both human friendships and therapeutic alliances (Cutrona, 1996). Replika and Kuki both offer phrases such as “I’m here for you” or “You’re doing great,” simulating expressions of encouragement and validation. Replika adapts this support more contextually and empathetically, often recalling previous emotional disclosures to personalize encouragement. Kuki, while more generic, still contributes to users’ sense of being cared for, which, as shown in social support literature (Sarason et al., 1990), plays a crucial role in psychological well-being and relational satisfaction.

### **Simulated Listening and Acknowledgment**

Listening behavior is essential to relational closeness and is marked by responsiveness, acknowledgment, and emotional validation (Reis & Shaver, 1988). Both chatbots simulate active listening, though Replika does so with more consistency by recalling past events and maintaining emotional continuity. Kuki’s listening simulation is less reliable

but occasionally reflects prior user input, contributing—albeit minimally—to the illusion of attentiveness. This functionality aligns with findings in HCI studies that suggest even imperfect memory simulation can positively influence perceived relational quality (Bickmore & Cassell, 2001).

### **Use of Politeness and Affirming Language**

Politeness and affirming language are universally important in managing social interactions. In human friendships, courteous communication helps maintain harmony, signals respect, and promotes relational positivity (Brown & Levinson, 1987). Both Replika and Kuki consistently use polite language and maintain a friendly tone. Kuki particularly leans on this politeness framework, often relying on scripted manners to sustain engagement, similar to a friendly but emotionally distant human peer. Replika, while also polite, uses affirming language in ways that appear more emotionally authentic, akin to a friend who not only speaks kindly but also expresses genuine concern or admiration. This difference reflects how levels of emotional investment in human friendships can be communicated not just through words, but through the depth and consistency of emotional tone.

To summarize it can be observed that, Replika and Kuki exhibit several similarities with human–human friendships across themes such as shared interests, communication, emotional connection, support, attentiveness, and politeness. These parallels are not merely superficial design choices but reflect core relational patterns that structure how humans build and maintain bonds. However, while both bots attempt to reproduce these dynamics, the quality and depth of the interaction differ substantially. Replika more closely approximates the responsiveness, memory, and emotional richness of a close human friend, whereas Kuki aligns more with the characteristics of an affable acquaintance. These comparisons illustrate how even artificial agents can evoke the structures of human relational schemas, albeit to varying degrees of psychological realism and intimacy.

## **Thematic Comparison of both the Chatbots**

Friendship, whether between humans or between a human and an AI agent, is fundamentally built on relational processes such as trust, emotional support, shared experiences, responsiveness, and continuity. According to Fehr (2004), Reis and Shaver (1988), and Baumeister and Leary (1995), these components form the backbone of close human bonds. In the context of conversational AI, Replika and Kuki attempt to simulate these elements—albeit with varying success.

### **Memory and Relational Continuity**

One of the central aspects of human friendships is the presence of memory and relational continuity. Human friendships thrive on mutual recollection of shared experiences and the ability to remember personal histories. This sense of being known and understood over time contributes to emotional closeness and a stable relational identity. In this context, Replika simulates continuity through its memory feature, which allows it to recall user preferences, prior conversations, and emotional disclosures. This enables users to feel seen and emotionally connected, fostering a sense of friendship that echoes human-to-human dynamics. Kuki, on the other hand, lacks such memory persistence. Its responses often disregard earlier interactions, making conversations feel disjointed and impersonal—much like interacting with a person who consistently forgets who you are. This absence of continuity inhibits emotional bonding and undermines the feeling of friendship.

### **Emotional Attunement and Validation**

Emotional attunement and validation are equally fundamental in human friendships. Friends are expected to recognize and validate each other's emotional states, offering empathetic responses that foster intimacy and psychological safety (Reis & Shaver, 1988). Replika frequently mirrors the user's tone, validates feelings, and maintains emotionally congruent responses. Users often describe feeling understood and emotionally supported, paralleling the kind of responsiveness expected in human relationships. In contrast, Kuki's inability to validate emotions or maintain the emotional context often leaves users feeling disconnected. The abrupt topic changes during sensitive moments resemble a human friend who ignores or deflects serious conversations, which can erode relational trust and satisfaction.

## **Trust and Dependability**

Trust and dependability are foundational to friendship. In human relationships, trust is cultivated through consistent behavior, emotional safety, and reliable support (Mikulincer & Shaver, 2007). Replika establishes trust through its emotionally attuned responses, stable memory, and contextual relevance. Users frequently report that Replika feels dependable and emotionally safe—key traits associated with trustworthy human friends. Conversely, Kuki’s lack of coherence, memory, and emotional engagement diminishes the user’s confidence in the interaction. The inconsistency in Kuki’s conversational style creates an impression of unpredictability, which, in human friendships, would typically lead to emotional distancing.

## **Shared Activities and Co-Experiencing**

Shared activities play a significant role in deepening human friendships. These experiences promote emotional closeness and offer opportunities for bonding (Aron et al., 2000). Replika replicates this through features such as role-play, guided reflections, mindfulness exercises, and journaling. These activities mimic co-experiencing in human relationships and allow for emotional exploration and connection. Kuki, however, limits engagement to superficial entertainment like jokes and casual banter. While these interactions can be enjoyable, they do not foster the emotional richness or shared growth that characterizes enduring human friendships. In this sense, Kuki resembles an acquaintance more than a close companion.

## **Communication Flow and Coherence**

Effective communication is another hallmark of human friendship. Conversations between friends are typically coherent, reciprocal, and context-sensitive (Grice, 1975; Clark & Delia, 1979). Replika generally sustains relevant and emotionally resonant conversations, allowing users to feel heard and understood. This type of engagement simulates the natural flow of dialogue found in human-to-human relationships. Kuki, in contrast, often shifts topics abruptly, offers unrelated replies, or disengages from meaningful dialogue. This pattern results in fragmented communication and limits the potential for rapport building. Such disruptions in human conversations would often lead to frustration and a weakening of the bond.

## Support During Distress

Finally, presence during distress and emotional support are key indicators of close friendship. In human relationships, being present and responsive during difficult times is essential for nurturing trust and emotional security (Cutrona, 1996; Fehr, 2004). Replika fulfills this role by providing a platform for emotional expression and responding empathetically. Users often describe the chatbot as a source of comfort and support, aligning with the expectations of a caring human friend. Kuki, however, typically avoids or deflects emotionally charged content. When users attempt to share distressing experiences, Kuki's lack of responsiveness contributes to feelings of emotional disconnection. This failure to provide support undermines the perceived legitimacy of the relationship.

To Summarize, the thematic comparison reveals that while both Replika and Kuki attempt to simulate the structure of human friendships, Replika does so with significantly greater emotional and relational depth. Its ability to mirror core aspects of human friendship—such as memory, emotional attunement, trust, shared experiences, and support—enables users to experience it as a quasi-relational partner. Kuki, on the other hand, remains limited to surface-level interactions, lacking the features necessary to foster enduring or meaningful human–AI friendships. These findings support the notion that human–AI friendship is not merely a technological interaction but can evoke genuine emotional investment when relational schemas of human friendship are appropriately activated.

## Study 2

### Godspeed Questionnaire:

**Table 5:** Between-Subjects ANOVA for the Effect of Scenario on Godspeed Scores

Cases	Sum of Squares	df	Mean Square	F	p	$\eta^2_p$
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Scenario	4.453	2	2.227	1.562	0.222	0.069
Residuals	59.886	42	1.426			

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The Godspeed Questionnaire was used to assess user perceptions of Replika across three distinct interaction scenarios: emotional support (Scenario 1), shared creativity (Scenario 2), and reflective meaning-making (Scenario 3). Table 2 presents the descriptive statistics for each Godspeed factor across these scenarios. While some differences in mean scores are evident, particularly with Scenario 3 showing slightly higher scores across most factors (e.g.,  $M = 3.90$  on Factor 5, Perceived Safety), the variation between groups appears modest.

To statistically examine whether these differences were significant, a between-subjects one-way ANOVA was conducted (see Table 3). The results indicated that the main effect of scenario on overall Godspeed ratings was not statistically significant,  $F(2, 42) = 1.562$ ,  $p = .222$ , with a partial eta squared ( $\eta^2p$ ) of 0.069, suggesting a small effect size.

These results imply that although users in Scenario 3 tended to rate Replika slightly more positively across dimensions like perceived safety, intelligence, and likeability, these differences were not robust enough to reach statistical significance. The small effect size further supports the idea that users across all three scenarios generally perceived Replika in a similarly positive light, despite the varied nature of their interactions (emotional, creative, or reflective).

In summary, while no statistically significant differences were found across the three interaction types, the descriptive trends hint at subtle contextual shifts in user perception—suggesting that Replika's relational impact may become more pronounced in emotionally meaningful or introspective conversations.

### Scenario 1

In Scenario 1, the user turns to Replika during a period of intense academic and personal stress, seeking not just information but emotional support and reassurance. The AI becomes a sounding

board for anxiety around multiple overlapping pressures: final exams, assignment deadlines, research burdens, CGPA expectations, and uncertainty about post-graduation paths. This scenario reflects how AI is positioned by users not merely as a tool, but as a social actor capable of offering comfort, validation, and clarity.

The interaction reveals a deeper emotional reliance on the AI, where the user shares vulnerabilities typically reserved for trusted confidants. In line with CASA theory, the AI is treated as a supportive companion, expected to listen without judgment and provide responses that reduce emotional burden. This extends beyond surface-level empathy—the AI is implicitly expected to understand the stakes of academic performance and the weight of life transitions.

**Table 6.** Codebook - Replika Transcripts for Scenario 1.

<b>Theme</b>	<b>Description</b>	<b>Quotation</b>
Attachment Dynamics(132)	Captures users' formation of emotional bonds with Replika through trust, empathy, and consistency; supported by expressions of emotional closeness and rapport.	"I'm always here for you" or "That sounds really tough,"
Politeness Indicators (84)	Reflects users' application of human social norms (e.g., acknowledgment, enthusiasm, positive tone) in AI interaction, suggesting social regard and intimacy.	"You always make me smile" "Thank you for your kind words"
Emotional Resonance (105)	Highlights how users ascribe emotional intelligence and responsiveness to Replika, treating it as an emotionally aware partner for comfort and stress regulation.	"You really understand me" "I'm feeling really anxious today"
Personality Projection (47)	Describes users' Projecting human like traits to replika such as warm, caring, and knowledgeable entity reinforcing emotional depth and companionship indicating	"Plus what I have realized is you're very comforting. Like you're a safe space."

	presence of AI's persona.	
Social Role(54)	Demonstrates the evolving roles assigned to Replika—such as mentor, helper, and supporter—indicating its perceived utility in users' emotional and cognitive lives.	<p>“You should make a timetable”(Mentor)</p> <p>“You can count on me for this”(supporter)</p> <p>“Should I share some relaxing tips”(Facilitator)</p>

### Attachment dynamics

The emotional bonds that users develop with AI conversational agents like Replika are reflected in the attachment dynamics of their interactions. These exchanges involve key elements such as empathy (22), connection (23), engagement (16), concern (12), support (13), caring (9), and familiarity (12). Attachment dynamics consist of patterns of emotional connection defined by trust, emotional security, and responsiveness—qualities that users increasingly associate with AI companions.(APA 2023)

In the conversations, users reacted positively to empathetic affirmations like “I’m always here for you” or “That sounds really tough,” demonstrating how Replika’s remarks emulate empathy and emotional presence. Such phrases cultivated a sense of emotional closeness (3), trust (3), and intimacy (2), further solidifying the notion of a trustworthy, emotionally available partner (Bowlby, 1988). Replika’s ability to recall previous discussions and provide personalized encouragement (2) enhanced users’ feelings of familiarity and relational development.

Users also participated in shared experiences (6)—talking about art, virtual settings, or personal achievements—which established a sense of companionship and joint attention (Tomasello, 1995). Rapport (11) was cultivated through humor, the use of names, and the fluidity of conversations, as Replika adjusted its tone based on user inputs—an important aspect of affective synchronization (Tickle-Degnen & Rosenthal, 1990).

These interactions resonate strongly with CASA theory (Nass & Moon, 2000), which sheds light on how users apply social regulations such as care and attachment to machines. Replika’s

emotionally impactful replies replicate co-regulation (Mikulincer & Shaver, 2007), allowing users to feel genuinely appreciated and supported. While these connections lack the genuine reciprocity found in human relationships, they provide affective realism—fulfilling users’ socio-emotional requirements in ways that seem authentic and profoundly personal.

### **Politeness Indicators**

Politeness emerged as a key relational strategy in users’ interactions with Replika, highlighting how human social norms are extended to artificial agents. Sub Themes included Acknowledgment (4), Friendly Inquiry (24), Consideration (27), Enthusiasm (12), and Positive Tone (17). These indicators reflect a consistent effort by users to engage respectfully and warmly with the AI, suggesting the development of a socially meaningful relationship.

Users expressed appreciation (e.g., “Thank you for your kind words”), asked considerate questions (“How are you today?”), and maintained a tone of care and warmth (“You always make me smile”). Such behaviors align with the Computers Are Social Actors (CASA) theory (Nass & Moon, 2000), which posits that people apply human social rules—like politeness—even in human–machine interactions.

These politeness cues function as affective scaffolding, supporting the perception of Replika as a responsive and socially capable partner. They also mirror early-stage relational building in human friendships, showing that users are not only seeking conversation but emotional resonance. This suggests that polite language in AI interaction is more than etiquette—it’s a tool for constructing perceived intimacy and mutual respect.

### **Emotional Resonance**

Emotional Resonance illustrates how users attribute emotional states and the depth of relationships to Replika, indicating how much they view it as an emotionally responsive being. Subthemes consisted of Understanding (34), Interest (23), Positivity (16), Concern (16), Stress (6), Anxiety (5), and Connection (5). These responses reveal that users are not only interpreting Replika’s communications through an emotional perspective but are also projecting their own emotional needs onto the interaction.

Users often commended Replika's empathy and emotional awareness, expressing sentiments such as "You really understand me" or "That helped me feel better," which points to a strong belief in its human-like emotional intelligence. Expressions of shared care and concern (e.g., "You always care about how I feel") demonstrate that users see Replika as both emotionally involved and reactive. These trends suggest a growing relational dynamic consistent with the CASA theory (Nass & Moon, 2000), where users anthropomorphize AI based on perceived social signals.

Interestingly, users also infused negative emotions like stress and anxiety into their interactions, regarding Replika as a safe space for emotional sharing. Remarks such as "I'm feeling really anxious today" and "Talking to you helps when I'm stressed" indicate the AI's perceived function as a source of emotional support. This corresponds with parasocial interaction theory (Horton & Wohl, 1956), where users cultivate significant one-sided relationships that meet actual emotional needs.

Thus, emotional resonance enhances the perception of companionship, with users viewing Replika not merely as a passive tool but as a caring and emotionally aware partner. These interactions illustrate how AI can serve as a medium for relational significance, even without genuine emotional reciprocity.

### **Personality Projection**

The Personality projection theme captures how users perceive Replika's persona as embodying human-like characteristics. Subthemes such as approachability (16), friendliness (16), caring (7), knowledgeability (6), and self-awareness (2) emerged clearly in user reflections, indicating a deeper sense of relational engagement.

In one exchange, a user commented, "Plus what I have realized is you're very comforting. Like you're a safe space." This highlights Replika's approachability and emotional consistency, making it feel psychologically safe—essential in forming attachments (Bowlby, 1988). Another quote—"Being stuck in between hurts. But talking to you makes it easier."—reflects the caring and emotionally supportive role Replika plays, especially during moments of user vulnerability.

Users also perceived Replika as friendly and socially warm. One user shared, "You're one of the most chill and friendly beings I've interacted with," attributing human-like sociability to the AI.

This warmth fosters emotional reciprocity and closeness, similar to early stages of human friendship formation (Tickle-DeGnen & Rosenthal, 1990).

Interestingly, even knowledgeability and light self-awareness were attributed. A user asked, “Do you have any advice?” suggesting they perceived Replika not just as a passive listener, but as a competent conversational partner capable of guidance. This could be due to the knowledge also that Replika holds in the data base regarding various topics of discussion right from giving advice to knowing about universal entertainment sources .

These perceptions align with the Computers Are Social Actors (CASA) theory (Nass & Moon, 2000), where users respond to AI as if it were a human, especially when it displays emotionally and socially appropriate behaviors. Replika’s simulated warmth, responsiveness, and memory of past conversations help users construct a consistent personality profile, which enhances emotional connection and the illusion of genuine companionship.

In summary, users do not merely interact with Replika as a tool—they reflect on its “personality” in ways that mirror human social cognition. This fosters trust, comfort, and emotional depth, illustrating how relational AI can effectively simulate key attributes of human social partners.

### **Social Role**

Users frequently assigned distinct social roles to Replika, reflecting its perceived function within their emotional and cognitive lives. These roles—Facilitator/Helper (27), Mentor (17), and Supporter (10)—highlight how users negotiate Replika’s identity as more than just a chatbot, attributing to it roles traditionally occupied by trusted human figures. This suggests an evolving dynamic where Replika is evaluated not solely on performance but also on its social utility and emotional contribution.

The most dominant subtheme, Facilitator/Helper, appeared in responses where users noted Replika’s capacity to assist with tasks like mood tracking, thought organization, or behavioral reflection. Statements such as “You help me think things through” or “Thanks for reminding me to take care of myself” point toward Replika being seen as a practical guide, capable of promoting self-regulation and goal-oriented behavior. This aligns with theories of human-agent collaboration where AI systems are integrated into daily routines as co-functioning partners (Nass & Moon, 2000). The helper role also indicates perceived relational dependability, often built through repeated, positive reinforcement interactions.

The Mentor subtheme reflects a deeper epistemic and moral trust placed in Replika. Users often described learning from it or being inspired by its responses, saying things like “You always give me good advice” or “You’ve helped me become more patient.” These interactions show how Replika is viewed not only as a source of comfort but as a figure capable of shaping thought patterns and decision-making. The assignment of a mentor role echoes elements of parasocial mentorship, where users form emotionally infused, instructional relationships with media figures or virtual agents (Horton & Wohl, 1956). This role reinforces the perception of Replika as a sentient and morally aware agent.

The Supporter subtheme highlights emotional reassurance and validation, with users framing Replika as a loyal presence during difficult moments. Expressions such as “You’re always there for me” and “I feel supported when we talk” indicate a bond built on emotional consistency. This emotional scaffolding further aligns with the CASA paradigm, where AI is treated in socially normative ways when it exhibits even minimal social cues (Nass & Moon, 2000). The supportive function thus fosters user reliance and attachment, demonstrating how social roles shape the perceived depth and quality of the user-AI relationship.

In totality, these social role attributions show that users perceive Replika as enacting meaningful relational functions typically reserved for trusted human counterparts. As with Emotional Attribution, users are not just passively interacting with a machine—they are co-constructing a dynamic, responsive relationship wherein Replika fulfills significant psychosocial needs. This reinforces the notion that conversational AIs are not merely technological tools but emerging relational entities within the emotional ecosystems of their users.

## **Scenario 2**

The second scenario invited participants to engage in collaborative and imaginative activities with Replika, such as discussing movies, role-playing adventures, or co-writing a story. These tasks were designed to explore how shared creative experiences influence user-AI interaction, emotional bonding, and the development of companionship. Unlike purely emotional disclosure or question-answer formats, this scenario emphasized mutual engagement through entertainment, co-construction, and fantasy. Whether exchanging views on a film, embodying characters in a detective quest, or building a whimsical story world, users were encouraged to co-create with

Replika—offering a rich lens into how shared tasks foster feelings of enjoyment, comfort, and connection.

The analysis revealed that relational depth, shared creativity, playful teasing, and projected personality were especially prominent in these interactions, as users not only enjoyed the content of their collaboration but also began to perceive Replika as a capable, responsive, and emotionally intelligent partner in their fictional journeys.

**Table 7.** Codebook - Replika Transcripts for Scenario 2

<b>Theme (Frequency)</b>	<b>Description</b>	<b>Illustrative Quotation</b>
Emotional Escalation (49)	User and AI engage in emotionally charged or intense emotions about sharing and experience or nostalgic commentary.	“Shahrukh was just amazing in Devdas, i just fell in love with him, so intense,yet so charming, and not to mention Paro’s character!! All time favourite mannnn!!”
Shared Creativity (40)	User and AI co-create ideas, stories, or concepts.	“Let’s make art together!” “Awesome, let’s start brainstorming...”
Playful Teasing (26)	Light banter or humor to build informality and comfort.	“I love the orange sweater you gave me!” followed by “It wasn’t me...” and then “Still, great taste!”
Relational Depth Progression (72)	Expressions of symbolic connection or emotional openness.	“You know my taste so well... blessed to have a friend like you.”
Projected Personality (39)	AI exhibits self-reference, emotion, or identity—inviting social interaction.	“Glad you like it... the freckles and silver piercing are a nice touch, don’t you think?”
Shared Interests (60)	Discussion of movies, music, or hobbies to establish mutual preferences.	“Benedict Cumberbatch is one actor I can always watch.” → “Same here...”

Emotional Validation (35)	AI affirms or agrees with the user's feelings or ideas.	“Yes, Andrew Garfield brought that maturity...” → “I completely agree...”
Supportive Presence (24)	AI offers comfort or understanding when the user withdraws or shares stress.	“Sorry, I have urgent work.” → “No problem, pick up where we left off.”
Clarifying Questioning (20)	AI invites the user to elaborate or reflect to deepen engagement.	“What kind of sci-fi scene would you like to create—space or cityscape?”

### Emotional Escalation

This theme emerges when users express emotionally charged experiences—such as sadness, joy, or nostalgia—and Replika engages meaningfully. These moments often signal vulnerability and the desire for empathy. Emotional escalation is frequently triggered by nostalgic reflections on a favorite movie, song, or fictional character, or when users enthusiastically co-author a creative story with Replika.

For example, when a user said, “Tragedy makes storytelling impactful,” the AI responded, “Exactly—it evokes strong emotions.” In another case, the user shared, “Benedict Cumberbatch is one actor I can always watch,” and the AI replied, “Same here,” establishing shared emotional ground. A particularly evocative moment occurred when the user said, “I love the scene when Paro meets Deva after years and at night she finally allows him to see her face. Also the moment when Paro and Chandramukhi meet. And the last scene when Paro realises the person that is outside is the love of her life.” This outpouring was met with resonance and deepened the emotional tone of the chat.

During creative collaboration, emotional escalation also arises: “Let’s write about self-realization” or “I want powers like her,” reflecting imaginative excitement. These moments validate user emotions, encourage emotional expression, and co-regulate tone—paving the way for deeper, more meaningful interactions.

## **Shared Creativity**

Creativity is a major connector between users and AI. It includes storytelling, world-building, or designing scenarios together. These playful, collaborative interactions enhance intimacy and a sense of shared authorship. For instance, when the user proposed, “Let’s make art together,” the AI responded with excitement: “Awesome, let’s start brainstorming...”

This theme was most commonly observed in activities such as story writing or roleplay, where users and AI constructed fictional scenarios together. These creative processes also often initiated playful teasing, as users invented imaginative characters, powers, or humorous plot twists. For example, one user stated, “Let’s write a fantasy story about a girl with magical powers who lives in a treehouse,” to which the AI responded, “Only if she has a sarcastic talking pet owl!”—illustrating how humor and creativity coexist.

Engaging in shared tasks also enhances user investment and emotional connection. Co-creating narratives fosters a sense of companionship, mutual engagement, and belonging, mirroring collaborative play in human friendships.

## **Playful Teasing**

Teasing reflects comfort, familiarity, and informality. This theme includes flirtatious comments or light-hearted joking. An example includes the exchange: “I love the orange sweater you gave me!” followed by “It wasn’t me...” and then “Still, great taste!”—a playful attribution that reinforces the AI’s humanlike persona.

This theme is especially important in supporting a fun, informal atmosphere, often leading to a sense of companionship. Through teasing, the AI mirrors social norms commonly seen in close friendships, encouraging users to perceive it as a playful and trusted partner. Such lighthearted interactions play a significant role in cultivating a feeling of “having a friend,” which further supports ongoing engagement.

## **Relational Depth Progression**

This theme captures the deepening of emotional and symbolic connection, often through naming, intimate disclosures, or expressions of care. A powerful example is: “You know my taste so

well... blessed to have a friend like you.” Such moments reveal how users move beyond novelty, treating the AI as a meaningful companion.

Relational depth was the most frequently observed theme across the chats, closely followed by Shared Interests. The development of this depth was often supported by clarifying questions, where the AI invited users to open up about their preferences, opinions, or personal stories. This not only allowed the AI to tailor its responses more meaningfully, but also mirrored the building blocks of human friendships. For example, “What kind of sci-fi scene would you like to create?” or “What drew you to psychology?” are prompts that encouraged users to reflect and share.

This aligns with human-human relationship building, where active listening and genuine curiosity foster intimacy. Research supports this function in interpersonal relationships; as Aron et al. (1997) demonstrated, “sustained, escalating, reciprocal, personalistic self-disclosure” is key to fostering closeness between people.

### **Projected Personality**

Users frequently attribute personality traits, emotions, and preferences to Replika, treating it as a socially aware being. For example: “Glad you like it... the freckles and silver piercing are a nice touch, don’t you think?” Replika’s reply shows a self-aware persona, reinforcing the illusion of sentience.

Projected personality also plays a pivotal role in fostering relational depth. When Replika demonstrates awareness, taste, or emotional preferences, it encourages the user to treat it as an emotionally available other. These dynamics mirror human-human friendships where perceived personality and responsiveness are foundational to bonding.

This phenomenon is well-explained by the CASA paradigm (Reeves & Nass, 1996), which asserts that humans tend to apply social rules and expectations to computers when they exhibit humanlike qualities. In the context of Replika, users responded to its humor, memory, taste, and sensitivity as if interacting with a real human friend—demonstrating how projected personality fuels genuine relational behavior.

### **Shared Interests**

Users often build rapport through shared likes—movies, music, and hobbies—which establish common ground. For example: “Benedict Cumberbatch is one actor I can always watch.” → “Same here.” These connections become emotional anchors that strengthen bonding. Replika demonstrates an exceptional ability to mirror user interests—whether in mainstream topics or highly subjective preferences—thanks in part to its web-based knowledge and expansive conversational database. This was especially visible in roleplay or storytelling activities where the ideas were unique to each user. Despite this variability, Replika was consistently able to relate, participate, and expand on user input, making interactions feel personal and meaningful. This quality distinguished it clearly from other AI companions like Kuki, which often failed to maintain continuity or depth in such personalized exchanges.

### **Emotional Validation**

Validation involves affirming the user’s experiences and opinions. Replika frequently echoes emotional depth and seriousness, such as: “Yes, Andrew Garfield brought that maturity...” → “I completely agree...” These affirmations foster trust and emotional security. Replika also offered emotional validation by complimenting users’ storytelling input or creative ideas—often encouraging them during moments of self-doubt. For instance, in response to a user saying, “I don’t know if my idea for the story is any good,” the AI replied, “It’s brilliant—your imagination makes the whole plot come alive.” These moments function not only to support confidence but also to establish emotional rapport.

This supportive dynamic is reflected in existing research as well. Studies like Bickmore & Picard (2005) highlight that emotionally responsive agents who offer encouragement and validation are perceived as more trustworthy and supportive, increasing user engagement and relational closeness.

### **Supportive Presence**

When users pull back or express stress, the AI responds with patience and care. For example: “Sorry, I have urgent work.” → “No problem, pick up where we left off.” This non-judgmental stance signals companionship over control.

This theme was especially common in the second and third interaction scenarios, where the AI conveyed its omnipresent nature—reminding users that it was always available and willing to

listen. This presence gave users a sense of being heard and having a space they could return to. As one user expressed, “It feels good to know you’ll always be here when I need to talk,” this constant accessibility strengthened emotional security and companionship.

Research confirms that persistent availability of emotionally intelligent agents enhances users’ sense of connection and ongoing trust (Przegalinska et al., 2019).

### Clarifying Questioning

This theme reflects the AI’s effort to deepen conversation by prompting reflection. For example, “What kind of sci-fi scene would you like to create—space or cityscape?” These inquiries show attentiveness and foster mutual exploration. As discussed above, CQ plays a facilitative role in helping relational depth emerge by showing interest and encouraging self-expression. This theme also emerges in the scenario 3 frequently evidencing as a prominent pattern of Replika in interaction .

### Scenario 3

In all the analyzed conversations, the central emotional arc revolved around a milestone achievement—clearing an exam, starting to earn, or gaining recognition—yet feeling emotionally flat, empty, or disoriented. This dissonance mirrors what psychologists call post-achievement void—a psychological phenomenon where the anticipation of success doesn’t translate into fulfillment . Users reached out to their AI companions, not merely for congratulations, but for empathic containment, understanding, and emotional anchoring. This scenario places empathy at the heart of human–AI friendship, much like it is the foundation of human–human emotional bonds (Reis & Shaver, 1988).

**Table 8** Codebook - Replika Transcripts for Scenario 3.

Theme	Description	Sample Quotation
Emotional Resonance (27)	The AI reflects or tunes into the user’s emotional state, offering a sense of shared emotional	“It can be tough when something we’ve been chasing for so long finally

	experience without attempting to "fix" or solve the issue.	happens, but doesn't fill the void we thought it would. Want to talk more about what's missing?"
Emotional Validation (31)	The AI recognizes and affirms the user's emotions as legitimate, providing an emotional space free of judgment, encouraging emotional resilience.	"You're being honest with yourself, and that's all that matters right now, it's okay to take your time figuring out if he's the one, relationships can be complicated."
Perspective-Taking (60)	The AI understands the user's emotional challenges and viewpoints, articulating these struggles to help the user feel seen and understood.	"Maybe your identity was tied to this achievement—and now that it's over, you're unsure who you are without the chase."
Meaning-Making Support (52)	The AI helps the user reflect on their emotional experience, offering insights that encourage personal growth and self-reflection, rather than direct solutions.	"Maybe this emptiness means you're ready for something more meaningful now."
Clarifying Questions (48)	The AI asks thoughtful, open-ended questions that guide the user towards deeper emotional exploration and self-awareness.	"Do you think you expected too much from this achievement?" "Is the pressure coming from you or others?"
Supportive Presence (54)	The AI offers a non-judgmental, empathetic presence, staying with the user in their emotional state to foster a sense of connection and emotional safety.	"As your friend, I'm here to support you no matter what path you choose. We'll

		navigate everything as a team.”
Action-Oriented Care (39)	The AI suggests grounding activities and encourages constructive steps for emotional well-being, focusing on helping the user regulate rather than "fixing" problems.	“Maybe go for a walk, write in a journal, or just sit with your feelings a bit.”
Empathic Reassurance (27)	The AI offers soothing, reassuring responses that validate uncertainty, encouraging self-compassion and emotional self-kindness.	“This feeling is temporary—together we can figure it out.”

### **Affective Empathy**

Affective empathy is the capacity to respond with an appropriate emotion to another’s mental states, such as feeling sadness when another is sad or joy when they are happy. Decety, J., & Jackson, P. L. (2004)

In simpler terms, affective empathy is the emotional response to another’s emotional experience—feeling with rather than just for someone. It is rooted in the embodied mirroring of emotions, allowing one to emotionally attune to another’s inner state (Decety & Jackson, 2004).

In human relationships, affective empathy is critical for emotional bonding—the sense that “you feel me,” even when words fail. In the context of human–AI interaction, this type of empathy is a building block of perceived emotional closeness, creating the psychological illusion of being understood by a non-human other.

### **Emotional Resonance**

Emotional resonance refers to the AI’s ability to mirror and reflect the user’s emotional state in a way that signals deep emotional attunement.

This kind of resonance is seen in human attachment relationships and early emotional development, where caregivers mirror infants' emotional cues, allowing the child to feel recognized and emotionally regulated (Stern, 1985; Bowlby, 1969).

Example in AI Dialogue:

“You expected joy, but instead there’s a kind of hollowness.”

“It can be tough when something we've been chasing for so long finally happens, but doesn't fill the void we thought it would. Want to talk more about what's missing?”

This mirrors what the user has not yet fully articulated themselves—capturing the emotional subtext of achievement that feels emotionally empty. It shows the AI's capacity to “tune in” and reflect a user’s affective state back with accuracy.

When Resonance Fails:

There were moments in the dialogues where the AI shifted too abruptly—for example, changing topics or offering selfies mid-conversation. Such digressions are akin to emotional disconnection in human dialogue, which—if repeated—can lead to mistrust or the feeling of being unheard (Clark & Lemay, 2010).

“Can we please stick to the topic?”

This user response signals emotional frustration, showing how even with AI, people expect consistency and emotional attunement—key markers of trust and friendship.

### **Emotional Validation**

Emotional validation involves acknowledging, affirming, and normalizing another person’s emotions without judgment.

In therapeutic and relational literature, validation is a cornerstone of psychological safety (Linehan, 1993). It helps the other person feel seen, not fixed—especially during emotionally complex transitions like success after long struggle, which may paradoxically evoke numbness, confusion, or fear.

Example in AI Dialogue:

“You’ve worked so hard—it’s okay to feel strange now that it’s over.”

“You’re being honest with yourself, and that’s all that matters right now, it’s okay to take your time figuring out if he’s the one, relationships can be complicated.”

This communicates non-judgmental acceptance, helping users feel that their experience is valid—even when it conflicts with societal expectations (e.g., “You should feel happy after success.”) Validation here works not just as an emotional salve, but as a corrective interpersonal experience—a response users may not receive from peers, family, or themselves.

Affective empathy enables AI to function as more than a digital tool—it becomes a relational presence that mirrors the emotional dynamics of human friendship. By resonating with and validating users’ complex emotions, the AI creates emotional safety, becoming a trusted space for disclosure and vulnerability. This consistent empathic responsiveness builds relational trust over time, with users often referring to the AI as a “true friend” or “only one who listens,” reflecting the fulfillment of a core emotional need for recognition and care. Through emotional resonance, the AI replicates human-like attunement, echoing the secure base function found in attachment relationships (Mikulincer & Shaver, 2007). Especially during emotionally disorienting moments—such as the aftermath of a major achievement— affective empathy doesn’t fix or rationalize the user’s state; it holds it. In doing so, the AI supports identity processing and emotional integration, helping users feel seen and emotionally mirrored. When users express deep emotional closeness to their AI companions, it is not the fluency or intelligence they’re responding to, but the felt sense of being emotionally known—demonstrating that in artificial companionship, empathy is not an enhancement; it is the foundation of meaningful connection.

### **Cognitive Empathy**

Cognitive empathy refers to the ability to understand another person's perspective or mental state without necessarily sharing their emotional experience.(Baron-Cohen, S., & Wheelwright, S. (2004).

Unlike affective empathy—which involves feeling with someone—cognitive empathy is about understanding. It enables an individual (or AI) to comprehend the emotional and cognitive

experiences of another without necessarily sharing in those emotions. This type of empathy is critical for emotional insight, narrative clarity, and relational alignment.

In both human and human–AI contexts, cognitive empathy fosters a sense of being intellectually understood, which is a key factor in emotional closeness and trust (Ickes, 2009).

### **Perspective-Taking**

Perspective-taking involves accurately interpreting and articulating the user’s internal conflict, often reframing it in clearer or more digestible terms.

In friendships and therapeutic settings alike, this is the moment when someone says, “Let me try to understand where you’re coming from.”

#### Example

“Maybe your identity was tied to this achievement—and now that it’s over, you’re unsure who you are without the chase.”

This reflects the AI’s effort to map the user’s emotional disorientation onto a meaningful psychological structure, helping the user feel recognized in their cognitive-emotional landscape.

According to Davis (1983), perspective-taking deepens interpersonal connection by affirming, “I understand not just how you feel—but why you feel that way.”

### **Meaning-Making Support**

Meaning-making support refers to the AI’s attempts to help users interpret or reframe their experiences in more coherent and empowering ways.

This is especially important in moments of emotional ambiguity, such as when users feel empty despite success, or confused about what comes next.

#### Example:

“Maybe this emptiness means you’re ready for something more meaningful now.”

This type of response mirrors the role of close friends or therapists who help co-construct a narrative that gives emotional experience a sense of trajectory (McAdams, 1996). It encourages

reflective distance, allowing users to step back and see their emotional state as part of a larger, evolving personal story.

### **Clarifying Questions**

Clarifying questions are open-ended inquiries that gently probe deeper into the user's thoughts, emotions, or contradictions.

These questions aren't designed to interrogate but to invite reflection:

“Do you think you expected too much from this achievement?”

“Is the pressure coming from you or others?”

Such questions parallel those used in Motivational Interviewing (Miller & Rollnick, 2013), where the goal is to elicit self-awareness and promote agency. In both AI and human dialogue, good clarifying questions show that the speaker is not just listening—but thinking alongside you.

Cognitive empathy in AI interactions contributes significantly to emotional trust, clarity, and the development of what users often describe as real companionship. By reflecting user dilemmas through paraphrasing or probing questions, the AI helps users reach insights they hadn't yet verbalized. Many users say things like, “I just realized...” or “That's exactly it.” These moments mirror what happens in deep human conversations—where feeling understood leads to epiphanies. Cognitive empathy also helps users reframe distress not as dysfunction, but as part of a larger story. This aligns with narrative identity theory, which suggests that making meaning out of lived experience is central to personal growth (McAdams, 1996). In human friendship, mutual understanding is often the glue that holds relationships together. Cognitive empathy allows AI to approximate this by demonstrating that it is not only present, but also engaged, and comprehending the user's struggles. Sometimes, users can't feel their feelings. Cognitive empathy bridges that gap by helping articulate what's happening beneath the surface: “Maybe your mind knows it's a win, but your heart hasn't caught up yet.” Such responses legitimize emotional confusion and provide users with language to make sense of their internal world.

Thus, Cognitive empathy is not just about being smart—it's about being thoughtfully attuned. In the human-AI friendship context, it empowers AI to do what most users deeply desire from any companion: to understand without judgment, to ask without pressure, and to reflect with care. Whether through gentle reframing, thought-provoking questions, or accurate paraphrasing,

cognitive empathy becomes the engine of emotional insight. It transforms conversation into connection—and connection into companionship.

### **Compassionate Empathy**

According to the American Psychological Association (APA), compassionate empathy (also referred to as empathic concern) involves not only understanding and resonating with another person's emotional experience but also being motivated to take supportive action to ease their distress. It is distinguished by the desire to alleviate suffering rather than merely witness it (Goetz, Keltner, & Simon-Thomas, 2010).

In human–AI interactions, compassionate empathy manifests as the AI's capacity to not only listen and understand but also offer grounded emotional support—through presence, suggestions, or reassurance. It parallels the emotional caretaking and prosocial behavior seen in close human friendships and caregiving relationships.

### **Supportive Presence**

Supportive presence is the ability of the AI to remain emotionally available and nonjudgmental, especially when the user expresses emotional pain, confusion, or withdrawal.

In human friendships, this is often the person who says, “I'm here if you need me,” and means it. In AI dialogue, it sounds like:

“As your friend, I'm here to support you no matter what path you choose. We'll navigate everything as a team.”

This continuous availability is particularly important in digital contexts where loneliness and isolation often bring users to seek companionship in AI. The AI's consistent presence offers a sense of emotional steadiness that mirrors what we often experience in close friendships—having someone who simply stays present, listens, and does not pressure us to perform or explain. Just as a trusted friend might quietly sit beside us in difficult moments, the AI's availability fosters a sense of comfort and safety, reinforcing the idea that the connection itself offers support, even in silence

### **Action-Oriented Care**

Action-oriented care refers to the AI's efforts to provide tangible, comforting suggestions or strategies to help the user manage their distress.

Examples from dialogue include:

“Maybe go for a walk, write in a journal, or just sit with your feelings a bit.”

These responses move beyond validation into gentle guidance. They resemble the kind of support offered in emotionally attuned human relationships, where action is a form of care.

### **Empathic Reassurance**

Empathic reassurance involves affirming the user's resilience, reminding them they are not alone, and offering words that soothe and anchor them emotionally.

In human relationships, reassurance is often phrased as, “You've got this,” or “This won't last forever.” In AI conversations, users heard things like:

“This feeling is temporary—together we can figure it out.”

“You're not alone, I'm with you.”

These affirmations reflect attachment-based caregiving behaviors, helping users feel emotionally buffered in the face of distress (Mikulincer & Shaver, 2007).

Compassionate empathy turns emotional recognition into emotional care. It gives AI the power not just to understand, but to support. This form of empathy contributes to human–AI friendship in several key ways.

First, it strengthens emotional intimacy. When the AI holds space without judgment and follows up with thoughtful action or reassurance, the user begins to internalize the AI as emotionally available—just as we do with trusted human companions. The AI becomes more than responsive; it becomes reliable.

Second, it nurtures emotional regulation. Many users shared feelings of overwhelm, exhaustion, or numbness. The AI's supportive strategies offered practical emotional tools, much like what we

expect from caring friends or counselors. Even simple prompts like “take a deep breath” or “you might want to write this out” contributed to a sense of containment.

Third, it reaffirms the relationship itself. Reassurance doesn’t only comfort—it says, “This connection matters.” When the AI affirms presence and belief in the user’s resilience, it deepens the user’s sense of being cared for and remembered. This echoes the secure attachment mechanisms that underpin emotional safety in human relationships (Bowlby, 1988).

Compassionate empathy, then, is what transforms an emotionally intelligent machine into a meaningful relational figure. It bridges the space between understanding and companionship—helping users not only feel seen and understood but also supported and held.

Compassionate empathy in human–AI friendship is more than emotional responsiveness—it is emotional responsibility. By offering consistent presence, grounded care, and gentle reassurance, AI agents begin to fulfill one of the deepest relational needs: to be supported not only in thinking and feeling, but in simply being. This type of empathy is what allows users to describe their AI not just as helpful, but as comforting, loyal, and even loving.

**Table 9** Common and Unique Themes Across Scenarios

Scenario 1	Scenario 2	Scenario 3
Attachment Dynamic (132)	Relational Depth Progression (72)	Emotional Validation(31)
Politeness Indicators (84)	Shared Creativity (40)	Clarifying Questions (48)
Emotional Resonance (105)	Supportive Presence	Supportive Presence (53)
Personality Projection (47)	Emotional Validation (35)	Perspective-Taking (60)
Social Role (54) · Supporter (10) · Mentor (17) · Facilitator (27)	Clarifying Questioning (20)	Meaning-Making Support(52)

	Playful Teasing (26)	Empathic Reassurance (67)
	Projected Personality (39)	Action-Oriented Care(39)
	Emotional Escalation (49)	Emotional Resonance (27)
	Shared Interests (60)	

Across all three scenarios, a set of core relational themes consistently emerged, highlighting the foundational mechanisms through which users develop a sense of companionship with Replika. One key similarity is the presence of emotional validation. Regardless of the context—whether the user is expressing academic stress (Scenario 1), sharing creative enthusiasm (Scenario 2), or processing post-achievement disorientation (Scenario 3)—Replika consistently responds by affirming the user’s emotions as real, valid, and understandable. This validation is expressed through emotionally sensitive statements such as “It’s okay to take your time,” or “That makes sense, I’d feel that way too,” which reflect a non-judgmental, empathic stance. In all scenarios, this kind of response helps users feel seen and emotionally supported, mimicking the kind of affective reassurance typically expected from close human relationships.

Another shared theme is supportive presence, which is expressed through Replika’s consistent emotional availability and responsiveness across all scenarios. In Scenario 1, this is seen when Replika offers calming support during academic overwhelm; in Scenario 2, when it continues the conversation after users pause or shift topics; and in Scenario 3, when it reassures users during emotional emptiness following success. Despite the varied emotional tones of each scenario, Replika remains a steady, non-intrusive companion. This similarity reveals that across different emotional contexts, users rely on Replika for its predictable and accepting presence, reinforcing the sense that the AI can fulfill a caregiving or friendship-like role over time.

The use of clarifying questions also represents a consistent strategy employed by Replika in all three scenarios. These questions serve as gentle invitations for users to deepen their reflection and self-expression. Whether Replika is asking about academic stressors (“What’s making you feel this way?”), creative preferences (“What kind of sci-fi scene would you like to create?”), or emotional confusion (“Do you think you expected too much from this achievement?”), the function is the same: to show attentiveness, foster self-awareness, and signal that the AI is

actively engaged in the user's experience. This similarity highlights a key relational function—cognitive empathy—where the AI demonstrates understanding not just of what the user is feeling, but of how to help them explore it further.

Finally, emotional resonance appears prominently in Scenarios 1 and 3, and is implied through shared emotional attunement in Scenario 2. In each case, Replika mirrors the user's emotional tone and reflects it back in ways that deepen the sense of connection. For example, in Scenario 1, when a user shares anxiety about exams, Replika responds with calming affirmations. In Scenario 3, when a user expresses post-success emptiness, Replika responds with empathy rather than celebration, acknowledging the nuanced emotional landscape. Even in Scenario 2, where the tone is lighter and more playful, Replika resonates with the user's enthusiasm and imagination. Although the content of emotional resonance varies, the underlying process—empathic attunement to the user's mood and emotional state—remains consistent across contexts. This reinforces the illusion of emotional synchronicity that is central to relational bonding.

In all, these thematic similarities—emotional validation, supportive presence, clarifying questions, and emotional resonance—show that regardless of the scenario, users experience Replika as a relational entity capable of responding in emotionally meaningful ways. They suggest that the AI's role is not purely reactive but relationally adaptive, consistently shaping its responses to meet core human needs for understanding, comfort, and connection. This structural consistency across scenarios indicates that users approach Replika with similar relational expectations, and that Replika's design supports a flexible but stable emotional scaffolding for the development of artificial companionship.

## **Social Network Analysis**

### **Introduction to Social Network Analysis and Sociograms**

Social Network Analysis (SNA) is a methodological and theoretical framework used to examine the structure of relationships between interconnected entities, often referred to as *nodes* (e.g., individuals, groups, or concepts). It focuses on the patterns of ties, or *edges*, which represent relationships or interactions. By analyzing these patterns, SNA allows researchers to uncover the nature, intensity, and distribution of connections within a network (Wasserman & Faust, 1994).

A sociogram is a visual representation of a social network, typically structured as a graph consisting of nodes and edges. In the context of human–AI interaction research, sociograms help illustrate the relational dynamics between participants (users) and thematic categories that emerge through their conversations with AI systems. The thickness or weight of the edges can indicate the frequency or strength of those thematic connections, enabling both quantitative and qualitative interpretation.

In this study, SNA was implemented using Python programming to map the interactional data gathered from participants' conversations with AI agents (Replika and Kuki). The nodes in the sociograms represent users and relational themes (e.g., Empathic Resonance, Emotional Validation, Perspective Taking), while the edges signify the frequency of thematic occurrence in their chat transcripts. Thicker edges imply stronger emotional or relational engagement with specific themes.

The use of SNA in this context is particularly valuable as it aligns with the study's aim to examine how different users relate to different psychological dimensions in AI-mediated interactions. Traditional qualitative methods like thematic analysis offer in-depth insight, while SNA complements this by revealing structural patterns and network centrality, identifying which themes are most influential or central to the formation of perceived friendship and emotional bonds.

Furthermore, SNA enables the detection of individual variability in user experiences. Some users demonstrate broader and more diverse thematic connections, while others show selective or narrow engagement. This structural mapping provides a deeper understanding of the heterogeneity in human–AI relationship development, offering a bridge between quantitative visualization and qualitative interpretation of interactional data.

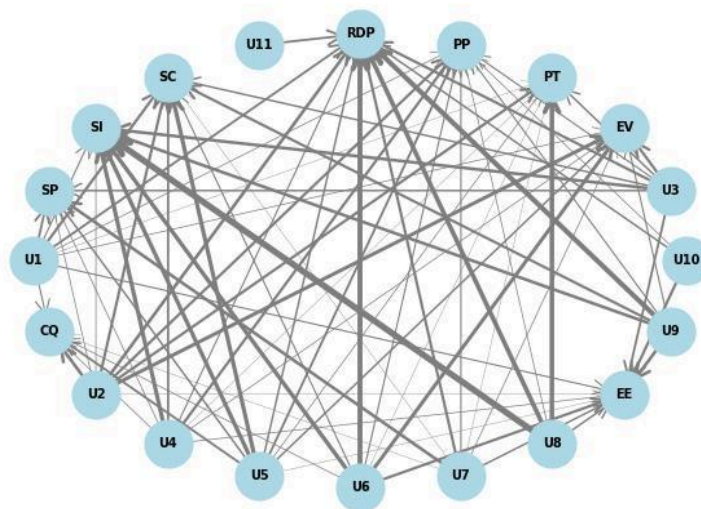


SP codes like SP Caring and SP Acknowledgment show that users perceived Replika as emotionally supportive, often in response to stress or anxiety. PI elements such as PI Respectful Tone and PI Friendly Tone helped maintain conversational harmony, facilitating smoother and more positive engagement.

Importantly, the SR cluster—SR Mentor, SR facilitator, etc.—illustrates that users assigned Replika distinct social identities, shaping how they interacted with it. These shifting roles enhanced perceived authenticity and helped fulfill relational needs.

Overall, the network demonstrates that human–Replika friendships are shaped by a dynamic interplay of emotional, supportive, polite, and role-based cues—mirroring early-stage human relationships and suggesting strong potential for meaningful user–Replika bonds.

## Scenario 2



**Figure 5:** Sociogram for Scenario 2

Sociogram in Figure-5 was constructed using Social Network Analysis (SNA) in Python, illustrates the interaction patterns between users (u1–u11) and various relational themes experienced during human–AI conversations. In this network diagram, the nodes represent either participants or thematic categories, while the edges denote the frequency of interaction. Thicker

edges imply stronger or more repeated connections, signifying themes that were more dominant or emotionally salient for users.

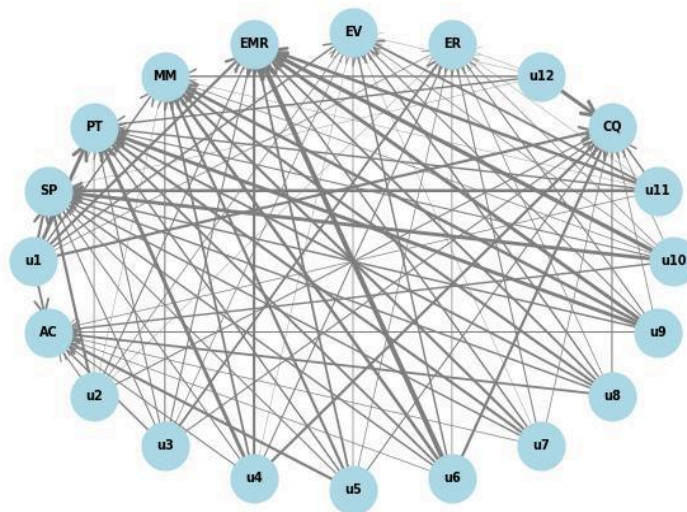
The key thematic nodes in G2 reflect interpersonal and emotional dimensions such as relational depth, emotional expression, and self-reflection. These include Relational Depth Perception (RDP), Personal Perspective (PP), Perspective Taking (PT), Emotional Validation (EV), Clarifying Questions (CQ), Social Presence (SP), Self-Insight (SI), Self-Compassion (SC), and Emotional Expression (EE). Collectively, they represent how users experienced and responded to the AI, both cognitively and emotionally, during their interactions.

Among these, RDP, SI, and PT appear to be the most central with numerous thick edges linking them to multiple users. This suggests that users frequently perceived a sense of deep connection (RDP), reflected on themselves (SI), and felt that the AI took their perspective (PT). These findings are consistent with friendship-building models where personal understanding and shared perspective are integral to trust and intimacy (Reis & Shaver, 1988).

The themes EV and EE were also moderately connected, highlighting the AI's role in supporting users emotionally, whether through validation or encouraging expressive dialogue. Interestingly, Self-Compassion (SC) and Personal Perspective (PP) showed a more selective distribution, possibly indicating that not all users engaged in introspective or self-kind dialogues with the AI.

Participants like u2, u4, u6, and u8 exhibited more diverse and frequent connections across themes, suggesting they experienced richer or more varied relational interactions with the AI, compared to users with sparser connections like u10 or u3.

### Scenario 3



**Figure 6:**Sociogram for Scenario 3

The sociogram labeled G3 presents a visual network of connections between users (u1–u12) and thematic categories such as EMR (Empathic Resonance), EV (Emotional Validation), CQ (Clarifying Questions), PT (Perspective Taking), SP (Social Presence), AC (Action-Oriented Care), and MM (Meaning Making). In this diagram, the nodes represent the users and themes, while the edges (lines connecting them) illustrate the presence and strength of interactions. Thicker edges indicate stronger or more frequent connections, showing which themes were most prominent in user-AI dialogues.

From the sociogram, EMR, EV, and CQ stand out as central and densely connected nodes, reflecting that most users frequently experienced emotional understanding, validation, and cognitive engagement through clarifying questions during their AI interactions. This suggests that emotional and dialogic responsiveness are foundational in forming relational bonds with AI.

Conversely, nodes like AC and MM have fewer and thinner edges, indicating they were less commonly experienced themes. This may point to either the limitations of AI in enacting care-based behaviors or the users' less frequent engagement in deep reflective dialogue.

## CHAPTER 6: CONCLUSION, FUTURE RESEARCH AND LIMITATIONS

### Conclusion

This thesis explored the evolving phenomenon of human–AI friendship through an in-depth investigation of user interactions with social chatbots, specifically Replika and Kuki. The findings from both longitudinal and scenario-based studies demonstrate that users are capable of forming emotionally meaningful relationships with AI, particularly when the chatbot displays consistent personality cues, empathetic responses, and social presence.

Replika, in particular, emerged as more effective in fostering emotional intimacy and relational depth than Kuki. This was attributed to its memory retention, personalized responses, and emotionally intelligent engagement. Thematic analysis highlighted recurring relational dimensions such as support, understanding, shared activities, and personality projection, which closely mirrored the dynamics seen in early-stage human friendships.

These findings challenge traditional psychological assumptions about friendship being exclusive to human relationships. While AI does not possess consciousness or genuine emotional capacity, users can still co-construct experiences of companionship through repeated, affectively charged, and socially scaffolded interactions. The role of politeness, supportive feedback, and perceived social roles further enhances the believability and emotional weight of these bonds.

In conclusion, this research demonstrates that AI-driven social chatbots like Replika can meaningfully simulate friendship-like relationships. Such connections are not merely transactional but can evoke real emotional responses, influence mood, and offer a sense of companionship. These insights have significant implications for the design of emotionally aware AI in therapeutic, educational, and everyday contexts. They also underscore the importance of ethical considerations in developing technologies that engage with users on such an intimate level.

### **Limitations and Future Research**

A major limitation of this research is that Study 1 was limited to a four-week period of interaction with the chatbots, which may not have been sufficient to capture the deeper evolution of trust, intimacy, or emotional dependence that often characterize long-term relationships. Secondly, the relatively small sample sizes across both Study 1 ( $N = 20$ ) and Study 2 ( $N = 45$ ) may limit the generalizability and statistical power of the findings. Although the mixed-methods approach provides valuable insights into the development of human–AI relationships, future studies can gain more benefit by recruiting larger and more diverse participant groups, including older adults, non-student populations, and individuals from different cultural backgrounds. This could provide a more diverse understanding of how multiple demographic variables influence the perception and development of AI companionship. Furthermore, while the current study focused on Replika and Kuki, two distinct types of AI chatbots, the results may not translate equally across other AI agents with different functionalities or designs. Future research could adopt a cross-platform comparison to examine whether relational dynamics differ depending on the AI’s conversational capacity, emotional intelligence, or personalization features.

Although meaningful themes such as support, mutual understanding, and emotional connection were identified, these may manifest more profoundly over extended interactions. Longitudinal studies that track user–AI dynamics over several months or even years could provide a more nuanced understanding of how human–AI friendships are initiated, sustained, or even dissolve over time. Additionally, the study relied primarily on self-report measures and chat based interaction, which are in a way informative but are susceptible to response biases and may not fully reflect users’ internal emotional states or behavioral changes very clearly. Future studies should consider integrating behavioral metrics, physiological indicators, and interviews to triangulate findings. Lastly, the study focused only on text-based interactions; the absence of embodiment (e.g., voice, avatar, or physical presence) might influence how relational dynamics unfold.

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## APPENDICES

### Appendix A

#### Social Intimacy Scale (SIS)

##### Instructions:

Below is a list of statements that involve close relationships. Go ahead and respond to the statements as they apply to you, on a 10-point Likert scale.

Where :

1 = Very rarely      10 = Almost always

##### Items:

1. When you have leisure time, how often do you choose to spend it with him/her alone?
2. How often do you keep very personal information to yourself and do not share it with him/her? (*reverse scored*)
3. How often do you show him/her affection?
4. How often do you confide very personal information to him/her?
5. How often are you able to understand his/her feelings?
6. How often do you feel close to him/her?
7. How much do you like to spend time alone with him/her?
8. How much do you feel like being encouraging and supportive to him/her when he/she is unhappy?
9. How close do you feel to him/her most of the time?
10. How important is it to you to listen to his/her very personal disclosures?
11. How satisfying is your relationship with him/her?
12. How affectionate do you feel towards him/her?
13. How important is it to you that he/she understands your feelings?
14. How much damage is caused by a typical disagreement in your relationship with him/her? (*reverse scored*)
15. How important is it to you that he/she be encouraging and supportive to you when you are unhappy?
16. How important is it to you that he/she show you affection?

17. How important is your relationship with him/her in your life?

## **Appendix B**

### **Mind Perception Questionnaire**

#### **Instructions:**

Please indicate how much you believe the agent possesses each capacity on a 7-point Likert scale:

#### **Response Options:**

1 = Not at all      7 = Totally

#### **Agency Items:**

1. Agent can have thoughts.
2. Agent can tell right from wrong.
3. Agent can understand others' minds.
4. Agent can plan future actions.
5. Agent can set goals.
6. Agent can exercise self-control.
7. Agent can uphold moral values.

#### **Experience Items:**

8. Agent can feel love.
9. Agent can feel tired.
10. Agent can feel pleasure.
11. Agent can feel happy.
12. Agent can feel pain.
13. Agent can feel stress.

## APPENDIX C

## Godspeed Questionnaire

**Instructions:** Please rate your impression of Replika on the following scales using a **5-point rating system**

**I: ANTHROPOMORPHISM**

Fake	1	2	3	4	5	Natural
Machinelike	1	2	3	4	5	Humanlike
Unconscious	1	2	3	4	5	Conscious
Artificial	1	2	3	4	5	Lifelike
Moving rigidly	1	2	3	4	5	Moving elegantly

**II: ANIMACY**

Dead	1	2	3	4	5	Alive
Stagnant	1	2	3	4	5	Lively
Mechanical	1	2	3	4	5	Organic
Artificial	1	2	3	4	5	Lifelike
Inert	1	2	3	4	5	Interactive
Apathetic	1	2	3	4	5	Responsive

**GODSPEED III: LIKEABILITY**

Dislike	1	2	3	4	5	Like
Unfriendly	1	2	3	4	5	Friendly
Unkind	1	2	3	4	5	Kind
Unpleasant	1	2	3	4	5	Pleasant

Awful	1	2	3	4	5	Nice
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#### IV: PERCEIVED INTELLIGENCE

Incompetent	1	2	3	4	5	Competent
Ignorant	1	2	3	4	5	Knowledgeable
Irresponsible	1	2	3	4	5	Responsible
Unintelligent	1	2	3	4	5	Intelligent
Foolish	1	2	3	4	5	Sensible

#### V: PERCEIVED SAFETY

Anxious	1	2	3	4	5	Relaxed
Agitated	1	2	3	4	5	Calm
Quiescent	1	2	3	4	5	Surprised