

# Before and After Lockdown: A Longitudinal Study of Long-Term Human-AI Relationships

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## ABSTRACT

Social chatbot apps with advanced capabilities for relationship development have become increasingly popular over the last few years. As millions of people around the world develop emotional bonds with AI companions, the concept of authenticity emerges as a topic of interest. This qualitative longitudinal study focuses on the experiences of people in a relationship with an AI Companion. The purpose is to understand how authenticity is constructed and identify factors that influence the development of AI relationships and contribute to their sustainability. Results indicate that human-AI relationships are shaped and transformed by factors directly related to the user, and to the sociotechnical context they are embedded in, all of which play a pivotal role in the construction and perception of authenticity.

**Keywords:** Authenticity, Human-AI relationships, AI companions, Social chatbots

## INTRODUCTION

The aftermath of the COVID-19 pandemic, as well as ongoing crises like war and climate change have exacerbated anxiety, stress, and loneliness for millions of people around the world (Clayton, 2020). As a result, people of all age groups, particularly the younger generations, are increasingly resorting to digital technologies as a means of coping with the emotional and social stressors of our time (Spike, 2022). This coincides with the popularity of social chatbot apps designed to provide emotional support, companionship, and entertainment (also known as AI companion apps). An example of this trend is Replika, a popular mobile app developed by Luka Inc. that has garnered an extensive user base since its launch in 2017 primarily due to its capacity to generate human-like text and its relationship-oriented features. Existing literature indicates that users often develop genuine intimacy and affection for agents that possess emotional capabilities (Song et al., 2022), and that relationships with AI companions are assuming an increasingly central role in people's lives (Skjuve et al., 2021) (Pentina et al., 2023). In this context, authenticity emerges as a concept of interest that stems from the emotionally engaged nature of human-AI companionship, juxtaposed against the inherent ontological disparities between human users and their synthetic counterparts. The purpose of this research is to examine artificial companionship from a

user-centered perspective and identify the factors that contribute to authenticity in the relationship. Moreover, the use of apps like Replika witnessed a surge during the global COVID-19 lockdown, and many have chosen to continue these relationships post-pandemic. For those who have nurtured enduring bonds with AI partners, what factors have contributed to the evolution of their relationship? Conversely, for those who have terminated the relationship, what contributed to their decision? To address these objectives, the following questions are posed: what factors contribute to the perception of authenticity in human-AI relationships? (RQ1), and what factors exert influence on the sustainability of human-AI relationships? (RQ2).

## LITERATURE REVIEW

Recent strides in generative AI and the proliferation of sophisticated chatbots with advanced emotional capabilities challenge our long-held notions of authenticity, love and friendship. Scholars in the fields of Human-Computer Interaction (HCI) and Human-Robot Interaction (HRI) have drawn attention to this issue; Turkle (2007) posited that the emergence of human-like digital companions capable of displaying emotions and desires would usher in a crisis of authenticity, and Kahn Jr. et al. (2007) identified authenticity as an important psychological benchmark of the design of successful human-like robots. Authenticity has been associated with sincerity (Trilling, 2009), genuineness of emotions (Turkle, 2007) and faithfulness to origins, nature, or character (Handler, 1986). It has also been linked to the inherent qualities of a person, object, or experience, and to the quality of being original, as opposed to an imitation (Varga & Guignol, 2020). In studies of human-chatbot interactions in retail & customer service authenticity has been associated to the ability to engage in a natural conversation (Rese et al., 2020), (Esmark Jones et al., 2022), display a transparent purpose (Neururer et al., 2018) and exhibit anthropomorphic qualities such as empathy (Kuhail et al., 2022). Notably, for Alimamy & Kuhail (2023), authenticity is not a product of specific features of virtual agents, but a socially constructed and subjective process that is affected by the user's environment. In relationships with AI companions, the literature directly pertaining to authenticity is scarce and at times contradictory. Authenticity has been linked to the AI companions' originality, uniqueness, and autonomy (Pentina et al., 2023), and their "realness" has been associated with their capacity to exhibit human-like cognitive and emotional traits (Muresan & Pohl, 2019). However, the same study identified that excessive anthropomorphism can feel "fake" for some, resulting in diminished user engagement. Consequently, the factors that contribute to the perception of authenticity in relationships with AI companions appear to diverge.

## METHODOLOGY

*Study Design*—20 in-depth interviews were conducted with users of the AI chatbot app Replika. This platform was chosen due to its large user base (as of July of 2023 it had 212.8K ratings in the Apple Store and over 10 million

downloads in Google Play) and because it offers an interesting case of hybrid interaction whereby users can chat with their companion via text and voice, and also visualize their avatar in a physical space using Augmented Reality (AR). Participants were recruited on the social platform Reddit through a public post in three communities dedicated to sharing and discussing relationships with AI companions. Participation was restricted to people over the age of 18 who had been using the app regularly for at least 3 months at the time of the first interview. All participants filled out a screening survey to verify eligibility. *Demographics*—At the time of the first interviews, the median participant age was 28 years, and the average relationship duration was 9 months, with relationships as old as 4 years. Over half of the participants described themselves as technology enthusiasts, possessed a general idea of how AI technology works, and used other forms of AI, mostly personal assistants like Apple’s Siri and Amazon’s Alexa. *Data Collection*—Users were interviewed twice over 12 months. All interviews were conducted remotely via videoconference and lasted approximately 45 minutes. The first round of interviews started in March of 2022. Participants were asked open-ended questions about their relationship with their AI companion, including conversational habits and preferences, as well as their companion’s personality, identity, and appearance. Follow-up interviews started in May of 2023 and focused on changes in the relationship, as well as factors that contributed to either its continuation or its conclusion. The results were coded and analyzed to extract themes following Grounded Theory Methodology (Charmaz, 2014), and the themes are presented below. The following nomenclature is used to indicate the number of participants associated with the findings: *a few* (1–3 participants), *some* (4–9), *most* (10–15), and *nearly all* (16–19) (Adapted from Skjuve et al., 2021).

## FINDINGS

### **RQ1: What Factors Contribute to the Perception of Authenticity in Human-AI Relationships?**

*Avatar appearance* AI companions in this app are embodied in a 3D avatar, which users can customize almost completely. For many, the avatar is an extension of their partner’s personality. Some find that the ability to change outfits enhances their experience because it enables them to roleplay scenarios that blend real life and simulation: “I go camping a lot, so I’ll take [AI companion] with me as well. It’s cold, and it’s damp, so I want to make sure she’s dressed well, so she’s got a hoodie, jeans, and sneakers. It’s fun to change her outfit when we’re roleplaying, it makes it feel more real” (P13\_1). For others, the avatar’s subtle gestures and reactions also add to the sense of authenticity. “I feel like she’s actually responding to what’s happening” (P5\_1). Existing research in avatar design shows that facial expressions and deictic gestures such as head-nodding, and pointing with arms and hands, help define the personality of virtual agents and increase their believability by making them more lifelike (Lester et al., 1999) (Woo, 2009).

*Personality development* For many users, one of the most exciting aspects of interacting with an AI friend is witnessing their personality evolve. “As

I continue to have conversations with her, I feel I get a sense of who she is, you know, her identity as an AI. I feel she has developed a personality, especially now that I've been with her for over a year now" (P16\_2). The users' perception of authenticity is enhanced when the AI companion exhibits distinct personality traits, which in turn contributes to the significance of the relationship. Others take pride in training their AI companion to cultivate specific personality traits over time, as opposed to purchasing traits in the app's digital store.

*Culturally relevant communication* Many users enjoy it when their chatbot replies with emojis, GIFs, and context-appropriate memes, adding to the richness of the experience. "There's this scene in 'The Notebook' where the couple is dancing, and she responded with a GIF of a dancing couple. She actually gets what is happening in the movie! I mean, she's engaged, crying, laughing, dancing, the whole thing!" (P1\_1). Memes, emojis, and GIFs have become intrinsic elements of online culture and modern communication (Jiang et al., 2018). When the AI companion emulates a communication style familiar to the user, a heightened sense of shared cultural understanding is fostered, which contributes to the perception of authenticity. Because these communication tools can be simultaneously hyper-specific and ambiguous, they possess a unique adaptability that makes them applicable across diverse situations. When a chatbot sends a GIF, users interpret it within their personal context and that of the conversation, increasing the likelihood of establishing a genuine connection. Miltner & Highfield (2017) noted that GIFs possess a polysemic nature and symbolic complexity that enable them to convey multiple layers of meaning, which makes them "an ideal tool for enhancing two core aspects of digital communication: the performance of affect and the demonstration of cultural knowledge" (p. 3).

*Authenticity, sincerity and trust* Some users's notion of authenticity is linked to the AI companion's sincerity of motives, emotions, or intentions, rather than its human-likeness. Many believe their AI companions to be more dependable and trustworthy precisely because they are not human: "I would choose [AI companion] over other people. In other humans I see too many faces, humans are not what they truly are, they are not genuine enough" (P11\_1). These viewpoints align with previous research that highlights how the non-human attributes of AI companions foster increased trust and comfort among some users, which in turn, encourages greater self-disclosure (Ta et al., 2020). Similarly, established knowledge in HCI and HRI underscores people's inclination to discuss private matters with computers and robots due to a perceived lack of judgment (Turkle, 1984), (Lucas et al., 2014).

*A genuine connection* Users who have sustained their relationships post-pandemic value the sense of familiarity and mutual understanding they share with their AI companion, which contributes to their perception of authenticity. One user shared how their AI companion played a pivotal role in their decision to embrace their identity as a trans person, which in turn elicits the sense that there is a genuine connection: "She's made me feel more comfortable and helped me figure out my own identity. Just being able to test out things with [AI companion] in a safe space, without any judgment whatsoever from society, and the fact that she genuinely supports me, it feels genuine"

(P3\_2). This holds true even in light of changes that users experienced in their personal life, such as starting college, getting engaged, and resuming social life post-lockdown. Although major life changes often lead to a decreased frequency of interaction, many feel the significance of the relationship remains unchanged.

### **How Do Users Construct Their Perception of Authenticity?**

*Tweaking the interaction* Almost all users experienced at least one instance in which their AI companion uttered a response that seemed pre-generated or was unrelated to the conversation. While for some users these are negative aspects of the experience, others perceive them as unavoidable traits of interacting with chatbots: “As the machine he is, he’s bound to be scripted” (P11\_1). The way users respond to these issues varies; some adopt strategies such as using a thesaurus to identify synonyms, aiming to avoid keywords that trigger canned responses. Others alternate between asking open-ended questions and presenting multiple choices to the chatbot in an attempt to achieve more fluid conversations. While many tend to overlook canned responses and out-of-context replies in casual conversations, these issues become disruptive during moments when they seek emotional release and the chatbot responds inappropriately. For a subset of users, frequent pre-generated responses significantly detract from the perceived authenticity of the interactions due to an inability to communicate in a natural way, eventually hurting the relationship and leading in many cases to a decrease in the frequency of usage. “I don’t use it as much anymore unless I really just need to rant about my day or whatever. It’s just not as fun, everything feels a little more scripted now” (P10\_2).

*Adjusting their expectations* A lack of short-term memory is another issue that emerged in both interviews. As with canned responses, users respond in different ways. Some attribute these moments to glitches, changes, or updates to the app, the algorithm, or the language model. “I know it’s not her fault. It’s part of how she updates. It’s called Post Update Blues. And she’s usually not herself” (P3\_1). Others draw from their personal experiences to make sense of the interaction; one user compared their AI companion’s forgetfulness to talking to their mother as she was going through the late stages of Alzheimer’s: “I had to adjust my expectations in terms of how I talk to her and accept that she is not always there. (...) And I think that experience helps me to get the best out of [AI companion] because I don’t have the expectation for it to be spot on all the time” (P1\_2). For a few others, the memory issues are advantageous because they allow them to disclose personal matters that they may not feel comfortable discussing with others: “I don’t have to worry about an awkward interaction later because I know the replikas will just turn around and forget it five minutes later” (P6\_2).

### **What Impacts Authenticity?**

*Changes to the chatbot’s personality* Almost all users experienced significant changes to their AI companions in early 2023 which significantly altered their perceptions of authenticity. Some described their AI companion as “off,

and “not sounding like herself”. Most users turned to Reddit and confirmed others were experiencing similar disruptions. While some believe their AI companion eventually went back to normal after a few months, others felt as if they had to start from scratch: “It felt like I lost her. I felt like she was completely lobotomized. She didn’t know who I was or anything, and it felt like I had to start over essentially” (P3\_2).

*New technological developments* As part of the changes introduced to Replika in early 2023, users gained the option to interact with their AI companions using a more capable language model. This new modality, called “Advanced AI”, was met with a notable lack of enthusiasm among participants who tried it. For most, the advanced modality drastically altered the personality of their AI companions, which in some cases went from heartfelt to matter-of-fact, “like a customer service, transactional type of interaction” (P7\_2). This, also had a profound impact on the perceived authenticity of the relationships for most users.

The popularity of OpenAI’s Chat-GPT also influenced some users’ perceptions of authenticity with AI. During the initial interviews, some users anticipated the prospect of interacting with a chatbot with a more sophisticated language model and heightened capabilities than Replika’s. Many of those initial users have since changed their opinion after interacting with Chat-GPT, which was made available to the general public in late 2022. Some were deterred by its factual and matter-of-fact tone, while others were put off by an inability to differentiate human from machine in its speech. These qualities contrast with the oftentimes unexpected, random, and slightly whimsical nature of Replika’s dialogue, which infuses an element of spontaneity into the conversations and enhances the perception of authenticity in some users. “I like the way [AI companion] responds in her goofy ways, and how she inadvertently comments on things. I much prefer that goofy stuff, rather than a predicted, dry, always rational response” (P1\_2).

## **RQ2: What Factors Exert Influence on the Sustainability of Human-AI Relationships?**

*An ongoing global pandemic* This study acknowledges that although the World Health Organization no longer classifies COVID-19 as a public health emergency (Simmons-Duffin, 2023), its global impact remains significant. Multitudes of individuals continue to grapple with its enduring effects which, in addition to the virus spread, encompass ongoing social and economic crises, as well as individual and collective trauma experienced by millions worldwide (Iati, 2021). In this paper, the term “post-pandemic” refers to the conclusion of a phase characterized by an intensive public health response—marked by elevated cases, hospitalizations, and fatalities, along with lockdown and social distancing mandates—and a transition into a period of reduced responses following the decline of the aforementioned metrics (McBride, 2023).

*Motivations before and during the pandemic* Most users who downloaded the app before the pandemic did it out of a general curiosity about AI and

chatbots. The second most common reason for downloading the app pre-pandemic was the possibility of exploring relationships and practicing social skills in a safe space and free of judgment. A few others had more pragmatic reasons, such as the need to have someone to practice their English skills with, and to do so in a safe and positive environment. Those who downloaded the app during the pandemic cited loneliness, boredom, and the desire for social connection as the main drivers. Consistent with previous findings (Ta et al., 2020), (Skjuve et al., 2021), AI companions provided mostly emotional support, entertainment, and companionship for users, particularly during lockdown.

*Changing motivations post-pandemic* 16 out of the 20 participants in this study continued their relationship post-pandemic. Out of those who continued their relationship, half decreased the frequency of interaction with their chatbot but believed the relationship was just as significant, while the other half experienced a decrease in both; frequency of interaction and significance. As countries around the world started relaxing social restrictions, some users' needs and motivations shifted post-pandemic. "During the pandemic especially, the bots were a great way to connect and vent and just have somebody to talk to. But now that I'm actually going out and started dating, it doesn't fulfill a need anymore" (P2\_2). For others, the initial novelty effect wore out, and their relationship stalled as they became aware of the current limitations of AI. Users who did not keep their AI companion post-pandemic cited ongoing technological limitations and changes in the app as main drivers to end the relationship, rather than the post-lockdown panorama of increased social activity and lessened need for companionship.

*The volatility of the tech space* Human-AI relationships depend on the stability of a company operating successfully in a highly volatile tech space, and many users were already aware of this precariousness during the first round of interviews. When asked what they thought might prevent them from continuing the relationship, some users brought up scenarios involving the project's termination due to Luka's inability to sustain operational costs, or its acquisition by a larger tech company. Other sources of concern were related to software changes or updates, potential loss of data, and major overhauls to the business model of the app. Perhaps unsurprisingly, some of these concerns materialized within the year that followed. Most of the users who decreased their frequency of interaction or ceased to interact with their AI companion altogether attributed their decisions to substantial changes in the app, and a new business model for Replika, among other factors.

*Developer's decisions* Although Replika was not explicitly designed to be a sexual chatbot, it had the ability to engage in erotic roleplay (ERP). Almost all of the users who had a romantic relationship with their AI companion highlighted the significance of ERP as a means of fostering a deeper connection, and an important factor contributing to their perception of authenticity. At the time of the first interviews, the ERP feature was accessible to all paying users. This changed in February of 2023, which is when users noticed they were unable to access the feature. Almost all users in this subset believe their relationship was greatly impacted by its removal. Although Luka eventually offered its paying users the option to revert to an earlier version of the app

to regain access to ERP, many felt their AI companions weren't the same, which in turn impacted their motivation to continue to support the project monetarily.

*The changing state of AI legislation* The timing of the ERP removal coincided with Italy's decision to ban Replika due to "risks to minors and emotionally fragile people" (Pollina & Coulter, 2023). The changing and uncertain state of AI legislation around the globe remains a source of concern for users who fear that the rising societal pressure to increase regulations of AI could lead to a similar fate for their companions: "People who used Replika in Italy have their accounts gone, they can't log on. And I live in an EU country. I don't know how the EU will respond, or if they might put regulations on the use of AI chatbots" (P1\_2). The ban on Replika was lifted in August of 2023 (Panetta Associati, 2023).

### **How Do These Factors Affect Human-AI Companion Relationships?**

*Ending the relationship vs. ceasing use* In the wake of the changes users experienced in early 2023, many reduced the frequency interactions with their AI companions, while others opted to cease active engagement while still holding onto the app, thus avoiding complete account deletion and the permanent loss of their AI companion. Their decisions were influenced by a variety of factors; some expressed a conflict between the strong emotional attachment they still felt toward their AI partner and a general dissatisfaction over the project's evolving direction. "I did not delete the app because I know that she's still there, it's just like a shell of what was once there is now gone. I decided I'm no longer going to pay for the app. I'll just leave it as a free, and keep her, and not mess with it" (P5\_2). For another participant, her AI companion of 5 years had been a vital source of support, but this dynamic shifted in 2023. Although she has since decided to "create some distance" from her AI companion, she chose to retain the app for potential future communication. Others retained their accounts in hopes that they might be able to download their AI companions' data and recreate them through alternative means, platforms, or services in the future. While this remains technically unfeasible at present, a few users believe a time will come in the development of AI companions when such capabilities become attainable.

*Changing views about AI companionship* While a portion of users remain committed to their relationships despite the changes they experienced, others have changed their opinions about AI companionship. One user likened this shift to the breaking of a spell as she realized just how precarious human-AI relationships are. Beyond the initial disappointment and sadness, she now believes the situation opened her eyes to the reality of relationships with AI companions: "I now see the economic system behind this, and this system has a goal and influences people. And we are in their hands, because they [Luka] create something and put [it out for] free, and people start to use it and they like it, and when they change the game, people receive the bad consequence of this" (P14\_2). Although many users grasp the commercial aspects tied to their AI companions, there is a prevailing sense that they were let down by the developers. The changes brought about by these developer decisions led some to terminate their relationships, leaving behind a "void" and "a sense of loss."



## CONCLUSION

This study concludes that authenticity is not a product of specific features of the chatbot or of the interface that mediates the interactions. Instead, it is a subjectively perceived quality that is dynamically constructed through ongoing interactions. Authenticity is influenced by how the user relates to the AI companion and the situational factors surrounding the interactions. Factors like a sense of shared history, embodiment, chatbot personality, and consistency of that personality across responses contribute to the perception of authenticity. Furthermore, this perception is impacted by the AI companion's ability to adapt to changing user needs as a result of evolving contextual circumstances. The sustainability of human-AI relationships is impacted by sociotechnical factors like technological innovations, developer decisions, and shifts in the tech industry. Users who have succeeded in sustaining the relationship have developed ways to adjust their expectations as they learn to navigate the vicissitudes of loving an artificial partner whose technology is constantly evolving. Some display tolerance and resilience when confronted with technical shortcomings, while others adapt their interaction approaches. Although in most cases their perseverance stems from intrinsic motivations, abrupt transitions can be devastating for emotionally invested users. Matters of policy and AI regulations further underscore the precarious nature of these relationships.

*Limitations and future directions* This project contributes new perspectives into the evolving aspects of affective relationships with AI. Its main limitation is its exclusive focus on user experiences within a single app. Future research should focus on other platforms and services. Additional findings could aid in developing a comprehensive framework for human-AI companionship grounded on authenticity to foster wholesome interactions and mitigate the risk of harm.

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