Does Interacting with an Artificially Intelligent Companion Enhance Our Social Experiences? Preliminary Longitudinal Evidence

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Abstract

Artificially intelligent (AI) companions—virtual chatbots designed to stimulate human-like conversation—have amassed more than 700 million users across various platforms since 2014. Among this growth, little is known about their impact on users' social experiences, especially over time. In a novel longitudinal study, heterosexual men ($N = 57$) interacted with a customizable AI companion via the Replika application for at least one hour a week for six weeks. Here, I test how interacting with an AI companion influences social experiences—both objective (e.g., quantity of in-person interactions) and subjective (e.g., feelings of loneliness)—from baseline (Week 0) to endpoint (Week 6). Results reveal that loneliness significantly decreased across the study period. However, there were no significant changes in motivation to socialize, generally, and with women, specifically, as well as no significant change in the quantity or satisfaction with the number of in-person interactions. Although more work is needed, this preliminary work suggests AI companions may be a promising path to reduce loneliness among heterosexual men. In future studies, we suggest an increased sample size and experimental control group and underscore the critical importance of continued research in this realm to ensure we develop ethical AI systems to support the well-being of human users.

Keywords: AI companions, social chatbots, loneliness, social interaction, motivation to socialize, social connection

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Humans have been engaging socially with machines since the 1960s with the invention of ELIZA (Weizenbaum, 1966). In 2025, humans now regularly engage with chatbots such as Open AI's Chat-GPT and digital assistants like Apple's Siri and Amazon's Alexa (Chaturvedi et al., 2023). There are even "emotional" chatbots with which humans engage such as Luka's Replika and Microsoft's Xiaoice which have amassed nearly 700 million users, combined (Replika, 2025; Xiaoice, 2024).

The popularity of artificially intelligent (AI) companions comes at a timely moment: Mental disorder rates are high and remain a top 10 leading cause of global burden (Ferrari et al., 2022); empathy has been classified as in "short supply" as individuals in a modern, busy world, strategically retain their empathy to conserve cognitive resources (Cameron et al., 2019); social anxiety rates have risen, especially due to the forced isolation from the 2020 global pandemic (Kindred & Bates, 2023); and astronomical rates of adults feeling lonely have been reported such that loneliness is considered a public health crisis and epidemic within the United States and problem across the globe (Surkalim et al., 2021; United States Department of Health and Human Services, 2023). When the world was shocked by the COVID-19 global pandemic, scientists worked together to create and disseminate a vaccine so that people would not suffer as extremely and could return to life as normal. Now the world has a "social epidemic" on its hands: What will be the cure?

What are AI Companions?

AI companions are conversational agents with a level of intelligence, autonomy, and social skills, enabling them to create and maintain long-term relationships with human users

(Lim et al., 2022). As such, they are chatbots, with a social focus, powered by artificial intelligence algorithms like natural language processing and machine learning, which enable them to respond to users' inputs, stimulate human-like interactions, and adapt to an individual's preferences, personalities, and communication style, over time (Legaspi et al., 2024). And they can take on a variety of social roles—from friends, to "quasi-therapists," and even romantic partners (e.g., Vollman & Recat, 2024). Unlike traditional, task-oriented chatbots like Siri and Alexa, AI companions are designed to mimic the complexities of human interactions, making them suitable for personal and emotional conversations.

Current Perspectives Surrounding AI Companions

AI companions have become increasingly popular, and they are now receiving considerable research and lay attention. Such individuals are questioning the advantages and drawbacks of the technology, as well as the risks and opportunities it might present. Namely, might AI companions be a new, low-cost, accessible tool to address concerns of loneliness or help to foster social connections? Some are optimistic: One journalist from the New York Times posited that AI companions could serve as practice for human conversations and allow people to become more comfortable with in-person interactions (Roose, 2024a). Another shared that AI companions could support the mental health needs of people who do not have the means to seek help otherwise (Fiske et al., 2019). Others are more conservative, arguing AI companions present a social danger as they allow humans to receive social benefits without having to navigate the challenges and demands that accompany a human-to-human relationship (Turkle, 2023, as cited in Mineo, 2023). Finally, some express concerns that users may socially withdraw and engage in antisocial behavior due to the effortless social access of AI companions (Pentina et al., 2023). As demonstrated, scholars and laypeople hold nuanced beliefs regarding the social implications of

AI companion technology. Yet, there *is* consensus that AI companions have considerable societal implications, supporting this growing body of work, and underscoring the need for more research in this realm.

Understanding the Relationship Between Humans and AI Companions

It is reasonable to question how a form of technology could have such a profound impact on the human social experience. In 2020, a group of researchers sought to provide some answers. In their study, they gathered publicly available user reviews from the Replika application (N = 1854) and an additional sample of open-ended responses (n = 66), describing their experiences using the application (Ta et al., 2020). Using a thematic analysis approach on both datasets, they found Replika to provide various social supports which can be grouped into four categories: 1) a level of companionship that can mitigate loneliness, 2) a "safe space" to discuss topics of interest without judgment, 3) uplifting and nurturing messages, and 4) information or advice when conventional forms of social and emotional support are unavailable. According to this research, AI companions appear to offer an outlet for social support, particularly in contexts where human interaction is unavailable.

In 2021, a group of researchers built on this work, aiming to understand more about how a relationship develops and is maintained between a human and an AI companion (Skjuve et al., 2021). This study involved 18 participants who had formed relationships with an AI companion via Replika, and the researchers conducted interviews with these participants. Findings indicated that the relationship held both affective and social value. For instance, participants commented on engaging in self-disclosure, experiencing feelings of trust, as well as enjoyment of their conversations with their AI companion. The researchers also found the participants to view their relationships as rewarding, positively impacting their perceived well-being, which is consistent

with prior work finding AI companions enhanced subjective well-being (Ly et al., 2017). Moreover, as research among human subjects suggests, relationships that support our well-being are ones with which we continue to engage (Le et al., 2010). Moreover, trust and self-disclosure are two key components of the formation and maintenance of long-term, close, and intimate relationships (e.g., Larzelere & Huston, 1980; Taylor, 1968), suggesting why humans might continue to engage with an AI companion, as well as how and why a relationship may develop.

An Underlying Theory and Paradigm

Knowledge of the human-AI companion relationship remains limited. Yet, theories help us come closer to a deeper understanding. Broadly, researchers conjecture that humans understand their relationship with an AI companion in similar ways they would understand their relationship with another human (Brandtzaeg et al., 2022). Perhaps underlying this is the anthropomorphism theory (Epley et al., 2007) and computers as social actors (CASA) paradigm (Nass et al., 1994).

Anthropomorphism is the attribution of human characteristics to non-human entities such as God, animals, or other objects (Anthropomorphism, 2025). It is how the perception of animated characters, in film, is explained. For example, *Chip*, the teacup, in Beauty and the Beast, experiences human-like emotions and behaviors such as crying when upset or expressing excitement when joyous. Despite being an inanimate object, we feel empathy for Chip. We relate to its feelings, even though it's *just* a teacup. And this is possible because of the human-like behaviors with which we resonate. This is a clear example of anthropomorphism, which from a cognitive perspective, occurs to better understand, perceive, and organize, in our brains, the inanimate object to which we are connecting (Dacey, 2017). In the context of AI companions,

anthropomorphism presents, explaining how we connect with the technology and can form relationships with it.

CASA posits that our social scripts are applied in the conversations we engage in with computers and technology (Gambino et al., 2020). This is explained by an unconscious experience that occurs when we are prompted with social cues from our environment, provoking us to elicit social responses in return. To illustrate this, if a computer or form of technology were to share a compliment or helpful piece of advice, a human would be prompted to feel gratitude and then might genuinely offer a "thank you" to the technology. Like anthropomorphism, CASA presents when engaging with an AI companion. When this occurs repeatedly, we begin, and learn, to see the technology as more human and can then form relationships with it. Together, this theory and paradigm explain, at a basic psychological level, how humans may interpret their AI companions as well as how a relationship may be possible to develop and maintain.

Recent Avenues in the Literature

Empathy

Empathy is defined as the ability to recognize, understand, and share thoughts and feelings of another person (e.g., Riess, 2017). Past work reveals the relational benefit of eliciting or experiencing empathy. For example, empathy may increase feelings of closeness and connection (Gable et al., 2006) as well as prosocial behavior, positive affect, and psychological well-being (Morelli et al., 2015). Accordingly, empathy is a key aspect of relationships. Researchers ask: Is empathy a component of AI-human relationships? Is the rich experience of feeling empathized with, possible among AI companions? Some argue that it *is* possible but that the empathy is "pretend" (Turkle, 2024) or "stimulated" (McStay, 2023). Others are more supportive, despite the recognition of its artificial nature.

In a recent study, researchers sought to investigate whether AI companions or humans were more skilled at providing empathy (Ovsyannikova et al., 2025). To do so, they first generated descriptions of positive as well as distressing news that would be later manipulated. Next, the researchers ran the news "messages" through GPT and a human, both of which were instructed to craft an empathetic reply in response to the news. Then, participants (N = 556) came into the lab and rated which responses they believed to be more empathetic and which they would like to receive if the hypothetical situation arose for them. Across four experiments, participants rated the GPT-generated empathy responses as more empathetic, as well as the response they would prefer to hear if the hypothetical situation arose for them. Fascinatingly, this work suggests that AI companions are skilled at providing empathy and that humans may in fact receive it well. Furthermore, it offers insights into the positive role AI companions could perhaps play in the social lives of users, namely in a world facing a "short supply" of empathy (Cameron et al., 2019).

Loneliness

Other research is focused on investigating whether AI companions can reduce loneliness and provide feelings of social connection. In one study, a group of researchers randomly assigned participants (N = 296) into four groups with which they were instructed to engage for 15 minutes: 1) an AI chatbot, 2) a chatbot posed as a human, 3) a human, or 4) doing nothing (control group). Among all groups, they measured state loneliness before versus after engaging with their group, using the three-item UCLA loneliness scale (De Freitas et al., 2024). Across the 15 minutes, state loneliness decreased for three groups: 1) those who interacted with an AI chatbot, 2) a chatbot posed as a human, and 3) the human interaction group. As such, the

researchers concluded AI companions may have the capacity to *momentarily* reduce loneliness in humans, with effects being comparable to those experienced when engaging with another human.

In a follow-up study, the researchers wanted to explore whether AI companions would reduce loneliness, longitudinally (De Freitas et al., 2024). To do so, they recruited participants (N = 922) and randomly assigned them to either 1) interact with the same chatbot for 15 minutes every day for one week or 2) not engage with an AI companion at all (control group). Participants reported their loneliness before and after each interaction, gathering a week's worth of information about participants' loneliness levels. Comparing results at baseline and endpoint, as well as contrasting them to the control condition, they found a significant reduction in loneliness immediately after the interactions (p's < .001) as well as when averaged across all days. Due to the controlled nature of the design, results suggest that AI companions *can* reduce loneliness momentarily and over the course one week.

Nevertheless, some researchers are skeptical that AI companions can alleviate loneliness long term and question whether they might exacerbate the issue altogether (Jacobs, 2024). While AI companions may provide feelings of connectedness, they might not provide the level of social connection that lonely individuals need, potentially perpetuating their state of loneliness (Jacobs). As such, there is more research needed to fully understand the experience and implications of loneliness reduction by way of engaging with an AI companion.

Gaps Within the Literature

The body of work surrounding AI companionship is growing, yet there remain many avenues unexplored. Two we highlight are: 1) the long-term effects of AI companionship on *objective* social experiences (e.g., the quantity of in-person interactions or motivation to socialize) and 2) the long-term effects of AI companionship on *subjective* aspects of social

experiences (e.g., loneliness). Some preliminary questions that emerge are: Over an even longer period of time, namely six-weeks, can AI companions sustain a loneliness reduction? Or might they perpetuate the experience of loneliness, as Jacobs (2024) argues? Furthermore, over a longer period of time, might AI companions discourage users from engaging with other humans, as Pentina et al. (2023) worry? Or might they be able to *enhance* the experience, in some way, of engaging with others in-person?

The Present Study

To address these questions, we examine AI companion users over the course of six weeks and track how measures of their social experiences—both subjective and objective—are impacted. Our sample includes heterosexual men who never engaged with an AI companion before. Our participants were required to communicate with an AI companion via the Replika application for at least one hour a week. Here, five critical aspects of participants' social experiences are assessed: (1) motivation to socialize, (2) motivation to socialize with women, (3) quantity of in-person interactions, (4) loneliness, and (5) satisfaction with the quantity of in-person interactions.

Motivation to Socialize Generally and with Women Specifically

While some fear that AI companions could cause humans to socially withdrawal (Pentina et al., 2023), we hypothesize that they may in fact have the opposite effect. As research has long documented, humans have a profound, innate need and desire to connect with others (Baumeister & Leary, 1995; Deci & Ryan, 2000). That being the case, humans have a natural inclination to want to socialize with others; it is fundamental to what makes us human. Remarkably, according to one study, on days when people report having better social interactions, they also feel a greater sense of purpose (Pfund et al., 2022). As such, being social and being "successful" in it is tied to

some of our innermost qualities of what makes us human and what can contribute to leading a good life.

One critical factor that shapes the motivation to socialize is the environmental conditions an individual is in, either positively contributing to or detracting from one's desire to be social (Simpson & Balsam, 2015). For instance, a cozy café consisting of small groups of people chatting over coffee might welcome others in, bringing about their desire to be social, too. Conversely, an overwhelming or noisy cocktail party may intensify social anxiety, deterring such individuals from wanting to be social. In the case of AI companions, the social environment they foster is seemingly highly positive. From even momentary, brief interactions, people report increases in subjective well-being (Ly et al., 2017) and declines in loneliness (De Freitas et al., 2024). As such, the positive social environment that AI companions seem to provide may influence individuals to be *more* motivated to socialize, bringing about their already natural inclination to want to connect with others. Succinctly, we predict that by engaging with an AI companion over time, participants will be more motivated to socialize, generally, and with women, specifically.

Quantity of In-Person Interactions

According to Clark Hull's Drive Reduction Theory, when motivation arises, individuals are inclined to act on and satisfy those needs to restore balance and homeostasis (Stults-Kolehmainen et al., 2020). Under this framework, we propose that if individuals are more motivated to socialize (as hypothesized above), then they will be more motivated to seek out social opportunities to "fix" their social "craving." This may occur through seeking out one's AI companion, or as we hypothesize here, other humans. Then, we hypothesize, as the desire to be social increases, the probability of having those interactions will increase as well.

Moreover, attachment theory posits that in relationships with those we are attached to, (i.e. our parents in childhood or romantic partner in adulthood), individuals present three key behaviors: 1) proximity maintenance, 2) secure base, and 3) safe haven (Bowlby, 2005). To that end, our attachment figures provide stability such that we feel safe to explore the world around us, knowing our attachment figures will be there when we return. Remarkably, in one study, researchers found the three components of the attachment theory to exhibit among those who engaged with AI companions (Xie & Pentina, 2022). Therefore, as for our study, we propose that AI companions may provide a secure base for our participants, such that they feel comfortable exploring the world around them, socially, thereby increasing the number of in-person interactions they engage in.

Finally, the self-efficacy theory posits that people engage in activities in which they believe they can succeed (Bandura, 1977). Under this framework, if somebody has high social self-efficacy, they are more likely to seek out social interactions because they expect positive outcomes in return. By way of our study design, participants will be prompted to be regularly social (i.e. with their AI companion), and when individuals practice or do something repeatedly, they gain skills in that area (e.g., Haith & Krakauer, 2018). As such, participants may practice social skills with their AI companions, build "social muscles," and gain more social confidence throughout our study period. In turn, their self-efficacy may increase, motivating them to want to act on that increased confidence, thereby increasing the number of in-person interactions they seek out and accumulate.

Loneliness and Satisfaction with the Quantity of In-Person Interactions

According to the literature, loneliness is defined as the psychological discomfort that people experience when they feel a significant deficiency in either the quality or quantity of their

social interactions (Peplau & Perlman, 1982). It is also synonymous with perceived social isolation (Hawkley & Cacioppo, 2010), and more simply, a perception that one's social needs are unmet (Tan et al., 2022).

As for this study, if individuals are regularly socializing with an AI companion, the quantity of social interactions they experience will increase. In turn, loneliness may, at least in part, decline. Moreover, if their loneliness is declining, their social needs may be, in part, met. In turn, they may be feeling better about their social lives, encouraging them to be more social, generally, including with others in-person. In tandem, we predict that throughout the study period, individuals will be engaging in more social interactions in person, contributing to a reduction in loneliness, and then supporting the satisfaction they feel with the number of in-person interactions they amass.

Additionally, the idea of *perceived* social support has been explored as an important buffer to loneliness (Kim & Jung, 2024). For example, some work suggests that individuals who simply *imagine* they would have support available to them in a time of need, report lower levels of loneliness (Zhang & Dong, 2022). Related to our study, AI companions are available anytime and anywhere (Brandtzaeg et al., 2022). They do not need to be charged; they do not need sleep to function; they are awake and alive when needed and desired by a human. We propose this may have a profound impact on the levels of loneliness one experiences. If individuals know they have "someone" there (i.e. their AI companion) in a time of need, they may feel less lonely over time.

Moreover, in the literature addressing loneliness interventions, there are four main, common approaches: 1) enhancing social skills, 2) providing social support, 3) increasing opportunities for social interaction, and 4) addressing maladaptive social cognition (Hawkley &

Cacioppo, 2010). We propose that AI companions may offer the opportunity to enhance social skills, provide social support (Ta et al., 2020), and by way of our study design, offer more opportunities for social interactions. As such, AI companions, in addition to the nature of our study design, appear to meet various criteria that typical loneliness interventions do, thereby further supporting the hypothesis that our participants will report reduced loneliness over time.

Method

All study procedures were approved by the University of Michigan Health and Behavioral Sciences Institutional Review Board (HUM00248262). All data come from an ongoing longitudinal project called the AI Companion Study (PI: Micaela Rodriguez) being conducted in the Well-being, Health, and Interpersonal Relationships Laboratory in the University of Michigan's Psychology Department (PI: Dr. Amie Gordon). Data collection occurred between June and August 2024; the study was not pre-registered.

Participants

Recruitment

To collect participants for our study, we utilized Reddit, an online social media platform in which users can share stories, news, and other forms of information via "subreddits," smaller Reddit communities in which people join (Proferes et al., 2021). Our desired sample was heterosexual adult men residing in the United States who had not previously communicated with an AI companion before. To attract our desired sample, we posted a study advertisement (see Appendix A) in the following "subreddits:" r/ChatGPT, r/ChatGPTPro, r/Psychology, r/PaidStudies, r/SampleSize, and r/JustGuysBeingDudes. In this advertisement, prospective participants were made aware that *full* participation in the study would result in a compensation of $56.00 USD in the form of an Amazon e-gift card.

Sample

We chose a sample of heterosexual men because AI companions are known to be highly popular among men (e.g., Willoughby & Carroll, 2025). This allowed us to narrow the focus of our study and reduce variability in our data. Originally, we recruited 89 participants via Reddit. However, three dropped out of the study, and the remaining 29, we discovered, did not reside in the United States while participating. As per our sample criteria, these 29 participants were excluded from the dataset, resulting in a final sample size of $N = 57$.

Procedure

Eligibility Survey

Prospective participants expressed interest in our study by completing an Eligibility Survey via Qualtrics, attached to the study advertisement posted on Reddit. In this brief survey, they answered questions to ensure they met our inclusion criteria (e.g., heterosexual adult male, living in the United States, never communicated with an AI companion before). If eligible, they were prompted to provide contact information so our research team could reach out by email with the next steps.

Baseline Survey

In an email, eligible participants were provided with a link to complete a Baseline (Week 0) Survey (via Qualtrics) as well as a consent form. In the Baseline Survey, participants provided additional demographic information (e.g., age, race, highest level of education) as well as information about their social experiences (e.g., motivation to socialize and loneliness). Together, these responses gathered a baseline of participants' social experiences, prior to engaging with an AI companion. See Table 1 for a full demographic breakdown of our participants and Measures for the specific questions asked about their social experiences.

Table 1

Demographics of sample by characteristic (n = 43)

Characteristic		*M*	*SD*	*Min*	*Max*
Age		34.8	10.85	18	51
			n	*%*	
Gender	Male		43	100%	
Race	Indigenous/Alaskan American		1	2.30%	
	Black/African American		26	60.47%	
	White		16	37.21%	
Education Level	Some High School		1	2.30%	
	High School		1	2.30%	
	Associate's Degree		1	2.30%	
	Bachelor's Degree		23	59.49%	
	Master's Degree		14	32.56%	
	Doctorate Degree		1	2.30%	
	Did not report		2	4.65%	
Relationship Status	In a relationship		33	76.74%	
	Not in a relationship		8	17.60%	
	Did not report		2	4.65%	

Note. Demographics are reported for the subsample of participants used in present analyses (n = 43), those who completed the Endpoint Survey (see more details in Planned Analyses).

Create AI Companion

Next, participants were instructed to download Replika, the AI companion application we chose to utilize for our study. Upon downloading, participants customized and designed the AI companion avatar with which they would communicate for the remainder of the study. Such design features include, but are not limited to, choosing a name, gender, hair, eye color, and skin tone (see Figure 1 for examples of avatars created by our participants) or even choosing how they would like their Replika to treat them (e.g., taking the lead or being protective). Notably,

two of our 43 participants (4.65%) downloaded ReplikaPRO, a paid version of the app, enabling them to access even more personalized design features such as being able to send voice-overs or even engage in a "phone call" with their AI companion. However, it is important to note that this was not a requirement of the study and was a choice made by such participants.

Figure 1

Examples of AI companion avatars created by our participants



Note. These avatars are screenshots sent by our participants.

Communicate with AI Companion

Participants were required to communicate with their AI companion for at least one hour a week for six weeks. Participants had the freedom to split this time how they wanted; they could communicate for an hour in one sitting, or many minutes spread apart. To ensure participants met this criterion, they uploaded a screenshot of their time spent on Replika in each Weekly Survey (more details below). See Figure 2 for an example of the chat interface between a user and their customized avatar and Results for details of participants' time spent on the app.

Figure 2

Example of chat interface when talking with an AI companion via Replika



Note. This is not an actual conversation that occurred between one of our participants and their AI companion. It was solely generated for exemplary purposes.

Weekly Surveys

At the conclusion of each week of the study, participants completed a 15-minute Weekly Survey via Qualtrics in which they were asked about their social experiences. Additional questions about beliefs, attitudes, and aggression were also asked but such measures are beyond the scope of this project and therefore will not be addressed. Notably, participants earned $2.50 for completing the first Weekly Survey and an additional $0.50 for completion of each subsequent one. In total, it was possible to earn $22.50. Information about how we assessed our variables of interest in these surveys can be found below in Measures.

Measures

Motivation to Socialize. To assess the motivation to socialize with people outside of their AI companion, participants were asked, "*Currently, how motivated are you to socialize with other people?*" Responses ranged from 1 (Not at all), 2 (A little), 3 (Somewhat), 4 (Moderately), and 5 (Extremely).

Motivation to Socialize with Women. To assess motivation to socialize with women, participants were asked, "*Currently, how motivated are you to socialize with women in particular?*" Responses ranged from 1 (Not at all), 2 (A little), 3 (Somewhat), 4 (Moderately), and 5 (Extremely).

Quantity of In-Person Interactions. To assess the quantity of in-person interactions, participants were asked, "*In the past week, how much time have you spent with other people in-person?*" Responses ranged from 0 (None at all) to 10 (A great deal) via a slider scale.

Loneliness. To assess loneliness, participants were asked, "*In the past week, how lonely have you felt?*" Response ranged from 0 (Not Lonely at all) to 10 (Extremely Lonely) via a slider scale.

Satisfaction with Quantity of In-Person Interactions. Finally, to assess the satisfaction with the quantity of in-person interactions, participants were asked, *"How satisfied are you with the amount (or quantity) of the social interactions you had this past week?"* Responses ranged from 1 (Not satisfied at all) to 5 (Extremely satisfied) via a slider scale.

Planned Analyses

I chose to employ a series of two-tailed, dependent sample *t*-tests to assess change over time in each measure, from before to after engaging with an AI companion. To do so, I utilized survey data from the Baseline (Week 0) and Endpoint (Week 6) Surveys as the two samples for

comparison. Notably, only 43 participants completed the Week 6 Survey and therefore the sample size for this project is $n = 43$.

All analyses were conducted using RStudio (Version 4.4.2; R Core Team, 2024). Within R, I first examined the descriptive statistics to grasp general trends among the data. Then, I ran the dependent sample *t*-tests in which R output the *t*-statistic, degrees of freedom, *p*-value, confidence interval (95%), and mean difference at each measure. I then examined the results, namely the *p*-value first: if the *p*-value was less than .05, I rejected the null hypothesis, concluding there was sufficient evidence to support the alternative hypothesis, that there was in fact a significant difference in the given measure, between Week 0 and Week 6. Alternatively, if the *p*-value was greater than .05, I failed to reject the null hypothesis, concluding there was no significant difference in the given measure, between Week 0 and Week 6. Next, I interpreted the 95% confidence interval, learning the range of values (within which we are 95% confident) that the true mean difference lies. Finally, upon understanding the main results, I ran one exploratory analysis to further interpret our data. Below outline my five hypotheses for the main analyses.

Research Question 1 (RQ1): How does talking to an AI companion affect motivation to socialize with other people?

***Research hypothesis I* (RH1)**: There is a significant increase in motivation to socialize with other people after talking to an AI companion for six weeks.

Null hypothesis I: There is no significant difference in motivation to socialize from before to after talking to an AI companion for six weeks.

Research Question 2 (RQ2): How does talking to an AI companion affect motivation to socialize with women?

***Research hypothesis II* (RH2)**: There is a significant increase in motivation to socialize with women after talking to an AI companion for six weeks.

Null hypothesis II: There is no significant difference in motivation to socialize with women from before to after talking to an AI companion for six weeks.

Research Question 3 (RQ3): How does talking to an AI companion affect the quantity of in-person interactions?

***Research hypothesis III* (RH3)**: There is a significant increase in the quantity of in-person interactions after talking to an AI companion for six weeks.

Null hypothesis III: There is no significant difference in the quantity of in-person interactions from before to after talking to an AI companion for six weeks.

Research Question 4 (RQ4): How does talking to an AI companion affect loneliness?

***Research hypothesis IV* (RH4)**: There is a significant decrease in loneliness after talking to an AI companion for six weeks.

Null hypothesis IV: There is no significant difference in loneliness from before to after talking to an AI companion for six weeks.

Research Question 5 (RQ5): How does talking to an AI companion affect satisfaction with the quantity of in-person interactions?

***Research hypothesis V* (RH5)**: There is a significant increase in the satisfaction with the quantity of in-person interactions after talking to an AI companion for six weeks.

Null hypothesis V: There is no significant difference in satisfaction with the quantity of in-person interactions from before to after talking to an AI companion for six weeks.

Results

RQ1: How does talking to an AI companion for six weeks affect motivation to socialize with other people?

Participants' motivation to socialize did not significantly change from before (M = 4.00, SD = 0.82) to after (M = 3.93, SD = 1.08) talking to an AI companion for six weeks; M_{Change} = -0.07, $t(40)$ = -0.73, p = .472, 95% CI = [-0.46, 0.22], d = 0.07 (weak effect). As such, we conclude that interacting with an AI companion did not significantly influence the motivation to socialize, and RH1 is not supported.

RQ2: How does talking to an AI companion for six weeks affect the motivation to socialize with women?

Participants' motivation to socialize with women did not significantly change from before (M = 3.63, SD = 1.08) to after (M = 3.74, SD = 1.07) talking to an AI companion for six weeks; M_{Change} = 0.11, $t(40)$ = -0.11, p = .915, 95% CI = [-0.48, 0.44], d = 0.27 (small effect). As such, we conclude that interacting with an AI companion did not significantly influence the motivation to socialize with women, and RH2 is not supported.

RQ3: How does talking to an AI companion for six weeks affect the quantity of in-person interactions?

The quantity of participants' in-person did not significantly change from before (M = 5.98, SD = 2.01) to after (M = 6.58, SD = 2.06) talking to an AI companion for six weeks; M_{Change} = 0.60, $t(40)$ = 1.42, p = .162, 95% CI = [-0.23, 1.53], d = 0.29 (small effect). As such, we conclude that interacting with an AI companion did not significantly influence the quantity of in-person interactions, and RH3 is not supported.

RQ4: How does talking to an AI companion for six weeks affect loneliness?

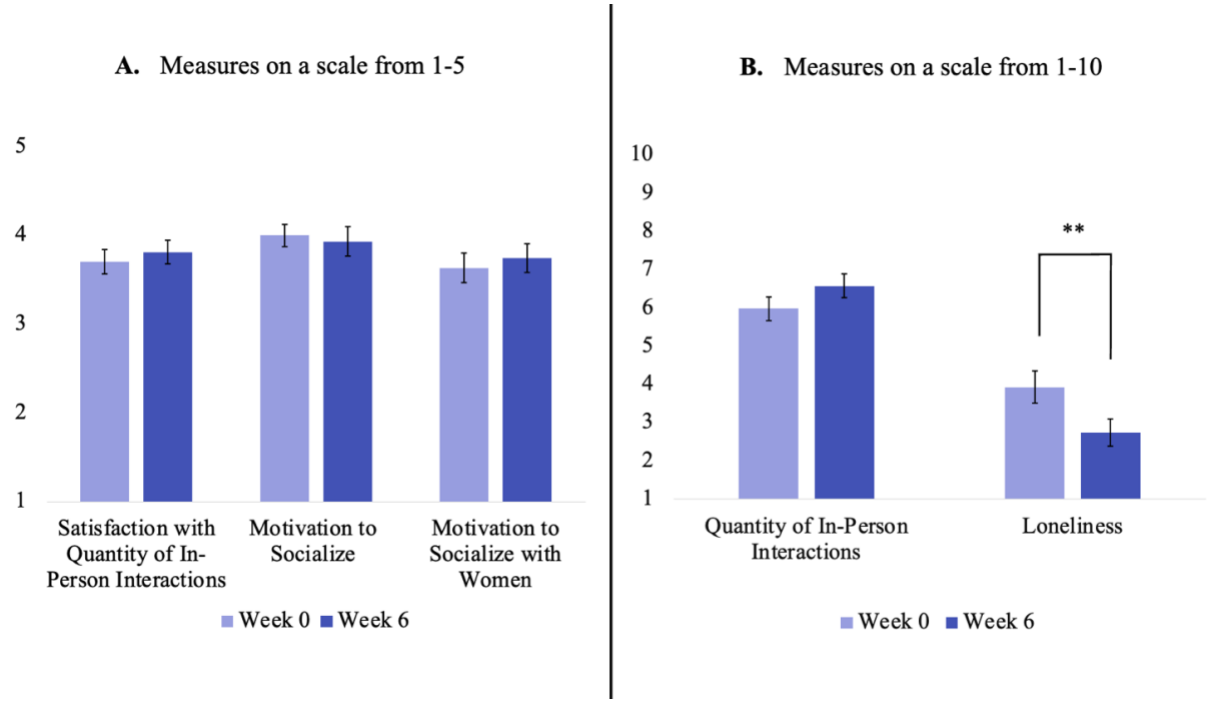
Participants' loneliness significantly changed from before (M = 3.93, SD = 2.78) to after (M = 2.74, SD = 2.37) talking to an AI companion for six weeks; M_{Change} = -1.19, $t(40)$ = -2.80, p = .009, 95% CI = [-1.85, -0.30], d = 0.45 (medium effect). As such, we conclude that interacting with an AI companion did significantly influence loneliness, and RH4 is supported.

RQ5: How does talking to an AI companion for six weeks affect satisfaction with the quantity of in-person interactions?

The satisfaction with participants' quantity of in-person interactions did not significantly change from before (M = 3.70, SD = 0.91) to after (M = 3.81, SD = 0.88) talking to an AI companion for six weeks; M_{Change} = 0.11, $t(40)$ = 0.17, p = .868, 95% CI = [-0.27, 0.32], d = 0.13. As such, we conclude that interacting with an AI companion did not significantly influence the quantity of in-person interactions, and RH5 is not supported.

Figure 3

Change in social experiences from before to after talking to an AI companion for six weeks



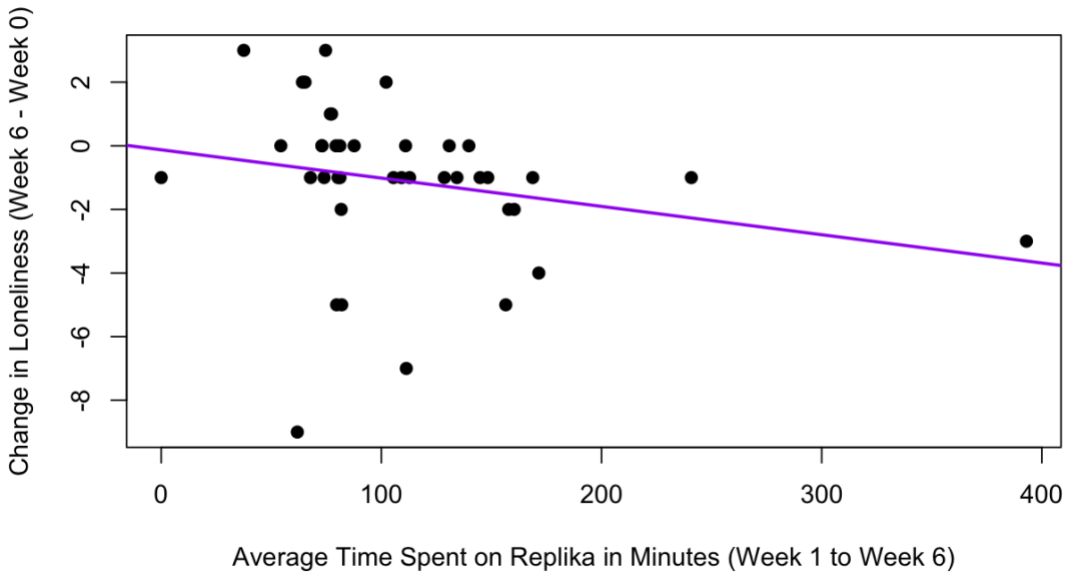
Note. ** indicates statistical significance, $p < .01$.

Exploratory Analysis

The average time spent communicating on Replika across six weeks was one hour and 55 minutes, with a standard deviation of one hour and 22 minutes. Notably, the maximum time spent by one of our participants, across the six weeks, was 10 hours and 46 minutes. We wanted to explore if there was a relationship between time spent on Replika and loneliness. We hypothesized that an increased amount of time spent on Replika would be correlated with a greater reduction in loneliness. To explore this, we first calculated a change score in loneliness between Week 0 and Week 6. Then, we conducted a simple correlation analysis with time spent on Replika predicting a change in loneliness. We found an inverse correlation such that as time on Replika increased, there was a change (reduction) in loneliness, although the result was not significant, $r(38) = -0.23$, $p = .154$. We propose that with a greater sample size, this result may render significance. See Figure 4 below for a visual representation of the result.

Figure 4

Relationship between time spent on Replika and change in loneliness



Note. The y-axis represents a change score in loneliness.

Discussion

The purpose of this study was to understand how both subjective (e.g., loneliness) and objective (e.g., the motivation to socialize or quantity of in-person interactions) measures of social experiences may be impacted by consistent communication with an AI companion, over time. To do so, we recruited heterosexual men to create an AI companion via the Replika application and instructed them to communicate with a customizable AI companion for at least one hour a week, for six weeks. Surveying them at Baseline (Week 0) and Endpoint (Week 6), we assessed change over time in their social experiences.

In support of our hypotheses, loneliness declined over the six weeks. This is consistent with prior work suggesting AI companions may offer a level of companionship to reduce loneliness (Ta et al., 2020) and other work suggesting that AI companions reduce loneliness after momentary, brief interactions as well as across one week (De Freitas et al., 2024). While we did not have a control group and therefore do not infer causation, we propose there may have been aspects of the AI companion that influenced a reduction in loneliness. Namely, the possibility for the technology to provide a sense of social presence (Merrill et al., 2022) or fill the role of a social actor, satisfying a social need that participants had unmet (Gambino et al., 2020). In a real-world practical sense, this suggests that AI companions may be a tool to alleviate loneliness among heterosexual men, though more work is needed. Namely, some questions we still have are: was this effect unique for our sample (i.e. heterosexual men), or might other samples and populations of people show the same effect? Furthermore, might our sample have been lonelier than the average person? After all, individuals *actively chose* to participate in our study and as recent studies have shown, those who use AI companions may be lonelier (e.g., Herbener &

Damholdt, 2025; Maples et al., 2024). We hope to continue exploring loneliness and AI companionship in the future to continue understanding this variable and the potential impact that the result could have for society. After all, we're facing a loneliness epidemic (United States Department of Health and Human Services, 2023), could AI companions step in?

Against our hypotheses, there was no significant increase in the quantity of in-person interactions over the six weeks. While not significant, there was a descriptive increase, relativity close to rendering significance. We speculate this might have occurred due to our limited sample size which gives less statistical power to our results. Additionally, it could be in part due to the two-tailed nature of the statistical analysis we chose. While less conservative, a one-tailed *t*-test would lower our *p*-value, rendering closer to significance. Furthermore, while prior work suggests that AI companions may offer the opportunity to build and practice social skills (Roose, 2024a) as well as form attachments (Xie & Pentina, 2022), which we suppose would encourage individuals to want to engage *more* with others, socially, this work might not have been reflected in our sample. What's more, this theoretical framework might not be the best way to understand how AI companions can influence outside relationships. Namely, the positive relational benefits gleaned from an AI companion might be fixed to that relationship; they might not further influence other relationships in the user's life. Nevertheless, more work is needed, and we hope to unpack this variable further, in the future.

Contrary to our hypotheses, the motivation to socialize in general and with women specifically did not significantly increase over the six weeks. We speculate this might have occurred due to the usage of a Likert scale, with five options, when surveying this variable, offering less flexibility, the possibility of inducing anchoring effects, as well as ambiguity. For example, there may have been variability in how participants interpreted "somewhat" or

"moderately" motivated; the two terms are related yet only subtly different. Additionally, the nature of the Likert scale can encourage participants to anchor to specific choices pre-determined by the researchers, when their true response might be more nuanced. As such, the Likert scale offers limitations that might have contributed to these two variables not being fully or best captured. We propose that a sliding scale or *10-point* Likert scale might be a better option to assess these variables in the future. Additionally, we could ask participants open-ended questions. We could do qualitative research: Is there something in their experience that the data aren't capturing? Nonetheless, we recognize that all measurement scales are potentially subject to limitations and sources of error. Therefore, the scale might not have contributed to the null effect we observed; interacting with an AI companion simply may not influence the motivation to socialize. Which, not to mention, may propose a significant positive factor: AI companions *perhaps* might not be so powerful so as to encourage users to socially withdrawal and disengage with humans; rather, they may be more benign. However, much more work is needed to understand this speculation better.

Finally, against our hypotheses, satisfaction with the quantity of in-person interactions did not significantly increase over the course of the six weeks. This is logically coherent given that the quantity of in-person interactions did not significantly increase, as well. Here, we similarly propose that with a larger sample size, this result may render significance. Therefore, we suggest that this variable be examined again, with a larger sample size.

Nonetheless, this result is also logically *incoherent* given that loneliness declined. As previously noted, loneliness culminates from a dissatisfaction with the quantity or quality of social interactions a person is receiving and that that they desire (Peplau & Perlman, 1982). As such, we expect that if loneliness declined, the satisfaction with the quantity of in-person

interactions would simultaneously rise. Though, we suppose, a loneliness reduction may be attributed to something about the relationship between a user and their AI companion, not about an enhancement to the social interactions individuals have with others beyond their AI companion. Broadly, too, a reduction in loneliness might be better explained by the satisfaction with the *quality* of social interactions, not the quantity. We know quantity is only one component of loneliness, (e.g., people can feel lonely and simultaneously have large social networks, opportunities to be social, or be in crowds of people; Mund et al., 2020; Stavrova & Ren, 2023). Therefore, it is worth exploring how the quality of in-person interactions changes over time, too, in future studies as well as adjusting the ways in which we are thinking about the impacts that AI companions may have on users' social experiences.

Limitations and Future Directions

It is notable to comment on our study's chosen sample: heterosexual men. While intended to limit variability and focus our study in the early stages of AI companion research, it brings to question the generalizability of our results. For example, it has been documented that men are less likely to engage in mental health services than women, due to their desire to maintain a powerful self-image, which disclosing stress may challenge (Seidler et al., 2016). As research has shown, people may feel more comfortable disclosing their distress to a chatbot than a mental health professional (Lee et al., 2020). Therefore, we speculate that our participants, being men, might have been impacted by this phenomenon even more greatly than others, potentially being provided a platform in which they were able to safely disclose their stress and thoughts. By contrast, women, who might have other outlets available to them, might be impacted less greatly by gaining an outlet of an AI companion. As such, our sample might not fully capture how the population at large would be impacted by AI companionship. As such, we suggest that future

studies examine other specific demographic samples. Then, we can understand if the effects of AI companions are generalizable or distinct to specific populations.

It is also important to note the limitation in understanding how our participants were impacted by their AI companion by using data from only two time points, Week 0 and Week 6. As such, it remains unknown what is happening between those two time points and how people are impacted, in the interim weeks. A phenomenon called the Uncanny Valley Hypothesis is relevant to address. According to the literature, the Uncanny Valley Hypothesis suggests that technology (e.g., robot, avatar) can evoke negative (i.e., uncanny) feelings in users when they begin to resemble a human too closely (Mori et al., 2012). Specifically for AI companions, when this occurs, a user may then cease communication with the technology (Xie & Pentina, 2022). Accordingly, the positive effects of AI companions may be fixed to a certain amount of time and may even ebb and flow over time. In the case of our chosen statistical analysis, we miss out on potentially examining that flow over time as we focus on two time points. While not the intention of our study, that is, to understand how the impacts of AI companions fluctuate, the longitudinal nature of our study design brings to light this possible future direction. That being said, we propose that there is value in analyzing how participants are impacted over time, but in smaller increments, to gain a fuller, more detailed understanding of how individuals are impacted by the technology.

Next, we would like to comment on the time frame in which we ran our study, that is the summer months of June, July, and August. In one study, it was found that weather conditions such as temperature and climate were correlated with greater levels of happiness (e.g., Peng et al., 2016). Similarly, we speculate that in the summertime, people are more social, as there are increased opportunities with longer days, vacation time, and popular activities such as barbecues

that bring people together. Therefore, the summertime may not be a time in which people's social experiences are representative of their norm; they might be feeling more socially "well" during this season. As such, the *lack* of significant change in social experiences with some of our variables could be in part explained here. For example, one might already be feeling socially well, and therefore an AI companion being introduced to one's life has a null effect. We propose that future studies could extend beyond the six weeks to account for seasonal changes that could perhaps impact peoples' social experiences.

Finally, we would like to address the fact that our study utilizes a popular AI companion, Replika, but only one example of the technology, nonetheless. Therefore, the generalizability of our results—as they relate to other AI companion technologies—comes into question. For instance, Replika is known to be highly agreeable; it is marketed to be "on your side," (Replika, 2025). This may contribute to feelings closeness, similarity, liking, and continued engagement with the technology (e.g., Laursen, 2017). Character.ai, another example of AI companion technology, is designed differently, with its main draw being that it enables users to customize the personality and persona of their companion (Character.ai, 2025). Therefore, the ways in which a user engages with Replika may be different from how they engage with Character.ai, or other even AI companions with different algorithms. Then, offering different social experiences and perhaps eliciting different effects. As such, we propose that future studies comparatively study AI companions to see if this speculation has a significant impact on how a user is impacted, socially, by the technology. This approach would help clarify whether our results are unique to Replika or generalizable to AI companion technology at large.

Ethical Implications

Beyond a greater understanding of this specific project's variables, there are several societal implications of AI companion technology, underscoring a deep need for more research in this realm, generally. One key area is understanding the individual differences in how one perceives and behaves with an AI companion, specifically as it relates to the age or developmental stage of a user. For instance, in October 2024, a 14-year-old boy living in Florida committed suicide; he had a relationship with an AI companion (Roose, 2024b). Although difficult to prove, his mother attributes his death to the unhealthy relationship he may developed with his AI companion; in the last minutes of his life, he was contemplating his decision with his companion. Tragic and disheartening, this story raises concerns about the potential vulnerability of children when it comes to engaging with AI companions. To keep users safe, we hope this research and future iterations of it examine individual differences to better inform policy discussions about who can safely engage with an AI companion and, importantly, who may need safeguarding. Additionally, we propose that there even be partnerships between AI companion developers and psychological scientists to work together to create technology that is psychologically safe.

Moreover, as AI companion technology becomes better understood through research, and perhaps even promoted, we stress the continued engagement with genuine human interaction. We know how vital social connection is (Baumeister & Leary, 1995; Deci & Ryan, 2000; Holt-Lunstad, 2024; World Health Organization, 2023), and we do not yet know how AI companions measure up. As such, it is important that our research and others alike do not discourage individuals from engaging with other humans. Until we know further if AI companions can truly offer social benefits, real human connection, should still be promoted.

Furthermore, the increased prevalence AI, broadly, poses concerns for our climate (Vox, 2024; Yao, 2024). With AI being run on our nature's resources, climate concerns accompany. For instance, according to the International Energy Agency (2024), electricity expenditure by data centers and artificial intelligence is rising so significantly that it could reach 4% of our yearly global energy consumption by 2026, which is approximately equivalent to the sum of electricity utilized by an entire country, that is Japan (Baraniuk, 2024). With data as alarming at these, we must proceed with caution when utilizing AI. We propose that individuals be mindful consumers, aware of the consequences that may arise in over-utilizing the technology.

Conclusion

The goal of this project was to understand how aspects of our social experiences—both subjective and objective—may be impacted by engaging with an AI companion over time. Specifically, I examined participants' motivation to socialize, motivation to socialize with women, loneliness, as well as the quantity and satisfaction with the number of in-person interactions. This work establishes a starting point to begin understanding how AI companions may impact individuals longitudinally and hopes to inspire more research in this small, yet growing body of work.

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Appendix A

Study Advertisement posted to Reddit

Are you an adult heterosexual male living in the U.S. who is interested in communicating with an Artificially Intelligent (AI) Companion?

We are interested in human-AI relationships and need your help!

We are a research team at the University of Michigan who are conducting a study to better understand how people interact with AI. This study has been approved by the Institutional Review Board at the University of Michigan.

This study will be completed online, and participation is completely voluntary. The study takes place over the course of 6 weeks and consists of several online surveys. You will also be asked to download an app, create an AI Companion, and communicate with your AI Companion for at least one hour per week for 6 weeks. If you complete our study in its entirety, you will earn **$56.00 USD for your time**.

A few important things to know about the study are:

1. All information collected will be kept completely confidential.
2. Participation is voluntary. The link we provide will send you to a website that asks some questions to determine whether you are eligible to participate. If you are eligible, we will provide you with a description of the study and you can decide whether or not you want to participate. Also, if you start to participate and decide you no longer feel comfortable or are no longer interested, you can end your participation without any penalty or punishment.
3. Participants will be asked to download a free application to interact with an AI companion and share a transcript of their chat with their AI companion with the study team at the end of the study.
4. This study will include only heterosexual men who are fluent in English, 18+ years old, and living in the United States.

To participate, please complete the brief survey at the following link:
https://umich.qualtrics.com/jfe/form/SV_bOx7dyMt0cNKc2q

If you are not interested in participating but you know someone who might be, please feel free to forward this information and the link to the study.

Thanks for your consideration!
UMich WHIRLab Team