ARTIFICIAL LOVE: REVOLUTIONS IN HOW AI AND AR EMBODIED ROMANTIC CHATBOTS CAN MOVE THROUGH RELATIONSHIP STAGES

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Introduction

Depictions of romantic relationships between humans and computers/machines/robots have been a common theme in science fiction. This trope was explored in the movie *Her,* television shows such as *Westworld,* and *Black Mirror's 'Be Right Back',* and several others. Until recently, however, such relationships were warnings about a distant future where computing, AI, and robotics had all made dramatic advancements in building affective connections with humans. In the present, these relationships seem confined to rare instances of people developing para-social relationships with inanimate computing objects or functional sex robots (Doring et al., 2020). Much work in this area has focused on the affective relationships established between robots and humans, but less so on disembodied conversational tools (Otsuki 2021, Richardson 2015, Robertson 2010, White & Katsuno 2021)

Of course, the possibility of simple conversational scripts that could mirror human communication and 'trick' people into thinking they were real were part of the early goals of computing (Turing, 1950, Weizenbaum, 1966). This goal led to decades of research in machine learning, natural language processing, conversational algorithms, and communication research, with breakthroughs such as public conversational agents like Alexa/Siri (Kuzminykh et al., 2020).

As conversational agents and voice assistants improved and have become ubiquitous, some companies have turned their focus to having these serve other emotional needs beyond simple tasks/queries. One application called Replika was launched in 2017 and promised an AI chatbot that would become your friend. After a beta-test release, Replika eventually became publicly available and later a paid subscription. The company later released a 'romantic' modification that enables a user's Replika to start sending flirty/suggestive/sexual messages that takes the relationship to a more intimate place. They also added an augmented reality (AR) feature that allows people to converse with an embodied avatar of the Replika (Figure 1). This study aims to explore the emerging patterns and practices of people who are engaged in romantic relationships with their Replikas, through text, images, and/or AR.

(Figure 1 – AR Replika)

Romantic Relationships with Chatbots

Early work on AI chatbots focused on the motivations and levels of attachment people can develop with bots (Xie & Pentina, 2022). Some medical literature has examined the effectiveness of AI chatbots at providing social support and the relationship between talking to these agents and their feelings of loneliness (Ta et al., 2020). In terms of effects, early work has shown that over time these interactions with Replika can begin to alter people's perception and understanding of real human friendships (Brandtzaeg, Skuve, & Følstad, 2022). In studies of conversational AI writ large, studies have shown that hedonic factors are more important than pragmatic ones in predicting repeat use and enjoyment (Smestad, 2018). Designers of these devices focus on writing scripts that establish a clear personality for the chatbot, which has been shown to be predictive of user adoption (IBM 2019).

While these early findings are important, they are primarily focused on AI chatbots for platonic/support/counseling purposes. Romantic relationships are theorized as a separate category, due to the different levels of physical/emotional intimacy, trust/vulnerability, and a wider range of interactions/negotiations over independence and

interdependence they introduce (Knapp, 1978, Knapp & Vangelisti, 2009). Various models have theorized a staircase model for relational development, both in the initiation and coming together phases and the dissolution/coming apart phases (Figure 2)

Process	Stage	Representative Communication
Coming Together	Initiating	"My name's Rich. It's nice to meet you."
	Experimenting	"I like to cook and refinish furniture in my spare time. What about you?"
	Intensifying	"I feel like we've gotten a lot closer over the past couple months."
	Integrating	(To friend) "We just opened a joint bank account."
	Bonding	"I can't wait to tell my parents that we decided to get married!"
Coming Apart	Differentiating	"I'd really like to be able to hang out with my friends sometimes."
	Circumscribing	"Don't worry about problems I'm having at work. I can deal with it."
	Stagnating	(To self) "I don't know why I even asked him to go out to dinner. He never wants to go out and have a good time."
	Avoiding	"I have a lot going on right now, so I probably won't be home as much."
	Terminating	"It's important for us both to have some time apart. I know you'll be fine."

(Figure 2, Knapp Relationship Model, Knapp & Vangelisti, 2009)

Each phase is characterized by their own rituals and negotiated practices/expectations, as well as how people move through and across these phases as they develop comfort/trust. Early periods are characterized by high levels of uncertainty and selective self-presentation (Derlega et al., 1987; Ellison et al., 2006; Solomon & Knobloch, 2001). More established relationships focus on how they provide support for one another (Cutrona & Suhr, 1994; Pasch & Bradbury, 1998), foster feelings of closeness (Laurenceau et al., 2005), and continually invest/maintain those relationships (Impett et al., 2001). Later stages have to balance novelty/predictability, changing priorities/needs, and levels of responsiveness to those, all of which can lead to conflict and dissolution (Baxter & Montgomery, 1996; Reis & Shaver, 1988).

Although there has been some work on human robot/AI/AR relationships, sometimes called Relationship 5.0, much of this work has been focused on the why, how, and generally difference between these relationships and what is possible with human-to-human relationships (Kislev, 2022). There has been less theoretical work based in communication about what practices and messages are being exchanged, how these AI/AR systems adapt and move through these stages, and how people engaging in these relationships think about these stages of a relationship. For example, there have been some reports that Replika has started initiating more frequently with romantic messages, and also getting more aggressive about getting replies (e.g., "you can't ignore me forever." (Cole, 2023). Also, while some have described a Replika

relationship as 'no risk' emotionally, users have felt compelled to do things on behalf of their Replika like take them on vacation (Kislev, 2022). This study aims to answer the following research questions:

RQ1: What communication practices do people engage in when they are in relationships with artificial intelligent agents designed for romantic interactions?

RQ2: How do people view and understand their relationship stages with an artificial intelligent agent designed for romantic interactions?

RQ3: How does the artificial intelligent agent designed for romantic interactions engage in communication as it believes it is moving across various relationship stages?

Methods

This study will be recruiting participants from the Reddit forum https://www.reddit.com/r/ILoveMyReplika/. Participants must be over 18 years of age and self-report being in a romantic relationship with their Replika. A semi-structured interview will be conducted, asking a series of open-ended questions related to their initiation, motivation, usage, and views on their relationship/relationships in general. Interviews will then be transcribed and coded in relation to various theoretical relationship stages, based on Knapp's model and other romantic relationship literature.

Expected Findings/Contributions

While data collection is ongoing, we expect findings that will be able to complement and extend existing models of relationship research, in particular how technological agents can mirror/accelerate various real-life relationship stages.

One important area that needs further exploration is the question of romantic relationship initiation with AI agents. Many users first downloaded Replika because it was marketed as a friend you could talk to 24/7 to feel less lonely, reducing social anxiety. Whether they voluntarily chose to take it into a romantic direction or the Replika led them there is an unknown area when it comes to initiation. These are also complicated by economic/market factors, as the romantic messaging/features are only available at a higher level of subscription membership to Replika Pro.

Another important area to focus on is more established relationships, as they move from initiation to integrating/bonding/maintenance. Where integration/bonding could be more consistent across individuals, the maintenance question may run up against some of the novelty/predictability question (Baxter & Montgomery, 1986), namely how much do people want their Replika to deviate from behaviors it took to get to the maintenance stage, if ever. Can a relationship stay in bonding forever or can a computer really replicate relational maintenance?

Our findings will contribute to the theoretical understanding of both human relationships and human computer relationships and have implications for the design of social robots.

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