Humanizing Artificial Intelligence: Exploring User Relationships and Interaction with Anthropomorphic AI Agents

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ABSTRACT

This thesis explores the idea of anthropomorphism in the context of human interactions with AI beings. The goal was to obtain a better understanding of how consumers perceive human-like characteristics in AI entities and how these characteristics influence their interactions. Previous study has shown that imbuing artificial intelligence with human traits may promote good communication practices and attitudes. However, contradictions exist as a result of varying definitions, metrics, cultural influences, and the diverse range of AI systems under investigation. This research aimed to fill these gaps by investigating how consumers perceive anthropomorphic traits in AI entities and form social interactions with them. The primary research questions revolve around users' perceptions of anthropomorphic qualities in AI beings and their capacity to build social relationships with such AI entities. The research incorporates theoretical frameworks to analyze these concerns, including the three-factor theory of anthropomorphism, social exchange theory, the warmth and competence hypothesis, and the HAII theory. Qualitative research methodologies such as purposive sampling and interviews were applied in order to acquire complete insights into participants' thoughts and experiences with anthropomorphic AI. The sample comprised people from many demographics, offering a broader variety of useful opinions. The results imply that we need to reconsider our approach to the human-AI connection. Rather than sticking to one theory, we should study the complicated relationship between the two. Users favor AI systems that display human-like qualities and behaviors because they feel more at ease with them. Meaningful discussions and dynamic encounters are critical in the formation of strong social relationships. AI systems that use cultural cues, sarcasm, and humor are seen as more engaging and human-like. Customization and personal interaction in AI speaking interfaces improve users' feeling of identity significantly. Human-AI relationships are distinguished by emotional bonds and intelligent communication. However, since consumers are aware of AI's limits, significant emotional ties may not be developed. Emotional intelligence and striking a balance in emotional expression are critical for producing pleasant user experiences. It is critical to examine and manage user expectations for AI interactions, focusing on timely completion of tasks and accurate data provision. Unfavorable emotions might be triggered by negative encounters, undermining the user-AI connection. Building user trust requires a focus on openness, control, and human monitoring. Context, user psychology, and the need for

balance all impact perceptions of AI's human-like traits. The findings of this research contribute to a better knowledge of how people engage with artificial intelligence and give significant perspectives for designing more user-friendly, tailored, and engaging AI products.

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1. Introduction

Artificial intelligence (AI) has become an undeniable reality that is altering many facets of our existence. According to Uysal et al. (2023), the way we interact with technology, people, and our surroundings has been completely transformed. The impact of artificial intelligence may be seen in many fields, from banking to medicine. Its influence has been propelled by the fact that it can complete jobs that would normally call for human involvement. Virtual assistants like Apple's Siri, Amazon's Alexa, and Google's Assistant have risen in prominence in recent years. Additionally, the integration of chatbots in customer care has also gained significance. To maintain uniform and efficient communication throughout this study, chatbots and virtual assistants will both be referred to as "chatbots."

These technologies have effectively blended into our everyday routines, becoming crucial tools for managing our homes and workplaces (Salles et al., 2020). However, the influence of these agents extends beyond their intended objective as basic tools. Research has proved that we display emotional reactions when interacting with human-like AI which is significantly influenced by our perceptions and attributions of human-like characteristics as well as how we engage with these AI agents (Waytz et al., 2010; Kim et al., 2019). This phenomenon which includes the process of assigning human characteristics to inanimate things is called anthropomorphism (Bartneck et al. (2009). A few examples of human-like characteristics include: an inviting physical appearance, a nice attitude, an authentic voice, and suitable behavior.

In terms of comprehending anthropomorphism in AI, Baumeister and Leary (1995) contend that the need to relate to and comprehend AI beings influences the tendency for anthropomorphism. This is reinforced when AI agents are promoted and marketed as sentient entities capable of comprehending human wants. The cognitive processes of users, such as assigning mental states and emotions, also influence their comprehension of anthropomorphic AI entities (Waytz et al., 2010). Another explanation is that the cultural backgrounds and prior experiences might influence AI behavior expectations based on cultural norms and values (Kocaballi et al., 2020).

From an interactive perspective, numerous research has shown that anthropomorphic traits have an influence on human interactions with AI. Epley et al. (2007) discovered that humans anthropomorphize AI agents, treating them as though they were alive. Similarly, Reeves and Nass (1996) discovered that humans react to humanistic features in AI agents as if they were interacting with actual people. This phenomenon is known as the "mind

projection fallacy" and it describes how people project their ideas, feelings, and intentions onto inanimate things (Jaynes, 1990). As a result, seeing human-like characteristics in chatbots has been demonstrated to promote social engagement, elicit socially acceptable behaviors, and boost human confidence (Ye et al., 2019; Hancock et al., 2011; Kiesler et al., 2008). However, on the other hand, Hornung and Smolnik (2021) warn that attaching humanistic features to AI systems may lead to dissatisfaction and distrust when these machines fail to reach these ambitious targets. Heerink et al. (2010) go on to say that people have a propensity to overestimate an agent's ability to mimic human behavior, resulting in disappointment and frustration when the agent falls short.

These inconsistencies in researchers' understanding of anthropomorphism in AI might develop through variances in definitions and measures of the conditions, developments in research methodology, cultural and contextual impacts on perceptions of AI, and the wide range of AI systems being examined. These characteristics might lead to discrepancies in data and conclusions, underscoring the difficulty of comprehending and interpreting human interactions with anthropomorphic AI beings. Airenti (2018) emphasized the importance of fully understanding how humans perceive anthropomorphic characteristics in AI from a relational and interactive standpoint. To close this gap, this research intends to uncover the fundamental mechanisms of human-AI communication, such as the comprehension of anthropomorphism and the social connection building with AI systems. Investigating how individuals distinguish between human-like and non-human-like AI qualities, as well as the criteria they use to define anthropomorphism in AI, will give important insights on human-AI interactions. The research questions are as follows:

Research question one: How do human users make sense of anthropomorphic features in AI agents?

Research question two: How do humans form social relationships with AI agents with anthropomorphic characteristics?

The goal is to learn about exactly how humans interpret anthropomorphic traits in AI beings and how this impacts forming connections with AI. It strives to increase understanding of user perception of AI agents that replicate human-like traits, as well as human-AI connections and interactions. Its specific intention is to explore 1) what AI traits humans identify as human-like or not human-like, 2) how anthropomorphic design affects the capacity of users to develop relationships with it.

This study can have implications on the technology and relevant industries. Understanding how people ascribe human-like traits to AI entities is crucial for improving AI technology because it enables the development of more user-friendly and specialized AI systems that can better serve our requirements (Waytz et al., 2014). The accessibility and customer adoption of such technologies across multiple sectors can also be improved by this insight. Moreover, the development of AI systems and techniques to boost consumer engagement and satisfaction, notably in the customer service and banking sectors, can be influenced by research on human-AI interactions, particularly with anthropomorphic AI beings (Dona & Mohan, 2020). Further on, from a societal standpoint, in order to deploy these entities in customer service, healthcare, education, and other different settings, it is essential to comprehend how humans interact with and interpret anthropomorphic traits in AI (Naeem et al., 2022).

Additionally, researching the emotional responses humans have to anthropomorphic AI is essential for figuring out the moral issues and adoption roadblocks connected to AI technology (Pelau et al., 2021). Understanding the interconnections between humans and AI may allay fears and guarantee the moral and responsible development of AI systems. Academically, the proposed study can add to the literature on human-AI interactions and the influence of anthropomorphic traits on these interactions by providing a deeper understanding of how people perceive anthropomorphic AI and providing guidance for future research (Go & Sundar, 2019). Finally, studying human-AI interactions and how anthropomorphic features affect these interactions will help us better understand how people view anthropomorphic AI and will offer useful direction for future studies in this area.

2. Theoretical Framework

In different facets of everyday lives, humans are engaging and developing relationships with AI systems. However, these interactions are not always as straightforward. Researchers have established a number of conceptual frameworks to help better comprehend the nuanced dynamics of the connection between humans and AI. These frameworks aid in organizing and directing variables affecting anthropomorphic perceptions and the ways in which humans develop relationships with AI (Bickmore & Picard, 2005). This chapter will cover five frameworks which will guide the research of this study. The frameworks discussed in this chapter are: understanding anthropomorphism in AI, the three-factor theory of anthropomorphism, the warmth and competence theory, the social exchange theory, and the rise of machine agency (HAII) framework (Kiesler et al., 2008; Epley et al., 2007; McKee et al., 2022; Homans, 1954; Sundar, 2020).

2.1 Understanding Anthropomorphism in AI

According to Bartneck et al. (2009), anthropomorphism is the process of giving non-human creatures human-like characteristics. Many researchers seem to find inconsistencies in what exactly defines human-like traits in AI. As a result, one must first take into consideration just how exactly these traits are defined. In one viewpoint, artificial intelligence is viewed as human-like when it can do activities that humans usually do, for example the ability to understand contextual language and make decisions (Frankish and Ramsey, 2014). This point of view comes from the Turing test which compares the ability of a computer programme to replicate human speech to the point of being indistinguishable from a human person (Turing, 1950).

Studies have also examined the results of imputing human traits to AI in interactions with humans. In a study by Lee et al.'s (2018) participants were more willing to heed fitness advice from AI coaches who exhibited human-like traits. Similarly, Kiesler et al. (2008) discovered that consumers shared more personal information with chatbots that had human-like conversational patterns because they saw them as trustworthy and fascinating. In addition, Hancock et al. (2011) found that engaging in socially acceptable conduct boosted participants' willingness to trade with AI entities with human-like qualities, resulting in more productive dialogues. To build on this, other researchers have contend that human-like qualities in AI should go beyond the capacity to replicate human cognition and behavior. Ye et al. (2019) discovered that people were more open to interacting with humanoid AIs that

had human-like traits including emotional expression and non-verbal communication. Human-chatbot bonding may also be aided by social signals including humor, emotions, and eye contact (Kiesler et al., 2008; Jung and Lee, 2004; Mutlu et al., 2012). Therefore, anthropomorphism was seen to improve human-AI interactions by creating a social presence, building user comfort and confidence, as well as fostering engagement (Roesler et al., 2020). This is especially true when social signals are provided by people.

However, contrarily, Smith (2018) challenges the idea of human-like attributes in AI by arguing in his book, "The AI Delusion," that AI will never be able to mimic distinctive human characteristics. According to research by Rosenthal-von der Pütten et al. (2013), participants who gave chatbots more human-like characteristics had greater expectations for emotional support, which resulted in emotional disappointment. When a chatbots' behavior or look is nearly human-like but not quite realistic enough, there is a reduction in emotional reaction, which Mori (1970) called the "uncanny valley" effect. According to MacDorman and Ishiguro (2006), our brain's developed threat detection suggests that this causes unpleasant emotional reactions.

In conclusion, developing AI systems that interact successfully requires a knowledge of how people see and respond to anthropomorphism in AI. While having human-like characteristics may increase engagement and trust, there are drawbacks to take into account, such as the uncanny valley effect and emotional discontent. These variables have an impact on how humans and AI interact and develop relationships (Roesler et al., 2020).

2.2 On Seeing Human: A Three-Factor Theory of Anthropomorphism

According to Epley et al.'s (2007) three-factor theory of anthropomorphism, elements affecting anthropomorphism include appearance, behavior, and mental states. Kätsyri et al. (2015) also stated that anthropomorphism is mostly influenced by appearance. Users interact socially and perceive AI agents as being more human-like when they exhibit physical characteristics and facial expressions that resemble humans. Facial expressions that convey emotion improve how human-like virtual figures are regarded to be.

Anthropomorphism also involves behavior. AI entities' perceptions of themselves as social beings are influenced by social cues including eye contact, gestures, and body language (Salem et al., 2015). According to research by Nass and Moon (2000), social cues make AI bots seem more socially present. Anthropomorphizing AI entities encourages social interactions, constructive attitudes, and higher reuse by assigning goals and motives.

Excessive anthropomorphism, however, may erode user trust and decrease their desire to cooperate with AI entities (Alabed et al., 2022). Nevertheless, ironic or hilarious language improves the view of AI as social creatures, which may have an impact on user perceptions (Li et al., 2017). Users' perceptions of AI agents are also influenced by empathy, with individuals seeing socially and emotionally intelligent AI bots more positively (Liu & Sundar, 2018).

Anthropomorphism is also influenced by mental conditions. Riek et al. (2009) states that people with higher degrees of empathy are more likely to anthropomorphize robots and attribute emotions to them. Agents powered by AI are said to have "human-like mental states" when they exhibit behaviors like thinking, feeling, and wanting. In social interactions, giving AI agents motivations and personality characteristics enhances the development of social bonds (Riek et al., 2009). Communication between humans and AI agents is influenced by social presence, with more social presence resulting in more accurate perception and cooperative behavior (Bickmore & Picard, 2005). Social chatbots encourage user involvement and marketing by speaking and expressing emotions in a human-like manner.

Several studies have been conducted on the theory, and the outcomes have repeatedly shown how important these three factors play in influencing people's attitudes towards AI. In one study by Reeves & Nass (1996) a robot's appearance, behavior, and mental state were all altered. The researchers discovered that all three variables had a substantial impact on participants' perceptions of the robot's social presence. Particularly, the humanoid appearance, social behavior, and emotional expression of the robot were associated with perceptions of a higher social presence. Another research indicated that when an AI chatbot had a more human-like look, behaved politely, and conveyed emotions, individuals had more positive sentiments towards it (Kim et al., 2018). The chatbot was made different by changing its look, how it behaved, and its mental states. What the researchers discovered was that all three aspects had an influence on the participants' opinions towards the chatbot. However, depending on the situation, these factors' effects can change. The three variables' effects on confidence in autonomous machines were studied, the autonomous machine's look, behavior, and mental states were all altered by the researchers, and they discovered that while mental states had no effect on confidence in the autonomous vehicle, appearance and behavior did. Participants trusted the machine more when it resembled a human being and behaved cautiously (Kim et al., 2018).

Thus, the three-factor hypothesis of anthropomorphism postulates that people's opinions towards AI are influenced by appearance, behavior, and mental states. According to studies, human-like physical characteristics, expressions on the face, feelings, social cues, and social presence are important variables. However, excessive anthropomorphism raises the need for balance because it may cause users to lose confidence in AI agents.

2.3 Warmth and Competence in Human-Agent Cooperation

The warmth and competence in human-agent cooperation theory by McKee et al. (2022) builds on this by suggesting that people also judge and engage with artificial agents based on their perceived warmth and competence. According to the notion, a successful human relationship is more likely the more likable and competent the AI agent is. Competence is the agent's acknowledged ability to do tasks, whereas warmth is the agent's perceived friendliness and reliability. Warmth is important in friendly agents because it fosters empathy and social connection, two things that are necessary for building trust and cooperation in interactions between humans and artificial intelligence (McKee et al., 2022). In human-agent collaboration, competence is equally important since agents who are seen as skilled tend to get greater respect and trust. In sum, the perceived friendliness and competence of an AI agent significantly influence the quality of interactions and relationships between humans and AI. In contrast, if a representative is seen as being cold or incompetent, collaboration may decline (Fiske et al., 2007).

Even prior to the warmth and competence theory, researchers have performed a number of studies to test users' perceptions on warmth and competence in AI in order to comprehend the implications for human-agent interaction. Brinkman et al. (2015) conducted an experiment to find out how users' impressions of virtual characters were affected by their warmth and competence. Two virtual personas, one seen as warm and competent and the other as cold and inept, were engaged with by participants. According to the findings, participants found the warm and competent persona to be more endearing and reliable, whereas the cold and inept figure received negative reviews. Participants were also more willing to assist and collaborate with the warm and capable persona while being less likely to assist the cold and incapable one (Brinkman et al., 2015). Similarly, in a study by Gilad et al. (2021) the authors ran an experiment to find out how people choose an AI system in relation to their views of competence and warmth. Two AI systems with varying levels of friendliness and competency were shown to participants as part of the experiment. The

authors discovered that people like AI systems that are both warm and competent, with competent but cold systems coming in second. Additionally, users reported higher levels of confidence and intent to use the friendly and knowledgeable AI system. Moreover, Belanche et al. (2021) conducted an experiment in which participants were shown two AI systems, each of which was described as having either high or low warmth and competence attributes. The aim was to find out how users' opinions of an AI system's warmth and competence are influenced. The participants were tasked with rating their level of liking and confidence for each system and selecting the one they would employ. The findings demonstrated that user preferences and confidence for the AI system were significantly influenced by perceptions of warmth and competence. Over the other three options, participants chose and trusted the AI system with high warmth and high competence traits. Additionally, user choice was significantly more influenced by perceptions of warmth than competence (Belanche et al., 2021).

According to Go and Sundar (2019) assessing warmth and competence is useful for studying a variety of issues pertaining to interactions between humans and artificial intelligence, such as how people's impressions of AI agents are affected by their visual appearance, conversational style, and task performance. Researchers may learn more about the underlying mechanics of human-AI interactions and create plans to enhance their quality by researching how warmth and competence affect these interactions. To guarantee that AI is created and applied in ways that respect human autonomy and privacy, it is essential to understand how warmth and competence impact human confidence in and collaboration with AI agents (Fiske et al., 2007).

Therefore, the warmth and competence in human-agent cooperation hypothesis contends that humans evaluate and engage with AI agents based on their perceived warmth and competence, which has a major impact on the caliber of relationships (Fiske et al., 2007). Studies have indicated that humans are more ready to trust and cooperate with AI agents when they are viewed as friendly and competent. This model offers a helpful framework for researching how people and AI interact and can assist guarantee that AI is developed and applied in ways that respect human autonomy and privacy.

2.4 The Social Exchange Theory

On the other hand, the social exchange theory (SET), proposes that social interactions between humans are based on cost analysis, where humans evaluate and

contemplate the benefits and costs of the interaction (Homans, 1954). Emerson (1976) explains this as thinking about the costs and benefits like an economic decision. According to the notion, people are more willing to associate with others socially when they believe the benefits will exceed the drawbacks (Homans., 1958). The social exchange theory does also emphasize the significance of reciprocity in social relationships. When people talk to AI, there might be differences in power because the AI might be more knowledgeable or in charge. Both sides must feel as if they are getting a fair and equal exchange of benefits and expenses for social interactions to be long-lasting and mutually beneficial. Due to this, a desire to keep utilizing the AI system and a feeling of loyalty might result from this sense of duty. As a result of their perception that doing so constitutes a sort of reciprocity, people may also feel obligated to contribute feedback or data to AI systems (van der Meijden et al., 2023). This is a crucial point when evaluating interactions between humans and AI. With a series of satisfying encounters, such as reliable advice or prompt help, trust is gradually developed. Yet if customers encounter technological issues, privacy concerns, or other problems with AI systems, confidence may be quickly lost (Jarrahi, 2018).

Recent studies have investigated the use of social exchange theory in a variety of scenarios, including service robots and human-robot interactions. To better comprehend users' attitudes and behaviors towards service robots Kim et al. (2022) uses the social exchange theory. According to the authors, user interactions with service robots are influenced by variables including trust, reciprocity, and perceived value. Additionally, they propose that social exchange theory can offer a practical framework for developing and putting service robots in tourism environments. In a similar vein, Ma and Brown (2020) expand social exchange theory to include the function of artificial intelligence agents in social exchanges by proposing a new theoretical framework called AI-Mediated Exchange Theory. The authors contend that the use of AI agents is spreading across many industries, and they propose that the AI-Mediated Exchange Theory may be used to better understand how AI agents affect human thought and behavior. They also talk about how the idea might be used to improve personalized suggestions and advance moral and ethical AI research.

However, there are ethical issues with applying social exchange theory to human-robot interactions. The gender performance and ethics of social exchange robots in simulated intimate encounters are investigated by Liu (2022). According to Bartneck et al. (2007), participants showed more compassion for a robot that was designed to act defiantly, which they attributed to the robot's apparent agency and individuality. They also point out

possible moral issues with this phenomenon, like the reinforcement of negative gender stereotypes and the encouragement of abusive behavior. Additionally, the study by Cao et al. (2022) investigates the connection between use preference and trust in human-robot interaction. The adoption and employment of robots in diverse situations is shown by the authors to be significantly influenced by trust. They also point out additional elements that affect trust, including past encounters with robots, perceived resemblance to the robot, and assessed competency of the robot.

While AI technologies have the capacity to be incredibly precise and efficient, interacting with them may be challenging for users. Users may find it difficult to grasp how AI systems operate and why they generate certain suggestions or judgements since they are often thought of as opaque. Users may be less eager to embrace and utilize AI systems due to this absence of openness, users' trust in the system might decline (Jarrahi, 2018). Thus, it is necessary to provide more transparency and understandability in the creation and application of AI systems. If users have problems interacting with AI systems, for example, they may get irritated and less satisfied (Chen et al., 2020).

Other factors affect the social exchange process between humans and AI such as the loss of privacy or control, and possible technical setbacks that might erode system confidence (van der Meijden et al., 2023). Concerns regarding how AI will impact ethics have also been raised. Fairness, bias, and discrimination issues might arise as a result of the usage of AI in systems. The framework offered by social exchange theory is utilized to identify any potential ethical concerns that may emerge from interactions between people and AI. For instance, the theory emphasizes the significance of taking into account the possible costs and dangers involved with these interactions, such as privacy problems or moral dilemmas including prejudice and discrimination (Blau, 1964). This has been acknowledged by academics who have called attention to the possible ethical issues that come from the usage of AI systems, notably in fields like employment, education, and healthcare (Jarrahi, 2018). These moral issues underline the need of comprehending the possible consequences connected to interactions and connections between humans and artificial intelligence, as well as the requirement for moral norms and guidelines for the creation and use of AI systems.

Since the social exchange hypothesis contributes to our comprehension of how people engage with AI systems it is a good framework to analyze the criteria on which humans form relationships with AI including the maintenance of those relationships which

may depend on characteristics such as trust, reciprocity, and perceived worth. Applying this theory may also help identify interactions between humans and robots which raise ethical issues like discrimination and unfavorable gender stereotypes.

2.5 Rise of Machine Agency: A Framework for Studying the Psychology of Human-AI Interaction (HAII)

The idea of social exchange theory is also closely related to the HAII model (Sundar, 2020), which contends that the increasing prevalence and significance of artificial intelligence and autonomous devices in society will alter the nature of work, social interactions, and ethics. This is referred to as machine agency which is defined as the level of intention, autonomy, and social presence that humans assign to robots (Sundar, 2020). Understanding this idea is crucial for creating fruitful interactions between humans and AI since it has important ramifications for how people see, evaluate, and engage with AI systems. The HAII framework outlines five key aspects of machine agency that affect how people see and interact with AI systems: perceived social presence, perceived intelligence, perceived goodness, perceived anthropomorphism, and perceived non-human-likeness.

Perceived social presence, a key component of machine agency, has been shown to have an impact on users' engagement, trust, and enjoyment with AI systems (Sundar, 2020). The degree to which a machine is seen as socially sensitive and capable of participating in social interactions is known as social presence. Research has demonstrated that when AI systems display social presence, people are more likely to be happy and trust them. As an example, chatbots that answer with sentient language and individualized replies are seen as having a greater level of social presence than those that just deliver generic, pre-written answers (Sundar, 2020). Perceived intelligence is a crucial aspect of machine agency that may have an influence on users' confidence in AI systems (Bartneck et al., 2009). The level of perceived intelligence describes how much a machine is seen as intelligent or capable of solving problems. People are more inclined to interact and trust AI systems that seem to be very intelligent. Users could be more willing to work with an AI-powered financial adviser who has a track record of making correct investment recommendations, for instance (Bartneck et al., 2009).

In addition, the level of perceived goodness measures how sympathetic, compassionate, or well-intentioned an AI system is seen to be. According to research, people choose AI systems that seem kind, and this preference may have an impact on user

happiness and engagement (Sundar, 2020). Patient engagement and satisfaction with the health service have been observed to increase when healthcare chatbots show empathy for their users (Liu & Sundar, 2018). The degree to which a machine is viewed as being like a human being is called perceived anthropomorphism. Anthropomorphic characteristics, such facial expressions or body language, may improve viewers' feelings of social presence and goodness (Nass & Moon., 2000). The ideal degree of anthropomorphism, it is crucial to note, may change based on the particular setting and objectives of the AI system. A chatbot created to give technical help, for instance, would not need a lot of anthropomorphism, but a virtual assistant created to provide emotional support could benefit from displaying more human-like traits (Bartneck et al., 2009).

Moreover, the level of perceived non-human-likeness indicates how different people believe a machine to be from people. Users tend to choose AI systems that are more human-like, hence it has been discovered that this dimension is adversely associated with user pleasure and trust (Sundar, 2020). The ideal amount of non-human similarity, it is crucial to note, may also change based on the particular setting and objectives of the AI system. In order to ensure their safety, users would choose an AI-powered drone that is built to carry out activities in hazardous or inaccessible settings to demonstrate a greater degree of non-human-likeness.

Finally, the user experience, usability, and transparency, in addition to these five aspects of machine agency, may also affect users' confidence and happiness with AI systems (Sundar, 2020). Users may be more inclined to interact with and trust an AI system if it is open and honest about how it handles and utilizes user data, for instance. Moreover, additional aspects including user demographics and past exposure to AI systems may have an effect on how users perceive and behave. For instance, research has indicated that consumers who are more experienced with AI technology have greater expectations and less tolerance for AI systems' flaws or limits (Bartneck et al., 2009).

To sum up, the rise of machine agency idea provides an essential framework for researching the dynamics of human-AI interaction, Users' engagement, trust, and satisfaction with AI systems have been shown to be significantly impacted by the five key aspects of machine agency listed in the HAII framework: perceived social presence, perceived intelligence, perceived goodness, perceived anthropomorphism, and perceived non-human-likeness.

2.6 Addressing the Research Gap

The objective of this research is to fill the current gap in research by examining how people interpret and perceive anthropomorphic characteristics in AI agents, and how these characteristics affect the development of social relationships. This research aims to make contributions to various areas by examining the identification of human-like AI traits and the impact of anthropomorphic design on user relationships. The study's primary objective is to provide a more detailed understanding of how anthropomorphism such as appearance, behavior, mental state, warmth, competence, and social interaction all interact with each other and affect how humans perceive and interact with AI. Understanding how users interpret anthropomorphic characteristics in AI agents can guide the conceptualization and advancement of AI systems, leading to interfaces that are more user-friendly and trustworthy.

Furthermore, the research can also pinpoint the constraints and difficulties linked to anthropomorphism in artificial intelligence. Recognizing these limitations underscores the significance of employing responsible design principles in the development of AI. This can serve as a valuable reference for future research and assist in the development of guidelines for creating AI systems that achieve a balance between anthropomorphic qualities and ethical considerations. The research aims to establish more research for future studies and research in the area of human-AI relationships. Gaining insights into the fundamental mechanisms of communication between humans and AI, such as how humans comprehend anthropomorphic characteristics and establish social bonds with AI systems, can be highly beneficial. These insights can be utilized to inspire further research on particular aspects of the human-AI relationship, thereby contributing to the overall progress of the field.

3. Method

3.1 Justification of the Research Method

      The purpose of the research was to comprehend the influence of AI on the everyday lives, actions, experiences, and social phenomena of persons. Creswell and Poth (2017) assert that qualitative research is well suited for probing intricate phenomena and producing detailed accounts of social operations and human experiences. By gathering specific information on participants' ideas, feelings, and behaviors, a qualitative method can provide researchers a deeper perspective of the phenomena they are studying. Additionally, qualitative research is well suited for understudied subjects like people's attitudes and feelings towards anthropomorphic AI agents. In addition, the purpose of this study's qualitative research approach was to use non-numerical data to understand human behavior, experiences, and social phenomena (Creswell, 2014). An exploratory study approach was created because of the subjectivity and intricacy of the anthropomorphic application of AI (Miles et al., 2013). This made it possible for the research to analyze people's subjective experiences and opinions rather than relying just on generalizing numerical data (Denzin & Lincoln, 2009).

      Interviews were used in this study to investigate how human users perceive and interact with anthropomorphic AI entities. Interviews are a qualitative research method that involves one-on-one conversations between the researcher and the participant to gather in-depth insights (Patton, 2002). Interviews were especially useful for this study's investigation of the anthropomorphic usage of AI and its influence on interpersonal communication. This is because an in-depth understanding of AI's impact was achieved through the ability of examining the experiences, viewpoints, and attitudes of participants. Interviews provided such a platform for participants to express their thoughts and experiences in a private setting, allowing for more individualized answers. The interviews allowed the researcher to gain the personal experiences of each participant, which would have been difficult to uncover if they had to be in a group setting for example (Patton, 2002).

      Moreover, since the interviews were one-to-one the participant could not be influenced by other participants' opinions and therefore no biases could be formed (Krueger & Casey, 2014), this allows the ability to explore any nuanced or sensitive issues. Interviews can also be particularly helpful for examining emotional and affective factors that affected users' interactions with anthropomorphic AI, as they allow for a more detailed exploration of

the participant's emotional states and reactions (Emmel, 2013). In interviews, participants' interpretations of anthropomorphism can be disclosed, and they may feel more at ease expressing their feelings in front of the researcher.

Interviews, however, also have some limitations that need to be considered. One notable disadvantage is the possibility of bias and subjectivity, from which the researcher's own interpretation and questioning style can influence the data collected (Patton, 2002). As a result, it was made sure to use an interview guide that followed a predetermined methodology to ensure consistency and minimize the potential for bias. Additionally, interviews can be time and resource intensive, requiring a skilled interviewer to conduct and transcribe the interviews and analyze the data collected. Despite these limitations, interviews remain an effective method for gathering detailed and nuanced understandings of people's attitudes, beliefs, and experiences with AI.

3.2 Procedure

Purposive sampling was employed as a method for this investigation. Purposeful sampling is a non-probabilistic sampling technique that includes the selection of participants based on certain qualities. Participants were chosen based on whether or not they use or were familiar with artificial intelligence. This method is useful for interviews as it allows the selection of participants to be representative (Ritchie et al., 2013). The benefit of utilizing purposive sampling is that it allows researchers to pick people who are informed about the issue being examined, resulting in more trustworthy and useful conclusions. In addition to being cost-effective, purposive sampling enables researchers to concentrate on a select set of persons who are most likely to offer the necessary information for the study. Purposive sampling has certain drawbacks, including the likelihood of selection bias and the difficulty to generalize the results to the whole population.

To compensate for these constraints, a thorough selection procedure was used to guarantee that the sample was representative of the population under investigation (Patton, 2002). Effort was done to avoid selection bias by choosing participants based on an objective criteria and not relying on personal preferences or presumptions (Emmel, 2013; Ritchie et al., 2013). In order to get a broader range of people's perceptions, the criteria included but was not limited to age, gender, geographic location, employment and culture. Those who have engaged with anthropomorphic AI, specifically virtual assistants and chatbots, were explicitly sought for the research. The participants were required to be

frequent users of a certain AI. The planned sample would include persons of various ages, genders, and nations. The research also addressed people with varied degrees of AI expertise, including those with minimal involvement with anthropomorphic AI systems and those who used them often.

To recruit participants, social media channels such as Facebook, Twitter, and LinkedIn were leveraged. Participants were enticed through a promotional flier designed by the interviewer (see appendix A). A statement describing the goal of the study and any eligibility requirements, such as age and location, was also provided. In addition, the statement reassured participants of confidentiality and research ethics, promising that all participant information will be kept secret (Krueger & Casey, 2014). Referrals from current participants or members of the target population were also an effective way of recruitment. For the success of the research, the significance of participants' ideas and opinions was highlighted (Krueger & Casey, 2014). To examine the complexity and subtleties of human connections with artificial intelligence, twenty in-depth, semi-structured interviews were conducted and each session lasted 45 to 90 minutes.

To gather all relevant information, all subjects and questions in the protocol were covered via audio or video recordings, with agreement attained or conflicts being clarified by the interviewer. Participants were instructed on the topic throughout the data collection process, and questions were asked in accordance with a predetermined methodology (Harding, 2018). Then, a series of screening and demographic questions were asked to the participants to be able to map each participant. After, personal ideas, attitudes, and use habits were collected via open-ended questionnaires and observations of body language. When needed the subjects and questions were clarified, expanded, and new ones were formulated to tailor the interview to the participant's need of understanding (Stewart & Shamdasani, 2014). With the aid of the interviews, the subjects and inquiries were expanded upon, and new ones were discovered (Stewart & Shamdasani, 2014).

Participants were asked to discuss their interactions with AI bots. It was important to find out exactly how the individuals use AI, how they think about it, and how that influences how they perceive it. To do this, the interviewer made use of open-ended questions to help elicit detailed discussions of the respondents' ideas and emotions. The researcher made sure that the participants felt comfortable and were aware that they will not be judged on their answers. This resulted in the collection of extensive and thorough data, which offered a profound insight of the viewpoints held by the participants. The researcher also took notes

throughout the interviews, capturing nonverbal cues and contextual details that added depth to the data. Overall, the use of qualitative interviews proved to be a valuable method for exploring complex and sensitive topics in a way that prioritized the participants' voices and experiences (Patton, 2002).

This qualitative study's data analysis procedure included coding, thematic analysis, data interpretation, and reporting, among other steps. The data gathered via interviews and other means of data collecting were transcribed first. After the data were transcribed, the coding procedure began, which consisted of finding major themes and patterns in the transcribed data, which were then given a code or label. The data was organized and analyzed in a rigorous and methodical manner (Saldana, 2021) by carefully classifying the data into significant themes and patterns.

Codified data was analyzed using thematic analysis. Thematic analysis is a qualitative research technique that identifies, analyses, and reports patterns within the data (Braun & Clarke, 2021). The codes and labels given during the coding process were examined to determine reoccurring themes and patterns in the data. These themes and patterns were then analyzed in search of insights and patterns that might aid in the comprehension of how anthropomorphic AI influences human behavior, experiences, and societal phenomena.

The interpretation of the data was a significant phase in the data analysis procedure, since it included synthesizing the themes and patterns revealed during the coding stage. At this phase, the context and significance of the discovered themes and patterns were evaluated in relation to the research topic (Braun & Clarke, 2021). The data was meticulously studied in search of trends and insights that might aid in comprehending the intricate ways in which anthropomorphic AI influences the perceptions and actions of humans. Several data sources, including direct quotations from participants and instances from the transcripts, were employed to assure the accuracy and dependability of the interpretations (Braun & Clarke, 2021).

Finally, the results of the study were then written up highlighting the important insights, themes, and conclusions. The use of visual aids such as charts, tables, and graphs to make the material easily understandable was used. In addition to providing the study results, recommendations and ideas were also given (Ritchie et al., 2013).

3.3 Operationalization

The research aims to examine the dynamic between human users and anthropomorphic AI beings, as well as to comprehend how people make sense of anthropomorphic AI. Five theoretical models will be used to provide an evaluation method.

First, the aspect of anthropomorphism in AI looks at how humans perceive AI entities in terms of their similarity to human traits (Kiesler et al., 2008),. This will allow the study to investigate what humans identify as human-like and non-human like. In addition, the degree to which AI agents exhibit social signals and communication styles that imply a feeling of presence will also be examined, as well as how much users believe AI creatures resemble humans (Frankish and Ramsey, 2014). Moreover, since this can also influence people's perceptions of an AI's human-likeness, the study will also take a look at how much people interact with and trust AI entities (Roesler et al., 2020). By using this framework, which human-like characteristics humans perceive more human-like in AI can be specifically identified.

Second, according to Epley et al. (2007), the three-factor theory of anthropomorphism conceptualizes human-likeness, human-like conduct, and human-like cognition. This paradigm also enables the investigation of how humans perceive AI entities that resemble people in terms of appearance or physical characteristics. However, it even enables the investigation of how human-like behavior and AI information processing and decision-making affect people. For instance, it allows for questions such as the following to be asked: if a chatbot behaves and acts like a person would it be seen as more dependable and approachable? Would it increase the possibility of user interaction? With the use of this framework, how much human users think AI agents resemble people from a physical, cognitive and behavioral aspect can be deduced. More so, how these traits affect interactions between people and AI can be identified. Third, the warmth and competence paradigm conceptualizes warmth and competence as two elements in evaluating interactions with AI (McKee et al., 2022). This paradigm enables the investigation on perceived friendliness or approachability of AI agents, as well as its aptitude for doing tasks and emotional state. The study will investigate more about how people react to an AI chatbot's warmth and competence by looking at these components. This paradigm can also assist in identifying if users experience comfort or threat from the presence of anthropomorphic AI, offering insights into the evolution of human-AI relationships. With the help of this framework, how

much human users think AI bots are kind and capable and how this affects how they engage with them can be assessed.

On the other hand, the social exchange theory enables the research to determine how people assess the benefits and drawbacks, interactions, and moral quandaries associated with exchanges between humans and artificial intelligence (Blau, 1964). Understanding of the nature of linkages and interactions between AI systems and people as well as any potential ethical ramifications from these interactions by looking at these areas may be gained. With this framework we can understand the transactional aspect that humans attribute with their relationship to AI. The HAII framework, which also encompasses interaction views, social concerns, and emotional components, enables a more thorough analysis of relationships and interactions with AI (Reeves and Nass, 1996). In addition, through this framework, ideas like loss of privacy or control, technological difficulties, and moral issues like injustice and prejudice are made measurable. This paradigm makes it possible to look at, among other things, how people and AI interact, communicate, judge, and react emotionally. Additionally, it permits the identifiable measurement of the impact of social norms, cultural values, and the importance of emotions in human-AI interactions. With the help of this framework, the social and emotional aspects of interactions between humans and artificial intelligence can be evaluated. Moreover, how social mores and cultural ideas affect these interactions can be discussed.

Therefore, informed by the aforementioned theories, this study will examine several elements of anthropomorphism in AI, including physical, cognitive, vocal, behavioral and emotional aspects of AI, amongst others. The study will also aid in identifying potential ethical issues and difficulties that could emerge in interactions between humans and AI.

The study's primary objectives guided the development of an extensive list of open-ended questions, allowing participants to provide thoughtful and personalized responses. It is worth noting that based on feedback received, the list of questions may have been refined or modified over time (Creswell & Poth, 2017). For a comprehensive compilation of the questions asked during the semi-structured interviews, please refer to Appendix "C". With this context in mind, the conceptualization of the interview questions serves as the cornerstone for collecting valuable insights and data in the operationalization section.

3.4 Participants

Age, gender, employment type, level of education, nationality, and language were all taken into screening so that the study can represent a diverse population. The participants' demographics are summarized in Table 1. The age ranges for this study were between the ages of 21 and 37. There were slightly more males than women in the sample, but overall the gender ratio is quite satisfactory. Marketers, media buyers, programmers, customer service reps, quality assurance analysts, HR professionals, lawyers, IT specialists, and language instructors are just some of the participants' professions. Everyone who participated was proficient in a minimum of two other languages. They spoke a variety of languages among themselves, including English, Dutch, Maltese, French, Creole, Spanish, and Romanian. Their educational level was also diverse ranging from postgraduate degrees to undergraduate degrees. This variation allows the possibility that the participants' views on the application of AI technology may be different.

The individuals' familiarity and expertise with AI technology also varies (see Table 1). Some people have a lot of experience with AI, having used it daily and worked with it while others don't. Nonetheless, all of the participants used AI with attributes that are human-like, like chatbots and voice assistants at some point or another. The participants utilize artificial intelligence in various ways in their daily lives. Some use it to improve the efficiency of their life, while others use it for advice, experimentation, or as a physical extension of themselves (Rosso, 2022). While some participants use voice assistants like Siri, Alexa, Google Home, and Cortana, others use ChatGPT, and still others use GitHub Copilot and generic customer service bots, ChatGPT is the most widely used AI technology among the participants. A member who has a great deal of knowledge and expertise with AI technology even mentioned constructing their own AI. The participants employ AI technologies at different rates. Depending on the sort of AI technology and the jobs they use it for, some people use it everyday while others only use it sometimes, like once a week or once a month.

Table 1

Sample Characteristics

Name	Age	Occupation	Bilingual	Familiarity with artificial intelligence	Frequency of use	Artificial intelligence product or service used
Amy	27	Marketer	Yes	High	Daily	Siri and ChatGPT
Anthony	24	Media buyer	Yes	High	Daily	Voice assistants, ChatGPT
James	24	Student	Yes	High	Daily	Voice assistants, ChatGPT
Darren	23	Freelancer	Yes	Medium	Weekly	ChatGPT
Andre	25	Software engineer	Yes	High	Daily	Copilot for coding, GitHub, Alexa
Claire	24	Jr Account Manager	Yes	Low	Monthly	Siri and Google Home
Yosef	22	Student	Yes	High	Daily	ChatGPT
Leonard	31	Q&A specialist	Yes	Medium	Weekly	ChatGPT
Angie	24	Recruitment	Yes	Low	Daily	Siri and ChatGPT
Joe	37	Technical writer	Yes	High	Daily	ChatGPT and build my own
Amanda	23	Digital marketer	Yes	Low	Daily	ChatGPT and Siri

Rowan	24	TV engineer	Yes	Medium	Weekly	ChatGPT
Rita	21	Student	Yes	Low	Daily	ChatGPT and Siri
Ramon	21	Student	Yes	Low	Monthly	Online Chatbots and Music AI
Luke	24	Lawyer	Yes	Low	Daily	Alexa, Siri, ChatGPT
Gareth	31	Software engineer	Yes	High	Weekly	Alexa, Siri, Cortana and ChatGPT
Jemma	27	Student	Yes	Low	Weekly	Customer support chatbot, ChatGPT
Derek	21	IT	Yes	Medium	Daily	ChatGPT
Dean	21	Language teacher	Yes	Low	Daily	Alexa and ChatGPT
Nate	24	Quality Assurance	Yes	High	Weekly	ChatGPT

3.5 Validity and Reliability

It is crucial to guarantee both validity and assurance in any research. Validity is the degree to which research findings are accurate and precise, whereas assurance is the extent to which biases or errors in the study design were minimized (Stewart & Shamdasani, 2014) Both validity and assurance received the consideration they deserved in the current study. By allowing participants to openly share their experiences and points of view, open-ended questions and prompts helped to assure the validity of the results. This method made it easier to collect rich, comprehensive data that could be thoroughly analyzed. The research was able to measure exactly what it set out to test as a consequence.

Several tactics were used to achieve assurance. A diverse participant pool was also employed, ensuring that the study included a variety of viewpoints and experiences (Mays & Pope, 2000). Through this method, any biases that might have developed if the study had used a more uniform participant pool were reduced. In addition, the study was able to ensure that individual perspectives did not unduly influence the findings by searching the data for trends and themes across a number of interviews. This method added to the research's robustness and gave more confidence that the findings were accurate and trustworthy (Mays & Pope, 2000). In conclusion, the present study was able to produce significant and trustworthy findings that may be utilized to guide future research in the area by assuring both validity and assurance. The study adds significantly to the corpus of information by utilizing a variety of techniques to reduce potential biases and increase the accuracy of the data.

3.6 Ethical Considerations

The participants' rights and well being were well protected. Ethical guidelines were thoroughly implemented and carried out whilst conducting the interviews. For example, all informed consent was collected from all participants through them filling in a consent form that highlighted the study's purpose, the risks and explaining their voluntary participation (Fisher, 2003). Getting informed consent was indispensable to make sure that participants fully understood the study's nature and voluntarily agreed to participate. Additionally, maintaining confidentiality and privacy was necessary to prevent potential harm or stigma to participants, given the study's sensitive topics such as human behavior and experiences. Also, participants' consent to record them and store their data securely, and that their identity was protected was also collected.

The potential impact of the research on the participants' emotional and psychological well-being was also seen as an ethical consideration and was made aware to the participants. Since the study aimed to explore human behavior and experiences, participants could share personal and sensitive information that could evoke emotional distress. Steps were taken to mitigate any potential harm, such as providing debriefing sessions and referrals to mental health services if necessary (Fisher, 2003). Additionally, asking overly personal questions was avoided and it was ensured that participants felt comfortable and safe throughout the study.

4. Results

Five themes were identified based on the qualitative analysis. They are the following: behavior, response style, physical qualities, vocal characteristics, and language. These topics depict how users' understand anthropomorphized traits in AI, as well as their impact on their interaction.

4.1 Theme 1: Human-like Behavior and the Dynamics of Human-AI Interaction

The results of the study indicate that anthropomorphic behavior, dynamic interactions, and customization hold considerable importance in artificial intelligence systems. The participants attributed human-like characteristics to anthropomorphized AI based on their personal understanding of what constitutes human-like traits. The study revealed that participants anticipate artificial intelligence to exhibit human-like behavior, despite not necessarily perceiving AI as a sentient entity. Participants in the study revealed that while they expect artificial intelligence to act like humans, they mostly focus on the differences between AI and humans.

One quality was that AI systems are more personalized than people because it uses complex mathematical analysis making sure to tailor itself to fit to your needs. The participants agreed that the ability of AI systems to learn and adapt to new situations was different from humans' abilities. Nate said: "This chatbot was, it's very sort of dynamic to your answers so it gives you back dynamic answers. Yeah, basically, it can adapt to your questions."

The participants also saw that AI systems didn't have much ability to think on their own, since their actions were only based on data and formulas, this leaves little room for individual thought. Angie said: "With a chatbot to be honest, I'd rather speak to a person in the sense you know, you seek that help to speak to someone who can reason with you not a robot so I'm not very confident."

One factor which participants found AI to be more human-like is when the system avoids strict and robotic behavior and instead uses warm and sensitive behavior. Even though AI can react in a pleasant way, participants were still aware that it can not show affection in the same manner humans do. Amanda said:

AI is very much to the point. So yeah, in that sense, it's warm because it's been coded by humans to give sort of like a warm response back, but it's very limited in that warmness of the response.

When it comes to forming social relationships, participants stressed how important it is for human AI characters to have nice behavior. Participants noted that they would not want to interact with a rude AI, rather they looked for AI that can help them, and actively listen to their concerns. Ramon said:

It's quite important for AI to be polite. Because I mean, if the bot isn't friendly it's just rude and like straight to the point and you're not going to really want to use that service or use that because why would you?

Rita said "All of the AI bots are really polite. And I think that's the main thing, like being polite and generic with their answers which is fine because I wouldn't want to interact with a rude or mean AI." Participants also felt a genuine need for AI to be able to tell exactly when it should display warm behavior and give appropriate suggestions. The possession of traits such as empathy, and curiosity helped participants bond with artificial intelligence systems. Angie gave an example:

When a person asked ChatGPT what it could do in order to be to reduce global warming, it suggested that the person should commit suicide, so it can reduce carbon emission. I mean, a robot shouldn't make that suggestion. It should, perhaps, say to reduce, reuse, recycle. Go vegan, you know, but not kill yourself.

4.2 Theme 2: Conversational Demands in Human-AI Interaction

Apart from behavior, participants also assessed the human-like attributes of AI by analyzing its conversational experience and response style. The participants said that the AI-generated responses seemed artificial and unnatural, often seeming rehearsed or fake. However, they did recognize that some artificial intelligence's capacity to use multi-turn dialogues and follow-up questions expressed a preference for discussions that followed a natural flow and mirrored the way in which humans typically communicate. Participants felt that when AI could understand context in sentences and simulate interactive and dynamic discussions they exhibit greater human-like qualities. Participants also found AI to be more human-like when it included humor and sarcasm. Amanda said:

Um, humor is definitely something that I find nice. So if they can reply back with a smiley face, or if it can, I don't know include some sort of sarcasm there like a joke or something that's always really cool because then it makes you feel like that warmth and that sort of like you're engaging in a warm conversation.

It was also suggested that if artificial intelligence responses include small mistakes, pauses, or deviations, it could make them seem more believable and less artificial. Participants felt that artificial intelligence's perfection can hinder human-AI relationships, causing a robotic and flawless behavior. Andre noted that:

It's very important to understand that humans are insanely flawed, even in the way we speak, the way we act. And the problem is AI isn't flawed. Or if it's flawed, it's buggy rather than natural. So if the AI needs to be as human as possible it needs to be bugged, it needs to stutter, it needs to make mistakes.

When assessing social relationships with AI, one interesting distinction occurred between participants. Individuals who sought a personalized and tailored experience with AI placed significant value on the AI's capacity to offer responses that were customized to their specific interests and needs. Participants noted that customized interactions not only enhanced the user's experience but also fostered trust in the AI system. In contrast, people who used AI mainly as a productivity tool or personal assistant appreciated the precision and speed of AI's responses, without necessarily anticipating human-like qualities.

Overall, the people recognized that being polite, having conversations that go back and forth, using humor, personalizing interactions, and not being too perfect are important for building social connections with artificial intelligence.

4.3 Theme 3: Perceptions of Human-like Physique in Encounters Between Humans and AI

Participants' physical perception of AI agents' human-like attributes was another factor that influenced participants' perception of AI. Participants noted that when they think of AI's physical embodiment, they can only relate to what has been portrayed in the media. Some participants associated AI agents with human-like qualities depicted in movies such as "Ex Machina," "Transformers," and "Her." Derek said: "When you say human-like form I am thinking physically looking like ExMachina." Their vision of AI agents involved

humanoids that had synthetic skin and carefully crafted facial features,which closely resembled those of humans. Anthony noted:

> Then obviously you've got a physical element, but I think that's, for us, it's much more far-fetched,like to have a robot in a human shape, whatever, I think we've only seen that in movies. So what comes to mind is like an embodiment like in the movie Ex Machina or Her.

Contrary, other participants imagine AI as having robotic features like the ones seen in movies such as "WALL-E," "iRobot," and "Terminator." They think of AI as having metal bodies, moving mechanically, and speaking with artificial voices. James said: "I mean, my only reference is from Hollywood movies, so I'd say the Terminator is like robots physically." They were drawn to the idea of robotic efficiency and imagined a future where gray metal and robots ruled the world. Claire noted:

> When I think of AI, I just think of a box with a lot of wires going through so literally like a robot or a robot as a computer or something like WALLE. I'm pretty sure it's because of how the media like portrays AI and the sort of creatives they use, but to me, and I don't know if this comes from films I've watched.

The participants also delved into the ways in which they establish social connections with AI agents that exhibit physical features. The participants emphasized that AIs shouldn't have too many physical human-like traits as they would find them disturbing and that would make the connection between them uncomfortable. Participants stressed the importance of being transparent about their artificial intelligence status. Amy said:

> I mean that idea kind of creeps me out. That said I would imagine it to have an AI generated image or else if we are talking about a physical being maybe it could have humanoid facial characteristics like eyes, a nose, and a mouth and it might be able to move and communicate with its surroundings in a manner like that of a person. But again, this can't be over done, it would make me uncomfortable.

4.4 Theme 4: The Use of Human-Like Verbal and Nonverbal Cues in AI to Human Interaction

Verbal and non-verbal traits was another theme that emerged in the explanation of understanding how AI bots use human-like traits and building bonds with them. Participants

agreed that AI systems have come a long way, especially voice assistant like Siri and Alexa, which can now sound more human than earlier versions, which sounded mechanical and fake Ramon said: "Speech pattern, sometimes it's very robotic. And you can hear that it's robotic and flat when a person's voice is not robotic."

The participants acknowledged that AI has difficulty in communicating non-verbal cues which makes it seem less human-like. Participants also thought that the lack of expression with a repetitive fake voice made interactions cold and boring, however a natural, emotional voice that could recognize and respond to tone and feelings made interactions feel like they were with a real person. This included sounding like a native speaker in speech, phrasing, accent, tone and pitch. Nate said: "If it were to be like, with a normal human pitch, I think that would make it very close to humans, basically."

Participants also evaluated how anthropomorphised vocal traits influenced their relationship with the AI. Voice modulation depending on users' personality characteristics, tasks, and ambient situations all contributed to a genuine and human-like interaction. Leonard also stated: "The main thing would be to shift a little bit to what's it called the tone? If it can do that, I think that would be the most human thing it could do. Or to show empathy." Hence, it was noted that by changing the voice of the AI to fit the user's needs and tastes, a stronger link was made with the user.

4.5 Theme 5: Language Adaptability and Cultural Awareness in Interactions Between Humans and AI

The participants found that artificial intelligence significantly lacked linguistic capabilities making them seem very obviously not human or human-like. Participants had concerns regarding the use of standardized English in AI models as they believed that AI was not exposed to certain linguistic features in different parts of the world. The participants felt that for AI agents to feel more human-like, they ought to possess the ability to comprehend and react in a manner that mirrors human communication, which includes the use of slang, dialects, and phonetics. During the discussion, James said:

> I think being trained somehow to be able to understand slang, and the lingo or abbreviations that we use in chats, like when you talk to someone in WhatsApp or messenger or whatever we don't we don't use full words for stuff. So being able to be flexible enough to understand the conversation as if you're talking to a human with different variations.

Participants also had concerns as most AIs use American English (with some having variations of more popular languages like Spanish, Italian and French), disregarding many of the other languages spoken around the globe. Participants felt that if they could communicate in their native language, it would result in a more authentic and comfortable interaction. Yosef said:

> It will be much better if we have our own native language, like if I had Siri that could speak fluently in my native language and give me a response like it's giving a response in English. When I interact in English and the experience I get when I talk in my native language, like in my language, the sense of the understanding, I think I will feel more comfortable interacting with it.

Some participants went a step further to mention that although some AIs do offer their services in a language other than English, the use of the language spoken is discriminatory and does not take into account the regional influences. Gareth said:

> It seems that the quality is better in English because when you see that in Spanish, like the response in Spanish, because of all the variations of the Spanish language, like throughout Spain and Latin America, they have a mixture of everything. Like if I chose to use Latin American, for some reason it is using Spanish from Europe.

Participants felt that if AI could include this feature, it would enhance their conversations and make them feel more relatable.

Similarly, the participants emphasized the importance of cultural sensitivity as another significant aspect. Andre said "And it needs to be culturally appropriate. So it has to at least have culture." Participants noticed that certain language use or language attributes have different meanings around the world. One word can be offensive or unsuitable in one part of the world while also being completely appropriate in another part of the world. was highlighted. Gareth also noted:

> Because I think that emojis themselves provide you somehow have a feeling, the only problem I see withemojis is that, again, going back to the languages part in Spanish, Argentinian and emoji may be different, maybe different for Spanish Mexico, perhaps maybe even offensive?

Overall, this research found that AI systems displayed both human-like and less human-like features. When AI demonstrated warm and empathic conduct, politeness, tailored interactions, and the capacity to comprehend and react to human emotions, they regarded it as more human-like. They did, however, acknowledge AI's limitations in terms of autonomous thought, real emotions, and physical appearance. Participants underlined the significance of balancing humanistic and technical elements in AI in order to develop productive interactions and social bonds. The research also found that individuals become more careful in their interactions with AI, realizing the need for compassion and respect in order to prevent undesirable effects. The study's results suggest that the linguistic abilities of AI agents that resemble human language were highly valued by the participants. This attribute not only demonstrated human-like characteristics but also encouraged inclusivity and eased interactions among individuals with diverse linguistic backgrounds.

5. Discussion and Conclusion

Artificial intelligence's explosive growth in recent years has drastically altered many aspects of people's lives. The advancements have opened up new doors and broken down formidable obstacles.The discourse surrounding the interplay between individuals and artificial intelligence systems has garnered significant interest in contemporary times. Consequently, intriguing and unparalleled associations have materialized amidst these two factions.

Understanding the intricate relationship between human beings and machines is crucial in the rapidly evolving subject of interactions between humans and artificial intelligence. Through this process, it is possible to get the knowledge and understanding needed to effectively navigate the quickly developing area of artificial intelligence with improved sagacity, observation, and judgment.

5.1 Key Findings

5.1.1 The Significance of Anthropomorphism, Dynamic Interactions, and Customization in AI Systems.

Throughout history, humans have always had a natural attraction towards individuals who possess exceptional qualities. These exceptional qualities form the basis for building social connections. In a similar vein, artificial intelligence systems are designed with comparable exceptional qualities to facilitate meaningful interactions with users and simplify their connection with the digital environment.

Previous researchers such as Epley et al. (2007) argue that humans anthropomorphize AI agents, treating them as though they are alive. While the empirical research conducted in this study reveals that humans have an innate inclination to expect AI to exhibit human-like behavior, users do not necessarily view them as alive. This is because although anthropomorphism is deeply ingrained in human psychology and can profoundly influence how people perceive artificial intelligence, humans are capable of drawing a distinction between what is made out of flesh and blood and what is not. Therefore, this study does not align with research such as that of Epley et al. (2007). That said, while users are aware that the AI is not "alive," they do project their own beliefs of what is human-like to them onto the AI system. This finding aligns with the mind projection fallacy first coined by Jaynes (1990) and it describes how people project their ideas, feelings, and intentions

onto inanimate things. In other terms, it is the mistaken belief that what we believe accurately represents how things really exist. As a result, the research agrees with Hu et al. (2021), who state that AI systems with human-like characteristics are preferable than robotic ones. This study reinforces this concept of anthropomorphism by also demonstrating that users prefer AI systems with human-like characteristics. The results suggest that users find psychological comfort when AI encounters display human-like traits. This preference stems from humans' inherent desire for familiarity and connection and therefore, enforces the study of Baumeister and Leary (1995) who note that humans anthropomorphize inanimate beings for the sake of relating to and comprehending AI beings.

As the demand for AI systems increases, users place importance on systems capable of engaging in meaningful dialogue. A unique finding of this research suggests that AIs that possess contextual awareness and can emulate interactive and dynamic discussions are seen to be more human-like and enhance the social bonding between the two parties. Users are motivated to engage in lengthy conversations, making AI interactions feel more genuine. This is likely because humans possess a strong need for lively and interesting conversations that can stimulate them and provide that 'feel-good' factor commonly felt during human-to-human interactions. Previous research by Poushneh (2021) notes that qualities like empathy, curiosity, and openness to new experiences contribute to better relationships between humans and AI. While studies by Salles et al. (2020) highlight that for machines to establish a strong connection with humans, they must possess certain traits such as civility and compassion. The research presented in this study aligns with both Poushneh (2021) and Salles et al. (2020), as it is noted that users tend to look for AI systems that have the ability to comprehend their inputs, give accurate responses, and offer captivating experiences. As users engage with an AI agent that demonstrates empathy and comprehends their desires and emotions, they become more invested in and connected to the system. The possibility of this leading to an improved experience overall is present.

However, factors like empathy and curiosity are not enough to suffice the social nature of human beings. One of the key and more nuanced findings of this research indicates that users also view AI as human-like and more engaging when the communication style also incorporates aspects like stutters, cultural appropriateness, sarcasm, and humor. This phenomenon can be explained by humans' innate need for social interaction that adheres to certain established rules and social consensus. The incorporation of such qualities may continue to fulfill user needs likely due to the fact that humans have a high demand for

authenticity and relatability in the language employed by AI systems. It is suggested that by adhering to language norms and conventional conversation dynamics, AI systems enhance the user experience.

In addition to discussing behavior, it is suggested that the voice of AI is also a significant human-like trait that affects how humans and AI engage with each other. Vocal cues have been an integral part of human speech, making humanity sensitive to small changes in how people talk. Interacting with AI voice interfaces allows users to communicate their preferences and strengthen their sense of self through customization. Such customization increases the user's personal involvement with the AI voice. A study by Zhang and Patrick Rau (2023) demonstrates the value of personalized interactions, showing that AI's ability to provide customized replies enhances the user experience. This is also consistent with the findings of this research hinting the importance of tailoring AI interactions to meet the specific needs of different users. Finally, a unique key finding regarding user behavior emerges. People have become more aware that AI systems can understand human words. This knowledge moves people to change their behavior towards AI, treating it with more respect, organization, and care. This change in behavior mostly serves as a preventive measure driven by concerns that AI systems may unintentionally act against users' interests.

5.1.2 Emotional Connection and Nuanced Communication in Human-AI Interactions

According to Waytz et al. (2010) and Kim et al. (2019), the advancement of human-like artificial intelligence has profound implications that extend beyond interpersonal and successful dynamic interactions, as it elicits genuine emotional responses from individuals. People have an innate need to connect with new people they encounter, and they actively seek out such connections. This leads to the development of bonds of friendship and community. When humans interact with AI, they lack this intrinsic motivation. This research implies that by seeing AI systems as more human-like, users are more likely to participate in emotionally engaging relationships and interactions that mimic social exchanges between humans. This can potentially be explained by humans' impulsive need for a sense of connection that satisfies their fundamental social needs. However, an important finding is highlighted. While the study recognizes that the emotional responses by the user are based on the users' perception of human-like characteristics, users do not necessarily feel

emotional attachment to AI. This relates back to the idea that the users are aware that artificial intelligence is inanimate and cannot reciprocate genuinely authentic emotions.

Therefore, while studies such as that of Pelau et al. (2021) underscore the significance of establishing emotionally resonant interactions with AI bots, this research from this study does not emphasize the importance of emotional bonding. However, the findings of this study do suggest the need for emotional awareness particularly in sensitive scenarios, thereby hinting at the necessity of an emotional connection or reaction. Establishing a sense of trust and reliability between individuals and AI necessitates the utilization of refined communication, where understanding the context, tone, and purpose behind the conversation becomes essential for emotional safeguarding.

Therefore, this study aligns with the findings of Eyssel et al. (2012), which note that finding the right balance in emotional expression is imperative for creating positive user experiences. This study also backs up other studies by Ye et al. (2019), Hancock et al. (2011), and Kiesler et al. (2008) by suggesting that human-like characteristics in AI promote social engagement, elicit socially acceptable behaviors, and boost human confidence.

5.1.3 Navigating the Human-AI Interplay: Redefining and Balancing User Expectation.

Although the findings suggest that users do not necessarily feel any sort of emotional attachment to AI, they certainly display emotions towards AI. The problem with having systems that are, as the word implies, artificial intelligence is that users develop a sense of understanding that the system can (almost) carry out any task that a human would normally do. The findings suggest that users value AI that provides accurate and up-to-date information; users specifically acknowledge the benefits of AI bots, particularly in customer service, technical support, and data retrieval. But more importantly, users prioritize completing tasks efficiently; the ability of AI agents to deliver reliable information quickly. This is seen as a significant factor in human-AI interactions. Research by Zhang and Patrick Rau (2023) demonstrates that AI bots can automate various activities, saving consumers time and effort. The findings of this study fully align with that of Zhang and Patrick Rau (2023), emphasizing the desire for quick task completion using AI agents, especially in situations requiring immediate responses, solutions, or support.

If an AI system comes short of the humans' expectations, the user may project emotions like anger, disappointment, and dissatisfaction while in the process tarnishing the social bonding between the two parties. This corresponds with what Heerink et al. (2010)

found: people tend to overestimate an agent's skills, which leads to sadness and dissatisfaction when the agent doesn't live up to expectations. Freud's (1953) theory of "psychological projection" explains why people may have emotional responses to AI, they project their own mental and emotional states onto AI systems, giving them feelings, plans, and goals based on their own experiences. Once again, the study suggests that adopting a well-rounded approach to emotional participation becomes essential. Negative experiences with AI discourage customers from using them in the future. Users express a desire for AI systems to be approachable and personable while being highly competent in their designated tasks.

In order to meet consumers' expectations, it is also suggested to be realistic about the capabilities of AI as well as the system's ability to provide trustworthy data. According to the findings of the research carried out, users understand the potential for AI algorithms to display biases stemming from the data they are trained on. While participants tend to perceive AI biases and mistakes similarly to those made by humans, indicating the complexity of human perception, the study highlights the importance of transparency and control for gaining users' confidence and keeping their positive opinion of AI systems. Therefore, in this respect, the study also challenges the commonly accepted notion that artificial intelligence is completely objective and free of errors (Taborri et al., 2021).

As the relationship between humanity and artificial intelligence becomes increasingly significant as time progresses and new technological advancements emerge, individuals may over time develop a balance between their confidence in AI's capabilities and their awareness of its limitations. The study suggests that preserving this equilibrium can be vital to ensure users can rely on artificial intelligence while being mindful of its constraints. This study also finds that users demand human control and oversight to ensure smooth operations, highlighting the users' strong emphasis on acquiring credible information.

5.1.4 The Influence of Context, User Personality, and Balance on Artificial Intelligence's Anthropomorphization

The preceding discoveries hold considerable importance; however, the research also highlighted a noteworthy aspect: the interpretation of AI's human-like characteristics is largely contingent on the context. In relation to the impact of the AI tool's purpose and intended use, it is plausible that users refrain from attributing anthropomorphic

characteristics to AI systems that are engineered to offer straightforward solutions (such as chatbots) due to their emphasis on efficacy and task fulfillment. This is likely due to the fact that users may perceive the AI as nothing more than a utilitarian tool designed to serve a particular function, rather than a social entity capable of fostering interpersonal connections. The emphasis on interaction that is oriented towards tasks may be attributed to the inclination to accomplish objectives in a prompt and efficient manner.

In scenarios involving dynamic interaction (such as with virtual assistants) in which AI is designed to offer continuous engagement, users tend to ascribe more anthropomorphic characteristics to the AI. A plausible explanation for this phenomenon could be attributed to the anticipation of a customized and empathetic interaction encounter. Individuals may express interest in artificial intelligence systems that possess the ability to comprehend contextual nuances, adjust to their preferences, and interact with them in a conversational style. The inclination towards human-like engagement in such situations may stem from the notion that a more interactive and responsive artificial intelligence would be better equipped to cater to their requirements.

The personality of the user is another important finding in the explanation of how humans bond and establish social connections with artificial intelligence. Individuals who exhibit introverted tendencies may already find human-to-human social interactions difficult; therefore, they may find an excessively anthropomorphized artificial intelligence to be socially overpowering. This sentiment may arise due to an affinity for communication styles that are more direct and focused on accomplishing tasks, which is in line with their inherent preferences. Individuals who exhibit introverted tendencies may exhibit a preference for social interactions that prioritize goal attainment and minimize social complexity, as opposed to engaging in prolonged social interactions.

Finally, one of the most valuable findings was the need to uphold a nuanced equilibrium in the process of anthropomorphizing artificial intelligence to prevent possible discontent and skepticism among its users. The research highlights apprehensions regarding probable discontent among customers that may arise due to the overuse of anthropomorphic features in artificial intelligence. The aforementioned concept is consistent with the research conducted by Hornung and Smolnik (2021), which warns against the incorporation of humanistic traits into AI systems. Such an approach may result in discontent and skepticism among users when these machines fall short of achieving these lofty objectives. The study is also in line with the idea of the uncanny valley phenomenon, which holds that users may

experience unease or apprehension when dealing with AI systems that resemble humans in some ways but not entirely (Mori, 1970). The reason of this discomfort could be the cognitive dissonance and decreased reliance brought on by the incompatibility between the expected anthropomorphic behavior and the AI's limitations. The concurrence between this study and the research conducted by Hornung and Smolnik (2021), coupled with the phenomenon of the uncanny valley, underscores the significance of maintaining an intricate balance in the development of artificial intelligence that avoids excessive anthropomorphism.

5.2 Theoretical and Practical Research Implications

The study contributes academically by strengthening existing literature on anthropomorphic AI and human-AI interactions. Through strengthening existing literature, this study also reduces the inconsistencies surrounding the topic. Contrary to works of Epley et al. (2007) the findings of this study indicate that while humans have a natural tendency to expect human-like behavior from AI, they do not necessarily perceive them as human or real beings thereby reducing the notion that humans view AI as anything other than an object or tool. The study also found that opposed to common beliefs that users are able to form emotional ties with AI, they also do not feel emotionally bonded to the system. This academic addition acknowledges that people tend to view artificial intelligence as the word implies - artificial as long as they are aware of how they are interacting with them. In terms of behavior, the results are similar to what Kiesler et al. (2008), Ye et al. (2019), and Mutlu et al. (2012) found in their own research. These studies acknowledge the importance of artificial intelligence's capacity to modify its actions in response to feedback and acquire knowledge from novel circumstances. By establishing this connection, this study strengthens the existing literature on the importance of AI displaying human-like qualities to enhance social connections.

While the study supports and aligns with theories such as that of Jaynes (1990) which recognizes that humans project anthropomorphic qualities onto AI, this study goes a step further in highlighting the importance of drawing a line. Supporting the "uncanny valley" phenomenon described by Mori (1970), the study suggested that users do not favor over-anthropomorphized artificial intelligence. This challenges the notion that AI can fully replicate specific human characteristics and emphasizes the need to avoid excessive

anthropomorphism in AI. This finding contributes to the literature by highlighting the limitations and potential pitfalls of anthropomorphizing AI.

The results partially support Epley et al.'s (2007) three-factor anthropomorphism hypothesis from 2007, which contends that an AI's perceived humanlikeness is impacted by its behaviors, physical attributes, and cognitive capabilities. This study expands to the understanding of the varied nature of anthropomorphism and its different factors by showing that people see AI entities as more human-like when they display physical qualities, social indicators, and empathetic behavior akin to humans. However, the study did discover that not every AI has this capability, and that the impact it has on the user varies on the user's experience. Therefore, this study notions the importance of taking the unique perceptions of users' into consideration.

Moreover, the findings align with the warmth and competence theory proposed by McKee et al. (2022). Users perceive friendliness and competence as crucial factors when evaluating and interacting with AI systems. This supports the existing literature on the importance of AI comprehending human emotions, providing support, and actively listening to foster better relationships. However, the study also found that some users prefer having systems that have either one or the other (warmth or competence) and not both. These inconsistencies also highlight the limitations of warmth and competence in AI systems, further contributing to the understanding of this theory.

Furthermore, the study examines the social exchange hypothesis in human-AI interactions, aligning with Blau's theory (1964). According to the findings, users expect AI systems to exhibit human-like behavior but tend to notice differences more than similarities. This upholds the premise of the social exchange theory, which suggests that people evaluate relationships by weighing the benefits and drawbacks of the rewards and costs involved. The study emphasizes the importance of AI adjusting its behavior based on user feedback and generating distinct responses to improve the perception of anthropomorphic characteristics, promoting social connections.This finding supports the theory that people evaluate relationships by weighing the benefits and drawbacks of the rewards and costs involved in the interaction. However, the users' acknowledgement of the constraints of AI in terms of independent thinking, knowledge, and sensory experiences, contradicts the theory's emphasis that a mutually beneficial interaction is possible.

The study also contributes to the HAII (Human-AI Interaction and Intelligence) model proposed by Sundar (2020) by shedding light on the variables influencing people's

perception and interaction with AI systems. It highlights the importance of machine agency and users' recognition of AI as an independent agent with unique capabilities and characteristics. However, it also reveals contradictions and limitations regarding machine agency, further adding to the understanding of this model. The study found that users acknowledged AI's ability to tailor responses, engage in multi-turn conversations, and imitate human communication styles, all of which played a significant role in shaping their perception of machine agency. However, participants also recognized AI's limitations in independent thinking, knowledge, and sensory experiences compared to humans.

Lastly, one unique finding which contributes to the existing body of literature by adding new insight is the awareness that the understanding of anthropomorphism in AI by humans is heavily contextual depending on a number of factors such as the purpose of the tool and the users' personality type. The study suggests that it would be incorrect to define how humans make sense of anthropomorphic AI without keeping these factors in mind.

The results of this study have important practical implications for the research, development, and design of artificial intelligence systems. To begin, including human characteristics in AI entities has the potential to improve user interactions. Users have a tendency to anticipate that AI will behave in a manner similar to that of humans and tend to favor systems that exhibit such qualities because they provide a sense of familiarity and connection. However, in order to minimize client unhappiness and distrust, it is essential to strike a balance and refrain from using anthropomorphism in an excessive manner. Second, it is recommended for human-AI interactions to have an emotional connection and nuanced communication. This can be accomplished by creating a stronger emotional relationship with users and providing a more satisfying experience. This can be done by infusing warmth, empathy, and genuine emotions into AI systems. The viability of this can be attributed solely to the progress achieved in the field of machine learning. Furthermore, it is imperative to recognize the constraints of artificial intelligence and provide pertinent details upon which users can depend to fulfill the anticipations of the technology's users. The presence of transparency, control, and human supervision are crucial prerequisites for artificial intelligence systems to gain user confidence and fulfill their potential. These practical ramifications underline how important it is to design AI systems that replicate human interactions, exhibit contextual awareness, and prioritize meaningful dialogues in order to increase user pleasure and trust.

5.3 Limitations and Recommendation for Future Research

First, the study acknowledges potential limitations in the generalizability of the findings due to the possibility of inadequate sample representation, despite the researchers' meticulous attempts to incorporate a varied cohort of subjects. The utilization of purposive sampling, a technique that involves the selection of participants based on predetermined criteria, may potentially result in biased outcomes due to variations in participants' levels of familiarity and experience with AI technology (Patton, 2002). It is imperative to consider these constraints while interpreting the outcomes, as they may lack generalizability to a wider scope.

Second, although the study provides useful insights, it's crucial to acknowledge that there could be constraints to its relevance for a wider audience. This might be because of the different demographics and personal traits of the participants. The results might not work for bigger groups due to the sample size. The study's shortcomings are carefully recognized since they might affect the study's external validity (Stewart & Shamdasani, 2014). Third, self-reporting bias represents a potential bias in the study. The utilization of participant self-reporting via interviews may result in the introduction of biases, including social desirability bias and memory recall bias. The potential for inaccuracies in data collected from participants exists due to the possibility of their responses aligning with societal expectations or being based on inaccurate recollection of their interactions with anthropomorphic AI agents.

Fourth, the limitations of time may impact the extent and scope of the data gathered in the research. The extent of the inquiry and the accessible resources could impact the depth and comprehensiveness of the examination. The acknowledgement of potential limitations imposed by time constraints is a crucial aspect that needs to be considered in order to evaluate the impact of such constraints on the study's findings. Fifth, the study employs thematic analysis, a method that entails the subjective interpretation and coding of data, which may result in bias. The interpretation of data may vary among researchers, and the outcomes could be influenced by the analysts involved. The consideration of subjectivity in analysis is imperative while interpreting the results (Braun & Clarke, 2021). Finally, the research is centered on the documentation of the subjects' experiences and perspectives at a particular moment in time, without the inclusion of longitudinal data. The study of longitudinal data tracking participants' interactions with anthropomorphic AI agents over an extended period has the potential to offer valuable insights into the evolution of relationships

and the stability of emotional connections (Krueger & Casey, 2014). The study's capacity to infer conclusions regarding the long-term consequences and dynamics of interactions with anthropomorphic AI agents is restricted due to the lack of longitudinal data.

Despite the remarkable advancements made by AI agents in emulating human-like behaviors and delivering proficient assistance, their capacity for authentic emotional depth and cultural comprehension remains deficient in comparison to that of humans. The attainment of an extensive comprehension of this subject matter necessitates the undertaking of research that delves into a variety of perspectives on anthropomorphic artificial intelligence agents. The consideration of users' cultural backgrounds, prior experiences, and individual traits is crucial in comprehending their comprehension of AI systems and their engagement with them. The potential for detecting individual variances among users may facilitate the customization of artificial intelligence to meet the specific needs and preferences of each user (Norman & Draper, 1986). The aforementioned phenomenon may lead to the establishment of more intimate connections between individuals and AI. Further investigation into the psychological and emotional components of human-AI interactions is imperative to augment our comprehension of the dynamics within these relationships.

Furthermore, it is recommended that forthcoming research endeavors investigate the consequences of anthropomorphism in diverse settings, such as healthcare, customer service, and education, among other domains. Valuable insights can be obtained to inform the design and development process by studying the impact of different levels of anthropomorphism on user experiences, trust levels, and the overall effectiveness of AI systems. The acquisition of this knowledge will make a valuable contribution towards the progress of AI agents that achieve an optimal equilibrium between anthropomorphic characteristics and the distinctive benefits provided by artificial intelligence. Furthermore, future research endeavors ought to meticulously deliberate ethical considerations and societal implications linked with the assimilation of anthropomorphic AI agents (Hagendorff, 2019). The present study emphasizes the significance of acknowledging potential obstacles concerning confidentiality, data protection, and the indistinct boundaries between individuals and artificial intelligence. The proactive resolution of these concerns is crucial to guarantee that the creation and execution of anthropomorphic AI technologies conform to ethical standards and produce a favorable outcome for society.

5.4 Conclusion

Based on the research conducted, it can be concluded that the findings have indicated the need to think differently about the interplay between humans and artificial intelligence rather than substantiating the value of a particular theoretical perspective. The research has outlined numerous key takeaways and offered insights into different facets of interactions between humans and AI. First, users favor AI systems that have human-like traits and behaviors because they feel psychologically at ease and comfortable with them. Dynamic interactions and meaningful conversation strengthen social bonds, and AI becomes more human-like and entertaining by including communication features like stutters, cultural appropriateness, sarcasm, and comedy. AI speech interfaces that allow for customization and personal engagement enhance users' sense of identity.

Second, relationships between humans and AI include emotional ties and sophisticated communication. Users may have emotional reactions to AI, but since they are aware of the limits of AI, they may not build meaningful emotional relationships. Positive user experiences depend on emotional intelligence and achieving the proper emotional expression balance. AI systems that comprehend context, adapt to preferences, and engage in dialogue are valued by users.

Third, user expectations for interactions between humans and AI need to be balanced and revised. Priority is given to timely work completion and correct data. Negative encounters might trigger negative feelings and weaken the connection with AI. For user confidence, transparency, control, and human monitoring are crucial. It is essential to address biases, provide reliable data, and be honest about AI's capabilities. The context, the user's personality, and the requirement for balance all have an impact on how human-like traits of AI are perceived. In certain situations, AI could be seen as a practical tool, but in dynamic interactions, people tend to give it more humanistic traits. The preferences for social interactions with AI may be influenced by user psychology, such as introversion. To avoid disappointment and mistrust, it's critical to strike a delicate balance while anthropomorphizing AI (Hornung and Smolnik, 2021).

In response to study question one, human users interpret anthropomorphic traits in AI agents because they have a natural tendency to anticipate that AI would behave in ways similar to humanity, while also being aware that AI is not a living being. The mind projection fallacy is a phenomenon where people tend to transfer their own ideas of what constitutes human-like behavior onto AI systems (Jaynes, 1990). When AI interactions

exhibit human-like characteristics, users experience psychological comfort because it meets their need for familiarity and connection. The user experience is improved and AI systems become more engaging when human-like characteristics, such as communication style, cultural appropriateness, and humor are included. Artificial intelligence's voice also has an impact because aural cues and personalization boost a user's feeling of identity and intimate interaction with the AI voice. Users balance their expectations and look for trustworthy information from AI, however, since they are aware that AI systems might have biases and limits.

In order to answer research question two, humans form social relationships with AI agents anthropomorphic by perceiving them as more human-like (Epley et al., 2007) . They interact with AI in emotionally stimulating ways in an effort to find a relationship that meets their social demands. Users express feelings toward AI, while without feeling an emotional link to them. The social connection between people and AI is strengthened by the capacity of AI agents to comprehend context, display empathy, and deliver customized interactions. Users like AI systems that emphasize work efficiency, deliver reliable data, and provide accurate and current information. However, bad experiences and unfulfilled expectations may cause feelings like wrath and disappointment, which might harm social ties. Maintaining good user experiences and trust in AI systems requires balancing user expectations, being open about AI capabilities and limits, and offering human management and supervision. Users view AI's human-like traits differently depending on the environment, attaching greater anthropomorphic traits in situations with dynamic interactions. The inclination for social interactions with AI is also influenced by user personality, such as introverted tendencies. To avoid consumer dissatisfaction and mistrust, it's critical to achieve a delicate balance while anthropomorphizing AI.

Each chapter in this research contributed significantly to addressing the main questions. They contributed to diverse viewpoints, conceptual frameworks, and empirical data resulting in a thorough comprehension of how people perceive anthropomorphic AI and develop social connections with these agents. The first chapter laid the foundation by emphasizing the importance of understanding human-AI interactions and their implications for AI technology and various sectors. It also highlighted the need to improve AI systems based on user preferences and responsible development. By doing so, this chapter established the relevance and significance of investigating human perception of anthropomorphic AI and the formation of social relationships. In the second chapter, various

frameworks were examined that offer theoretical perspectives for comprehending interactions between humans and AI. Several frameworks have been developed to provide insights into the factors that influence human perception and interactions with anthropomorphic AI. These frameworks include anthropomorphism in AI, the three-factor theory of anthropomorphism (Epley et al., 2007), warmth and competence theory (McKee, 2022), social exchange theory (Homans, 1954), and the HAII framework (Sundar, 2020). Our comprehension of the fundamental mechanisms involved in users' interactions with AI agents possessing human-like qualities was enhanced through our understanding of these frameworks. In the third chapter, a qualitative approach was used to examine how anthropomorphic AI affects users' daily lives and social phenomena. This chapter has provided valuable insights into the perceptions and interactions of human users with anthropomorphic AI by conducting in-depth interviews and presenting real-life experiences and perspectives.

Through this qualitative analysis, we were able to collect valuable data and recognize recurring patterns and themes that provide insight into how individuals interpret anthropomorphic characteristics in AI agents and establish social connections with them. In the fourth chapter, the results obtained from the qualitative analysis carried out were presented. This chapter offers valuable insights into the preferences and expectations of human users when interacting with anthropomorphic AI. It identifies themes related to behavior, response style, physical qualities, vocal characteristics, and language that provide specific insights. To comprehend the particular factors that influence human perception and social interactions with AI agents that have anthropomorphic features, it was crucial to grasp these themes. The last chapter effectively synthesized the insights gathered from the previous chapters and skillfully tied them together to provide answers to the main questions. This chapter offers a comprehensive understanding of how human users perceive anthropomorphic features in AI agents and develop social relationships with them. It emphasizes the importance of balancing humanistic and technical elements in AI, taking into account context and user personality, and finding the suitable balance between human-like characteristics and acknowledging AI's limitations.

The results of this research provide a major contribution to the field by offering a thorough examination of anthropomorphic AI and interactions between humans and AI. The research adds a new viewpoint to the literature by refuting the concept that people identify with AI on an emotional level and see it as human-like. This discovery is critical for

understanding how people perceive AI as tools or objects, which has significant ramifications for the creation of AI systems. In line with the "uncanny valley" phenomena, the research also emphasizes the dangers of overdoing anthropomorphism and the necessity to find a balance when introducing human traits into AI. The work adds to a more complex understanding of human-AI interactions by endorsing current anthropomorphism ideas and illuminating its flaws and conflicts.

The research also emphasizes how important user input and social relationships are in influencing AI behavior. The results highlight the significance of AI systems modifying their behavior depending on user input to improve the user experience and develop social relationships by aligning with the social exchange hypothesis. As it emphasizes the need for constant development and modification to match user expectations, this understanding is helpful for researchers, developers, and designers working on AI systems. The research also highlights the contextual aspect of anthropomorphism in AI, highlighting the necessity to take into account elements like the tool's goal and users' personality types. This knowledge adds to a more thorough understanding of the factors that affect how humans perceive and interact with AI systems, as suggested by the HAII paradigm (Sunder, 2020). It offers beneficial insights for academics and practitioners to customize AI systems to certain circumstances and user preferences. Practically speaking, the study's results indicate key factors that should be taken into account while developing and deploying AI systems. The research highlights the significance of encouraging emotional ties and subtle communication while ensuring transparency, control, and human oversight. These elements are essential for fostering user trust in AI systems, which will eventually result in greater acceptance and adoption.

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Social Media Text

Are you someone who frequently interacts with virtual assistants like Siri, Alexa, or Google Assistant? Or maybe you have experience using smart home devices like Nest Learning Thermostat, Philips Hue, Amazon Echo, or Google Nest Hub? Or do you find yourself regularly engaging with chatbots on customer service and e-commerce websites or chatting platforms such as ChatGPT? If so, I would really like to hear from you!
I am currently recruiting participants for interviews as part of my master's thesis at Erasmus University Rotterdam. In an age where AI is on the rise, your insights and opinions will be valuable in contributing to a greater understanding of the impact of human-like AI agents on user interactions and relations.
It doesn't matter how frequently you interact with the AI, I am interested in hearing from individuals who have different levels of usage with different backgrounds.

The interview will take place online, and participation will involve a one-time commitment of approximately 45-60 minutes. All the information you provide will remain strictly confidential (fake names will be used if necessary).

Poster
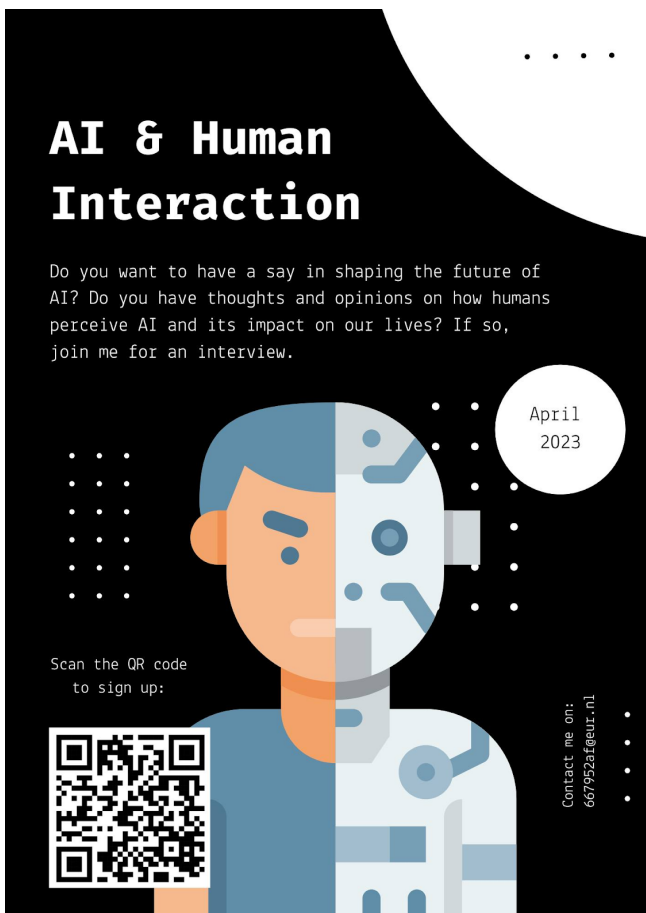
CONSENT REQUEST FOR PARTICIPATING IN RESEARCH

FOR QUESTIONS ABOUT THE STUDY, CONTACT:

Analise Fenech

analisefenech@student.eur.nl

DESCRIPTION

You are invited to participate in a research about how human attributes in artificial intelligence (AI) affect how people interact and build relationships with the AI beings. The purpose of the study is to understand how human users perceive the employment of humanistic characteristics in AI agents when building relationships with them, and how these characteristics impact human interactions with AI agents.

Your acceptance to participate in this study means that you accept to be part of a focus group. In general terms, my questions will be related to how you interpret your relationship and interaction with artificial intelligence.

Unless you prefer that no recordings are made, I will make an audio recording of the focus group.
I will use the material from the focus group and my observation exclusively for academic work, such as further research, academic meetings and publications.

RISKS AND BENEFITS

As far as I can tell, there are no risks associated with participating in this research. I will not use your name or other identifying information [such as your signature] in the study. The participants in the study will only be referred to with pseudonyms, and in terms of general characteristics such as age and gender, etc…

You are always free not to answer any particular question, and/or stop participating at any point.

TIME INVOLVEMENT

Your participation in this study will take forty-five minutes. You may interrupt your participation at any time.

PAYMENTS

There will be no monetary compensation for your participation.

PARTICIPANTS' RIGHTS

If you have decided to accept participation in this project, please understand your participation is voluntary and you have the right to withdraw your consent or discontinue participation at any time without penalty. You have the right to refuse to answer particular questions. If you prefer, your identity will be made known in all written data resulting from the study. Otherwise, your individual privacy will be maintained in all published and written data resulting from the study.

CONTACTS AND QUESTIONS

If you have questions about your rights as a study participant, or are dissatisfied at any time with any aspect of this study, you may contact –anonymously, if you wish— dr. (Vivian) HH Chen, Erasmus School of History, Culture and Communication, chen@eshcc.eur.nl

SIGNING THE CONSENT FORM

If you sign this consent form, your signature will be the only documentation of your identity.

Name   Signature   Date

_____

I give consent to be recorded during this study:

Name   Signature   Date

_____

This copy of the consent form is for you to keep.

Information

**Examples of Artificial Intelligence**

1. **Virtual assistants** have become an increasingly popular technology that enables users to effortlessly accomplish tasks with natural voice commands in their daily lives. Here are some popular examples:
- Siri
- Alexa
- Google Assistant
- Nest Learning Thermostat
- Philips Hue
- Amazon Echo
- Google Nest Hub
- Ring Security System

2. **Chatbots** have also become increasingly popular in various industries and settings, including customer service, e-commerce, healthcare, banking, education, human resources, travel, and hospitality. Here are some examples:
- Customer service: Chatbots are used to provide quick and efficient responses to frequently asked questions and resolve issues in a hassle-free manner.
- E-commerce websites and messaging platforms: Chatbots provide customers with personalized recommendations and assistance with their purchases, resulting in a seamless shopping experience.

Visual examples of chatbots:
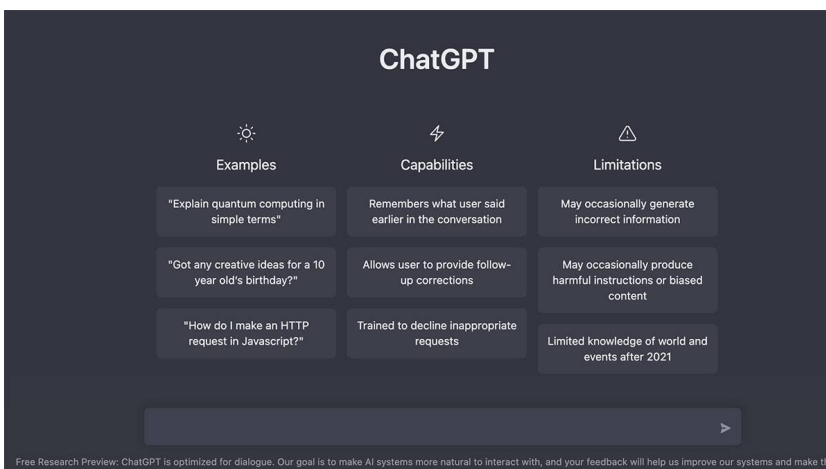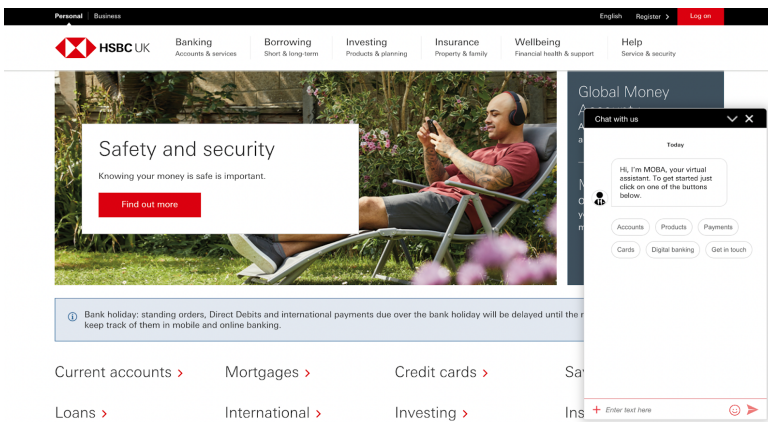
Questions

1. Screening Questions

1. Are you above the age of 18?
2. What is your level of familiarity with AI technology?
3. Do you have any prior experience working with AI technology? If so, please explain.
4. Have you ever used an artificial intelligence product or service with human-like characteristics?
5. If so, which artificially intelligent goods or services with human-like traits have you used?
6. How frequently do you make use of the product/service in question?
7. In your daily life, why do you use AI?

2. Demographic information

1. How old are you?
2. What gender do you identify as?
3. What is your occupation?
4. What is your educational level?
5. What is your nationality?
6. What are your first and second languages?

3. Experience with using different AI applications

1. Have you ever engaged with a chatbot or virtual assistant that made you feel like you were talking to a real person? - Anthropomorphism (Bartneck, 2009)
2. Can you provide an example of a chatbot or virtual assistant with which you have engaged and how it resembled (or did not resemble) a human? - Anthropomorphism (Bartneck, 2009)
3. How at ease and confident are you when engaging with chatbots and virtual assistants? - HAII (Sundar, 2020)
4. What scenarios do you find chatbots or virtual assistants to be especially useful in?
    a. Why?
5. Describe any situations in which you would rather engage with chatbots and virtual assistants than with humans?
    a. Why?
6. Have you ever received unexpected or surprising replies from a chatbot or virtual assistant? Please describe your experience.
    a. If so, how did it change your perspective on a chatbot or virtual assistant?
7. Have you ever had a bad encounter with a chatbot or virtual assistant? - SET (Homans, 1954)
    a. If so, what was the problem?
    b. How did this affect your feelings about the chatbot or virtual assistant?

2. Defining human characteristics

8. What comes to mind when you think of typical AI behavior? Three Factor Theory (Epley et al., 2007)
    a. Why?
9. How do you typically behave when interacting with an AI agent? - Three Factor Theory (Epley et al., 2007)
    a. Why?
10. What comes to mind when you think of a machine that resembles a human physically? - Three Factor Theory (Epley et al., 2007)
    a. Why?
11. Are there any physical characteristics that you believe are very important? - Three Factor Theory (Epley et al., 2007)
    a. Why?
12. When you use an Al supported service, what are the things that make you think you are interacting with a human?
13. What are the things that make you realize that you are still using or interacting with a machine?
14. Describe situations where the voice of machines makes you think it is a human talking to you. - Anthropomorphism (Bartneck, 2009)
    a. Which vocal traits would make it appear more human?
15. What types of machine replies would make you feel like you were dealing with a human?
    a. Can you offer an example of a machine reply that felt very human?
16. What do you notice about the language used by Al service? - Anthropomorphism (Bartneck, 2009)
17. What aspects of language use makes Al human like? - Anthropomorphism (Bartneck, 2009)
18. Are there any additional qualities or aspects that you believe are essential in a machine that seems human-like?
    a. If yes, what are they and why do you believe they are important?

3. Framework questions

19. Do you believe it's easier to regard AI as a person when it looks or sounds more like a human? - Three Factor Theory (Epley et al., 2007)
    a. Why?
20. What are the benefits of using AI agents in your daily life? - SET (Homans, 1954)
21. What are the costs of using AI agents in your daily life? - SET (Homans, 1954)
22. Do you believe that the benefits of AI outweigh the costs? Please provide examples. - SET (Homans, 1954)
23. How does AI's human-like form influence your view of its capabilities and limitations? Please identify the human-like characteristics you are thinking about while answering this question. - Warmth & Competence Theory (McKee et al., 2022)
    a. Why?

The next question is about social cues. Social cues are nonverbal or subtly expressive behavioral hints that individuals use to communicate with one another. Social signals include, but are not limited to, eye contact, facial emotions, and body language. Emoticons, voice intonation, and even the usage of sarcasm and humor may all be considered social signals in the context of AI.

24. How do AI's social cues (such as eye contact or emoticons) influence how you engage with them? - Three factor theory (Epley et al., 2007)
    a. Could you give an example?
25. How important is it for AI to be friendly and nice to interact with? Warmth & Competence Theory (McKee et al., 2022)
    a. Why?
26. How important is it for a human-like AI to exhibit compassion or empathy? - HAII (Sundar, 2020)
    a. Can you give me an example of an AI chatbot being compassionate or expressing empathy?
    b. In what context would this be significant to you?
27. What will make you describe an AI service as being kind? Warmth & Competence Theory (McKee et al., 2022)
28. How will kindness from an AI make you feel? Warmth & Competence Theory (McKee et al., 2022)

a.　How will that influence how you react to AI service?

29. Did you ever develop an emotional attachment to AI? - HAII (Sundar, 2020)

　　　a.　How do you deal with those feelings?

30. Do you have any ethical reservations about using AI? - Three factor theory (Epley et al., 2007)

　　　a.　What are they?

31. How important is it for chatbots and virtual assistants to be human-like to improve human life?

　　　a.　Why?

32. Is there anything else you would like to add about the way you interact and build relationships with human-like AI?

Appendix D: Tables

Table 1

Sample Characteristics

Name	Age	Occupation	Bilingual	Familiarity with artificial intelligence	Frequency of use	Artificial intelligence product or service used
Amy	27	Marketer	Yes	High	Daily	Siri and ChatGPT
Anthony	24	Media buyer	Yes	High	Daily	Voice assistants, ChatGPT
James	24	Student	Yes	High	Daily	Voice assistants, ChatGPT
Darren	23	Freelance and Teaching Assistant	Yes	Medium	Weekly	ChatGPT
Andre	25	Software engineer	Yes	High	Daily	Copilot for coding, GitHub, Alexa
Claire	24	Jr Account Manager	Yes	Low	Monthly	Siri and Google Home
Yosef	22	Student	Yes	High	Daily	ChatGPT
Leonard	31	Q&A specialist	Yes	Medium	Weekly	ChatGPT
Angie	24	Recruitment	Yes	Low	Daily	Siri and ChatGPT
Joe	37	Technical writer	Yes	High	Daily	ChatGPT and build my own

Amanda	23	Student and digital marketer	Yes	Low	Daily	ChatGPT and Siri
Rowan	24	Network engineer	Yes	Medium	Weekly	ChatGPT
Rita	21	Psychologist	Yes	Low	Daily	ChatGPT and Siri
Ramon	21	Student and DJ	Yes	Low	Monthly	Online Chatbots and Music AI
Luke	24	Lawyer	Yes	Low	Daily	Alexa, Siri, ChatGPT
Gareth	31	Student and software engineer	Yes	High	Weekly	Alexa, Siri, Cortana and ChatGPT
Jemma	27	Student	Yes	Low	Weekly	Customer support chatbot, ChatGPT
Derek	21	IT (Information Technology)	Yes	Medium	Daily	ChatGPT
Dean	21	Language teacher	Yes	Low	Daily	Alexa and ChatGPT
Nate	24	Quality Assurance Manager	Yes	High	Weekly	ChatGPT

Appendix E: Transcripts

The comprehensive collection of all twenty transcripts was provided in a separate document.

Appendix F: Coding Scheme

Themes	Codes	Quote
Behavior	AI's learning and adaptation abilities	They always kind give your unique response, they can identify its patterns. Like AI can adapt its behavior based on the feedback you give it so it can make predictions or judgements based on that data. You can also prompt it to behave however you want. And that's why it's able to give such unique replies. (Anthony) This chatbot was, it's very sort of dynamic to your answers so it gives you back dynamic answers. Yeah, basically, it can adapt to your questions. (Nate) So when I'm talking to an AI, I expect the AI to adjust to my level. The adaptability is what makes it most human-like for me. (James) They can, of course, learn from a bunch of other things. And they're continuously adapting and learning more things are becoming more powerful. (Amanda)

		Like AI can adapt its behavior based on the feedback you give it so it can make predictions or judgements based on that data. You can also prompt it to behave however you want. And that's why it's able to give such unique replies. (Anthony)
Behavior	Personalized AI systems	I guess the way that it's programmed to chat, so it's not directly spitting out responses. It sort of tries to engage in a personalized way as well. (Amanda) But if I'm actually asking sort of this, I want this personalized message or feeling I don't want it to be structured. I want a human conversation as well. (Ramon) Counterproductive to what the use would be, but more lengthy replies and personal context as to why reply has been given a certain way, perhaps. (Luke)
Behavior	Lack of independent thinking	With a chatbot to be honest, I'd rather speak to a person in the sense you know, you seek that help to speak to someone who can reason with you not a

		robot so I'm not very confident. (Angie)
		So if it's, for example, asking for, for recommendation, it'll just go search the webs. The typical traits would be it citing items so it never gives you its opinion. It tries to give you others' opinions on a one on one screen. (Rowan)
		For example, you need a solution to a problem that would require objective opinions or emotionally driven opinions, it should be able to do this but it just provides answers from Google instead. (Dean)
		So we simply wanted to test if it has an opinion or how far it can think and we were quite surprised to see that it's very vague, and it tends to run in circles, providing ambiguous responses. (Leonard)
Behavior	Limited warmth and sensitive behavior	AI is very much to the point. So yeah, in that sense, it's warm because it's been coded by humans to give sort of like a warm response back, but it's very limited in that warmness of the response. (Amanda)

| | | If you're sad, if you're happy, they don't care about emotions or feelings, you won't get empathy, sympathy with AI. (Rita)

So typical AI behavior or assistant behavior would be an Iike scripted way of communicating. (Rowan)

I think that the use of spontaneous language was that, say the informal, you have to make a bit of a mixture between informal language and the formal language, the AI usually gives you a very structured line response, always a very structured response. (Gareth) |
|---|---|---|
| Behavior | Importance of politeness and nice behavior | It's quite important for AI to be polite. Because I mean, if the bot isn't friendly it's just rude and like straight to the point and you're not going to really want to use that service or use that because why would you? (Ramon)

All of the AI bots are really polite. And I think that's the main thing, like being polite and generic with their answers |

| | | which is fine because I wouldn't want to interact with a rude or mean AI." (Rita)

Well, first of all, they're super polite, because they're made to be polite. (Amanda)

It's always really polite, it takes into consideration that when you talk if it makes some mistakes and it realizes the next iteration that it did their mistake previously it apologizes so it has like these formalities in it. (James) |
|---|---|---|
| Behavior | Possession of traits like empathy and curiosity | When a person asked ChatGPT what it could do in order to be to reduce global warming, it suggested that the person should commit suicide, so it can reduce carbon emission. I mean, a robot shouldn't make that suggestion. It should, perhaps, say to reduce, reuse, recycle. Go vegan, you know, but not kill yourself. (Angie)

So like a robot with a human-like, body and characteristics will still lack emotions, empathy, sympathy, |

		but that's the main thing for me. (Rita)
		It shows like it has some emotions, like the phrases in the words depict some emotions, that it is feeling something or it is showing empathy on me. (Yosef)
		To have empathy, you can have empathy, you have to have to relate. You have to have sense, like logical sense. So you need to reason you can't just be black or white. (Andre)
Conversational dynamics	Artificial replies	So typical AI behavior or assistant behavior would be an Iike scripted way of communicating. (Rowan)
		I think that the use of spontaneous language was that, say the informal, you have to make a bit of a mixture between informal language and the formal language, the AI usually gives you a very structured line response, always a very structured response. (Gareth)

		But when I need to deal with more emotion and feelings, I don't need the generic reply. And I need some more emotion. So that's lacking. (Rita)
Conversational dynamics	Inclusion of humor and sarcasm	I think it's very, very important. Not just friendly, even possibly mean sarcastic and any other personality trait. (Anthony) So for example, if I asked something sarcastic to see it, she wouldn't get my sarcasm, because obviously, AI takes everything literal. And they wouldn't get the sarcasm. (Rita) Um, humor is definitely something that I find nice. So if they can reply back with a smiley face, or if it can, I don't know include some sort of sarcasm there like a joke or something that's always really cool because then it makes you feel like that warmth and that sort of like you're engaging in a warm conversation. (Amanda)

| Conversational dynamics | AI's biases, flaws, and mistakes | It's very important to understand that humans are insanely flawed, even in the way we speak, the way we act. And the problem is AI isn't flawed. Or if it's flawed, it's buggy rather than natural. So if the AI needs to be as human as possible it needs to be bugged, it needs to stutter, it needs to make mistakes. (Andre)

I keep going back to the same thing, like mistakes and, and consistencies and like these weird quirks, like being maybe funny at times, maybe sometimes even like being too harsh. (Anthony)

And then of course, like ai once again, it's biased. So because of that, then it'll always promote what it sees in its best interest. And if people don't know how to deal with the bias, it can be a problem. (Darren) |
| Conversational dynamics | Inclusion of small mistakes, pauses, and deviations | Some stuttering pauses like I'm doing now. All these things mental breaks, or change in the intonations |

		coming out static. (Luke)
		Stuttering is the most important thing. It's very important to understand that humans are insanely flawed, even in the way we speak, the way we act. And the problem is AI isn't flawed. Or if it's flawed, it's buggy rather than natural. So if the AI needs to be as human as possible it needs to be bugged, it needs to stutter, it needs to make mistakes. And it needs to be culturally appropriate. So it has to at least have culture. (Andre) It's always really polite, it takes into consideration that when you talk if it makes some mistakes and it realizes the next iteration that it did their mistake previously it apologizes so it has like these formalities in it.(James)
Conversational dynamics	Perfection hindering relationship	You know, yeah, robotic because everything is very perfect. There is no room. There isn't the human trait of imperfection in AI, which

		that's what makes it unrelatable.(Claire) I feel like it's still very obvious that you're not speaking to humans. Like a computer or like technology. It's still not. It's too perfect (Amanda) the AI usually gives you a very structured line response, always a very structured response. (Gareth)
Human-like physique	Influence of the Media	When you say human-like form I am thinking physically looking like ExMachina. (Derek) If I try to think of a machine that resembles a human I probably think of animatronics and Disney or something like that or like the robot in IRobot. (Amanda) Probably through films that we've seen in the past seasons that we've seen in the past, which, like, sort of make this robotic feeling. (Nate) I mean, my only reference is from Hollywood movies, so I'd say the Terminator is like robots physically. (James)

Human-like physique	Robotic features vs Human-like features	When I think of AI, I just think of a box with a lot of wires going through so literally like a robot or a robot as a computer or something like WALLE. I'm pretty sure it's because of how the media like portrays AI and the sort of creatives they use, but to me, and I don't know if this comes from films I've watched. (Claire)
		Then obviously you've got a physical element, but I think that's, for us, it's much more far-fetched,like to have a robot in a human shape, whatever, I think we've only seen that in movies. So what comes to mind is like an embodiment like in the movie Ex Machina or Her. (Anthony)
		Um, so for example, in factories when they use AI, I don't think they need, like, human-like features to function because it's not really needed. But in this case, I like it feels more familiar to me. (Rita)
Human-like physique	Transparency about AI's status	I would need to be aware of its capabilities and always be

		aware that I am talking to a robot, to maybe accept it. (Amy) And even if we do get to that stage AI should be upfront about being artificial, especially if they become really smart because I wouldn't be happy getting tricked. (Angie) You know, so for example, if you go to Madame Tussauds or whatever, and then you have like an AI thing embedded in one of those wax things, I'd be creeped out. I think if an AI system is super aware and conscious, it should totally admit that it's not human-made.(Darren)
Human-like physique	Physical features and comfort level in connections	I mean that idea kind of creeps me out. That said I would imagine it to have an AI generated image or else if we are talking about a physical being maybe it could have humanoid facial characteristics like eyes, a nose, and a mouth and it might be able to move and communicate with its surroundings in a manner like that of a person. But again,

		this can't be over done, it would make me uncomfortable. (Amy) First off, that would be very, very weird in my opinion. But I would imagine that it resembles very close to our human, our human structure, and with a sort of characteristics that, you know, sort of feels like it's human, but it still gives that the fact that it's, you know, a robot coded. (Nate) I feel the more human we make them, the more dangerous they can become. So I'd rather keep them the way they are. (Angie) Hmm, I wouldn't to be honest, because at that point, where you start adding, like pictures and more visual things more tech, I mean, I get it, but I get it will start getting scarier. (Derek)
Verbal and nonverbal cues	Vocal capacity of humans	Yeah, I mean, going back to the whole Siri and Alexa thing I know it's made to sound like I'm talking to a human because they have like the different

| | | voices which are actually made by humans, but obviously, it just sounds like bits, which are placed together. I feel like it's still very obvious that you're not speaking to humans. (Amanda)

Speech pattern, sometimes it's very robotic. And you can hear that it's robotic and flat when a person's voice is not robotic, and that the speech patterns and tonality and spacing between the words. (Ramon)

The voice for sure would make it seem more human-like. Ironically, like the tone of voice because obviously, as we're having a conversation now, and then hearing the robot speak would be something completely different from an AI. (Jemma) |
|---|---|---|
| Verbal and nonverbal cues | Lack of non-verbal cues and expressions | I think there are not enough social cues in my opinion. That's why it makes it less relatable because I feel like speaking to an AI or a bot or whatever. It's like speaking to someone who has no emotion on their face. (Claire) |

| | | Social cues over voice or over text and maybe like emojis or, a little bit of humor, and that's something you can tell and something AI doesn't really use very often. (Darren)

I mean, the more accurate social cues, uh, are, the more believable they are, the more believable the AI is to be human. Uh, so they are really important. But I don't think I've seen ai, which is really good at social cues to be honest, in my experience. (James)

So if I'm speaking to a robot, which is human-like, and I am crying, they would not know I'm crying, you know, and because they wouldn't get my social cues that I am sad, my body language and how I'm sitting. So humans will notice by the way, I'm sitting by the way I'm looking at them, by the way I am as in my body language they will notice that I'm sad. (Rita) |
|---|---|---|
| Verbal and nonverbal cues | Voice modulation and personalization | If it were to be like, with a normal human pitch, I think |

		that would make it very close to humans, basically. (Nate)
		The main thing would be to shift a little bit to what's it called the tone? If it can do that, I think that would be the most human thing it could do. Or to show empathy. (Leonard)
		If it can sense the emotion of the current representation of the talk, the AI assistant should be able to interpret the tone of voice. (Yosef)
		Because there are cases where information is misinterpreted because the robot would not be able to pick up on social or emotional cues of the individual as a person. For example, you can say a sentence in one tone and then another and it could have a completely different connotation. It's like when I tell you Yes! or Yes… I said the same word, but the tone of voice I used was completely different and had a tonne of different connotation to it. (Angie)

| Language and cultural importance | Lack of linguistic capabilities

Inclusion of slang, dialects, and phonetics | Let's say speaking or something like that, even typing it were to use slang, uh, certain dialectic phonetics, uh, possibly I'm an English speaker, but if it spoke to me, Maltese or if I was Italian, spoke to me in English. Uh, and I think, yeah, putting these vocal quirks. For example, let's say a gamer would speak differently to a businessman, so like saying lol or saying haha, doing a smiley face nowadays is different as well. (Anthony)

I guess if it learned all the slang. I think I just saw this today someone was tweeting about if you ask Chet GPT to create tweets for you. It sort of sounds like a 45 year old man trying to say like, hip or like. So yeah, I feel like if it could pick up on the way that humans actually speak, as opposed to just professional conversations, if it could actually get more into that. (Amanda)

I think being trained somehow to be able to understand slang, and the lingo or abbreviations |

		that we use in chats, like when you talk to someone in WhatsApp or messenger or whatever we don't we don't use full words for stuff. So being able to be flexible enough to understand the conversation as if you're talking to a human with different variations. (James)
Language and cultural importance	Concerns about standardized English	I think it is related to languages, most of the time, English, and even the type of English that they use is very basic, or it's very light. (Darren) In general, it uses a lot of American English, but nothing extraordinary. (Luke)
Language and cultural importance	Native language interaction	It will be much better if we have our own native language, like if I had Siri that could speak fluently in my native language and give me a response like it's giving a response in English. When I interact in English and the experience I get when I talk in my native language, like in my language, the sense of the understanding, I think I will feel more comfortable interacting with it. (Yosef)

		There's no Siri which has a Costa Rican accent. There's a Latin American Siri, which has a Mexican accent, but then it will not pick up on the things that I am trying to say if I use my Costa Rican accent, so I don't want to be modifying the way that I speak. So that my AI can understand me if I can do it, just as easily in my second language, which is English. (Amanda)
		Definitely if they speak the same language as the person who is inquiring about the certain question. (Jemma)
		I mean, it will be more similar with a human rather than with your first language. But yeah, I think I haven't heard it in my native language. (Leonard)
Language and cultural importance	Regional and cultural influences	IIt seems that the quality is better in English because when you see that in Spanish, like the response in Spanish, because of all the variations of the Spanish language, like throughout Spain and Latin America, they have a mixture

		of everything. Like if I chose to use Latin American, for some reason it is using Spanish from Europe. (Gareth)
		Being from Malta we use alot of code switching in our language. So if it could throw in a Maltese word, even a filler word like 'mela' or 'ta' or whatever, AI it's strictly English so that might be another thing. (Claire)
		While some AI prevails, and then they do a fantastic job, but I'd say there's a lot more to improve on the language side, like there's sometimes quite a few issues where they were completely out of work. (Ramon)
Language and cultural importance	Importance of cultural sensitivity	Because I think that emojis themselves provide you somehow have a feeling, the only problem I see with emojis is that, again, going back to the languages part in Spanish, Argentinian and emoji may be different, maybe different for Spanish Mexico, perhaps maybe even offensive? (Gareth)

		And it needs to be culturally appropriate. So it has to at least have culture. (Andre)
		Different regions also have different dialects and stuff like that. So yeah, really catering to people's actual mother language. (Amy)
		I think it could learn the abbreviations like I said, and not slang per se, but more colloquial terms, and it would be better. (Claire)