

# AI and the Vulnerable

Short Paper

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## Abstract

*Firms increasingly deploy artificial intelligence (AI) based agents for service delivery. While extant research suggests that consumers are oftentimes reluctant to rely on AI agents and prefer human agents, this short paper suggests that for vulnerable consumers the opposite should be the case. The authors theorize that vulnerable consumers make inferences about whether an agent is likely to devalue them in the service interaction. As AI agents are attributed inferior mental abilities than human agents, vulnerable consumers should deem them less capable of social devaluation, resulting in favorable firm-related and consumer-related outcomes. However, if an AI agent is anthropomorphized, the preference for AI agents should diminish or even disappear fully. Therefore, in light of consumer vulnerability, the taken-for-granted assumption of "the more human-like, the better" may not hold. The authors present the conceptual framework, derive research propositions and discuss the planned empirical studies and contributions.*

**Keywords:** AI agents, anthropomorphism, vulnerability, social devaluation

## Introduction

The infusion of artificial intelligence (AI) into service delivery is changing both firm's strategies as well as consumer behavior (Davenport et al. 2020). In fact, AI has gained increasing research attention in a variety of literature streams, such as IS (Benbya et al. 2020), service marketing (Huang and Rust 2018; Puntoni et al. 2021) and consumer psychology (Mariani et al. 2022). In line with prior research, we define AI as "programs, algorithms, systems or machines that demonstrate intelligence" (Shankar 2018, p. vi). Industry reports suggest that marketers' adoption of AI has increased by 186 % within merely two years (Salesforce Research 2020). One of the most relevant applications of AI is AI-based agents, which refers to a variety of nonhuman technologies, such as service robots or virtual assistants (i.e., chatbots or voice assistants) (Kim et al. 2022; Maedche et al. 2019; Schanke et al. 2021). Services that human agents have delivered in the past are increasingly being delivered by AI agents instead, which is not only motivated by cost savings but also around-the-clock availability and high information processing capacities (Kumar et al. 2016). In turn, AI agents offer standardization, personalization and relationalization benefits (Huang and Rust 2021).

Despite these promising developments, consumers are oftentimes reluctant to use AI agents and prefer human interactions. This happens because of the inferences consumers make about the agents' minds – a process called mind perception (Gray et al. 2007). Although AI agents often outperform human agents at an increasingly comprehensive list of service tasks (Castelo et al. 2019; Dietvorst et al. 2015), research

indicates that consumers attribute inferior mental abilities to AI than to human agents and are therefore less likely to rely on them (Kim et al. 2022; Lee et al. 2020; Srinivasan and Sarial-Abi 2021).

This research, however, brings forward the notion that this inferior mind perception may be of advantage for a certain type of consumer: the vulnerable consumer. Consumer vulnerability refers to a state in which consumers' functioning could be impaired due to stigmatizing characteristics (e.g., health or social conditions, such as obesity or poverty; Harmeling et al. 2021) they possess or stigmatizing situations (e.g., uncomfortable service or purchase situations, Blair and Roesse 2013) they are in (Andreasen and Manning 1990; Hill and Sharma 2020). Gartner (2019) predicts that AI has significant impact for the vulnerable and helps them overcome previously existing barriers. Despite research calling to investigate extant frameworks and theories through the eyes of the vulnerable (Field et al. 2021; Ostrom et al. 2021; Rosenbaum et al. 2017), which are oftentimes overlooked but make up a nonnegligible part of the world population (Arnett 2008), surprisingly, only a few studies mirror this practical relevance and have examined consequences of deploying AI agents in settings with vulnerable consumers.

For example, research finds that consumers are more likely to talk about stigmatizing health conditions with an AI agent than with a human agent (Tsai et al. 2021). Similarly, consumers feel less embarrassed when interacting with an AI agent than with a human agent in a service encounter posing a possible social identity threat (Holthöwer and van Doorn 2022; Pitardi et al. 2022). These studies provide initial hints to potentially favorable reactions towards AI agents for people that feel vulnerable. Our research plans to contribute to prior work and shed light on whether, and if so why, consumers with vulnerable conditions or in vulnerable situations prefer AI over human agents, which would clearly challenge the prevalent mantra of a preference for human agents. In addition, prior work in AI research has neglected to extend typical firm-beneficial outcomes (e.g., purchase, satisfaction, or information disclosure) by outcomes beneficial for the consumers themselves (e.g., goal attainment, well-being), which is particularly desirable in a setting with high consumer vulnerability where consumer welfare is at stake and "advocacy" for consumers and taking ownership for their problems is key for firms and policymakers (Anderson and Ostrom 2015; Blut et al. 2021). Therefore, we pose the following research question:

*RQ1: How does the type of service agent (human agent vs. AI agent) impact beneficial firm- and consumer-related outcomes for vulnerable consumers?*

Next, this research notes that it does not suffice to merely compare AI agents to human agents, implying that human interaction is still the default and should be used as the reference for evaluating the impact of AI agents. This is or at least soon will be unrealistic as more and more AI agents do not assist human employees but fully replace them for most service tasks (Huang and Rust 2018). Instead, it should be acknowledged that often AI is the sole contact interface available for (vulnerable) consumers. AI agents exist in many different forms and not every form might be equally favorable for vulnerable consumers. AI agents can be purely functional agents which are perceived as having lower mental capacities than humans (Gray et al. 2007; Kim et al. 2022). However, firms may opt to enrich basic functional features with human-like attributes, such as human-like identity cues or (non)verbal cues, so that consumers anthropomorphize them (Seeger et al. 2021). Prior work has shown that anthropomorphized AI agents can elicit identical behavioral responses as human agents (e.g., Kim et al. 2022) and are therefore viewed as being generally preferred compared to less human-like AI agents (Blut et al. 2021; Schanke et al. 2021). However, the crucial question is whether this holds for vulnerable people or whether humanizing AI agents could backfire or even aggravate the problem in this setting. Therefore, the second research question reads as follows:

*RQ2: How does the type of AI agent (anthropomorphized vs. not) impact beneficial firm- and consumer-related outcomes for vulnerable consumers?*

In order to investigate the preference of vulnerable consumers for different service agents (human agents, AI agents, anthropomorphized AI agents), we theorize that the effect can be explained by the consumer's anticipated social devaluation in the service encounter. Specifically, we propose that consumers anticipate whether and to which extent an agent will devalue them in an interaction. Previous insights show that the level of anticipated social devaluation impacts consumer behavior detrimentally (Harmeling et al. 2021). The anticipation of devaluation is strongly associated with the perceived mental capacities of the respective agents, which, according to theory of mind perception (Gray et al. 2007) are much lower for functional AI than for human agents.

If anthropomorphism means consumers ascribing human-like minds to nonhuman agents (Epley et al. 2007), then anthropomorphism attenuates or eliminates the low mind perception of AI agents, potentially to a degree that the differentiation between humans and AI agents blurs with the latter being simply perceived as digital humans. Accordingly, high mind perception attenuates the key advantage of AI agents for vulnerable consumers, namely the perception of a low ability to judge. If vulnerable consumers perceive AI agents as human(-like), it consequently increases their anticipated social devaluation (possibly to the same extent as they fear devaluation by real humans) with comparable detrimental impact on consumer behavior. Hence, high anthropomorphism should mitigate or even eliminate the preference for AI agents over human agents. Therefore, in light of consumer vulnerability, the taken-for-granted assumption of "the more human-like, the better" may not hold. This explanatory mechanism is the focus of our third research question:

*RQ3: Does anticipated social devaluation mediate the effects of service agents (human agent, AI agent, anthropomorphized AI agent) described in RQ1 and RQ2?*

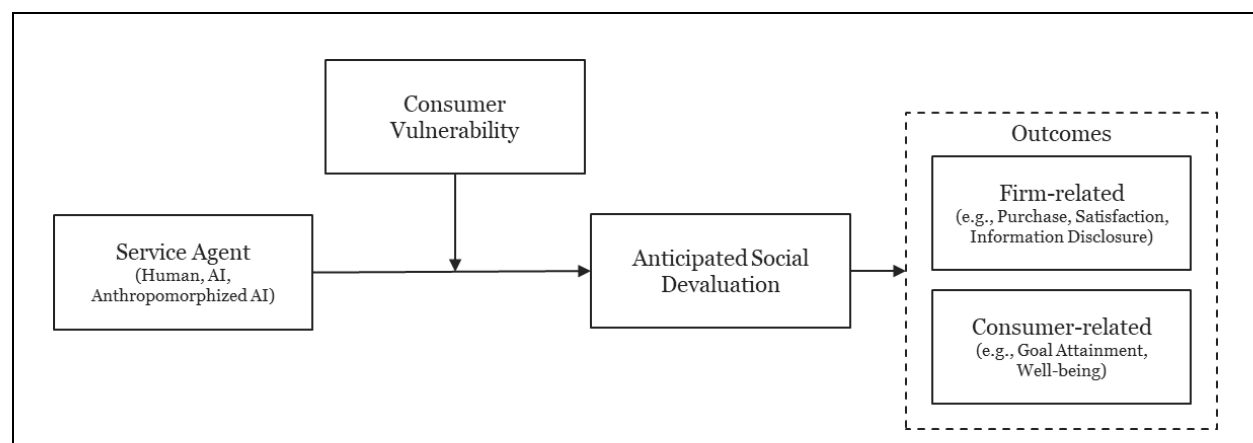
The present work lays the conceptual foundation for our research-in-progress, which is to be complemented by several empirical studies in the near future. In answering our three research questions, we plan to contribute to prior work on human-AI interaction by improving the understanding of the outcomes, operating mechanisms and boundary conditions of AI usage for people constantly challenged in their mental or behavioral functioning, representing a significant and often overlooked consumer group (Rosenbaum et al. 2017). We achieve this by a) capitalizing on the concept of vulnerable consumers as an umbrella term for capturing different threatening consumer characteristics or service contexts highly relevant for AI-empowered settings, b) not merely comparing vulnerable consumers' responses to AI agents vs. human agents, but to different types of AI agents in terms of different levels of anthropomorphism, c) providing an explaining mechanism for the proposed effects of AI usage for vulnerable consumers and d) including both firm- and consumer-relevant outcomes.

The rest of the article is structured as follows: We first discuss the conceptual background, which includes an overview of our conceptual framework, relevant theories and related research streams. Based on this, we derive research propositions that we plan to test empirically. The article closes with a discussion of the next steps, as well as the article's planned contributions.

## Conceptual Background

### Conceptual Framework

Figure 1 depicts our conceptual framework, where the different service agents (human, AI, anthropomorphized AI) represent the independent variable and beneficial firm-related and consumer-related outcomes represent the dependent variables. We propose that the effect of the service agent on the different outcomes is moderated by consumer vulnerability. Further, we suggest that the social devaluations anticipated by the consumer mediate these effects.



**Figure 1. Conceptual Framework**

## **Theory of Mind Perception & Anthropomorphism**

In order to explain why AI agents are perceived differently than human agents by consumers, we consult the theory of mind perception. The theory provides a meaningful account for why most consumers prefer interacting with human over AI agents, and at the same time helps to understand why for vulnerable consumers the opposite should be the case.

Mind perception is the process of making inferences about another being's mental states. According to the theory of mind perception, individuals perceive and ascribe minds along two dimensions (Gray et al. 2007). The first dimension, *agency*, refers to the capacity to do, intend and exercise self-control. The second dimension, *experience*<sup>1</sup>, refers to the capacity to sense and feel (Gray and Wegner 2012). Individuals do not only perceive minds of other human beings, but also nonhuman beings, such as animals, supernatural entities or, more relevantly, robots. According to the theory of mind perception, robots are perceived to have some level of agency but rather low levels of experience (Gray et al. 2007). Corresponding to the original model by Gray et al. (2007), more recent works have validated that in comparison to humans, agency and experience perceptions of AI agents are significantly lower (Pitardi et al. 2022).

However, mind perception of AI agents vs. human agents is not as static as this might suggest, but it is dependent on the level of anthropomorphism. Anthropomorphism is the most widely studied theoretical phenomenon in research on AI agents (De Keyser and Kunz 2022). The term refers to endowing nonhuman entities with human-like characteristics (Epley et al. 2007). As a consequence of this, individuals attribute cognitive and emotional capabilities to the anthropomorphized agent (Duffy 2003), i.e., anthropomorphism increases mind perception (Srinivasan and Sarial-Abi 2021; Yam et al. 2021).

A variety of studies on interactions between consumers and AI agents has used the theory of mind perception as a theoretical foundation, because it provides an explanatory mechanism for psychological and behavioral reactions to AI agents. Empirical evidence suggests that mind perception positively influences intentions to use an AI agent (Lee et al. 2020). Interestingly, depending on contextual factors, high mind perception can also have negative consequences. For example, Stafford et al. (2014) found that the elderly prefer AI agents with lower levels of agency, because they are unfamiliar and not at ease with technologies having their own minds in terms of acting autonomously. Along a similar line, Gray and Wegner (2012) show that robots with high perceived experience might trigger higher feelings of unease. Furthermore, studies show that with higher agency comes greater responsibility attribution, therefore negative reactions towards anthropomorphized AI agents are more pronounced, while more functional AI agents are forgiven more easily (Garvey et al. 2022; Srinivasan and Sarial-Abi 2021). However, for AI agents capable of high experience, the opposite seems to be the case, as they are forgiven more easily after failures (Yam et al. 2021).

It becomes clear that overall, different types of agents are perceived to have different mental capabilities which clearly shape consumer behavior. How this effect turns out seems to be dependent on contextual factors, as to who the consumers are and how they feel, as well as in which service setting the AI agent is used. The present work adds to prior research by comparing reactions to different types of service agents from the perspective of vulnerable consumers representing a major consumer group which so far has almost completely been overlooked by AI researchers despite several calls from business practice.

## **Consumer Vulnerability and Social Devaluation**

In this section, we provide a definition for the term consumer vulnerability and describe manifestations of consumer vulnerability that are relevant in the light of interactions with AI agents. Furthermore, we describe how vulnerability shapes feelings of social devaluation in response to AI. Based on this, we derive our research propositions.

Many consumers enter a service encounter in a vulnerable condition (Rosenbaum et al. 2017). Vulnerability stems from the interplay of individual states and characteristics as well as external conditions, where

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<sup>1</sup> Note: As prior work has pointed out (e.g., Srinivasan & Sarial-Abi 2021; Pitardi et al. 2022), the term "experience" in the theory of mind perception has to be distinguished from the common use of the word. While the latter refers to observation of or participation in certain events, the former refers to the perceived capacity for sensation.

consumers perceive threats to their resources, inhibiting their ability to function in the marketplace (Baker et al. 2005; Furrer et al. 2021; Hill and Sharma 2020). Vulnerable consumers "are at a disadvantage in exchange relationships where that disadvantage is attributable to characteristics that are largely not controllable by them at the time of transaction." (Andreasen and Manning 1990, p. 13). Therefore, vulnerable consumers often depend on the service provider to acknowledge these disadvantages and help them attain their desired goal (Rayburn 2015). Generally, there are different types of vulnerability that need to be distinguished. For example, vulnerability can either be experienced (by the consumer) or observed (by a bystander, firm, etc.) (Hill and Sharma 2020). In order to fully understand the consequences of consumer vulnerability, it is necessary to differentiate between different sources of vulnerability (Furrer et al. 2021; Hill and Sharma 2020). As our work takes in a consumer-centric perspective, we focus on the consumer's experienced vulnerability in encounters with service providers. Here, consumer vulnerability can be induced by individual consumer characteristics, such as sociodemographics, physical or financial conditions that leave them helpless, or situations where consumers risk a social identity threat in the service encounter (Baker et al. 2005; Steele et al. 2002).

Vulnerable consumers strive for safety (Sandberg et al. 2022). This pursuit is, however, threatened when feeling susceptible to other human beings' judgements (Smith and Cooper-Martin 1997). Steele et al.'s (2002) "theory of context" introduces the notion of anticipated social devaluation and states that consumers form a hypothesis in their minds on whether their individual characteristics, conditions or situations might pose a threat of social devaluation depending on the audience cues available in the encounter. If an audience might see them in an unfavorable light and hence might devalue them, consumers behavioral reactions are not only harmful for themselves, but also for firms (Harmeling et al. 2021). We propose that in order to attenuate or prevent this social disapproval (Goffman 1963), vulnerable consumers seek out interacting with a more benevolent audience, more specifically one that does not have a mind and hence not the capability to devalue them to begin with: technologies. Only recently have studies begun to investigate the response to AI agents vs. humans in contexts where consumers might feel vulnerable. However, since the introduction of computers as technologies for communication, researchers have demonstrated the aptness of computers for getting consumers to "confess" to them, much rather than they would to a human person (Smith 1963). Recent empirical studies corroborate this notion by demonstrating that consumers are more likely to disclose information about possible causes for vulnerability to AI agents than to human agents (Lucas et al. 2014; Sohn et al. 2021; Tsai et al. 2021). Notably, AI-based technologies are perceived to provide a more private interaction than human service agents, while at the same time individuals might display privacy concerns in terms of the technologies ability to store data (Pitardi et al. 2022).

Further, it can be observed that information disclosure behavior varies depending on the human-likeness of the AI agents: Early work on perceptions of human-like agents has shown that consumers tend to present themselves in a more favorable light to them (Sproull et al. 1996), which has prompted researchers to investigate social desirability biases towards anthropomorphized agents. Consumers increasingly respond in a socially desirable manner to human-like AI agents when asked about sensitive issues, suggesting that anthropomorphizing the AI agent impairs information disclosure (Schuetzler et al. 2018). In line with this, consumers experience less embarrassment when interacting with AI agents vs. humans, however, the more human-like the AI agent appears, the less distinct is this difference (Bartneck et al. 2010). We take these insights further and suggest that these negative emotional and behavioral responses emerge due to the apprehension of audiences forming an unfavorable impression of them, i.e., devaluing them. As stated above, consumers make inferences based on available audience cues about whether their safety might be thwarted due to possible devaluation potential (Steele et al. 2002). Notably, previous studies on AI interactions fall short in accounting for this anticipated social devaluation mechanism and in capturing it empirically. However, in interpersonal (Leary et al. 1992; Watson and Friend 1969) as well as traditional service contexts (Harmeling et al. 2021), extant psychological research has established the detrimental effects of social devaluation on individuals' well-being.

Taken together, based on the insights from theory of mind perception, anthropomorphism as well as previous work on vulnerable consumers and social devaluation, we suggest that vulnerable consumers will analyze audience cues – that is, the agent's human(-like)ness – to anticipate whether social devaluation potential emerges in the service encounter. According to theory of mind perception, AI agents are perceived to have less of a mind than human agents. Therefore, vulnerable consumers anticipate that AI agents are less likely or less able to devalue them, hence being more likely to choose them over human agents. The

reduced anticipated social devaluation should further have positive consequences for consumer well-being. Therefore, we posit following research proposition:

*RP1: For consumers who experience high vulnerability, AI agents (vs. human agents) positively affect beneficial firm-related outcomes (e.g., purchase, satisfaction, information disclosure) as well as beneficial consumer-related outcomes (e.g., goal attainment, well-being) due to reduced anticipated social devaluation.*

As noted above, while a technology feels like less of an audience than a human service provider, a humanized technology does feel like one: To the vulnerable consumer, it represents an audience, with a mind, that is – seemingly – able to socially devalue them. While above, we noted vulnerable consumers prefer AI agents over human agents, the literature discussed indicates that this preference wanes or even fully vanishes when AI agents are anthropomorphized.

*RP2: For consumers who experience high vulnerability, anthropomorphized (vs. not) AI agents thwart the positive firm-related and consumer-related effects of AI agents.*

## Next Steps & Planned Contributions

We plan to test our conceptual propositions empirically in a series of experimental studies. To test RP1, we plan to compare consumer reactions to AI agents vs. human agents. We will consider different sources of consumer vulnerability to examine whether the extent of feared devaluation in response to a focal agent varies across the level of vulnerability. In our studies, consumer vulnerability will either be measured through objective consumer traits (such as stigmatizing traits, e.g. a high body-mass-index), or manipulated through the setting or goal of the service encounter. For capturing our explaining mechanism and outcomes we capitalize on perceptual measures as well as well as actual observable behavior (e.g., for information disclosure). While this first series of experiments establishes the effects of AI vs. human agents, for testing RP2 the second series of experiments zooms in into different types of AI agents by considering anthropomorphized AI agents. To be able to provide actionable managerial implications, we plan to foster anthropomorphism through different components of humanness (i.e., agency and experience). Notably, the dimension of agency seems to play a vital part in individuals' devaluation apprehension (Pitardi et al. 2022), as it makes up the capacity to make judgements – whereas the dimension of experience might even be appreciated in certain situations where vulnerable consumers seek a feeling, empathetic (but nonetheless nonhuman) conversational partner. Therefore, our research aims to shed light not only on anthropomorphized AI agents as a whole, but examining perceptions of agency vs. experience, which might have oppositional effects for vulnerable consumers. To assure high internal and external validity, we plan to conduct some of the experiments as vignettes, others as actual interactions with AI agents and human agents. For the first series of experiments, we will apply the Wizard-of-Oz technique to ensure high comparability between the AI and human agent conditions. In addition, for the other experiments, we create AI agents with different levels of anthropomorphism using Google Dialogflow.

With the insights from our studies we add knowledge on how vulnerable people act in a service landscape that is more and more dominated by technology-driven interfaces, with AI agents augmenting and substituting human service agents (Huang and Rust 2018; Larivière et al. 2017). By doing so, we respond to a recent call by Ostrom et al. (2021) to investigate (unintended) consequences of technologies for customer experience, how vulnerable consumers experience service delivery, whether and to what extent technology should be humanized and to include well-being as an outcome variable in research frameworks. In combining insights from several literature streams, we explore repercussions of deploying AI vs. human agents for interactions with vulnerable consumers, who represent a consumer group that is relevant, but oftentimes overlooked (Rosenbaum et al. 2017). Based on existing theory and our empirical investigations, we plan to demonstrate that AI agents will be evaluated as a neutral audience, from which there is no risk of social devaluation, therefore emphasizing the significance of deploying AI agents to make services more accessible to a broader range of consumers. Facilitating vulnerable peoples' access to services and support their goal attainment increases service inclusivity. Furthermore, we explore unintended negative consequences of anthropomorphizing AI agents. In doing so, we challenge the oftentimes taken-for-granted assumption that human-like AI is desired by all consumers. However, if firms follow the general recommendation to anthropomorphize AI agents (Blut et al. 2021), they might unknowingly make the service less accessible to the vulnerable, in that vulnerable consumers may be deterred by AI agents'

resemblance to human agents – which would create barriers for using the firm’s services (Boenigk et al. 2021). Therefore, we provide insights on what types of AI agents are desired by vulnerable consumers, which not only enhances service provision by firms on the one hand, but further empowers vulnerable consumers attain their goals and contribute to their own well-being.

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