

# I, chatbot! the impact of anthropomorphism and gaze direction on willingness to disclose personal information and behavioral intentions

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## Abstract

The present research focuses on the interplay between two common features of the customer service chatbot experience: gaze direction and anthropomorphism. Although the dominant approach in marketing theory and practice is to make chatbots as human-like as possible, the current study, built on the humanness-value-loyalty model, addresses the chain of effects through which chatbots' nonverbal behaviors affect customers' willingness to disclose personal information and purchase intentions. By means of two experiments that adopt a real chatbot in a simulated shopping environment (i.e., car rental and travel insurance), the present work allows us to understand how to reduce individuals' tendency to see conversational agents as less knowledgeable and empathetic compared with humans. The results show that warmth perceptions are affected by gaze direction, whereas competence perceptions are affected by anthropomorphism. Warmth and competence perceptions are found to be key drivers of consumers' skepticism toward the chatbot, which, in turn, affects consumers' trust toward the service provider hosting the chatbot, ultimately leading consumers to be more willing to disclose their personal information and to repatronize the e-tailer in the future. Building on the Theory of Mind, our results show that perceiving competence from a chatbot makes individuals less skeptical as long as they feel they are good at detecting others' ultimate intentions.

## KEYWORDS

anthropomorphism, artificial intelligence, chatbot, chatbot trust, conversational agents, digital assistants, gaze direction, privacy disclosure

## 1 | INTRODUCTION

Self-service technologies (SSTs) are revolutionizing the interactions between consumers and providers (van Pinxteren et al., 2019). These interactions assume various forms, including automated teller

machines, self-service kiosks, self-checkouts, and service robots (Collier et al., 2017). The latest generation of SSTs includes chatbots, computer programs with natural language capabilities conceptualized as automated advice-givers that are configured to converse with human users (Tintarev et al., 2016). Chatbots have become quite

CHATBOT ANTHROPOMORPHISM AND GAZE DIRECTION

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common, whether as customer-service agents on e-commerce sites or personal assistants within Apple's Siri and Amazon's Echo (Go & Sundar, 2019). As their underlying technology evolves to encompass more types of interactions (Brandtzaeg & Følstad, 2018), chatbots may be able to replace human service employees and thus increase the level of customer service (Ameen et al., 2022) while decreasing costs (Edwards et al., 2014). Indeed, the market for chatbots is forecasted to exceed \$1.34 billion by 2024 (Wiggers, 2018). However, although companies are increasingly adopting these conversational agents for various purposes (Lim et al., 2022), research on how chatbots should be designed and deployed has yielded mixed results thus far (e.g., Crolic et al., 2022; Rajaobelina et al., 2021). Moreover, because consumers view chatbots with skepticism, it is necessary to understand how to reduce this tendency (Dietvorst et al., 2015; Luo et al., 2019).

We rely on the humanness-value-loyalty (HVL, hereafter) theoretical framework (Belanche et al., 2021) to investigate how customers' perceptions of chatbots' humanness (i.e., anthropomorphism and gaze direction) affect customers' future intentions toward the service provider that provides a chatbot-mediated interface. Previous theoretical frameworks, such as computers as social actors (CASA, Moon, 2000; Nass et al., 1995), have shown that consumers tend to treat digital assistants as social agents, but they have not considered that current advances in technology allow chatbots to actually look and behave like social agents and the implications of this. By applying the HVL model, we can advance the literature that affirms that a chatbot's humanness increases future intentions and willingness to disclose personal information. Accordingly, we focus on two common features of customer service chatbot design: gaze direction and anthropomorphism. Anthropomorphism refers to the physical features of the chatbot, while gaze direction refers to one nonverbal communication behavior of the chatbot that reinforces its humanlike appearance (van Pinxteren et al., 2019). Building on the HVL framework, this paper explains the effects of these chatbot features (i.e., gaze direction and anthropomorphism) on consumers' perceptions (i.e., perceived warmth and competence of the chatbot, consumers' skepticism toward the chatbot and consumers' trust in the service provider) and how they, in turn, affect consumers' behaviors (i.e., willingness to disclose personal information and future intentions). By doing so, the present work adds two novel insights to this stream of literature: first, this study combines, in an original way, the literature on gaze direction with the literature on chatbots' nonverbal communication; second, it addresses the impact of chatbots' anthropomorphism on warmth and competence, which is novel in this stream of literature.

We assume that the humanness features proposed by the HVL model positively influence the perceived warmth and competence of chatbots and determine consumers' expectations of the value delivered in the service interaction (Belanche et al., 2021; Fiske et al., 2007). Accordingly, when the perceived warmth and competence of the chatbot increase, consumers reduce their skepticism toward the chatbot and increase their trust in the service provider. Consequently, consumers' willingness to disclose personal

information to the chatbot and their future intentions toward the chatbot increase. The present research provides a novel explanation for individuals' skepticism toward the interpretation of conversational agents in light of the warmth and competence attributed to chatbots.

Since previous studies have also highlighted the moderating role of individual traits in frontline innovation and technology adoption processes (Belanche et al., 2021), we also address the Theory of Mind as a moderator of the relationship between consumers' skepticism and their perceptions of warmth and competence. While many prior studies have shown that warmth exerts a stronger effect than competence on consumers' perceptions (Roy & Naidoo, 2021), the present study, by building on Theory of Mind, explains the conditions under which competence perceptions are also significant drivers of consumers' skepticism.

This research develops two studies that adopt an experimental approach to manipulated chatbots (built with current technology) to investigate consumers' perceptions and behavioral intentions. By collecting data on a simulated webpage with a real chatbot, the present research allows for the exploration of a wider set of effects that go beyond stated intentions to show that chatbots' gaze direction, but not their anthropomorphism, affects individuals' purchase behaviors. Accordingly, the current study adds value to the HVL model (Belanche et al., 2021) by considering different contexts of application and constructs that help to further validate the model.

In this way, the present research further illuminates the effects of adopting SSTs, which can aid managers in designing chatbots (i.e., defining the proper gaze direction and level of anthropomorphism for the chatbot) to achieve the best marketing outcomes (i.e., greater consumer willingness to disclose personal information to chatbots and express positive future intentions toward the firm).

## 2 | THEORETICAL BACKGROUND

Chatbots can be understood as conversational agents that enable the interaction of humans with machines through natural language (Tintarev et al., 2016). Over the last decade, text-based chatbots have spread in a variety of application domains thanks to platforms that support their design (Grudin & Jacques, 2019). As chatbot applications have proliferated, the literature on chatbots as service providers has grown, producing mixed results (Crolic et al., 2022; Sands et al., 2022). Among other aspects, humanness represents a central topic in research that studies human-chatbot interaction (Rapp et al., 2021). Humanness in chatbots has been investigated considering two main streams of research: (i) studies that focus on the chatbot's features that lead consumers to ascribe humanness, such as the chatbot's grammar and language (De Kleijn et al., 2019), conversational style (Go & Sundar, 2019), or human-like appearance (Araujo, 2018), and (ii) studies that focus on both the positive and negative consequences of humanness on users. On the one hand, chatbots that appear more human-like may foster users' trust, tolerance, willingness to disclose personal information, closeness,

and prosocial behaviors, such as willingness to repair misunderstandings or a predisposition to donation (Lee et al., 2020). On the other hand, increased human likeness may encourage users to increase their expectations, leading to more anger or disappointment toward the chatbot when the interaction is not satisfactory (Crolic et al., 2022). Moreover, the chatbot's humanness may foster consumers' deceptive behaviors and engender feelings of eeriness, as the uncanny valley theory suggests (Mori, 1970).

As chatbots proliferate, users tend to consider chatbots not merely a means or a "tool" for achieving a goal, such as providing support or executing a task, but also the "subject" intersubjective relation in which both parts of the interaction have the same dignity and their own "needs" to be satisfied (Rapp et al., 2021).

### 3 | HYPOTHESIS DEVELOPMENT

#### 3.1 | HVL model

The HVL model proposes that customers' perceptions of a technology's humanness are crucial for determining whether the service is advantageous and for shaping the future relationship with the technology and the service provider (Belanche et al., 2021). According to Sweeney and Soutar (2001), service value is composed of functional value, social value, monetary value, and emotional value. A high service value that consumers expect to derive from patronizing the service provider stimulates the intention to stay loyal to this particular firm (Belanche et al., 2021). In this regard, prior literature has suggested that skepticism toward the chatbot and consumers' trust toward the website are among the main determinants of expected service value (Chai et al., 2015). The HVL model is rooted in social categorization theory (Fiske et al., 2002), which states that individuals rely on visual and behavioral cues to categorize an unknown person or object into a desirable or undesirable category. Accordingly, the (un)desirable categorization of chatbots based on their humanness might affect the value that customers anticipate receiving from a service. Humanness perceptions revolve around two main determinants, namely, perceived warmth and competence (Belanche et al., 2021). Because chatbots can be assimilated as social actors (Moon, 2000), warmth and competence perceptions are human-like characteristics that can be extended to chatbots as well. Previous studies have proposed that individuals' perceptions of chatbots' humanness might depend on the anthropomorphic appearance of chatbots (Pizzi et al., 2021; Roy & Naidoo, 2021) or on their nonverbal communication style (van Pinxteren et al., 2019). These prior findings can be interpreted in light of the HVL framework to support the notion that consumers form their expectations about the value of a service provider starting from the humanness of the chatbot, which serves as a digital interface between the service provider and the customer.

This study adopts the HVL model proposed by Belanche et al. (2021) and extends its application in several ways. First, it tests the model in a chatbot-mediated customer service environment, which is

a different context from the robot service environment of Belanche et al. (2021). Second, the model of this study is tested by adopting a real chatbot in a simulated shopping environment (i.e., car rental and travel insurance), which adds more realism to the scenario. This further validates the framework and provides robust results. Third, the current study adds value to the existing model by considering further constructs such as trust in the service provider, future intentions and willingness to disclose personal information toward the service provider, which are related to the concepts of value and loyalty adopted in the original HVL model (Chai et al., 2015; Cloarec et al., 2022; Malhotra et al., 2004). Finally, the model is tested considering the influence of individual traits (i.e., Theory of Mind), which is an important aspect, as also highlighted by Belanche et al. (2021).

#### 3.2 | The effects of gaze direction on willingness to disclose and future intentions

Gaze direction can be described as the object of interest controlled by individuals' eyes (Velichkovsky et al., 2021). Scholars have shown that gaze direction is one of the primary nonverbal sociocommunicative dimensions (Senju & Johnson, 2009) because it affects visual attention, facial mimicry, and the subjective experience of others (Schrammel et al., 2009; Soussignan et al., 2013). The psychological literature has distinguished between direct (i.e., directed toward the viewer) and averted (i.e., not directed toward the viewer) gaze and has shown that the former is more likely to induce trustworthiness (Willis et al., 2011), garner higher attractiveness ratings (Kampe et al., 2001), and be more rapidly detected (Senju et al., 2005; Yokoyama et al., 2013). Hence, individuals tend to associate an averted gaze with less honesty than a direct gaze (Riggio & Friedman, 1983; Vrij & Semin, 1996).

The marketing literature has only recently incorporated this body of evidence by focusing on consumers' message memorization rather than their behavior (Adil et al., 2018; Droulers & Adil, 2015; Hutton & Nolte, 2011; Sajjacholapunt & Ball, 2014). Quite surprisingly, gaze direction has found limited application in the chatbot literature thus far. Because gaze is one of the defining features of an entity's anthropomorphic properties (Epley et al., 2007), gaze direction affects individuals' perception of chatbots' anthropomorphism (van Pinxteren et al., 2019). Adopting the HVL perspective, direct gaze direction increases the humanness perception of the chatbot (Belanche et al., 2021; Rapp et al., 2021) because human-human interaction is based on direct gaze direction. A chatbot that looks directly at the user (i.e., direct gaze) exploits a nonverbal communication cue indicating that its object of interest is the user. By looking at the user, the chatbot is visually and emotionally connected with the user.

According to the HVL model, higher perceived humanness usually leads to a higher expected service value that in turn leads to higher customer loyalty intentions in frontline interactions (Belanche et al., 2021). Service value expectations reflect an anticipation of the utility of a service with regard to its functionality,

social aspects, costs, and affectivity (Sweeney & Soutar, 2001). Thus, based on the HVL model, the expected service value should ultimately determine customers' future intentions, which can be defined as the intent to continue using the service following the introduction of a chatbot. Accordingly, because a direct gaze increases the perceived humanness of the chatbot, we expect that a direct gaze would increase future intentions toward the brand because of the higher expected service value provided by the chatbot (Balakrishnan & Dwivedi, 2021).

Moreover, prior research on human–human interaction has widely documented that a direct gaze increases perceptions of trustworthiness. Trustworthiness has been shown to be one of the main drivers of self-disclosure (Cloarec et al., 2022). Accordingly, we might expect that chatbots with direct gaze direction will positively influence the willingness to disclose personal information because of the higher trustworthiness perceived by chatbot users. Thus, we posit that consumers will be more likely to disclose their personal information and have positive future intentions toward the brand when using a chatbot with a direct rather than an averted gaze. Formally, we present

**H1:** *A chatbot's direct gaze increases (a) consumers' willingness to disclose personal information and (b) consumers' future intentions toward the service provider.*

### 3.3 | The effects of anthropomorphism on willingness to disclose and future intentions

Anthropomorphism can be defined as the extent to which a machine possesses human-like characteristics in terms of visual appearance (Wirtz et al., 2018), relational style (Huang & Rust, 2018) or gestures (Blut et al., 2021; Moriuchi, 2021). Recent literature has advanced anthropomorphism as a potentially relevant dimension of conversational agents such as chatbots (Mehta et al., 2022; Pizzi et al., 2021; Roy & Naidoo, 2021). For instance, human-like chatbots garner more trust than nonhumanoid chatbots (Waytz et al., 2014). According to the HVL model, anthropomorphism refers to the physical features that increase the perceived humanness of chatbots.

Despite the controversial results from the marketing literature on the effects of anthropomorphism on consumers' perceptions and behaviors, HVL theory supports the positive effect of chatbots' anthropomorphism on consumers' future intentions toward the brand because of the higher expected value originating from the higher level of humanness of the chatbot. Moreover, high levels of anthropomorphism increase consumers' perceptions of social presence and, by extension, their purchase intention (Han, 2021). Similarly, human-like chatbots are able to increase consumers' trust in the service provider (De Visser et al., 2016; Seeger & Heinzl, 2018), which then increases consumers' willingness to disclose personal information (Chang et al., 2017). It follows that due to the relationships between chatbots' anthropomorphism and trust in the website (De Visser et al., 2016) and between trust in the website and consumers' behavioral responses in terms of willingness to disclose

personal information (Chang et al., 2017) and future intentions (van Pinxteren et al., 2019), increasing levels of chatbots' anthropomorphism may strengthen consumers' willingness to disclose their personal information and future intentions. Thus, we posit the following:

**H2:** *A chatbot's anthropomorphism increases (a) consumers' willingness to disclose personal information to the chatbot and (b) consumers' future intentions toward the service provider.*

### 3.4 | The role of warmth and competence

The HVL model is strongly linked to the concepts of warmth and competence. The HVL model proposes that chatbots' humanness features, that is, the human-likeness of their appearance, determine customers' expectations toward the value delivered in the service interaction (Belanche et al., 2021). Focusing on humanness cues, the literature on social cognition identifies competence and warmth as the two universal perceptions that drive individuals' expectations of persons (Fiske et al., 2007) and services (Güntürkün et al., 2020). Competence reflects the chatbot's ability to accurately and reliably perform a frontline task, which includes assessments of its intelligence, skill, and efficacy. Warmth can be described as the customer's judgment of whether a chatbot has good or bad intentions, which includes assessments of its friendliness, helpfulness, sincerity, trustworthiness, and morality (Fiske et al., 2007).

Prior research has established that warmth and competence exert equally strong mediating effects (e.g., Aaker et al., 2010); thus, how people respond to others depends on their perceptions of others' warmth and competence (Cuddy et al., 2008). In service encounter situations, consumers who perceive a brand as both warm and competent are more willing to buy its products and show higher levels of engagement, connection, and loyalty (Aaker et al., 2012). Scott et al. (2013) revealed that an employee's appearance-related cues can affect consumer perceptions of warmth and competence; these inferences then mediate consumers' behavioral intentions toward the focal employee. This reasoning has been extended to frontline service encounters between consumers and robots under the logic that warmth and competence inferences about service robots drive downstream effects (e.g., assessments of the service experience in terms of perceived quality and satisfaction as well as customer loyalty) (Van Doorn et al., 2017). Accordingly, we anticipate that a chatbot's appearance affects consumers' perceptions of warmth and competence. This assumption is also supported by the HVL model, which suggests that the humanness features of the chatbot (i.e., direct gaze direction and higher anthropomorphism) lead to higher expectations in terms of warmth (i.e., higher trustworthiness) and competence (i.e., higher efficacy).

As already outlined, gaze direction is a component of nonverbal communication that—in addition to other factors (e.g., smiling, expressions of active interest, facing the customer)—contributes to an empathetic state that facilitates the development of trust and leads directly to cooperative behavior (Gabbott & Hogg, 2001). Moreover, as the prior literature in psychology demonstrates, a more direct and

focused gaze helps to facilitate persuasion and compliance in customers (Hall, 1980). Research in robotics relates gaze direction to responsiveness perceptions, which have been found to yield significant positive effects in terms of perceived efficacy, which is related to competence (Gratch et al., 2007; Kaptein et al., 2011). For instance, Kanda et al. (2007) showed that eye contact enabled a robot to convey more information (i.e., competence) and establish a stronger affiliation (i.e., warmth) with the user. Similarly, Stanton and Stevens (2014) discovered that a robot that demonstrates gaze movements increases users' trust in the robot when the robot helps to perform a difficult task. Based on the above, we propose the following:

**H3:** *Direct (as opposed to averted) gaze direction will lead to higher perceived warmth.*

**H4:** *Direct (as opposed to averted) gaze direction will lead to higher perceived competence.*

With regard to anthropomorphism, previous studies have demonstrated that people usually treat something with a human appearance differently than they do inanimate objects (Chari et al., 2016; Fox et al., 2015). This can be explained by the HVL model, which suggests that value expectations rely on the level of humanness ascribed to the target object. Accordingly, anthropomorphic cues lead people to expect higher service value because of the higher warmth and competence ascribed to the object (Belanche et al., 2021). Previous theoretical frameworks, such as computers as social actors (CASA, Moon, 2000; Nass et al., 1995), have confirmed this approach, but they have not considered that current advances in technology allow chatbots to actually look and behave like social agents (Miao et al., 2022). By applying the HVL model, we can advance the literature affirming that chatbots' anthropomorphic cues increase their perceived humanness, which leads to higher consumer perceptions in terms of warmth and competence. Hence, we posit the following:

**H5:** *Higher chatbot anthropomorphism leads to higher perceived warmth compared with lower chatbot anthropomorphism.*

**H6:** *Higher chatbot anthropomorphism leads to higher perceived competence compared with lower chatbot anthropomorphism.*

### 3.5 | Chatbots and consumers' skepticism

Although consumers are increasingly reliant on digital service encounters, they do not always readily accept technological service providers; thus, the use of such technologies can evoke skepticism and trigger negative feelings (Holthöwer & van Doorn, 2022; Mozafari et al., 2021). Skepticism refers to a person's tendency to doubt, not believe, or question (Boush et al., 1994; Foreh & Grier, 2003). This construct is both a personality trait (Obermiller & Spangenberg, 1998) and a consumer state induced by situational factors independent of trait characteristics and varies depending on context and situation (Patel et al., 2017; Vanhamme & Grobden, 2009). In this research, we consider skepticism to be a consumer state induced by situational factors.

Market research in several European countries (e.g., Elsner, 2017) has found that consumers frequently encounter chatbots with skepticism. Consumers express a preference for engaging with humans and demonstrate general resistance towards chatbots (Araujo, 2018). In this vein, many users experience unsatisfactory encounters with chatbots (e.g., high failure rates), which might fuel their skepticism and resistance and thereby discourage users from accepting the chatbot's recommendations and requests (Adam et al., 2021). Thus, it is extremely important to understand how to reduce skepticism toward chatbots.

We posit that warmth and competence, as social judgment components, contribute to this explanation. Warmth and competence are positively related to trust (Kervyn et al., 2022). Warmth leads to emotional trust (i.e., the chatbot has positive intentions toward the consumer; Aaker et al., 2012), and competence leads to rational trust (i.e., the chatbot has the ability to achieve its goals; MacInnis, 2012). Trust is related to skepticism; the latter has also been defined in terms of distrust (Isaac & Grayson, 2020; Lopes & Goulart-da-Silva, 2022). Thus, by increasing trust via higher levels of warmth and competence, skepticism might be reduced. Accordingly, we address skepticism as a mediator of the relationship between warmth, competence, and trust. Thus, we expect the following:

**H7:** *The higher the perceived warmth, the lower the level of skepticism that consumers will feel toward the chatbot.*

**H8:** *The higher the perceived competence, the lower the level of skepticism that consumers will feel toward the chatbot.*

### 3.6 | The moderating role of Theory of Mind

Consistent with the HVL framework, which incorporates individual traits as relevant moderators in the humanness-value relationship (e.g., in frontline innovation and technology adoption processes as in Belanche et al., 2021), we address the Theory of Mind as a moderator of the relationship between consumers' perceptions of warmth and competence and skepticism. Theory of Mind is defined as an individual's ability to understand the intentions of others (Minton et al., 2021). This theory has primarily been examined in developmental psychology (e.g., Wellman & Estes, 1986) to understand when a child develops an understanding that others have intent, preferences, and attitudes (i.e., a mind) separate from their own. Although the Theory of Mind represents a developmental milestone in childhood, it has been applied in other situations to demonstrate that adults exhibit various levels of Theory of Mind, which has implications for a range of consumption decisions and plays a key role in people's response to potentially persuasive communications (Craig et al., 2012; Weathers et al., 2015; Woodside, 2008). However, to date, marketing studies have provided meager applications of the Theory of Mind (Minton et al., 2021). Nonetheless, this theory holds relevance for marketing purposes: recent psychological research has shown that the Theory of Mind is critical in understanding a person's capacity for empathy (McLellan & McKinlay, 2013), attribution

decisions (Bryant et al., 2013), response to social risk (Yokoyama et al., 2014), and socially desirable response patterns (Nentjes et al., 2015). Thus, the Theory of Mind is useful for understanding when consumers trust companies and marketing initiatives.

In the marketing literature, Dietvorst et al. (2009) examined how a salesperson's Theory of Mind influences his or her awareness of customers' intentions and response to other interpersonal cues. In contrast, Craig et al. (2012) examined the role of consumers' Theory of Mind on evaluations of deceptive advertisements. Minton et al. (2021) examined how consumers apply Theory of Mind socially when evaluating marketing communications. Their results showed that high Theory of Mind leads to a higher ability to identify persuasion. Relatedly, Minton et al. (2021) found that higher levels of Theory of Mind aligned with higher levels of consumer skepticism. In this vein, McAlister and Cornwell (2010) described how a higher Theory of Mind enables a better understanding of brand symbolism as a tool for persuasion, suggesting that a high Theory of Mind increases deception through skepticism.

Although the current study does not focus on persuasion, research has shown that humans usually have lower confidence in chatbots' performance and are thus skeptical about these digital conversational agents (Dietvorst et al., 2015). As a result, chatbots are perceived as less knowledgeable and empathetic than humans (Blut et al., 2021; Luo et al., 2019). Since we expect that chatbots' anthropomorphism, and gaze direction will positively affect warmth and competence and thereby reduce individuals' skepticism toward chatbots' performance, we also expect that this effect can be reversed by high levels of Theory of Mind. Given findings that high levels of Theory of Mind increase skepticism toward advertisements (Minton et al., 2021), we expect that the dampening effect of skepticism on warmth and competence can be overturned by the presence of higher levels of Theory of Mind. Accordingly, we posit the following:

**H9:** *Theory of Mind moderates the effect of warmth on skepticism. Accordingly, individuals who rate themselves as good at detecting other people's intentions display higher skepticism when they associate high levels of warmth with the chatbot.*

**H10:** *Theory of Mind moderates the effect of competence on skepticism. Accordingly, individuals who rate themselves as good at detecting other people's intentions display higher skepticism when they associate high levels of competence with the chatbot.*

### 3.7 | The role of trust

Trust has been defined as the "willingness to rely on an exchange partner in whom one has confidence" (Moorman et al., 1993, p. 82). Confidence can be conceived as consumers' perceptions about the exchange partner's integrity and reliability (Morgan & Hunt, 1994). In service encounters, users' trust represents an overall belief that the service provider will generally take actions that will result in positive outcomes for the user and will refrain from taking actions that might have negative consequences for the user. Trust is central for environments that produce

high levels of uncertainty, such as online settings (Riedl et al., 2011), and trust has been a focal construct in a variety of chatbot and technology-based studies (e.g., De Visser et al., 2016; Nunamaker et al., 2011). In particular, scholars have used the absence of trust to explain consumers' aversion to digital service delivery (Dietvorst et al., 2015). Skepticism is described as distrust toward certain objects (Obermiller & Spangenberg, 1998), making skepticism and trust two strongly related constructs (Isaac & Grayson, 2020). Thus, we assume that a decrease in skepticism toward a chatbot will lead to an increase in consumers' trust toward the service provider using the chatbot. Thus, we hypothesize the following:

**H11:** *Lower levels of skepticism lead to higher levels of trust toward the service provider.*

Based on previous research, trust in an exchange partner is a key mediating variable between services and relational outcomes (Hart & Johnson, 1999; Morgan & Hunt, 1994) as well as the basis for loyalty (Berry & Parasuraman, 1991). People who establish trust in a relationship will commit themselves to that relationship (Hrebiniak, 1974). Trust (i.e., rational and emotional) is also a predictor of expected service value, which in turn leads to loyalty intentions (Chai et al., 2015). This path is aligned with the HVL framework, which assumes that the expected value caused by the humanness of the chatbot leads to loyalty intentions. In the context of online services, trust has been associated with privacy concerns and consumers' willingness to disclose personal information. Internet privacy concerns decrease trust beliefs, which affects consumers' willingness to disclose personal information (Malhotra et al., 2004). Accordingly, higher trust beliefs increase the willingness to disclose personal information (Cloarec et al., 2022). Thus, building on the HVL framework, and consistent with the extant literature dealing with privacy concerns, we posit the following:

**H12:** *Higher levels of trust toward the service provider lead to (a) a higher willingness to disclose personal information with the chatbot and (b) more positive future intentions toward the service provider.*

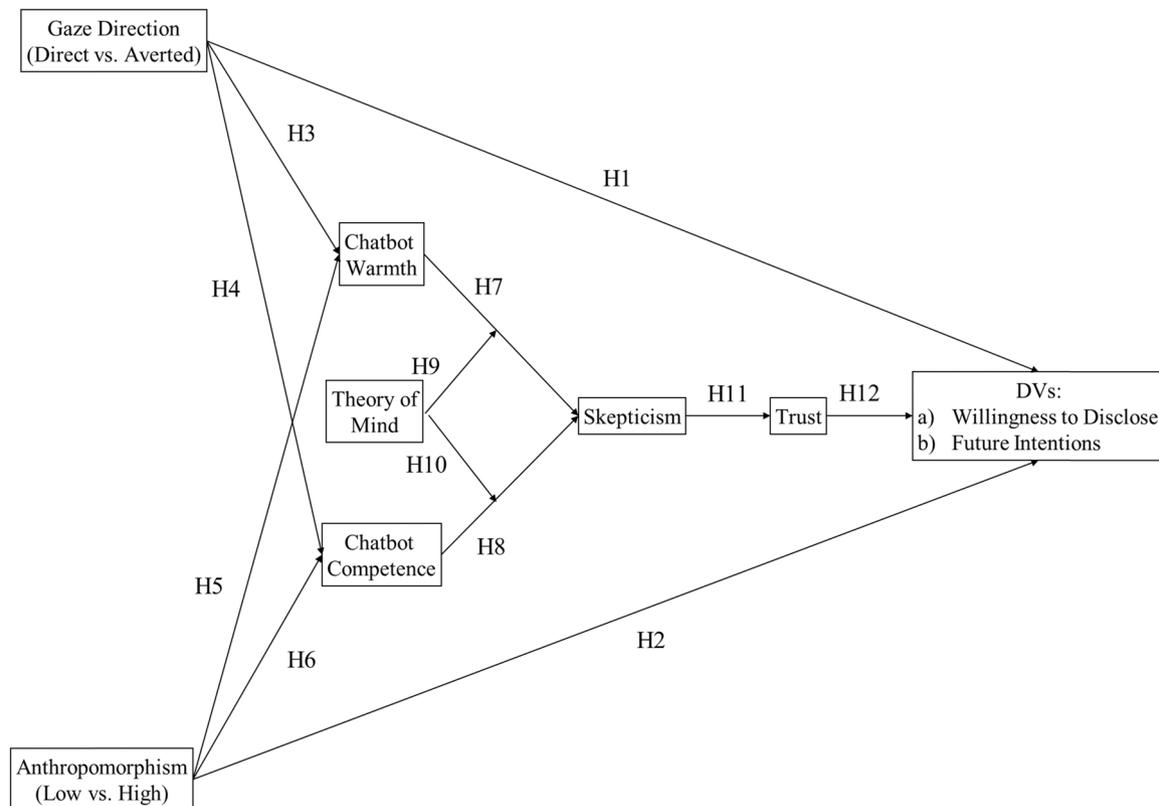
Figure 1 summarizes the conceptual model described in this section.

## 4 | METHODOLOGY

### 4.1 | Study 1

#### 4.1.1 | Participants and design

A total of 451 consumers (mean age = 41.60; 68% female) were recruited online from Prolific in May 2022 and invited to participate in an experiment implemented on the Qualtrics online survey platform. The experiment involved a 2 (gaze direction: direct vs. averted) × 2 (anthropomorphism: low vs. high) × 2 (chatbot gender: male vs. female) between-subject experimental design.



**FIGURE 1** Conceptual model.

#### 4.1.2 | Procedure

First, participants were asked to read an introductory section that explained that their task was to imagine themselves spending a holiday in a foreign country where they needed to rent a car from a website that provided support by means of a chatbot. Next, participants viewed a mock-up webpage that mimicked a car rental website. Car rental websites qualify as an appropriate empirical setting for the purposes of the present study for two main reasons. First, Pizzi et al. (2021) provided empirical evidence showing that chatbots reduce choice difficulty and increase users' satisfaction in the context of car rentals online. This context is characterized by high choice difficulty due to the relatively high levels of assortment and product complexity in terms of the features used by consumers to make comparisons. Second, recent literature has reported that chatbots are frequently adopted by rental car companies to provide better service to their customers (Kim et al., 2022). The website was embedded in the Qualtrics webpage as an iframe. Participants were instructed to choose a car to rent among the multiple alternatives available on the website. They were also told that a chatbot would help them filter the available options based on their queries typed in the dedicated chat box. Depending on the experimental condition, the chatbot presented different levels of apparent anthropomorphism. In the high anthropomorphism condition, participants saw a chatbot whose appearance reflected an AI-generated picture taken from [www.thispersondoesnotexist.com](http://www.thispersondoesnotexist.com).

Regardless of the level of anthropomorphism, the chatbot had either a direct or averted gaze. Recent literature has noted that the gender of the chatbot interacts with anthropomorphism in determining the effectiveness of the chatbot's recommendations: when the gender of the chatbot matches the gender of the user, it exerts a stronger impact on consumer behavior (Zogaj et al., 2023). Accordingly, the present work manipulated the gender of the chatbot to test whether such a gender match effect also occurs to shape individuals' perceptions of the chatbot's warmth and competence. To manipulate the gender of the chatbot without introducing systematic bias due to differences in facial traits, we converted the face of the female chatbot extracted from [www.thispersondoesnotexist.com](http://www.thispersondoesnotexist.com) to the face of a male chatbot by means of FaceApp. We then avatarized both the male and female photos using the ToonMe app.

The graphical implementation as well as the set of conversational skills of the chatbot were developed by Genius Voice, a company that specializes in the development of conversational agents. Using their toolset, we were able to create and implement very realistic chatbots for the purposes of this research. Similarly to Balakrishnan and Dwivedi (2021), the full description of the experimental conditions, as well as sample stimuli are available in [Appendix A](#).

Participants were instructed that they could interact with the chatbot for as long as they wished to find a car that matched their preferences. They were also told that they could avoid choosing any car if none seemed suitable. Participants' experience on the mock-up webpage concluded when they clicked on the "next" button at the

bottom of the page to proceed with the following sections of the questionnaire, which were available regardless of whether they chose a car.

After engaging with the chatbot-aided choice task, participants completed two manipulation checks to assess their perceptions of the chatbot's anthropomorphism (two items from Aggarwal & McGill, 2007) and gaze direction (two items from To & Patrick, 2021). Then, participants received a set of scales to measure the key constructs for this research: warmth and competence (12 items from Wu et al., 2017), skepticism (9 items adapted from Obermiller & Spangenberg, 1998), Theory of Mind (5 items from Gentina et al., 2021), trust (2 items adapted from Morgan & Hunt, 1994), willingness to disclose (3 items from Anderson & Agarwal, 2011), and consumers' future intentions (3 items from Inman & Nikolova, 2017).

Finally, the participants were thanked and debriefed.

### 4.1.3 | Results

A factor analysis confirmed the reliability of the seven scales drawn from the literature, with Cronbach's  $\alpha$  equal to 0.92 for Warmth, 0.93 for Competence, 0.72 for Theory of Mind, 0.94 for Skepticism, 0.93 for Trust, 0.97 for Disclosure Intentions, and 0.96 for Future Intentions. The composite reliability (CR) and the average variance extracted (AVE) were greater than the recommended 0.7 and 0.5 thresholds, respectively (Fornell & Larcker, 1981), except for the construct of Theory of Mind. The scale items, Cronbach's  $\alpha$ , CR, and AVE values for each construct are detailed in Appendix B. We averaged the items of the aforementioned scales to define the factors for the subsequent analyses.

First, as a manipulation check, we compared the perception of the chatbot's anthropomorphism between participants exposed to the low (i.e., avatarized picture) and high (i.e., AI-generated picture) anthropomorphism conditions. We found that participants perceived the avatarized pictures as less anthropomorphic than the AI-generated pictures ( $M_{\text{low}} = 2.63$ ;  $M_{\text{high}} = 3.03$ ;  $F(1;450) = 20.15$ ;  $p < 0.001$ ;  $\eta^2 = 0.04$ ). Similarly, we found that participants correctly perceived the chatbots' gaze direction as less direct in the direct condition than in the averted condition ( $M_{\text{direct}} = 1.60$ ;  $M_{\text{averted}} = 2.15$ ;  $F(1;450) = 46.91$ ;  $p < 0.001$ ;  $\eta^2 = 0.10$ ), thereby supporting the effectiveness of our experimental manipulations.

We then evaluated whether the four conditions had significantly different impacts on the set of investigated dependent variables. The results of a multivariate analysis of variance (MANOVA) showed a significant multivariate effect of gaze direction (Wilks  $\lambda = 0.96$ ,  $F = 2.76$ ,  $df = 6$ ;  $442$ ,  $p = 0.01$ ,  $\eta^2 = 0.04$ ) and a marginal multivariate effect of anthropomorphism (Wilks  $\lambda = 0.98$ ,  $F = 1.89$ ,  $df = 6$ ;  $442$ ,  $p = 0.08$ ,  $\eta^2 = 0.03$ ).

The univariate tests that followed the MANOVA showed a significant main effect of gaze direction on warmth. Specifically, the direct gaze enhanced warmth perceptions ( $M_{\text{direct}} = 4.69$ ;  $M_{\text{averted}} = 4.36$ ;  $F(1;447) = 10.89$ ;  $p = 0.001$ ;  $\eta^2 = 0.02$ ). Furthermore, the univariate ANOVA revealed a significant main effect of

anthropomorphism on perceived competence ( $M_{\text{high}} = 4.77$ ;  $M_{\text{low}} = 4.50$ ;  $F(1;447) = 4.76$ ;  $p = 0.03$ ;  $\eta^2 = 0.01$ ).

To rule out the possibility that the gender of the chatbot interacted with its gaze and anthropomorphism in affecting consumers' reactions (Borau et al., 2021), we ran an additional 2 (gaze direction: direct vs. averted)  $\times$  2 (anthropomorphism: low vs. high)  $\times$  2 (gender match: yes vs. no) MANOVA. The gender match variable was operationalized by comparing the gender of the respondent with the gender of the chatbot to which each participant was exposed. No multivariate effect emerged for the interaction of gender match with either gaze direction (Wilks  $\lambda = 0.98$ ,  $F = 0.56$ ,  $df = 12$ ;  $864$ ,  $p = 0.88$ ,  $\eta^2 < 0.01$ ) or anthropomorphism (Wilks  $\lambda = 0.98$ ,  $F = 0.84$ ,  $df = 12$ ;  $864$ ,  $p = 0.61$ ,  $\eta^2 = 0.01$ ). Therefore, we can conclude that individuals' reactions to the chatbot's gaze direction and anthropomorphism did not change based on whether the chatbot's gender matched that of the user.

The hypothesized effects of anthropomorphism and gaze direction on consumers' willingness to disclose and future intentions through warmth, competence, skepticism, and trust were tested using serial mediation analysis (PROCESS Model 80 customized with syntax to allow for the moderation of Theory of Mind; Hayes, 2018), similar to Frank et al. (2022).

The results from the moderated mediation model (5000 bootstrap samples) yielded no direct effect of gaze direction and anthropomorphism on either future intentions or disclosure intentions, thereby rejecting H1 and H2, respectively. Consistent with H3, gaze direction significantly affected warmth (Effect = 0.38;  $p = 0.008$ ; 95% confidence interval [CI] [0.100; 0.666]), while no effect emerged for competence (Effect = 0.24;  $p = 0.16$ ; 95% CI [-0.097; 0.577]), thus rejecting H4. Conversely, and consistent with H6, anthropomorphism affected competence (Effect = 0.45;  $p = 0.011$ ; 95% CI [0.103; 0.789]) but not warmth (Effect = 0.06;  $p = 0.672$ ; 95% CI [-0.226; 0.350]), thus rejecting H5. Warmth, in turn, positively affected skepticism (Effect = 0.61;  $p = 0.005$ ; 95% CI [0.188; 1.025]), in line with the effect posited in H7. In contrast to what was hypothesized in H8, competence did not directly affect skepticism (Effect = 0.06;  $p = 0.710$ ; 95% CI [-0.275; 0.403]), but it significantly interacted with Theory of Mind in affecting skepticism (Effect = 0.07;  $p = 0.04$ ; 95% CI [0.004; 0.134]), thereby supporting H10. Specifically, the effect of competence on skepticism was enhanced at higher levels of Theory of Mind (low levels of Theory of Mind: Effect = 0.34;  $p < 0.001$ ; 95% CI [0.239; 0.438]; high levels of Theory of Mind: Effect = 0.46;  $p < 0.001$ ; 95% CI [0.378; 0.547];  $R^2$  change = 0.005;  $F = 4.29$ ,  $df = 1$ ;  $445$ ,  $p = 0.04$ ). In other words, individuals who rated themselves as good at detecting other people's intentions displayed higher skepticism when they associated the chatbot with high levels of competence. Theory of Mind was found not to moderate the warmth-skepticism relationship, thus rejecting H9. Consistent with H11, skepticism positively affected trust (Effect = 0.48;  $p < 0.001$ ; 95% CI [0.392; 0.560]), which ultimately affected both disclosure intentions (Effect = 0.679;  $p < 0.001$ ; 95% CI [0.552; 0.806]) and future intentions (Effect = 0.92;  $p < 0.001$ ; 95% CI [0.874; 0.974]), thereby providing support in favor of H12.

Accordingly, the results suggest that warmth, competence, skepticism, and trust fully mediated the relationship between gaze

direction and anthropomorphism on consumers' disclosure and future intentions.

## 4.2 | Study 2

### 4.2.1 | Participants and design

A total of 800 consumers ( $M_{\text{age}} = 41$  years; 47% females) were recruited on Prolific in December 2022 to participate in this study. Participants from Experiment 1 were excluded. The experiment involved a 2 (gaze direction: direct vs. averted)  $\times$  2 (anthropomorphism: low vs. high)  $\times$  2 (chatbot gender: male vs. female) between-subject experimental design.

### 4.2.2 | Procedure

The procedure was identical to that for Experiment 1, but Study 2 extended Study 1 in several ways. First, it replicated the experiment with a different product category to provide higher ecological validity to the results of Study 1 since the investigated product category in Study 2 (travel insurance) was related to the empirical setting of the first study, thus guaranteeing a certain level of comparability between the two studies. Second, insurance plans can be conceived as more utilitarian in nature than cars, thereby providing the opportunity to compare our theoretical model across empirical settings with different levels of utilitarian value for the customer.

Third, we added some measures to the survey to control for external variables that might overshadow the effects of our independent variables. Specifically, we added a measure of familiarity with the technology as a covariate, as in Bonnin (2020). Finally, we collected behavioral data about the users' interactions with the chatbot in terms of (i) whether they ultimately purchased something, (ii) the time spent on the simulated webpage, and (iii) the number of interactions with the chatbot.

Participants were instructed that they had to choose travel insurance before spending a holiday in a foreign country and that a chatbot was available on the webpage to assist them in their choice by filtering the available options based on the criteria specified by the participants in the chat. The eight versions of the chatbots were identical to those adopted in Study 1. The chatbot that appeared to each participant was randomized on Qualtrics. After interacting with the chatbot, participants were redirected to the following sections of the questionnaire on Qualtrics, where they were asked to complete the same measurement scales as in Study 1 in addition to the two covariates added in Study 2.

### 4.2.3 | Results

A factor analysis confirmed the reliability of the seven scales drawn from the literature, with Cronbach's  $\alpha$  equal to 0.90 for Warmth, 0.90

for Competence, 0.74 for Theory of Mind, 0.93 for Skepticism, 0.94 for Trust, 0.98 for Disclosure Intentions, and 0.95 for Future Intentions. The CR and the AVE were greater than the recommended 0.7 and 0.5 thresholds, respectively (Fornell & Larcker, 1981), except for the construct of Theory of Mind. The scale items, Cronbach's  $\alpha$ , CR, and AVE values for each construct are detailed in Appendix B. We averaged the items of the aforementioned scales to define the factors for the subsequent analyses.

First, as a manipulation check, we compared the perception of the chatbot's anthropomorphism between participants exposed to the low (i.e., avatarized picture) and high (i.e., AI-generated picture) anthropomorphism conditions. We found that participants perceived the avatarized pictures as less anthropomorphic than the AI-generated pictures ( $M_{\text{low}} = 2.24$ ;  $M_{\text{high}} = 3.63$ ;  $F(1;799) = 29.72$ ;  $p < 0.001$ ;  $\eta^2 = 0.04$ ). Similarly, we found that participants correctly perceived the chatbots' gaze direction as less direct in the direct condition than in the averted condition ( $M_{\text{direct}} = 1.57$ ;  $M_{\text{averted}} = 2.14$ ;  $F(1;799) = 91.76$ ;  $p < 0.001$ ;  $\eta^2 = 0.10$ ), thereby supporting the effectiveness of our experimental manipulations.

In line with findings from Study 1, the MANOVA yielded a significant multivariate effect of gaze direction (Wilks  $\lambda = 0.98$ ,  $F = 3.26$ ,  $df = 6$ ;  $787$ ,  $p = 0.004$ ,  $\eta^2 = 0.02$ ) and anthropomorphism (Wilks  $\lambda = 0.98$ ,  $F = 2.55$ ,  $df = 6$ ;  $787$ ,  $p = 0.02$ ,  $\eta^2 = 0.02$ ). Specifically, the univariate ANOVAs following the significant MANOVA showed that direct gaze enhanced warmth ( $M_{\text{direct}} = 4.48$ ;  $M_{\text{averted}} = 4.18$ ;  $F(1;799) = 17.38$ ;  $p < 0.001$ ;  $\eta^2 = 0.02$ ) and competence ( $M_{\text{direct}} = 4.72$ ;  $M_{\text{averted}} = 4.45$ ;  $F(1;799) = 12.77$ ;  $p < 0.001$ ;  $\eta^2 = 0.02$ ) perceptions. At the same time, high levels of the chatbot's anthropomorphism were found to increase perceptions of both warmth ( $M_{\text{low}} = 4.19$ ;  $M_{\text{high}} = 4.46$ ;  $F(1;799) = 14.34$ ;  $p < 0.001$ ;  $\eta^2 = 0.02$ ) and competence ( $M_{\text{low}} = 4.48$ ;  $M_{\text{high}} = 4.68$ ;  $F(1;799) = 7.20$ ;  $p = 0.007$ ;  $\eta^2 = 0.01$ ). Next, we adopted the same operationalization as in Study 1 to compare the gender of the chatbot to which each participant was exposed. Since no multivariate effect emerged for the interaction of gender match with either gaze direction (Wilks  $\lambda = 0.99$ ,  $F = 0.69$ ,  $df = 6$ ;  $787$ ,  $p = 0.66$ ,  $\eta^2 < 0.01$ ) or with anthropomorphism (Wilks  $\lambda = 0.99$ ,  $F = 0.76$ ,  $df = 6$ ;  $787$ ,  $p = 0.61$ ,  $\eta^2 = 0.01$ ), we could rule out the possibility that individuals' reactions to the chatbot's gaze direction and anthropomorphism also varied as a function of the chatbot's gender.

As in Study 1, serial mediation analysis (PROCESS Model 80 customized with syntax to allow for the moderation of Theory of Mind; Hayes, 2018) was adopted to test the hypothesized set of effects of anthropomorphism and gaze direction on consumers' willingness to disclose and future intentions through warmth, competence, skepticism and trust, controlling for familiarity with chatbots, which was added to the model as a covariate.

Consistent with Study 1, the results from the moderated mediation model (5000 bootstrap samples) yielded no direct effect of gaze direction and anthropomorphism on either future intentions or disclosure intentions, thereby rejecting H1 and H2, respectively. Consistent with H3, gaze direction significantly affected warmth (Effect = 0.30;  $p = 0.003$ ; 95% CI [0.104; 0.496]). In contrast to Study

1, gaze direction was found to positively affect competence perceptions (Effect = 0.31;  $p = 0.003$ ; 95% CI [0.106; 0.520]), thus supporting H4. Similarly, and consistent with H5 and H6, respectively, anthropomorphism affected perceptions of both warmth (Effect = 0.26;  $p = 0.012$ ; 95% CI [0.055; 0.456]) and competence (Effect = 0.23;  $p = 0.034$ ; 95% CI [0.017; 0.441]). In line with the results from Study 1 and with H7, skepticism was found to be affected only by warmth (Effect = 0.35;  $p = 0.029$ ; 95% CI [0.035; 0.660]), but not by competence (Effect = 0.05;  $p = 0.763$ ; 95% CI [-0.279; 0.381]), thus rejecting H8. Consistent with Study 1, competence significantly interacted with Theory of Mind in affecting skepticism (Effect = 0.09;  $p = 0.009$ ; 95% CI [0.021; 0.153]), thereby supporting H10. Specifically, the effect of competence on skepticism was enhanced at higher levels of Theory of Mind (low levels of Theory of Mind: Effect = 0.40;  $p < 0.001$ ; 95% CI [0.310; 0.490]; high levels of Theory of Mind: Effect = 0.56;  $p < 0.001$ ; 95% CI [0.465; 0.648];  $R^2$  change = 0.004;  $F = 6.70$ ,  $df = 1$ ; 793,  $p = 0.009$ ). As in Study 1, Theory of Mind was found not to moderate the warmth-skepticism relationship, thus rejecting H9. Consistent with H11, skepticism positively affected trust (Effect = 0.80;  $p < 0.001$ ; 95% CI [0.719; 0.840]), which ultimately affected both disclosure intentions (Effect = 0.72;  $p < 0.001$ ; 95% CI [0.631; 0.804]) and future intentions (Effect = 0.89;  $p < 0.001$ ; 95% CI [0.851; 0.925]), thereby providing support in favor of H12.

Accordingly, the results from the serial mediation analysis align well with the findings from Study 1, suggesting that warmth, competence, skepticism, and trust fully mediate the relationship between gaze direction and anthropomorphism on consumers' disclosure and future intentions.

Next, we analyzed the behavioral data that were collected in each user's interaction with the chatbot. For each participant, Qualtrics passed the user ID field to the webpage hosting the chatbot so that it was possible to match the behaviors of individuals on the webpage with the experimental condition to which they were exposed. The webpage recorded whether the participant ultimately put one of the insurance plans in his or her shopping cart, the length of stay on the webpage, which was measured as the time difference between the time stamp associated with the connection to the webpage and the time stamp of the exit from the page, and the number of interactions with the chatbot, which was measured by the number of instructions typed on the chat box by each user. The MANOVA yielded a significant multivariate effect exerted by gaze direction (Wilks  $\lambda = 0.99$ ,  $F = 2.60$ ,  $df = 3$ ; 695,  $p = 0.05$ ,  $\eta^2 = 0.01$ ) but not by anthropomorphism (Wilks  $\lambda = 0.99$ ,  $F = 0.34$ ,  $df = 3$ ; 695,  $p = 0.79$ ,  $\eta^2 = 0.001$ ). Specifically, the univariate ANOVAs following the significant MANOVA showed that direct gaze enhanced the number of participants making a purchase after interacting with the chatbot ( $M_{\text{direct}} = 0.52$ ;  $M_{\text{averted}} = 0.42$ ;  $F(1;700) = 6.65$ ;  $p = 0.01$ ;  $\eta^2 = 0.01$ ). This finding corroborates the empirical evidence on the impact of nonverbal communication on users' interactions with chatbots. Specifically, our results show that a

chatbot with a direct gaze is more likely to induce the user to finalize a purchase on the website in comparison with a chatbot with an averted gaze direction.

## 5 | DISCUSSION

This research provides support for the hypothesized chain of effects from chatbots' gaze direction and anthropomorphism to consumers' future and disclosure intentions across two experiments conducted in two different empirical settings (i.e., car rental and insurance plans). Prior literature has shown that warmth and competence are typical perceptions of social interactions (Aaker et al., 2012; Fiske et al., 2002), even in digital environments (Van Doorn et al., 2017). In this vein, the combined evidence stemming from our empirical studies contributes to the extant literature by consistently showing that warmth and competence are affected by two different aspects of nonverbal communication: gaze direction and anthropomorphism.

Second, our results shed light on how consumers develop skepticism toward a chatbot. On the one hand, high perceptions of warmth lower consumers' skepticism. In this case, we found that the effect of warmth perceptions on skepticism held regardless of individuals' beliefs about their ability to interpret other individuals' intentions (i.e., Theory of Mind). On the other hand, our results show that competence perceptions did not directly affect skepticism toward the chatbot but instead interacted with Theory of Mind to drive this effect. Specifically, our results show that competence exerts a stronger impact on skepticism as individuals express a higher belief in their ability to interpret other individuals' intentions. In other words, perceiving competence from a chatbot makes individuals less skeptical about the technology as long as they feel they are good at detecting others' ultimate intentions.

Third, and relatedly, our results support the pivotal role of skepticism toward the chatbot. On the one hand, we show that lower levels of skepticism lead to higher trust in the chatbot, which aligns with prior advertising studies noting that skepticism toward a communication source leads consumers to distrust the message (Chari et al., 2016). On the other hand, we demonstrate that this trust perception toward the website hosting the chatbot makes consumers more open to disclosing their personal information and repatronizing the e-tailer in the future.

Finally, the results from Study 2 show that the effects of chatbots' nonverbal communication are not limited to users' perceptions but also affect their behaviors. Specifically, we found that a chatbot's direct gaze increases the likelihood that the customer will purchase a product after interacting with the chatbot.

In summary, e-tailers seeking to exploit the potential of chatbots should implement digital assistants with high levels of anthropomorphism and make their avatars gaze directly at the user. A summary of the key findings of this research as well as their main implications and contributions are provided in Table 1 below.

TABLE 1 Summary of the findings.

Take away	Findings	Our incremental contribution
Anthropomorphism and gaze direction impact warmth and competence perceptions.	Direct gaze direction increases warmth (S1 and S2) and competence (S2) perceptions. Anthropomorphism increases competence (S1 and S2) and warmth (S2) perceptions.	This research contributes to the literature on nonverbal socio-communicative dimensions of chatbots. Specifically, this is the first study documenting the effects of chatbots' gaze direction on consumers' perceptions and behaviors. Second, this paper contributes to the literature on chatbot anthropomorphism by addressing its impact on warmth and competence which is novel in this stream of research.
Warmth and competence impact consumers' skepticism.	Warmth perceptions lower consumers' skepticism (S1 and S2), while competence perceptions do not directly affect skepticism (S1 and S2).	The paper deepens the role of warmth and competence in human-chatbot interactions by providing a novel explanation to individuals' skepticism toward conversational agents.
Theory of Mind moderates the relationships between competence and skepticism.	The effect of competence on skepticism was enhanced at higher levels of Theory of Mind (S1 and S2). Perceiving competence from a chatbot makes individuals less skeptical about the technology as long as they feel they are good at detecting others' ultimate intentions. No moderation by Theory of Mind was found on the relationship between warmth and skepticism.	In the present research, the Theory of Mind has been adopted to originally moderate the relationship between warmth/competence and consumers' skepticism toward chatbots. Addressing Theory of Mind in this specific context can help explaining mixed results about the effects of chatbots warmth and competence.
Skepticism impacts trust perception toward the website hosting the chatbot.	Lower levels of skepticism lead to higher trust toward the chatbot (S1 and S2).	This finding aligns with prior literature in the domain of advertising research and extends them to the field of human-chatbot interactions by showing that high levels of skepticism toward the chatbot leads consumers to distrust the website hosting chatbot.
Trust toward the website hosting the chatbot impacts both consumers' intentions.	Trust perception toward the website hosting the chatbot increases consumers' intentions to disclose their personal information and repatronize the e-tailer in the future (S1 and S2).	This research contributes to the extant literature by providing theoretical explanation and empirical evidence to the relationship between trust and consumers' intentions. The adoption of the HVL theoretical framework allows interpreting such relationship in light of the spillover of value (in terms of trust) onto consumers' attachment towards the website. Our findings also show that such attachment is not reflected just in the intentional loyalty but extends to information disclosure.
Gaze direction impacts consumers' behaviors.	Chatbot's direct gaze increases the likelihood that the customer purchases a product after interacting with the chatbot (S2).	By collecting data on a simulated webpage with a real chatbot, the present research documents a set of effects, which go beyond stated intentions showing that chatbots gaze direction, but not their anthropomorphism, affect individuals' purchase behaviors.

## 6 | CONCLUSIONS

As stated, this study examined how gaze direction and anthropomorphism affect consumers' willingness to disclose personal information and their future intentions. To that end, we illuminated some psychological mechanisms that influence these relationships.

**Theoretical Contributions.** As emphasized by Belanche et al. (2021), despite the progress made in the "human-chatbot interaction" area of research, important gaps in the academic literature remain to be addressed. In particular, the works by Van Doorn et al. (2017),

Wirtz et al. (2018) and Grewal et al. (2020) provide relevant conceptual contributions in this domain. However, empirical work in this field has been scarce, with few relevant exceptions (e.g., Belanche et al., 2021). To fill these gaps, the present study adopted the HVL theoretical framework but extended its scope by explaining how nonverbal behaviors affect customers' willingness to disclose personal information and purchase intentions. In this sense, the present research clarifies how physical appearance is an essential element of social categorization (i.e., humanness perceptions). Moreover, the current study adds value to the HVL model (Belanche

et al., 2021) considering different contexts of application and constructs that further validate the model. From a broader perspective, this article enriches and empirically supports the previous literature on human-robot interaction (Kim et al., 2013), showing that consumers attribute human mind-like capabilities to the objects with which they interact depending on the level of human-likeness (Krach et al., 2008; Rosenthal-Von der pütten & Krämer, 2014). Furthermore, and consistent with the HVL framework, our model predicts that physical and behavioral chatbot cues influence customers' willingness to disclose personal information and purchase intentions so that customers expect to derive greater value from chatbots with greater humanness. Overall, this study contributes to the advancement of theory on chatbot-mediated service encounters through the lens of the HVL framework in several ways.

First, this study contributes to the literature on nonverbal sociocommunicative dimensions (Sajjacholapunt & Ball, 2014; Senju & Johnson, 2009; Stoyanova et al., 2010; Strick et al., 2008; To & Patrick, 2021). Specifically, we clarify the effects of gaze direction on consumers' willingness to disclose and future intentions. Second, this paper contributes to the literature on anthropomorphism (Blut et al., 2021; Huang & Rust, 2018; Pizzi et al., 2021; Wirtz et al., 2018) by illuminating the positive and negative marketing consequences of chatbots' anthropomorphism. Third, the paper broadens the discourse about the constructs of warmth and competence (Aaker et al., 2012; Ang et al., 2018; Fiske et al., 2007; Van Doorn et al., 2017). Specifically, we describe how they interact with nonverbal communication to impact consumers' skepticism and trust. Finally, the paper offers a practical application of the Theory of Mind (individuals' ability to understand the intentions of others; Minton et al., 2021) within the marketing field. In particular, Theory of Mind can help to explain mixed results about chatbots' efficacy because it seems to moderate the relationship between warmth/competence and consumers' skepticism toward chatbots.

## 6.1 | Managerial implications

Due to this study's empirical use of contemporary and realistic chatbots, we can offer tangible insights to managers who are responsible for configuring this technology and the most effective "human-chatbot interaction."

If a fundamental outcome of the recent scientific contribution (i.e., the HVL model) is to advise service providers to introduce digital service tools, such as digital conversational agents or chatbots with higher levels of humanness, this research clarifies "how" to craft the technology human-likeness in terms of anthropomorphic features and gaze direction. Our findings show that it is not sufficient to simply add digital service tools to frontline operations to achieve the expected managerial outcomes; managers might also take into account the relevant impact of chatbots' characteristics on customers' reactions and behaviors.

In particular, our results can help managers define the right level of anthropomorphism and the most appropriate gaze direction for

their chatbots. Proper tuning will reduce the risk of a suboptimal decision and increase consumers' willingness to disclose personal information and express more positive future intentions toward the chatbot (and, by extension, the firm). Furthermore, the chatbot's nonverbal communication through its gaze direction can affect the likelihood that the customer will finalize a purchase on the website. Moreover, this study can help managers reduce consumers' skepticism about chatbots and digital SSTs in general. Indeed, people seem more inclined to apply the social rules of human-to-human interactions to chatbots based on the latter's anthropomorphism and gaze direction. In other words, it is possible to reduce skepticism by making social judgment components (i.e., warmth and competence) more salient. Lower levels of consumer skepticism, in turn, increase this technology's efficacy as a marketing tool for service management.

Accordingly, managers should implement digital assistants with high levels of anthropomorphism (i.e., not avatarized features or other appearances with even lower levels of anthropomorphism but AI-generated, realistic pictures) and make their avatars gaze directly at the user. In other words, managers should carefully consider what customers are implicitly asking chatbots to activate the most valuable "human-chatbot interaction": *"Dear Chatbot, please be as human as possible, and please look at me! If you do, I won't be skeptical about you. I will consider you warm and competent, and then I will trust you more, and I will have positive future intentions toward you and your firm (I will purchase, visit your store, and recommend you), and I will disclose my personal information to you, my dear Chatbot!"*

### 6.1.1 | Limitations and future research

This study features some limitations that represent interesting directions for future research. First, this study only manipulated gaze direction and anthropomorphism. Although the literature has found that these two features are potentially relevant drivers of consumers' perceptions of chatbots, there might be additional verbal (e.g., language style; Araujo, 2018; van Pinxteren et al., 2023) and nonverbal (e.g., gesture; Shumanov & Johnson, 2021) cues that affect warmth and competence perceptions. Relatedly, the present work relied on a narrow operationalization of anthropomorphism as the chatbot's holistic visual appearance (Wirtz et al., 2018). However, we did not consider the naturalness of eye movements, which scholars have noted is a defining feature (Epley et al., 2007). Data from our manipulation checks revealed no differences in perceived anthropomorphism as a function of gaze direction. Nevertheless, future research might attempt to replicate our findings by enlarging the chatbot's set of verbal and nonverbal communication cues and analyzing whether and to what extent they contribute to perceived anthropomorphism.

Second, we did not allow participants to freely choose whether they interacted with the chatbot, nor were they free to navigate the website. We chose this approach to expose participants to the key independent variables at the core of the present research. However,

in real situations, participants can freely navigate a website and choose to close a chatbot's window at any time. Thus, future studies might explore whether different chatbot characteristics (such as gaze direction and/or anthropomorphism) alter consumers' likelihood of starting or leaving a conversation with a chatbot.

Third, our manipulation checks of anthropomorphism suggest that the chatbot in the "high anthropomorphic" condition did not score high in absolute terms on the perceived anthropomorphism scale. This might be because prior literature has defined anthropomorphism as a multifaceted construct involving not only the physical appearance of the chatbot but also its gestures, movements, language, and so forth (Blut et al., 2021). In the present study, we deliberately opted to manipulate only the facial appearance of the chatbot. Although our manipulation checks indicated that the two levels of anthropomorphism manipulated in both experiments were significantly different from each other, future research might extend our findings by incorporating more aspects related to chatbots' anthropomorphism.

Finally, the present research relied on perceptual data to measure consumers' cognitive and emotional reactions in terms of warmth, competence, and skepticism. Future research could instead analyze consumers' actual visual search behavior and emotional reactions to chatbots. For example, scholars could involve participants in a combined eye-tracking and face-reading study (conducted in a behavioral lab), exposing them to the same experimental condition that we used and comparing our results against the biometric data.

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## CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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## REFERENCES

- Aaker, J., Vohs, K. D., & Mogilner, C. (2010). Nonprofits are seen as warm and for-profits as competent: Firm stereotypes matter. *Journal of Consumer Research*, 37(2), 224–237.
- Aaker, J. L., Garbinsky, E. N., & Vohs, K. D. (2012). Cultivating admiration in brands: Warmth, competence, and landing in the "golden quadrant". *Journal of Consumer Psychology*, 22(2), 191–194.
- Adam, M., Wessel, M., & Benlian, A. (2021). AI-based chatbots in customer service and their effects on user compliance. *Electronic Markets*, 31(2), 427–445.
- Adil, S., Lacoste-Badie, S., & Droulers, O. (2018). Face presence and gaze direction in print advertisements: How they influence consumer responses—an eye-tracking study. *Journal of Advertising Research*, 58(4), 443–455.
- Aggarwal, P., & McGill, A. L. (2007). Is that car smiling at me? Schema congruity as a basis for evaluating anthropomorphized products. *Journal of Consumer Research*, 34(4), 468–479.
- Ameen, N., Cheah, J. H., & Kumar, S. (2022). It's all part of the customer journey: The impact of augmented reality, chatbots, and social media on the body image and self-esteem of generation Z female consumers. *Psychology & Marketing*, 39(11), 2110–2129.
- Anderson, C. L., & Agarwal, R. (2011). The digitization of healthcare: Boundary risks, emotion, and consumer willingness to disclose personal health information. *Information Systems Research*, 22(3), 469–490.
- Ang, T., Liou, R. S., & Wei, S. (2018). Perceived cultural distance in intercultural service encounters: Does customer participation matter? *Journal of Services Marketing*, 32(5), 547–558.
- Araujo, T. (2018). Living up to the chatbot hype: The influence of anthropomorphic design cues and communicative agency framing on conversational agent and company perceptions. *Computers in Human Behavior*, 85, 183–189.
- Balakrishnan, J., & Dwivedi, Y. K. (2021). Role of cognitive absorption in building user trust and experience. *Psychology & Marketing*, 38(4), 643–668.
- Belanche, D., Casaló, L. V., Flavián, M., & Ibáñez-Sánchez, S. (2021). Understanding influencer marketing: The role of congruence between influencers, products and consumers. *Journal of Business Research*, 132, 186–195.
- Berry, L. L. and Parasuraman, A. A. (1991). *Marketing services: Competing through quality*. Free Press.
- Blut, M., Wang, C., Wunderlich, N. V., & Brock, C. (2021). Understanding anthropomorphism in service provision: A meta-analysis of physical robots, chatbots, and other AI. *Journal of the Academy of Marketing Science*, 49(4), 632–658.
- Bonnin, G. (2020). The roles of perceived risk, attractiveness of the online store and familiarity with AR in the influence of AR on patronage intention. *Journal of Retailing and Consumer Services*, 52, 101938.
- Borau, S., Otterbring, T., Laporte, S., & Fosso Wamba, S. (2021). The most human bot: Female gendering increases humanness perceptions of bots and acceptance of AI. *Psychology & Marketing*, 38(7), 1052–1068.
- Boush, D. M., Friestad, M., & Rose, G. M. (1994). Adolescent skepticism toward TV advertising and knowledge of advertiser tactics. *Journal of Consumer Research*, 21(1), 165–175.
- Brandtzaeg, P. B., & Følstad, A. (2018). Chatbots: Changing user needs and motivations. *Interactions*, 25(5), 38–43.
- Bryant, L., Coffey, A., Povinelli, D. J., & Pruett Jr., J. R. (2013). Theory of Mind experience sampling in typical adults. *Consciousness and Cognition*, 22(3), 697–707.
- Chai, J. C. Y., Malhotra, N. K., & Alpert, F. (2015). A two-dimensional model of trust-value-loyalty in service relationships. *Journal of Retailing and Consumer Services*, 26, 23–31.
- Chang, S. E., Liu, A. Y., & Shen, W. C. (2017). User trust in social networking services: A comparison of Facebook and LinkedIn. *Computers in Human Behavior*, 69, 207–217.
- Chari, S., Christodoulides, G., Presi, C., Wenhold, J., & Casaletto, J. P. (2016). Consumer trust in user-generated brand recommendations on Facebook. *Psychology & Marketing*, 33(12), 1071–1081.
- Cloarec, J., Meyer-Waarden, L., & Munzel, A. (2022). The personalization-privacy paradox at the nexus of social exchange and construal level theories. *Psychology & Marketing*, 39(3), 647–661.
- Collier, J. E., Breazeale, M., & White, A. (2017). Giving back the "self" in self service: Customer preferences in self-service failure recovery. *Journal of Services Marketing*, 31(6), 604–617.
- Craig, A. W., Loureiro, Y. K., Wood, S., & Vendemia, J. M. C. (2012). Suspicious minds: Exploring neural processes during exposure to deceptive advertising. *Journal of Marketing Research*, 49(3), 361–372.

- Crolic, C., Thomaz, F., Hadi, R., & Stephen, A. T. (2022). Blame the bot: Anthropomorphism and anger in Customer-Chatbot interactions. *Journal of Marketing*, 86(1), 132-148.
- Cuddy, A. J., Chang, L., & Shen, P. (2008). 2017 Warmth and competence as universal dimensions of social perception: The stereotype content model and the BIAS map. *Advances in Experimental Social Psychology*, 40, 61-149.
- Dietvorst, B. J., Simmons, J. P., & Massey, C. (2015). Algorithm aversion: People erroneously avoid algorithms after seeing them err. *Journal of Experimental Psychology: General*, 144(1), 114-126.
- Dietvorst, R. C., Verbeke, W. J. M. I., Bagozzi, R. P., Yoon, C., Smits, M., & Van Der Lugt, A. (2009). A sales force-specific theory-of-mind scale: Tests of its validity by classical methods and functional magnetic resonance imaging. *Journal of Marketing Research*, 46(5), 653-668.
- Van Doorn, J., Mende, M., Noble, S. M., Hulland, J., Ostrom, A. L., Grewal, D., & Petersen, J. A. (2017). Domo arigato Mr. Roboto: Emergence of automated social presence in organizational frontlines and customers' service experiences. *Journal of Service Research*, 20(1), 43-58.
- Droulers, O., & Adil, S. (2015). Perceived gaze direction modulates ad memorization. *Journal of Neuroscience, Psychology, and Economics*, 8(1), 15.
- Edwards, C., Edwards, A., Spence, P. R., & Shelton, A. K. (2014). Is that a bot running the social media feed? Testing the differences in perceptions of communication quality for a human agent and a bot agent on Twitter. *Computers in Human Behavior*, 33, 372-376.
- Elsner, N. (2017). KAYAK mobile travel report: Chatbots in the UK. *Dostupno*, 23, 2020.
- Epley, N., Waytz, A., & Cacioppo, J. T. (2007). On seeing human: A three-factor theory of anthropomorphism. *Psychological Review*, 114(4), 864-886.
- Fiske, S. T., Cuddy, A. J. C., & Glick, P. (2007). Universal dimensions of social cognition: Warmth and competence. *Trends in Cognitive Sciences*, 11, 77-83.
- Fiske, S. T., Cuddy, A. J. C., Glick, P., & Xu, J. (2002). A model of (often mixed) stereotype content: Competence and warmth respectively follow from perceived status and competition. *Journal of Personality and Social Psychology*, 82, 878-902.
- Foreh, M. R., & Grier, S. (2003). When is honesty the best policy? The effect of stated company intent on consumer skepticism. *Journal of Consumer Psychology*, 13(3), 349-356.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39-50.
- Fox, J., Ahn, S. J., Janssen, J. H., Yeykelis, L., Segovia, K. Y., & Bailenson, J. N. (2015). Avatars versus agents: A meta-analysis quantifying the effect of agency on social influence. *Human-Computer Interaction*, 30(5), 401-432.
- Frank, D. A., Chrysochou, P., & Mitkidis, P. (2022). The paradox of technology: Negativity bias in consumer adoption of innovative technologies. *Psychology & Marketing*.
- Gabbott, M., & Hogg, G. (2001). The role of non-verbal communication in service encounters: A conceptual framework. *Journal of Marketing Management*, 17(1-2), 5-26.
- Gentina, E., Chen, R., & Yang, Z. (2021). Development of theory of mind on online social networks: Evidence from facebook, twitter, instagram, and snapchat. *Journal of Business Research*, 124, 652-666.
- Go, E., & Sundar, S. S. (2019). Humanizing chatbots: The effects of visual, identity and conversational cues on humanness perceptions. *Computers in Human Behavior*, 97, 304-316.
- Gratch, J., Wang, N., Gerten, J., Fast, E., & Duffy, R. (2007). Creating rapport with virtual agents. *International workshop on intelligent virtual agents* (pp. 125-138). Springer.
- Grewal, D., Kroschke, M., Mende, M., Roggeveen, A. L., & Scott, M. L. (2020). Frontline cyborgs at your service: How human enhancement technologies affect customer experiences in retail, sales, and service settings. *Journal of Interactive Marketing*, 51, 9-25.
- Grudin, J., & Jacques, R. (2019). Chatbots, humbots, and the quest for artificial general intelligence. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems* (1-11).
- Güntürkün, P., Haumann, T., & Mikolon, S. (2020). Disentangling the differential roles of warmth and competence judgments in customer-service provider relationships. *Journal of Service Research*, 23(4), 476-503.
- Hall, J. A. (1980). Voice tone and persuasion. *Journal of Personality and Social Psychology*, 38(6), 924-934.
- Han, M. C. (2021). The impact of anthropomorphism on consumers' purchase decision in chatbot commerce. *Journal of Internet Commerce*, 20(1), 46-65.
- Hart, C. W., & Johnson, M. D. (1999). Growing the trust relationship.
- Hayes, A. F. (2018). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford publications.
- Holthöwer, J., & van Doorn, J. (2022). Robots do not judge: Service robots can alleviate embarrassment in service encounters. *Journal of the Academy of Marketing Science*, 1-18.
- Hrebiniak, L. G. (1974). Effects of job level and participation on employee attitudes and perceptions of influence. *Academy of Management Journal*, 17(4), 649-662.
- Huang, M. H., & Rust, R. T. (2018). Artificial intelligence in service. *Journal of Service Research*, 21(2), 155-172.
- Hutton, S. B., & Nolte, S. (2011). The effect of gaze cues on attention to print advertisements. *Applied Cognitive Psychology*, 25(6), 887-892.
- Inman, J. J., & Nikolova, H. (2017). Shopper-facing retail technology: A retailer adoption decision framework incorporating shopper attitudes and privacy concerns. *Journal of Retailing*, 93(1), 7-28.
- Isaac, M. S., & Grayson, K. (2020). Priming skepticism: Unintended consequences of one-sided persuasion knowledge access. *Psychology & Marketing*, 37(3), 466-478.
- Kampe, K. K. W., Frith, C. D., Dolan, R. J., & Frith, U. (2001). Reward value of attractiveness and gaze. *Nature*, 413(6856), 589.
- Kanda, T., Kamasima, M., Imai, M., Ono, T., Sakamoto, D., Ishiguro, H., & Anzai, Y. (2006). A humanoid robot that pretends to listen to route guidance from a human. *Autonomous Robots*, 22(1), 87-100.
- Kaptein, M., Markopoulos, P., de Ruyter, B., & Aarts, E. (2011). Two acts of social intelligence: The effects of mimicry and social praise on the evaluation of an artificial agent. *AI & society*, 26(3), 261-273.
- Kervyn, N., Fiske, S. T., & Malone, C. (2022). Social perception of brands: Warmth and competence define images of both brands and social groups. *Consumer Psychology Review*, 5(1), 51-68.
- Kim, K. J., Park, E., & Shyam Sundar, S. (2013). Caregiving role in human-robot interaction: A study of the mediating effects of perceived benefit and social presence. *Computers in Human Behavior*, 29(4), 1799-1806.
- Kim, W., Ryoo, Y., Lee, S., & Lee, J. A. (2022). Chatbot advertising as a Double-Edged sword: The roles of regulatory focus and privacy concerns. *Journal of Advertising*, 1-19.
- De Kleijn, R., Wijnen, M., & Poletiek, F. (2019). The effect of context-dependent information and sentence constructions on perceived humanness of an agent in a Turing test. *Knowledge-Based Systems*, 163, 794-799.
- Krach, S., Hegel, F., Wrede, B., Sagerer, G., Binkofski, F., & Kircher, T. (2008). Can machines think? interaction and perspective taking with robots investigated via fMRI. *PLoS One*, 3(7), e2597.
- Lee, S., Lee, N., & Sah, Y. J. (2020). Perceiving a mind in a chatbot: Effect of mind perception and social cues on co-presence, closeness, and intention to use. *International Journal of Human-Computer Interaction*, 36(10), 930-940.
- Lim, W. M., Kumar, S., Verma, S., & Chaturvedi, R. (2022). Alexa, what do we know about conversational commerce? Insights from a systematic literature review. *Psychology & Marketing*, 39(6), 1129-1155.

- Lopes, E. L., & Goulart-da-Silva, J. (2022). The effect of celebrity endorsement on omission neglect at different levels of skepticism. *International Journal of Consumer Studies*, 46(3), 803–817.
- Luo, X., Tong, S., Fang, Z., & Qu, Z. (2019). Frontiers: Machines vs. humans: The impact of artificial intelligence chatbot disclosure on customer purchases. *Marketing Science*, 38(6), 937–947.
- MacInnis, D. J. (2012). "Brands as intentional agents": Questions and extensions. *Journal of Consumer Psychology*, 22(2), 195–198.
- Malhotra, N. K., Kim, S. S., & Agarwal, J. (2004). Internet users' information privacy concerns (IUIPC): The construct, the scale, and a causal model. *Information Systems Research*, 15(4), 336–355.
- McAlister, A. R., & Cornwell, T. B. (2010). Children's brand symbolism understanding: Links to theory of mind and executive functioning. *Psychology & Marketing*, 27(3), 203–228.
- McLellan, T., & McKinlay, A. (2013). Sensitivity to emotion, empathy and theory of mind: Adult performance following childhood TBI. *Brain Injury*, 27(9), 1032–1037.
- Mehta, P., Jebarajakirthy, C., Maseeh, H. I., Anubha, A., Saha, R., & Dhanda, K. (2022). Artificial intelligence in marketing: A meta-analytic review. *Psychology & Marketing*, 39(11), 2013–2038.
- Miao, F., Kozlenkova, I. V., Wang, H., Xie, T., & Palmatier, R. W. (2022). An emerging theory of avatar marketing. *Journal of Marketing*, 86(1), 67–90.
- Minton, E. A., Cornwell, T. B., & Yuan, H. (2021). I know what you are thinking: how theory of mind is employed in product evaluations. *Journal of Business Research*, 128, 405–422.
- Moon, Y. (2000). Intimate exchanges: Using computers to elicit self-disclosure from consumers. *Journal of Consumer Research*, 26(4), 323–339.
- Moorman, C., Deshpandé, R., & Zaltman, G. (1993). Factors affecting trust in market research relationships. *Journal of Marketing*, 57(1), 81–101.
- Morgan, R. M., & Hunt, S. D. (1994). The commitment-trust theory of relationship marketing. *Journal of Marketing*, 58(3), 20–38.
- Mori, M. (1970). The uncanny valley: the original essay by Masahiro Mori. *IEEE Spectrum*.
- Moriuchi, E. (2021). An empirical study on anthropomorphism and engagement with disembodied AIs and consumers' re-use behavior. *Psychology & Marketing*, 38(1), 21–42.
- Mozafari, N., Weiger, W. H., & Hammerschmidt, M. (2021). Trust me, I'm a bot—repercussions of chatbot disclosure in different service frontline settings. *Journal of Service Management*, 33(2), 221–245.
- Nass, C., Moon, Y., Fogg, B. J., Reeves, B., & Dryer, D. C. (1995). Can computer personalities be human personalities? *International Journal of Human-Computer Studies*, 43(2), 223–239.
- Nentjes, L., Bernstein, D. P., Arntz, A., Slaats, M. E., & Hannemann, T. (2015). Theory of mind, social desirability, and unlikely symptom reporting in offenders with and without psychopathy. *Journal of Nervous & Mental Disease*, 203(8), 596–603.
- Nunamaker, J. F., Derrick, D. C., Elkins, A. C., Burgoon, J. K., & Patton, M. W. (2011). Embodied conversational agent-based kiosks for automated interviewing. *Journal of Management Information Systems*, 28(1), 17–48.
- Obermiller, C., & Spangenberg, E. R. (1998). Development of a scale to measure consumer skepticism toward advertising. *Journal of Consumer Psychology*, 7(2), 159–186.
- Patel, J. D., Gadhavi, D. D., & Shukla, Y. S. (2017). Consumers' responses to cause related marketing: Moderating influence of cause involvement and skepticism on attitude and purchase intention. *International Review on Public and Nonprofit Marketing*, 14(1), 1–18.
- van Pinxteren, M. M., Pluymaekers, M., Lemmink, J., & Krispin, A. (2023). Effects of communication style on relational outcomes in interactions between customers and embodied conversational agents. *Psychology & Marketing*, 1–16.
- van Pinxteren, M. M. E., Wetzels, R. W. H., Rüger, J., Pluymaekers, M., & Wetzels, M. (2019). Trust in humanoid robots: Implications for services marketing. *Journal of Services Marketing*, 33(4), 507–518.
- Pizzi, G., Scarpi, D., & Pantano, E. (2021). Artificial intelligence and the new forms of interaction: Who has the control when interacting with a chatbot? *Journal of Business Research*, 129, 878–890.
- Rajaobelina, L., Prom Tep, S., Arcand, M., & Ricard, L. (2021). Creepiness: Its antecedents and impact on loyalty when interacting with a chatbot. *Psychology & Marketing*, 38(12), 2339–2356.
- Rapp, A., Curti, L., & Boldi, A. (2021). The human side of human-chatbot interaction: A systematic literature review of ten years of research on text-based chatbots. *International Journal of Human-Computer Studies*, 151, 102630.
- Riedl, R., Mohr, P., Kenning, P., Davis, F., & Heekeren, H. (2011). Trusting humans and avatars: Behavioral and neural evidence.
- Riggio, R. E., & Friedman, H. S. (1983). Individual differences and cues to deception. *Journal of Personality and Social Psychology*, 45(4), 899–915.
- Rosenthal-Von der pütten, A. M., & Krämer, N. C. (2014). How design characteristics of robots determine evaluation and uncanny valley related responses. *Computers in Human Behavior*, 36, 422–439.
- Roy, R., & Naidoo, V. (2021). Enhancing chatbot effectiveness: The role of anthropomorphic conversational styles and time orientation. *Journal of Business Research*, 126, 23–34.
- Sajjacholapunt, P., & Ball, L. J. (2014). The influence of banner advertisements on attention and memory: Human faces with averted gaze can enhance advertising effectiveness. *Frontiers in Psychology*, 5, 166.
- Sands, S., Campbell, C., Plangger, K., & Pitt, L. (2022). Buffer bots: The role of virtual service agents in mitigating negative effects when service fails. *Psychology & Marketing*, 39(11), 2039–2054.
- Schrammel, F., Pannasch, S., Graupner, S. T., Mojzisch, A., & Velichkovsky, B. M. (2009). Virtual friend or threat? The effects of facial expression and gaze interaction on psychophysiological responses and emotional experience. *Psychophysiology*, 46(5), 922–931.
- Scott, M. L., Mende, M., & Bolton, L. E. (2013). Judging the book by its cover? how consumers decode conspicuous consumption cues in buyer–seller relationships. *Journal of Marketing Research*, 50(3), 334–347.
- Seeger, A. M., & Heinzl, A. (2018). Human versus machine: Contingency factors of anthropomorphism as a trust-inducing design strategy for conversational agents. *Information Systems and Neuroscience* (pp. 129–139). Springer.
- Senju, A., & Johnson, M. H. (2009). The eye contact effect: Mechanisms and development. *Trends in Cognitive Sciences*, 13(3), 127–134.
- Senju, A., Tojo, Y., Yaguchi, K., & Hasegawa, T. (2005). Deviant gaze processing in children with autism: An ERP study. *Neuropsychologia*, 43(9), 1297–1306.
- Shumanov, M., & Johnson, L. (2021). Making conversations with chatbots more personalized. *Computers in Human Behavior*, 117, 106627.
- Soussignan, R., Chadwick, M., Philip, L., Conty, L., Dezecache, G., & Grèzes, J. (2013). Self-relevance appraisal of gaze direction and dynamic facial expressions: Effects on facial electromyographic and autonomic reactions. *Emotion (Washington, D.C.)*, 13(2), 330–337.
- Stanton, C., & Stevens, C. J. (2014). Robot pressure: the impact of robot eye gaze and lifelike bodily movements upon decision-making and trust. *International conference on social robotics* (pp. 330–339). Springer.
- Stoyanova, R. S., Ewbank, M. P., & Calder, A. J. (2010). "You talkin' to me?" Self-relevant auditory signals influence perception of gaze direction. *Psychological Science*, 21(12), 1765–1769.
- Strick, M., Holland, R. W., & van Knippenberg, A. (2008). Seductive eyes: Attractiveness and direct gaze increase desire for associated objects. *Cognition*, 106(3), 1487–1496.

- Sweeney, J. C., & Soutar, G. N. (2001). Consumer perceived value: The development of a multiple item scale. *Journal of Retailing*, 77(2), 203–220.
- Tintarev, N., O'donovan, J., & Felfernig, A. (2016). Introduction to the special issue on human interaction with artificial advice givers. *ACM Transactions on Interactive Intelligent Systems*, 6(4), 1–12.
- To, R. N., & Patrick, V. M. (2021). How the eyes connect to the heart: The influence of eye gaze direction on advertising effectiveness. *Journal of Consumer Research*, 48(1), 123–146.
- Vanhamme, J., & Grobben, B. (2009). Too good to be true!?. The effectiveness of CSR history in countering negative publicity. *Journal of Business Ethics*, 85(2), 273–283.
- Velichkovsky, B. M., Kotov, A., Arinkin, N., Zaidelman, L., Zinina, A., & Kivva, K. (2021). From social gaze to indirect speech constructions: How to induce the impression that your companion robot is a conscious creature. *Applied Sciences*, 11(21), 10255.
- De Visser, E. J., Monfort, S. S., McKendrick, R., Smith, M. A., McKnight, P. E., Krueger, F., & Parasuraman, R. (2016). Almost human: Anthropomorphism increases trust resilience in cognitive agents. *Journal of Experimental Psychology: Applied*, 22(3), 331–349.
- Vrij, A., & Semin, G. R. (1996). Lie experts' beliefs about nonverbal indicators of deception. *Journal of Nonverbal Behavior*, 20(1), 65–80.
- Waytz, A., Heafner, J., & Epley, N. (2014). The mind in the machine: Anthropomorphism increases trust in an autonomous vehicle. *Journal of Experimental Social Psychology*, 52, 113–117.
- Weathers, D., Swain, S. D., & Makienko, I. (2015). When and how should retailers rationalize the size and duration of price discounts? *Journal of Business Research*, 68(12), 2610–2618.
- Wellman, H. M., & Estes, D. (1986). Early understanding of mental entities: A reexamination of childhood realism. *Child Development*, 57, 910–923.
- Wiggers, K. (2018). Google Acquires AI Customer Service Startup Onward, VentureBeat (October 2), <https://venturebeat.com/2018/10/02/google-acquires-onward-an-ai-customer-service-startup/>
- Willis, M. L., Palermo, R., & Burke, D. (2011). Social judgments are influenced by both facial expression and direction of eye gaze. *Social Cognition*, 29(4), 415–429.
- Wirtz, J., Patterson, P. G., Kunz, W. H., Gruber, T., Lu, V. N., Paluch, S., & Martins, A. (2018). Brave new world: Service robots in the frontline. *Journal of Service Management*, 29(5), 907–931.
- Woodside, A. G. (2008). Using the forced metaphor-elicitation technique (FMET) to meet animal companions within self. *Journal of Business Research*, 61(5), 480–487.
- Wu, J., Chen, J., & Dou, W. (2017). The Internet of things and interaction style: The effect of smart interaction on brand attachment. *Journal of Marketing Management*, 33(1-2), 61–75.
- Yokoyama, R., Nozawa, T., Sugiura, M., Yomogida, Y., Takeuchi, H., Akimoto, Y., Shibuya, S., & Kawashima, R. (2014). The neural bases underlying social risk perception in purchase decisions. *NeuroImage*, 91, 120–128.
- Yokoyama, T., Noguchi, Y., & Kita, S. (2013). Unconscious processing of direct gaze: Evidence from an ERP study. *Neuropsychologia*, 51(7), 1161–1168.
- Zogaj, A., Mähner, P. M., Yang, L., & Tschulin, D. K. (2023). It's a match! The effects of chatbot anthropomorphization and chatbot gender on consumer behavior. *Journal of Business Research*, 155, 113412.

## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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