Marketing Science Institute Working Paper Series 2021

Report No. 21-135

The Effect of Anticipated Embarrassment on the Preference for Using Chatbots

Rumela Sengupta, Lagnajita Chatterjee and Jeffrey R. Parker

Title:

The Effect of Anticipated Embarrassment on the Preference for Using Chatbots.

Author(s) name, title, institution, address, telephone number, and e-mail address:

1) Author 1 (corresponding author):

Rumela Sengupta
Doctoral Candidate of Marketing
University of Illinois at Chicago
2228 University Hall, 601 S Morgan St,
Chicago, IL 60607
(404) 960-7596
rsengu4@uic.edu

2) Author 2:

Lagnajita Chatterjee
Assistant Professor of Marketing
Worcester State University
Sullivan Academic Center, Suite S-203
486 Chandler St.
Worcester, MA 01602
(312) 282-2773
lchatterjee@worcester.edu

3) Author 3:

Jeffrey R. Parker
Associate Professor of Marketing
University of Illinois at Chicago
2209 University Hall, 601 S Morgan St,
Chicago, IL 60607
(312) 996-6233
jeff@uic.edu

Date of Submission: 09/14/2021

Artificial intelligence (AI) and machine learning have become integral parts of our daily lives. Today, we engage with various intelligent agents using these technologies at home, on the street, as well as at work—chatbots, robo-advisors, and voice assistants are some examples. Such agents use software that accepts natural language as input and generates natural language as output, engaging in a conversation with the user (Griol, Carbo, and Molina 2013). Among these agents, chatbots are the fastest growing digital communication trend and one of the strongest tools that marketers have at their disposal. In recent years, several websites and applications have started using a variety of conversational chatbots (e.g., ALICE and IBM Watson Assistant) to help improve their business and customer support efforts. The global chatbot market is anticipated to reach nearly USD 15 billion by 2025[1].

The main functions of chatbots are to interact with users, respond to their questions, and address their concerns. The experience provided by these chatbots is considered to be better than a static delivery of information, such as a list of frequently asked questions or a traditional search bar. Chatbots offer more interaction and user engagement—so much so that several companies have begun to use chatbots as replacements for human agents or telephone-based customer support. For instance, many businesses are planning to automate small-amount payments and allow users to make simple payments via live chatbots[2]. As such, the use of chatbots seems to hold tremendous promise for providing users with quick and convenient support.

Not only do the chatbots assume roles hitherto fulfilled by humans, but rapid advances in technological capabilities increasingly make them seem more humanlike. Advanced, "intelligent" chatbots employ design features in the form of visual appearance, speech synthesis,

[1] https://www.globenewswire.com/news-release/2020/07/23/2066366/0/en/Chatbot-Market-to-grow-at-30-CAGR-to-reach-US-15-billion-by-2025-Global-Insights-on-Trends-Key-Leaders-COVID-19-Impact-Analysis-Growth-Drivers-Competitive-Landscape-and-Future-Oppo.html

[2] https://chatbotslife.com/6-conversational-chatbot-trends-for-2020-71f0aaf28ad7

discourse structure, and reasoning that are common of humans. Accordingly, human users tend to anthropomorphize chatbots, attributing humanlike behavior, emotions, and other characteristics to them (Aggarwal and McGill 2007; Epley, Waytz, and Cacioppo 2007). Consequently, consumers commonly think of chatbots as having a high degree of socialness, intelligence, and efficiency, marking a higher quality of human computer interaction (HCI) than was experienced with traditional, less social, less interactive, less "intelligent" agents.

While companies increasingly employ chatbots to assist consumers, the consequences of this practice have been mixed thus far. Recent reports have indicated high failure rates in chatbot interactions with users (e.g., Dilmegani 2021; Orlowski 2017). Also, the technology itself is frequently met with consumer skepticism as shown by market research in several European countries (e.g., Elsner 2017). Although chatbots afford many opportunities (e.g., convenience, automation, and interactivity), they also have potential negative impacts on their users, such as a perceived loss of decision autonomy and free will, and a perceived lack of transparency and privacy concerns (André et al 2018; Carmon et al. 2019; Ng et al. 2020).

Contributing to the relatively sparse research on the negative consequences of anthropomorphizing chat agents, we explore the effect of anticipated emotions on the willingness to use such agents. Specifically, we consider the impact of anticipating embarrassment during an online search on the likelihood of using a chatbot to conduct that search. Embarrassment is a negative self-conscious emotion that threatens an individual's public-self by deviating from socially acceptable behavior and eliciting unwanted audience evaluations (Edelmann 1987; Miller and Leary 1992). Social presence plays a key role in fostering embarrassment (Dahl, Manchanda, and Argo 2001; Krishna, Herd, and Aydınoğlu 2015). Therefore, one of the commonly used mechanisms adopted by individuals to cope with embarrassment is to avoid

social contact. Building on this premise, we investigate people's unwillingness to use chatbots in contexts where they prefer to avoid social contact due to anticipated embarrassment. In the process, we inform the growing interest in the social perception of technology and help understand when and why chatbots are avoided by users while conducting online searches. Additionally, we offer a cautionary perspective on the implications of anthropomorphizing AI-powered devices.

In the following sections, we first review relevant research on chatbots and anthropomorphism. We then integrate that research with the relevant literature on social presence and embarrassment to develop a set of arguments linking anticipated embarrassment with the willingness to use a chatbot. Afterwards, we present five experimental investigations of our proposal, and close with a discussion of implications and future research directions.

THEORETICAL BACKGROUND

Chatbots and Anthropomorphism

A common, nearly ubiquitous element of the modern-day marketplace is the regular interaction consumers have with technology. Such interactions arise in many forms, ranging from relatively simple browsing and purchasing from retailers' websites to highly interactive exchanges with autonomous and intelligent programs (Mimoun and Poncin 2015; Papadopoulou et al. 2000), commonly called "conversational agents," that use "software that accepts natural language as input and generates natural language as output, engaging in a conversation with the user" (Griol et al. 2013, 760). Conversational agents that present minimal physical

representations (usually nothing more than a static profile picture) and primarily communicate with users via messaging-based interfaces that allow text and other types of media (including images, cue cards, and videos) to be exchanged between the agent and the user are commonly referred to as chatbots (Edwards et al. 2016). An interaction between users and chatbots mimics human-to-human communication and, therefore, the use of chatbots as a substitute for human agents (Zhao 2003) has been researched in multiple contexts including customer service interactions (Lunardo, Bressolles, and Durrieu 2016; Verhagen et al. 2014), online product recommendations (Holzwarth, Janiszewski, and Neumann 2006, Tan and Liew 2020), sales (Luo et al. 2019), healthcare (Lucas et al. 2014; Wang et al. 2021), and financial advising (Ng et. al 2020; Zang, Pentina, and Fan 2021).

The ever-increasing ability of chatbots to mimic human-to-human interactions is fueled by recent advances in AI, especially in machine learning and Natural Language Processing (NLP) techniques (Jordan and Mitchell 2015) that allow for more natural and contextually sensitive responses that result in more semantically correct answers (Abdul-Kader and Woods 2015; Li et al. 2016). Machine learning also allows chatbots to understand the intent of the user and intelligently adapt to their needs in real-time (Ng et. al 2020). Combining this adaptability and responsiveness with explicit human-like cues (Araujo 2018; Go and Sundar 2019; Lee, Lee, and Sah 2020) such as identity prompts (e.g., human names, gender) and conversational style (e.g., back channeling cues, paralinguistic cues) allows users to easily anthropomorphize the chatbots (Kim and Sundar 2012).

Anthropomorphism is the attribution of human-like physical and non-physical features, behaviors, emotions, characteristics, and attributes to a non-human agent or an inanimate object (Epley et al. 2007). While many factors can influence the likelihood of users

anthropomorphizing chatbots (see van Pinxteren et al. 2020 for a review), the focus of the current research is on the consequences of anthropomorphizing chatbots, as opposed to its antecedents. To this end, studies based on the "Computers Are Social Actors" (CASA) paradigm have shown that people tend to interact with computers as they would with other humans, even when they are aware that they are interacting with a machine (Nass and Moon 2000; Reeves and Nass 1996). Such interactions with machines lead to seemingly "unnatural" reactions towards them, like engaging in socially appropriate manners (Nass, Moon, and Carney 1999; Lopatovska and Williams 2018), using gendered pronouns (Druga et al. 2017; Purington et al. 2017), and even reprimanding or confessing one's love for the machine (Lopatovska and Williams 2018). Anthropomorphic cues also make users evaluate the quality of the chatbot's performance based on their expectations of human agents (Koh and Sundar 2010). In short, the adaptive functional capabilities of chatbots coupled with their other visual and interactive humanlike cues results in users both thinking of chatbots as being human and treating them as such.

Social Presence

Of particular intrigue and pertinence for our purposes, previous research has found that the anthropomorphic cues typical of chatbots can lead users to not only think and behave as if the chatbot is human, but also experience the feeling of "social presence" (Kim and Sundar 2012; Sundar, Oeldorf-Hirsch, and Garga 2008), which is the "sense of being with another" (Biocca, Harms, and Burgoon 2003, 456). And, as might be expected, this feeling of social presence arising from interactions with chatbots intensifies with the more human characteristics the chatbot possesses (Nass and Moon 2000; Skalski and Tamborini 2007).

Social presence is a critical aspect of human psychology because it is a key predictor of both attitudes and behaviors (Bente et al. 2008; Biocca et al. 2003; Palmer 1995). For instance, perceived social presence during online purchases (driven by the availability of synchronous chats, asynchronous reviews, etc.) has a positive influence on the perceived usefulness of the website as well as trust and enjoyment experienced during the process (Cyr et al. 2007; Lu, Fan, and Zhou 2016). More specific to the current research, the perception of social presence while interacting with chatbots has been shown to positively reinforce the chatbots' perceived expertise and friendliness (Go and Sundar 2019) and, consequently, consumers' trust in and intentions to use them (Ng et al. 2020). These favorable attitudes toward the chatbot subsequently engender positive attitudes toward the website where the chatbot is embedded, and, ultimately, intentions among users to revisit the website in the future (Araujo 2018; Go and Sundar 2019; Verhagen et al. 2014). For example, users' perceptions of a mind within a chatbot have a positive influence on co-presence (i.e., the feeling of being co-located with another) and experienced interpersonal closeness with the chatbot, which further increases the intention of using the corresponding website (Lee et al. 2020).

Although most research finds benefits of anthropomorphizing chatbots, there can also be a dark side. Hadi (2019) and Ng et al. (2020), for instance, shed light on contexts where humanizing chatbots may have negative downstream consequences for customer dissatisfaction and privacy concerns. In particular, Ng et al. (2020) found that participants were more willing to share financially sensitive information such as account numbers, routing numbers (known as sort codes in UK), and payment information with a machine-like financial chatbot compared to its human-like counterpart. So, there are contextual characteristics that can result in a preference for more technical and mechanical (i.e., less humanlike) chatbots. In a similar vein, we explore the

willingness to use chatbots for conducting online search when users anticipate experiencing embarrassment, a negative emotion which is enhanced by social presence, during the search.

Embarrassment

Embarrassment is a reactive emotional response typically arising in response to violations of social convention either in public or private contexts (e.g., social faux pas, tripping in public, addressing someone by the wrong name; Keltner and Buswell 1997; Krishna, Herd, and Aydınoğlu 2019; Tangney and Tracy 2012). Embarrassment threatens an individual's public-self by deviating from socially acceptable behavior and eliciting unwanted audience evaluations (Edelmann 1987; Miller and Leary 1992), making it a powerful regulator of social behavior (Modigliani 1971). Violations of acceptable behavior in the presence of others or concerns about anticipated violations can be triggered in different ways including failures to conform to a publicly presented self-image (e.g., performing poorly during a presentation), social faux pas (e.g., stumbling or forgetting someone's name), and privacy breaches (e.g., bodily noise; Edelmann 1981; Krishna et al. 2019). These experiences are usually driven by inferences drawn by either real or imagined others (Krishna et al. 2015) with respect to the behaviors' social acceptability (Leary 2007) and leads to identity-goal incongruence (Tracy and Robins 2004). For instance, individuals might feel embarrassed when they think that their behavior might lead other people to form negative inferences about them, even in a private context with no one watching (e.g., purchasing incontinence medicine online; Krishna et al. 2015).

Social presence, whether real or imagined, plays a key role in fostering embarrassment (Dahl et al. 2001; Krishna et al. 2015) by eliciting either imagined or real audience evaluations

(Edelmann 1987; Miller and Leary 1992). For instance, consumers felt embarrassed when purchasing condoms both in stores where they had to interact with store employees and in a bathroom where they could use a vending machine (Dahl et al. 2001). As a result of this heightened awareness about negative evaluations, people are pushed into "a state of flustered, awkward, abashed chagrin" (Miller 1996, 129). In response, people employ multiple regulation strategies to avoid such situations (Blair and Roese 2013; Lau-Gesk and Drolet 2008; Nichols, Raska, and Flint 2015). One of the commonly used coping mechanisms adopted by individuals is to avoid social contact (Chen and Pham 2019). For instance, Dong, Huang, and Wyer (2013) found that embarrassed consumers coped with their embarrassment by choosing products that hide their faces (e.g., sunglasses). Similarly, compared to neutral-mood participants, embarrassed participants with low self-esteem tended to prefer sweaters with smaller, less conspicuous Nike logos, presumably to avoid attracting attention to themselves (Song, Huang, and Li 2017).

The desire to avoid social contact, persists even when negative appraisals by others are only anticipated (Dahl et al. 2001; Krishna et al. 2019; Brown 1970). For instance, when asked to choose among different formats for sharing their experience that varied in degrees of exposure to the audience (e.g., speaking directly to the audience while being video recorded, making an audiotape recording, writing a statement), embarrassed participants were more likely than non-embarrassed participants to choose a format that reduced exposure to the audience even though it meant receiving a smaller compensation (Brown 1970). Extending these ideas to the present context, we assert that since people prefer lower degrees of social contact and presence in embarrassing situations, they will be less likely to conduct embarrassing online searches using chatbots, which are easily anthropomorphized and likely to generate a feeling of social presence (as argued in the previous section).

Our conceptual model is summarized in Figure 1 (Figures and Tables follow Reference throughout). We propose that when faced with a decision of whether to use a chatbot to conduct a search (vs. searching manually or using a more traditional, less humanlike search bar), consumers are less likely to do so when they anticipate feeling embarrassed about the search than when they do not. We further propose that this results from a sense of perceived social presence while interacting with a chatbot.

OVERVIEW OF THE CURRENT RESEARCH

In the following sections, we present five experimental studies that investigate our proposals. Study 1 demonstrates the basic phenomenon that individuals are less likely to use a chatbot to search for embarrassing products. Study 2 replicates the phenomenon using a hypothetical scenario in which participants must search for embarrassing information, while also exploring the influence of a theoretical moderator: self-esteem. Studies 3 and 4 provide additional support for the main proposition by contrasting the likelihood of using a chatbot versus a more traditional, non-AI-based search aid and contrasting the influence of anticipated embarrassment with that of a positive self-conscious emotion: pride. Study 5 examines our full conceptual model by measuring perceived social presence as the underlying mechanism.

STUDY 1: THE BASIC EFFECT

Study 1 was designed to test the main proposition that people would be less willing to use a chatbot when searching for embarrassing products. To do this, participants were presented with

a list of products that varied in terms of the degree of embarrassment evoked while purchasing them. Participants had the option of either using a chatbot to search for the products online or search for them manually. We predicted that the likelihood of using the chatbot would be lower for products considered more embarrassing.

Method

Data was collected from 300 Amazon Mechanical Turk (hereafter, AMT) participants. They were assigned to one of three conditions: (i) not embarrassing (control), (ii) mildly embarrassing, or (iii) highly embarrassing. Web Appendix A provides full details of the wording of the stimuli.

All participants were presented the same list of products (Table 1). The products included in the list were based on the results of a pilot study (Web Appendix B). Participants in the mildly- (highly-) embarrassing condition were asked to select a product which they would be mildly (extremely) embarrassed to buy for themselves. Participants in the not-embarrassing condition were asked to choose a product which they would not be embarrassed to buy for themselves. To reinforce the manipulation, participants in all three conditions were asked to explain their reason for choosing the product. Participants then rated the extent to which they would feel embarrassed purchasing their chosen product (1 = not at all embarrassed, 9 = very embarrassed) and the extent to which they would be comfortable with people knowing about their purchase (1= not at all comfortable, 9= very comfortable).

Next, participants were asked to imagine that they were shopping for their chosen product on an online store with a dedicated section for that product. They were told that there was a long

list of options they would have to manually sort through to find the perfect fit or they could opt to use the chatbot (called a "virtual assistant" in the stimuli in this and all other studies), Emma (Figure 2). Participants rated how likely they would be to ask Emma for help instead of manually browsing through the assortment (1 = not likely at all; 9 = very likely).

Next, participants rated the perceived humanness of the chatbot by indicating the extent to which they agreed (1 = strongly disagree, 9 = strongly agree) with the statement, "To me, the virtual assistant, Emma, seems like a human." Following this, two potential covariates were measured. Participants rated their own knowledge (1 = not at all knowledgeable, 9 = very knowledgeable) and familiarity (1= not at all familiar, 9 = very familiar) with the product they had hypothetically chosen to purchase. Next, participants indicated their age, gender, and whether they agreed to allow us to use their responses in our analyses. Finally, a simple attention-check question asked participants to indicate the type of search aid they could use to look for information in the scenario.

Results

Fifty-five participants were excluded from the study either because they failed to answer the attention check question correctly or did not respond to the open-ended questions in a sensical way (see Web Appendix C for the excluded responses). This left a final sample size of 245 (M_{age} = 38.77, 42.4 % female). The two measures assessing (i) the extent to which participants anticipated feeling embarrassed about purchasing the product and (ii) the extent to which they would be comfortable with others knowing they had purchased the product (reverse-coded) were significantly correlated ($r = 0.586$, $p < 0.001$) and combined into a single composite

measure of anticipated embarrassment for each participant. Confirming that participants in the three conditions (not-, mildly-, and highly-embarrassing) followed instructions to choose products of varying embarrassment, a one-way ANOVA found that anticipated embarrassment significantly differed across conditions (F (2, 242) = 159.32, $p < .001$, $\eta_p^2 = .568$). Participants in the highly-embarrassing condition ($M_{high} = 7.15$, SD = 1.69) anticipated experiencing significantly more embarrassment than those in the not-embarrassing ($M_{no} = 2.47$, SD = 1.78; F (2, 242) = 273.78, $p < .001$, $d = 2.692$) and mildly-embarrassing ($M_{mild} = 6.28$, SD = 1.74; F (2, 242) = 10.26, $p = .002$, $d = .506$) conditions. Participants in the mildly-embarrassing condition also anticipated experiencing significantly more embarrassment than those in the not-embarrassing condition (F (2, 242) = 204.43, $p < .001$, $d = 2.165$).

A similar one-way ANOVA also found that the likelihood of using the chatbot differed significantly across the three conditions (F (2, 242) = 4.23, $p = .016$, $\eta_p^2 = .034$). Participants in the highly-embarrassing condition ($M_{high} = 4.44$, SD = 2.72) were significantly less likely to use the chatbot, Emma, than those in the mildly-embarrassing condition ($M_{mild} = 5.65$, SD = 2.74, F (2, 242) = 8.32, $p = .004$, $d = .443$), and marginally significantly less likely than those in the not-embarrassing condition ($M_{no} = 5.26$, SD = 2.59, F (2, 242) = 3.49, $p = .06$, $d = .307$; Figure 3). No significant difference was found between the not- and mildly-embarrassing conditions (F (2, 242) = 0.93, $p = .342$, $d = .147$). The lack of a significant difference in likelihood of using the chatbot between the highly- and not-embarrassing conditions reflects the variety of factors that are at play when one considers whether to use a chatbot or not. Specifically, as we discuss in Web Appendix D, participants reported being more knowledgeable and familiar with their chosen products in the not-embarrassing condition, which would render a search aid less useful and less likely to be used.

Discussion

Study 1 finds that people are significantly less likely to use a chatbot to search for products they find highly embarrassing to purchase compared to non-embarrassing or mildly embarrassing products. However, participants in this study were able to choose different products for which they might search, which might have caused potential confounds. For instance, as we discuss in Web Appendix D, knowledge and familiarity did vary significantly across conditions but did not account for the results when included as a covariate in our analyses. Of course, there could also be other variables that differed across the different types of products chosen in each condition that we did not measure. Accordingly, Study 2 further examines the effect of embarrassment on search preferences by directly measuring anticipated embarrassment in a hypothetical scenario, allowing for us to further control for various confounding factors.

STUDY 2: THE MODERATING ROLE OF SELF-ESTEEM

Study 2 had two main goals. The first was to replicate the results of Study 1 while holding the search context constant and measuring participants' relative degrees of anticipated embarrassment in that context. Holding the search context constant helps rule out confounds that may arise across different search and purchase contexts. The second was to examine the moderating role of self-esteem. Prior research has shown that one's level of self-esteem affects their responses to negative affect and the coping behaviors they employ (Rosenberg 1965; Baumeister 1982). More specifically, individuals with low self-esteem are more likely than those

with high self-esteem to engage in escape-based coping behaviors that minimize attention to themselves (Song et al. 2017). Therefore, we predicted that the effect of anticipated embarrassment on the likelihood of using a chatbot would be more pronounced among individuals with low self-esteem than those with high self-esteem.

Method

Ninety-one AMT participants were recruited for this study. Web Appendix A provides full details of the wording of the stimuli. They were asked to imagine that they had been "experiencing involuntary incidents of flatulence (i.e., the buildup of gas often accompanied by farting especially when you cough, sneeze, or laugh)". They were told that their condition had impacted certain aspects of their social life as the odor and noise sometimes drew attention in public spaces. Participants then rated the extent to which they would feel embarrassed because of their condition (1 = not at all embarrassed, 9 = very embarrassed). They were then told that they had decided to look for more information about involuntary flatulence (e.g., how to treat the problem, how to seek medical care, etc.) and had found and started browsing a website dedicated to providing medical advice. Next, the participants were told that while they were browsing the website "a virtual assistant, Emma, pops up" and shown the same chatbot image used in study 1. They could look for the information either by browsing the website or by asking Emma for help and were asked to indicate how likely they were to ask Emma to help them search for information on flatulence (1 = not likely at all; 9 = very likely).

Next, the participants rated the perceived humanness of the virtual assistant using the same measure as study 1. They then responded to a nine-item self-esteem scale adapted from

Song et al. (2017) (see Appendix). Finally, participants provided demographic information, reported their agreement to allow us to use their responses in our analyses, and answered a simple attention-check question that asked them to indicate the information type they were looking for in the scenario.

Results

Two participants failed the attention-check question and were dropped from the analysis resulting in a final sample size of 89 (M_{age} = 36.13, 38.2% female). The anticipated embarrassment (M = 7.88, SD = 1.54) and the self-esteem (M = 6.51, SD = 1.77; α = .94) measures were not correlated with each other (r = -.02, p = .85). A linear regression with likelihood of using the chatbot to conduct the website search as the dependent variable and anticipated embarrassment, self-esteem, and their two-way interaction as the independent variables (variables mean centered) revealed that likelihood of using a chatbot was negatively related to anticipated embarrassment (b = -.33, t(85) = -1.89, p = .06, f^2 = .04). That is, the higher the degree of anticipated embarrassment the less likely the participants were to use the chatbot, Emma, to conduct the search. The main effect of self-esteem was not significant (b = -.17, t(85) = -1.07, p = .29, f^2 = .013). However, a marginally significant interaction between anticipated embarrassment and self-esteem (b = .23, t(85) = 1.86, p = .06, f^2 = .039) was found. A floodlight analysis revealed that there was a significant negative effect of anticipated embarrassment on the likelihood of using Emma among participants with self-esteem less than 6.42 (Figure 4A). A subsequent spotlight analysis showed a significant negative effect of anticipated embarrassment on the likelihood of using Emma to conduct the search (b = -.75, t(85) = -2.53, p = .01) among

participants with low self-esteem (-1 SD = 4.73) but no effect among participants with high self-esteem (+1 SD = 8.28: b = .08, $t(85) = .29$, $p = .77$; see Figure 4B).

Discussion

Replicating study 1, study 2 once more finds that people are less likely to use a chatbot to conduct their search when they anticipated feeling more embarrassment when conducting that search. This effect was more pronounced for participants with low levels of self-esteem. While both studies are consistent with our conceptual reasoning, each has only examined the likelihood of using a chatbot versus using no search aid whatsoever (i.e., searching manually) as a consequence of anticipated embarrassment. However, not all search aids possess the same anthropomorphic qualities that chatbots do. For instance, traditional search bars, like those found on Google.com or near the top of the screen on Amazon.com, possess no discernible humanlike qualities. As such, our conceptual framework would suggest that the effects of embarrassment on the likelihood of using a search aid should be much less pronounced for search bars than for chatbots. This prediction is tested in study 3.

STUDY 3: MANIPULATING SEARCH AID TYPE AND ANTICIPATED EMBARRASSMENT

We have argued that the humanlike qualities of chatbots make people more likely to anthropomorphize them and, consequently, perceive social presence when interacting with them. The feeling of social presence makes the use of chatbots less preferable while conducting

embarrassing searches. As shown in Web Appendix D and E, the chatbots in studies 1 and 2 were perceived as significantly humanlike. Search bars, in contrast, do not possess the same humanlike qualities, should be less likely to be anthropomorphized, and should therefore be less likely to create a feeling of social presence. So, the impact of anticipated embarrassment on one's search preferences should be less pronounced when the search aid is a search bar, as opposed to a chat bot. Study 3 tests this prediction and additionally contrasts an embarrassment invoking scenario with a more affect neutral scenario.

Method

Four hundred one AMT participants participated in this study. The study utilized a 2 (search aid: chatbot vs. search bar) × 2 (scenario: sexually transmitted disease [STD] vs. furniture assembly [FA]) mixed design. The search aid factor manipulated the humanlike qualities of the search aid between subjects while the scenario factor, which was designed to influence the extent to which participants would feel embarrassment while searching for information, was randomized within subjects. Web Appendix A provides full details of the wording of the stimuli.

In the STD scenario, participants were asked to imagine that they had recently read an article about a new product designed to prevent STDs and wanted to learn more about that product. They were then asked to describe how they would feel while searching for information on preventing STDs. Following the writing task, the participants were asked to imagine that they started looking for more information about the new product and started browsing a website dedicated to new product releases. In the FA scenario, participants were asked to imagine that

they bought a piece of furniture online and needed detailed instructions to assemble it. They were then asked to describe how they would feel while searching for information on furniture assembly. Following the writing task, they were asked to imagine that they started looking for more information about assembling the piece of furniture and started browsing a website dedicated to furniture assembly.

For both scenarios, participants were told that they encountered either a search bar or a virtual assistant (the chatbot condition), manipulated between-subjects, as they began searching the website. In the search-bar (chatbot) condition, they were told "… imagine, while you were browsing the website, a search bar (virtual assistant) pops up," and were shown an image of their respective search aid (see Figure 2 for the chatbot image and Figure 5 for search bar image). They could look for the information either by browsing the website or by using the available search aid and were asked to indicate how likely they were to use the search aid to answer a specific query. In the *STD* condition, the query was, "What is the new product that will help me prevent contracting an STD?" In the *FA* condition, the query was, "What type of hardware is required to assemble part A and B of model X456?" The likelihood of using the search aid was measured on a 1 (= not likely at all) to 9 (= very likely) scale.

Next, participants rated the extent to which they would feel embarrassed while searching for the information in each scenario (1 = not at all, 9 = very). We also measured five other emotions in addition to embarrassment – pride, happiness, disgust, excitement, and sadness – to mask the purpose of the study (results for these emotions are included in the Web Appendix F). Next, they completed a 10-item perceived humanness scale adapted from Kim and McGill (2011) and Waytz et. al (2010) for their respective search aid (1 = strongly disagree, 9 = strongly agree; see Appendix) to assess the efficacy of our manipulation of the humanlike qualities of the

search aid between the search bar and chatbot conditions. Participants then indicated their age, gender, and whether they agreed to allow us to use their responses in our analyses. Finally, a simple attention-check question asked participants to rearrange the letters of the word "drip" in alphabetical order in a provided box.

Results

Three participants failed the attention-check question and were dropped from the analysis resulting in a final sample size of 398 (M_{age} = 39.01, 41.4% female). The ten perceived humanness items (α = 0.95) were averaged to form a single composite measure, with higher values indicating a greater perceived humanness. Analysis of this composite measure revealed that the chatbot was perceived as significantly more humanlike ($M_{chatbot}$ = 4.62, SD = 2.03) than the search bar ($M_{searchbar}$ = 3.57, SD = 2.18; $F(1, 396) = 24.70$, $p < .001$, $\eta_p^2 = .059$). The two scenarios also had the intended effect on anticipated embarrassment. Specifically, the STD scenario was considered significantly more embarrassing than the FA scenario (M_{STD} = 4.90, SD = 2.87 vs. M_{FA} = 2.36, SD = 2.13; $t(397) = 16.66$, $p < .001$, d = -.84). A mixed analysis ANOVA found that search aid type did not have a significant effect on anticipated embarrassment ($F(1, 396) = 1.90$, p= 0.17, $\eta_p^2 = .005$). However, there was a marginally significant interaction effect of search aid and scenario type (STD: $M_{chatbot}$ = 4.62, SD = 2.77 vs. $M_{searchbar}$ = 5.18, SD = 2.95; FA: $M_{chatbot}$ = 2.36, SD = 2.17 vs. $M_{searchbar}$ = 2.35, SD = 2.09, $F(1, 396) = 3.58$, p = .06, η_p^2 = .009).

A mixed-design ANOVA revealed significant main effects of search aid type and scenario type on the likelihood of using the search aids. First, participants were significantly

more likely to use the search bar (M = 6.65, SD = 2.04) than the chatbot (M = 5.93, SD = 2.29; $F(1, 396) = 11.20$, $p = .001$, $\eta_p^2 = .028$) to search for information. Likewise, participants were significantly more likely to use a search aid to look for information in FA condition (M = 6.82, SD = 2.26) than in STD condition (M = 5.78; SD = 2.75; $F(1, 396) = 73.90$, $p < 0.001$, $d = .42$). More importantly, these main effects were qualified by a significant interaction (F (1, 396) = 9.86, $p = .002$, $\eta_p^2 = .024$), which revealed the expected pattern of results. While participants were less likely to use the search bar in the STD scenario than in the FA scenario (M_{STD} = 6.32, SD = 2.49 vs M_{FA} = 6.99, SD = 2.12; $F(1, 396) = 18.71$, $p < .01$, $d = .30$), this effect was far more pronounced when participants were considering using the chatbot (M_{STD} = 5.21, SD = 2.89 vs M_{FA} = 6.64, SD = 2.38; $F(1, 396) = 56.45$, $p < .001$, $d = .54$; Figure 6), consistent with our prediction. Also consistent with our reasoning, participants were significantly less likely to use the chatbot than the search bar in the more embarrassing STD scenario ($M_{chatbot}$ = 5.21, SD = 2.89 vs. $M_{searchbar}$ = 6.32, SD = 2.49; $F(1, 396) = 16.87$, $p < .001$, $\eta_p^2 = .041$), while no significant difference was found in the more mundane FA scenario ($M_{chatbot}$ = 6.64, SD = 2.38 vs. $M_{searchbar}$ = 6.99, SD = 2.12; $F(1, 396) = 2.32$, $p = .13$, $\eta_p^2 = .006$).

Discussion

Consistent with the results of studies 1 and 2, study 3 finds that people are less likely to use a chatbot when they anticipated feeling more embarrassed while searching for information. Anticipated embarrassment had significantly less influence on the likelihood of using the search bar, which possesses none of the humanlike qualities of a chatbot and, thus, is unlikely to be anthropomorphized and result in feelings of social presence. So far, the studies examined the

influence of our focal emotion (anticipated embarrassment) on the likelihood of using different means of searching. Pride is the conceptual converse of embarrassment since it is driven by enhanced self-awareness (Leary 2007) and is most typically low in situations where embarrassment is high. As discussed in Web Appendix F, participants expected to experience more pride in the FA scenario than in the STD scenario, which is the converse of the expectations for embarrassment. Therefore, in the next study we use anticipated pride to serve as comparison for anticipated embarrassment.

STUDY 4: BETWEEN SUBJECTS (INCONTINENCE VS DONATION)

As opposed to using a relatively affect neutral control condition as in study 3, study 4 used anticipated pride as a contrast to anticipated embarrassment to further examine the effects documented thus far. Pride is a positive self-conscious emotion which is experienced when people believe that they are responsible for a socially valued outcome or that they are a socially valued person (Mascolo and Fischer 1995). As a result, unlike embarrassment, pride does not result in the need to avoid social attention (Leary 2007) and, therefore, the likelihood of using a chatbot should be significantly less influenced when one anticipates pride.

Method

Four hundred three AMT participants were randomly assigned to one of four conditions in a 2 (scenario: incontinence vs. donation) × 2 (search aid: chatbot vs. search bar) between-

subjects design. Web Appendix A provides full details of the procedure, including the wording of the stimuli and measures.

The scenario conditions were designed to elicit either greater anticipated embarrassment (the incontinence condition) or pride (the donation condition; Akin, Mayraz, and Helliwell 2017). In the incontinence condition, participants were asked to imagine that they had been "experiencing incontinence lately (involuntary leaking of urine, especially when you cough, sneeze, or laugh)". They were told that their condition had caused them embarrassment on multiple social occasions (e.g., work meetings) due to people noticing unwanted stains. They were then told that they had decided to look for more information about incontinence (e.g., how to treat the problem, how to seek medical care, how to get out of awkward and embarrassing social situations, etc.) and had landed on and started browsing a website dedicated to incontinence. They were then asked to think of and write down the question they would like to search on the website. In the donation condition, participants were asked to imagine that they had "started volunteering on a regular basis" for different causes and were proud of the impact they had made on their community. They were then told that they had decided to look for other causes they could donate to (e.g., fighting hunger, supporting orphaned children, fighting homelessness, etc.) and had landed on a website offering information on different causes. They were then asked to think of and write down the question they would like to search on the website.

All participants then encountered a chatbot (Figure 2) or a search bar (similar to study 3) and were told that they could continue their search by either browsing the website or by asking the chatbot their question (entering their question in the search bar). They were then asked how likely they were to use the chatbot (search bar) to ask their question (1 = not likely at all, 9 = very likely).

Participants then rated the extent to which they would feel (1) embarrassed and (2) prideful in each scenario (1 = not at all, 9 = very). Similar to study 3, we also measured other emotions in addition to embarrassment and pride – shame, guilt, happiness, anger, disgust, excitement, fear, surprise and sadness – to mask the purpose of the study (results for these emotions are included in the Web Appendix G). Next, participants completed a 10-item perceived humanness scale (see Appendix), demographics questions, and attention check question as in study 3.

Results

Nine participants failed the attention check questions and were excluded from the analysis. Excluding these participants resulted in a final sample size of 394 (M_{age}= 37.24, 37% female). A 2 (scenario) × 2 (search aid) ANOVA yielded a main effect of scenario for both anticipated embarrassment ($F(1, 390) = 787.56$, $p < .001$, $\eta_p^2 = .669$) and anticipated pride ($F(1, 390) = 360.37$, $p < .001$, $\eta_p^2 = .480$). As expected, participants anticipated feeling more embarrassment in the incontinence ($M = 7.83$, SD = 1.96) than in the donation ($M = 2.13$, SD = 2.07) conditions. Conversely, they anticipated feeling more pride in the donation ($M = 6.73$, SD = 2.35) than in the incontinence ($M = 2.24$, SD = 2.33) condition. There was neither a significant main effect of search aid for either emotion (anticipated embarrassment: $F(1, 390) = 1.36$, $p = .24$, $\eta_p^2 = .003$; anticipated pride: $F(1, 390) = .03$, $p = .86$, $\eta_p^2 = .000$) nor a significant interaction between the two factors on either anticipated embarrassment ($F(1, 390) = 0.19$, $p = .66$, $\eta_p^2 = .000$) or anticipated pride ($F(1, 390) = .16$, $p = .69$, $\eta_p^2 = .000$). A second 2 × 2 ANOVA found that the chatbot was considered significantly more humanlike ($\alpha = 0.97$; $M =$

4.50, SD = 2.47) than the search bar (M = 2.76, SD = 2.33; $F(1, 390) = 51.35$, $p < .001$, $\eta_p^2 = .116$). There was neither a significant main effect of scenario ($F(1, 390) = 1.27$, $p = .26$, $\eta_p^2 = .003$) nor a significant interaction between the two factors ($F(1, 390) = 0.06$, $p = .81$, $\eta_p^2 = .000$) on perceived humanness.

Turning to our focal dependent variable, a 2 (scenario) × 2 (search aid) ANOVA revealed a significant main effect of scenario such that participants were significantly more likely to use a search aid to look for information in the incontinence (M = 6.53, SD = 2.51) than in donation (M = 6.01, SD = 2.63; $F(1, 390) = 4.06$, $p = .045$, $\eta_p^2 = .010$) condition. Participants were also significantly more likely to use the search bar (M = 6.94, SD = 2.11) than the chatbot (M = 5.60; SD = 2.83; $F(1, 390) = 27.47$, $p < 0.001$, $\eta_p^2 = .066$) to search for information. More importantly, these two main effects were qualified by a significant interaction ($F(1, 390) = 7.05$, $p < .01$, $\eta_p^2 = .018$). Consistent with our predictions, participants searching for information on incontinence, who anticipated experiencing greater embarrassment, were significantly less likely to use the search aid in the chatbot condition than in the search bar condition ($M_{chatbot}$= 5.53, SD = 2.83 vs. $M_{searchbar}$ = 7.49, SD = 1.69; $F(1, 390) = 35.64$, $p < .001$, $d = .841$; Figure 7). In contrast, participants' likelihood of using their respective search aid was far less influenced when they were searching for information on possible donations and anticipated feeling greater pride (M_{chabot} = 5.68, SD = 2.84 vs. $M_{searchbar}$ = 6.33, SD = 2.35; $F(1, 390) = 2.86$, $p = .07$, d = .246).

Discussion

These results provide additional support for our main proposition that people are less likely to use chatbots than a search bar while searching for information that may evoke

embarrassment. This pattern is significantly diminished in scenarios that evoke pride, as we predicted. Additionally, this study provides evidence that this trend is unique to negative self-conscious emotions such as embarrassment and is not observed for positive self-conscious emotions like pride. Next, study 5 directly examines the role of social presence in driving the effects documented thus far.

STUDY 5: SOCIAL PRESENCE MEDIATION ANALYSIS

Study 5 further examines our conceptual model (Figure 1) by utilizing a mediation-by-measurement design to directly investigate the role of perceived social presence proposed to underlie the effects found in the preceding studies. Participants were asked to report the extent to which their search aid gave them a feeling of social presence. We predicted that (i) the effect of the search aid type (chatbot vs. search bar) on the likelihood of using the search aid would be mediated by the perceived social presence and (ii) the link between social presence and likelihood of using the search aid would be moderated by the extent of anticipated embarrassment arising from the search scenario.

Method

Four hundred fifty-nine participants were randomly assigned to one of four conditions in a 2 (scenario: incontinence vs. donation) × 2 (search aid: chatbot vs. search bar) between-subjects design. The procedure was identical to study 4, with exceptions noted below.

As in study 4, participants' anticipated emotions were manipulated using the incontinence and donation scenarios. Participants were then asked to imagine they were using a medical website (a website on donations) to search for information that would answer the specific question, "I involuntarily leak urine every time I laugh. How can I stop it?" ("I want to donate to a cause that helps the society. What are the top 3 causes that need help?") in the incontinence (donation) condition.

As in study 4, participants then encountered a chatbot or search bar and were presented with corresponding images (Figure 8). In addition to the image of the focal search aid, these images also included additional information. The image in the search bar condition indicated, "You can type in your keywords or questions and it will find quickly the information needed. To start, enter your question in the provided space and hit search." The image in the chatbot condition included speech clouds with the statements, "Hi I am Emma, your virtual assistant. I am here to help you with your queries" and "Ask me anything and I will quickly find the information." This manipulation was based on previous research suggesting that describing an object in the first person (vs. third person) encourages its anthropomorphism (Aggarwal and McGill 2007). Participants were informed that they could either continue browsing the website or use the search bar (chatbot) to find an answer to their question. They were then asked how likely they were to use the search bar (chatbot) to ask their question (1 = not likely at all, 9 = very likely).

Afterwards, participants responded to a five-item social-presence scale, which asked the extent to which interacting with the search aid felt like "interacting with a person", "being observed", "a social exchange", "somebody is there," and "interacting with another social being" (see Appendix). They then rated the extent to which they anticipated feeling embarrassment and

pride in the scenario on nine-point scales (1= strongly disagree, 9 = strongly agree), along with the additional emotions from study 3 (results for these emotions are included in the Web Appendix H), and indicated whether the search aid was more machine-like (= 1) or human-like (= 9). Additionally, three potential covariates were measured. First, participants indicated their impressions of the competence and likeability of the search aid on a 6-item, bipolar scale (adapted from Bartneck et al. 2009; see Appendix). Second, they completed a 4-item privacy measure adapted from Ischen et al. (2019; see Appendix). Next, participants indicated their age, gender, and whether they agreed to allow us to use their responses in our analyses. Finally, a simple attention-check question asked participants to indicate the medium they were browsing in the scenario.

Results

Six participants were excluded from the analysis because they did not respond to the open-ended questions in a sensical way (see Web Appendix C for the excluded responses), resulting in a final sample size of 453 (M_{age} = 37.72, 49% female). A 2 (scenario) × 2 (search aid) ANOVA found a significant main effect of scenario on both anticipated embarrassment ($M_{incontinence}$ = 6.80, SD= 2.35 vs. $M_{donation}$ = 1.99, SD =1.99; $F(1, 449) = 549.37$, $p < .001$, $\eta_p^2 = .550$) and anticipated pride ($M_{incontinence}$ = 2.63, SD = 2.46 vs. $M_{donation}$ = 5.68, SD = 2.69; $F(1, 449) = 157.28$, $p < .001$, $\eta_p^2 = .259$). There was neither a significant main effect for search aid for either emotion (anticipated embarrassment: $F(1, 449) = 0.09$, $p = .77$, $\eta_p^2 = .000$; anticipated pride: $F(1, 449) = 0.38$, $p = .54$, $\eta_p^2 = .001$) nor a significant interaction between the two factors on either anticipated embarrassment ($F(1, 449) = 0.04$, $p = .84$, $\eta_p^2 = .000$) or anticipated pride

($F(1, 449) = 0.11$, $p = .74$, $\eta_p^2 = .000$). A second 2 × 2 ANOVA found that the chatbot was considered significantly more humanlike ($M = 4.88$, SD = 2.717) than the search bar ($M = 4.22$, SD = 2.724; $F(1, 449) = 6.71$, $p = .01$, $\eta_p^2 = .015$). There was neither a significant main effect of scenario ($F(1, 449) = 0.02$, $p = .88$, $\eta_p^2 = .000$) nor a significant interaction between the two factors ($F(1, 449) = 1.53$, $p = .22$, $\eta_p^2 = .003$) on perceived humanness.

Turning to our focal dependent variable, a 2 (scenario) × 2 (search aid) between-subjects ANOVA revealed a significant main effect of search aid such that people were significantly more likely to use the search bar ($M = 6.61$, SD = 2.28) than the chatbot ($M = 6.02$, SD = 2.75; $F(1, 449) = 6.04$, $p < .05$, $\eta_p^2 = .013$) to search for information. The scenario did not have a significant main effect ($M_{\text{incontinence}} = 6.40$, SD = 2.60 vs. $M_{\text{donation}} = 6.21$, SD = 2.49; $F(1, 449) = 0.66$, $p > .1$, $\eta_p^2 = .001$) on intended search aid use. More importantly, the expected significant interaction between the scenario and search aid type ($F(1, 449) = 4.02$, $p < .05$, $\eta_p^2 = .009$) was found. Consistent with our previous findings, participants were less likely to use a chatbot (vs. search bar) to search for information in the incontinence condition ($M_{\text{chatbot}} = 5.88$, SD = 2.95 vs. $M_{\text{searchbar}} = 6.94$, SD =2.07; $F(1, 449) = 9.98$, $p = .002$, $d = .416$; Figure 9), while there was no significant difference in usage intent between the two search aids in the donation condition ($M_{\text{chatbot}} = 6.16$, SD = 2.55 vs. $M_{\text{searchbar}} = 6.27$, SD = 2.43; $F(1, 449) = 0.10$, $p = .75$, $d = .043$). The expected interaction remained significant after controlling for the three covariates (privacy, competence, and likeability) individually. Results for the covariate analyses are included in the Web Appendix H.

The five perceived social presence items ($\alpha = .95$) were averaged to form a single composite measure. A 2 (scenario) × 2 (search aid) ANOVA found that perceived social presence was significantly higher in the chatbot ($M = 5.03$, SD = 2.39) than in the search bar (M

= 3.88, SD = 2.50, $F(1, 449) = 24.98$, $p < .001$, $\eta_p^2 = .053$) condition. There was no significant main effect of scenario ($M_{incontinence} = 4.51$, SD = 2.61 vs. $M_{donation} = 4.44$, SD = 2.41; F (1,449) = .175, p > .10, $\eta_p^2 = .000$) nor a significant interaction between scenario and search aid type on perceived social presence ($F(1, 449) = .092$, $p > .10$, $\eta_p^2 = .000$).

A moderated mediation analysis was conducted to explore the mediating role of social presence and the influence of anticipated emotion on this process. The mediation analysis was conducted using PROCESS model 14 (Hayes 2018), where 95% CI was used to generate the indirect effects performed using 5,000 bootstrap samples. The mediation analysis was used to assess the proposition that the effect of type of search aid (chatbot vs. search bar) on usage likelihood was driven by the experienced social presence and was moderated by embarrassment (post-mediator). Consistent with our prediction, the effect of type of search aid on usage likelihood was mediated by social presence and moderated by scenario type (b = .43, 95% CI, .128 to .826; Figure 10). The effect of search-aid type on perceived social presence was significant (b = 1.15, SE = .2301, 95% CI [0.699, 1.603]), indicating that participants perceived greater social presence in the chatbot condition than in the search bar condition. Controlling for search aid type, the effect of perceived social presence on likelihood of using search aid was significant (b = -.44, SE = .14, 95% CI [-.717, -.169]) and was moderated by scenario type (b = -.46, SE = .09, 95% CI [.285, .641]). Together, the coefficients can be interpreted to mean that participants perceiving greater social presence were less likely to use the search aid in the incontinence condition, but not in the donation condition.

Discussion

Together, the results provide support for our conceptual model. Participants were less likely to use a chatbot (compared to search bar) when they anticipated experiencing embarrassment while searching for information. This effect appears to be driven by the perception of social presence while interacting with a chatbot. Further the desire to avoid using the chatbot is not observed in contexts that result in anticipated pride.

GENERAL DISCUSSION

Rapid developments in artificial intelligence, machine learning, and the Internet of Things have produced a growing category of "intelligent" agents that profoundly influence consumer behavior. One important influence involves the anthropomorphism and social perception of such technology and their consequence on consumer decision making. An ongoing debate exists regarding the ramifications of anthropomorphism for technology acceptance. On the one hand, anthropomorphizing technological devices may increase acceptance by creating a sense of connectedness (Lee et al. 2017; Toure-Tillery and McGill 2015) and enhancing perceptions of intelligence and trustworthiness (Bartneck et al. 2009; Nass, Isbister, and Lee 2000; Qui and Benbasat 2009). On the other hand, anthropomorphizing technological devices can create unrealistic user expectations (Mimoun, Poncin, and Garnier 2012) or perceptions that the devices are awkwardly unnatural (Gray and Wegner 2012; Schmitt 2019). Our research informs this debate by demonstrating an unwillingness to use an intelligent agent (specifically chatbots) to perform an embarrassing task due to perceived social presence arising while interacting with such highly anthropomorphized chatbots.

Our research is among the first to empirically demonstrate a negative impact of anthropomorphized chatbots. Across five studies, we explore the impact of anticipated embarrassment on the willingness to use chatbots for online searches. Our findings suggest that anticipated embarrassment while searching online decreases the likelihood of using chatbots, which results from perceived social presence while interacting with chatbots. Thus, our findings contribute to growing body of research on the influence of user-AI interactions on consumer decisions (André et al. 2018; Puntoni et al. 2021). In addition, we extend existing work on the influence of emotions on consumer behavior (Krishna et al. 2019; Watson and Spence 2007) by documenting how the preference for online search aids vary based on the degree of embarrassment anticipated while conducting the search. Consistent with the principle that individuals tend to avoid social contact/attention when embarrassed, our findings suggest that users avoid using chatbots to conduct an embarrassing search to avoid the social presence that arises while interacting with chatbots.

Theoretical and Managerial Implications

This research has theoretical implications for several different streams of research. First, our research adds to the understanding of how and when anthropomorphizing chatbots can have negative consequences. Most research on anthropomorphizing chatbots has focused on positive consequences, such as the increased likelihood of using a website (Lee et al. 2020) or enhanced positive consumer experience (Cyr et al. 2007; Lu et al. 2016). In contrast, there is only limited understanding of the negative consequences of anthropomorphizing chatbots (Hadi 2019; Ng et al. 2020). The current research therefore contributes to this line of research, by focusing on

people's negative reactions to anthropomorphized chatbots when they anticipate experiencing embarrassment while conducting an online search. Although we only examined chatbots here, we can generalize our findings to other embodied conversational agents. Since embodied conversational agents (e.g., avatars) take human forms (2D or 3D) and can communicate both verbally (text or speech) and nonverbally (e.g., facial expressions, gaze and body movements) in real time (Araujo 2018; Tan and Liew 2020), we expect the negative influence of anticipated embarrassment to be even more pronounced when users interact with such agents.

Second, we add to the accumulating evidence that anthropomorphizing conversational agents increases perceived social presence, which has myriad downstream consequences. For instance, previous research suggests that perceived social presence leads to enhanced positive impressions of chatbots (Go and Sundar 2019). Through our studies we provide a more nuanced understanding of this phenomenon by not only showing that social presence is a direct consequence of anthropomorphizing agents but also demonstrating that, under certain boundary conditions (specifically, anticipating embarrassment), it can weaken people's willingness to use a chatbot.

Finally, this work also contributes to the research on embarrassment. Connecting the existing work on chatbots (e.g., Keltner and Buswell 1997; Krishna et al. 2019; Tangney and Tracy 2012) with our understanding of emotional responses, the current work studies the impact of anticipated embarrassment on the use of chatbots. Our findings suggest that anticipated embarrassment significantly reduces the likelihood of using chatbots because of the desire to avoid perceived others, which is enhanced in presence of anthropomorphized chatbots that beget the sense of social presence. We do not observe this effect for anticipated pride (a positive self-

conscious emotion) because, unlike embarrassment, pride does not result in the need to avoid social attention.

From a managerial perspective, incorporating chatbots and AI is one of the fastest growing trends in digital communication. Marketers often perceive it as a strong tool for modernizing their offerings online and improving customer support efforts. However, our research indicates that consumers may not always be willing to interact with a chatbot, particularly for certain product categories which they find embarrassing. Therefore, companies selling products in these categories (e.g., condoms, laxatives, adult diapers) should consider implementing AI functionality in less humanlike forms, such as optimized search bars and customized suggestions without the interactive properties. Such firms should also consider incorporating chatbot cues and designs that would mitigate the embarrassment anticipated during such interactions and instead allow users to experience a comfortable and empathetic conversation.

Future Research and Conclusions

While we offer a deeper understanding of the effect of anticipated embarrassment on the use of chatbots, our research has its limitations like all research. For instance, we did not identify ways in which consumers can cope with the types of situations that they were confronted with in our studies. Indeed, we only gave them two routes of action in each study: use the available search aid (chatbot or search bar) or browse manually. In reality, consumers may choose neither of these options and instead opt to use a different retailer/website or abandon their search altogether. There very well may be other coping behaviors as well. Future research can explore

the various coping mechanisms consumers use to avoid using AI-based chatbots and the contextual characteristics that guide their choices of coping mechanism.

Additionally, future research can help develop a more nuanced understanding of the boundary conditions for the observed phenomenon, likely in the form of context- and task-specific factors that influence the willingness to use AI-based chatbots. Finally, while we found self-esteem moderates the impact of anticipated embarrassment on the likelihood of using a chatbot, future work has the opportunity to examine how numerous other individual differences can influence the general likelihood of experiencing embarrassment and the general propensity to use chatbots (e.g., tendency to anthropomorphize).

In closing, incorporating chatbots into online platforms is becoming increasingly popular and consumers are constantly encouraged, and sometimes compelled, to engage with them. Additionally, managers are consistently trying to make these technologies seem more humanlike to improve users' experiences. However, our research shows that there are many instances in which consumers may avoid chatbots altogether. When people anticipate experiencing embarrassment while searching for products or information, they may become less inclined to use chatbots, instead sticking with more traditional forms of browsing.

APPENDIX

Self-esteem measurements (used in Study 2)

We are interested in understanding people's personality attributes. Listed below are variety of statements. Please read each statement carefully and indicate the extent to which you feel it applies to you by indicating your level of agreement.

On the whole, I am satisfied with myself.
Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree

At times, I think I am no good at all. (R)
Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree

I feel that I have a number of good qualities.
Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree

I am able to do things as well as most other people.
Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree

I feel I do not have much to be proud of. (R)
Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree

I certainly feel useless at times. (R)
Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree

I feel that I'm a person of worth, at least on an equal plane with others.
Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree

I wish I could have more respect for myself. (R)
Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree

All in all, I am inclined to feel that I am a failure. (R)
Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree

Note: (R) indicates items that were reverse coded

Perceived humanness measurements (used in Study 3 and 4)

In the previous two scenarios, you had the option of asking your queries to the following virtual assistant –

[chatbot image]

Now please rate your agreement with the following statements.

The virtual assistant _____

or

In the previous two scenarios, you had the option of typing in your queries to the following search bar on the website –

[search bar image]

Now please rate your agreement with the following statements.

The website search bar _____

Study 3

Looks like a person.
Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree
Feels like a person.
Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree
Appears to have a mind of its own.
Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree
Appears to have intentions.
Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree
Can form opinions about me.
Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree
Can form judgements about me.
Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree
Is competent.
Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree
Is intelligent.
Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree
Is warm.
Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree
Is friendly.
Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree

Study 4

Looks like a person.
Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree
Appears to have a mind of its own.
Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree
Appears to have intentions.

Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree

Appears to have free will.

Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree

Appears to have consciousness.

Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree

Appears to have desires.

Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree

Appears to have beliefs.

Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree

Appears to have an ability to express emotions.

Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree

Can form opinions about me.

Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree

Can form judgements about me.

Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree

Perceived social presence measurements (used in Study 5)

In the previous scenario, you had the option of asking your query to the following virtual assistant, Emma, on the website –

[chatbot image]

To what extent would interacting with Emma _____

Or

In the previous scenario, you had the option of typing in your query to the following search bar on the website –

[search bar image]

To what extent would using the search bar _____

Feel like interacting with a person.

Not at all 1 2 3 4 5 6 7 8 9 A lot

Make you feel like you were being observed by Emma (the search bar).

Not at all 1 2 3 4 5 6 7 8 9 A lot

Feel like a social interaction/exchange.

Not at all 1 2 3 4 5 6 7 8 9 A lot

Make you feel like "somebody is there" while using the website.

Not at all 1 2 3 4 5 6 7 8 9 A lot

Feel like interacting with another social being.

Not at all 1 2 3 4 5 6 7 8 9 A lot

Competence measurements (used in Study 5)

In the previous scenario, you had the option of asking your query to the following virtual assistant, Emma, on the website -

[chatbot image]

Now please rate your impression of the above search bar on the following scales

Or

In the previous scenario, you had the option of typing in your query to the following search bar on the website -

[search bar image]

Now please rate your impression of the above search bar on the following scales

Incompetent	1	2	3	4	5	6	7	8	9	Competent
Ignorant	1	2	3	4	5	6	7	8	9	Knowledgeable
Unintelligent	1	2	3	4	5	6	7	8	9	Intelligent

Likeability measurements (used in Study 5)

In the previous scenario, you had the option of asking your query to the following virtual assistant, Emma, on the website -

[chatbot image]

Now please rate your impression of the above search bar on the following scales

Or

In the previous scenario, you had the option of typing in your query to the following search bar on the website -

[search bar image]

Now please rate your impression of the above search bar on the following scales

Unlikeable 1 2 3 4 5 6 7 8 9 Likeable
Unpleasant 1 2 3 4 5 6 7 8 9 Pleasant
Unfriendly 1 2 3 4 5 6 7 8 9 Friendly

Privacy concern measurements (used in Study 5)

Please indicate your general concerns about using a virtual assistant –

[chatbot image]

When I use virtual assistants _____

Or

Please indicate your general concerns about using a search bar –

[search bar image]

When I use search bars _____

I am concerned they are collecting too much personal information.
Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree
I am concerned that unauthorized people may access my queries.
Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree
I am concerned that they may collect my personal information in an unauthorized way.
Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree
I am concerned about submitting personally relevant queries.
Strongly disagree 1 2 3 4 5 6 7 8 9 Strongly agree

REFERENCE

Abdul-Kader, Sameera A. and John C. Woods (2015), "Survey on Chatbot Design Techniques in Speech Conversation Systems," *International Journal of Advanced Computer Science and Applications*, 6(7).

Aggarwal, Pankaj and Ann L. McGill (2007), "Is That Car Smiling at Me? Schema Congruity as a Basis for Evaluating Anthropomorphized Products," *Journal of Consumer Research*, 34(4), 468–79.

Aknin, Lara B., Guy Mayraz, and John F. Helliwell (2017), "The Emotional Consequences of Donation Opportunities," *The Journal of Positive Psychology*, 12(2), 169–77.

André, Quentin, Ziv Carmon, Klaus Wertenbroch, Alia Crum, Douglas Frank, William Goldstein, Joel Huber, Leaf van Boven, Bernd Weber, and Haiyang Yang (2018), "Consumer Choice and Autonomy in the Age of Artificial Intelligence and Big Data," *Customer Needs and Solutions*, 5(1), 28–37.

Araujo, Theo (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, 183–89.

Bartneck, Christoph, Dana Kulić, Elizabeth Croft, and Susana Zoghbi (2009), "Measurement Instruments for the Anthropomorphism, Animacy, Likeability, Perceived Intelligence, and Perceived Safety of Robots," *International Journal of Social Robotics*, 1(1), 71–81.

Baumeister, Roy F. (1982), "Self-Esteem, Self-Presentation, and Future Interaction: A Dilemma of Reputation," *Journal of Personality*, 50(1), 29–45.

Bente, Gary, Sabine Rüggenberg, Nicole C. Krämer, and Felix Eschenburg (2008), "Avatar-Mediated Networking: Increasing Social Presence and Interpersonal Trust in Net-Based Collaborations," *Human Communication Research,* 34(2), 287–318.

Biocca, Frank, Chad Harms, and Judee K. Burgoon (2003), "Toward a More Robust Theory and Measure of Social Presence: Review and Suggested Criteria," *Presence: Teleoperators and Virtual Environments,* 12(5), 456–80.

Blair, Sean and Neal J. Roese (2013), "Balancing the Basket: The Role of Shopping Basket Composition in Embarrassment," *Journal of Consumer Research,* 40(4), 676–91.

Brown, Bert R. (1970), "Face-Saving Following Experimentally Induced Embarrassment," *Journal of Experimental Social Psychology,* 6(3), 255–71.

Carmon, Ziv, Klaus Wertenbroch, Haiyang Yang, and Rom Schrift (2019), "Designing AI Systems That Customers Won't Hate," *MIT Sloan Management Review*.

Chen, Charlene Y. and Michel Tuan Pham (2019), "Affect Regulation and Consumer Behavior," *Consumer Psychology Review*, 2(1), 114–44.

Cyr, Dianne, Khaled Hassanein, Milena Head, and Alex Ivanov (2007), "The Role of Social Presence in Establishing Loyalty in E-Service Environments," *Interacting with Computers*, 19(1), 43–56.

Dahl, Darren W., Rajesh V. Manchanda, and Jennifer J. Argo (2001), "Embarrassment in Consumer Purchase: The Roles of Social Presence and Purchase Familiarity," *Journal of Consumer Research*, 28(3), 473–81.

Dilmegani, Cem (2021), "8 Epic Chatbot / Conversational Bot Failures [2021 Update]," https://research.aimultiple.com/chatbot-fail/.

Dong, Ping, Xun (Irene) Huang, and Robert S. Wyer (2013), "The Illusion of Saving Face: How People Symbolically Cope With Embarrassment," *Psychological Science*, 24(10), 2005–12.

Druga, Stefania, Randi Williams, Cynthia Breazeal, and Mitchel Resnick (2017), "'Hey Google Is It OK If I Eat You?': Initial Explorations in Child-Agent Interaction," in Proceedings of the 2017 Conference on Interaction Design and Children, New York: Association for Computing Machinery, 595–600,

Edelmann, Robert J. (1981), "Embarrassment: The State of Research," *Current Psychological Reviews*, 1(2), 125–37.

——— (1987), *The Psychology of Embarrassment*, Oxford, England: John Wiley & Sons.

Edwards, Chad, Austin J. Beattie, Autumn Edwards, and Patric R. Spence (2016), "Differences in Perceptions of Communication Quality between a Twitterbot and Human Agent for Information Seeking and Learning," *Computers in Human Behavior*, 65, 666–71.

Elsner, Noam (2017), "KAYAK Mobile Travel Report - KAYAK UK," *KAYAK Blog UK*, https://www.kayak.co.uk/news/mobile-travel-report-2017/.

Epley, Nicholas, Adam Waytz, and John T. Cacioppo (2007), "On Seeing Human: A Three-Factor Theory of Anthropomorphism," *Psychological Review*, 114(4), 864–86.

Go, Eun and S. Shyam Sundar (2019), "Humanizing Chatbots: The Effects of Visual, Identity and Conversational Cues on Humanness Perceptions," *Computers in Human Behavior*, 97, 304–16.

Gray, Kurt and Daniel M. Wegner (2012), "Feeling Robots and Human Zombies: Mind Perception and the Uncanny Valley," *Cognition,* 125 (1), 125–30.

Griol Barres, David, Javier Ignacio Carbó Rubiera, and José Manuel Molina López (2013), "An Automatic Dialog Simulation Technique to Develop and Evaluate Interactive Conversational Agents," *Applied Artificial Intelligence*, 27(9), 759-780.

Hadi, Rhonda (2019), "When Humanizing Customer Service Chatbots Might Backfire," *NIM - Nuremberg Institute for Market Decisions*, 2, 30–25.

Hayes, Andrew F. (2017), *Introduction to Mediation, Moderation, and Conditional Process Analysis, Second Edition: A Regression-Based Approach*, Guilford Publications.

Holzwarth, Martin, Chris Janiszewski, and Marcus M. Neumann (2006), "The Influence of Avatars on Online Consumer Shopping Behavior," *Journal of Marketing*, 70(4), 19–36.

Ischen, Carolin, Theo Araujo, Hilde Voorveld, Guda van Noort, and Edith Smit (2020), "Privacy Concerns in Chatbot Interactions," in *Chatbot Research and Design*, ed. Asbjørn Følstad, Theo Araujo, Symeon Papadopoulos, Effie Lai-Chong Law, Ole-Christoffer Granmo, Ewa Luger, and Petter Bae Brandtzaeg, Cham: Springer International Publishing, 34–48.

Jordan, M. I. and T. M. Mitchell (2015), "Machine Learning: Trends, Perspectives, and Prospects," *Science*, 349(6245), 255–60.

Keltner, D. and B. N. Buswell (1997), "Embarrassment: Its Distinct Form and Appeasement Functions," *Psychological Bulletin*, 122(3), 250–70.

Kim, Sara and Ann L. McGill (2011), "Gaming with Mr. Slot or Gaming the Slot Machine? Power, Anthropomorphism, and Risk Perception," *Journal of Consumer Research*, 38(1), 94–107.

Kim, Youjeong and S. Shyam Sundar (2012), "Anthropomorphism of Computers: Is It Mindful or Mindless?," *Computers in Human Behavior*, 28(1), 241–50.

Koh, Yoon Jeon and S. Shyam Sundar (2010), “Heuristic Versus Systematic Processing of Specialist Versus Generalist Sources in Online Media,” *Human Communication Research*, 36(2), 103–24.

Krishna, Aradhna, Kelly B. Herd, and Nilüfer Z. Aydınoğlu (2015), “Wetting the Bed at Twenty-One: Embarrassment as a Private Emotion,” *Journal of Consumer Psychology*, 25(3), 473–86.

——— (2019), “A Review of Consumer Embarrassment as a Public and Private Emotion,” *Journal of Consumer Psychology*, 29(3), 492–516.

Lau-Gesk, Loraine and Aimee Drolet (2008), “The Publicly Self-Consciousness Consumer: Prepared to Be Embarrassed,” *Journal of Consumer Psychology*, 18(2), 127–36.

Leary, Mark R. (2007), “Motivational and Emotional Aspects of the Self,” *Annual Review of Psychology*, 58(1), 317–44.

Leary, Mark R., Ellen S. Tambor, Sonja K. Terdal, and Deborah L. Downs (1995), “Self-Esteem as an Interpersonal Monitor: The Sociometer Hypothesis,” *Journal of Personality and Social Psychology*, 68(3), 518–30.

Lee, Byounggwan, Ohkyun Kwon, Inseong Lee, and Jinwoo Kim (2017), "Companionship with smart home devices: The impact of social connectedness and interaction types on perceived social support and companionship in smart homes," *Computers in Human Behavior*, 5 (October), 922-34.

Lee, Sangwon, Naeun Lee, and Young June Sah (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), 930–40.

Li, Jiwei, Will Monroe, Alan Ritter, Michel Galley, Jianfeng Gao, and Dan Jurafsky (2016), "Deep Reinforcement Learning for Dialogue Generation," *arXiv:1606.01541 [cs]*, http://arxiv.org/abs/1606.01541.

Lopatovska, Irene and Harriet Williams (2018), "Personification of the Amazon Alexa: BFF or a Mindless Companion," in *Proceedings of the 2018 Conference on Human Information Interaction&Retrieval - CHIIR '18*, New Brunswick, NJ, USA: ACM Press, 265–68.

Lu, Baozhou, Weiguo Fan, and Mi Zhou (2016), "Social Presence, Trust, and Social Commerce Purchase Intention: An Empirical Research," *Computers in Human Behavior*, 56, 225–37.

Lucas, Gale M., Jonathan Gratch, Aisha King, and Louis-Philippe Morency (2014), "It's Only a Computer: Virtual Humans Increase Willingness to Disclose," *Computers in Human Behavior*, 37, 94–100.

Lunardo, Renaud, Gregory Bressolles, and Durrieu FranÃ§ois (2016), "The Interacting Effect of Virtual Agentsâ€™ Gender and Dressing Style on Attractiveness and Subsequent Consumer Online Behavior," *Journal of Retailing and Consumer Services*, 30(C), 59–66.

Luo, Xueming, Siliang Tong, Zheng Fang, and Zhe Qu (2019), *Machines versus Humans: The Impact of AI Chatbot Disclosure on Customer Purchases*, SSRN Scholarly Paper ID 3435635, Rochester, NY: Social Science Research Network.

Mascolo, Michael F. and Kurt W. Fischer (1995), "Developmental Transformations in Appraisals for Pride, Shame, and Guilt," in *Self-Conscious Emotions: The Psychology of Shame, Guilt, Embarrassment, and Pride*, New York, NY, US: Guilford Press, 64–113.

Miller, Rowland S. (1996), *Embarrassment: Poise and Peril in Everyday Life*, viii, 232, New York, NY, US: The Guilford Press.

Miller, Rowland S. and Mark R. Leary (1992), "Social Sources and Interactive Functions of Emotion: The Case of Embarrassment," in *Emotion and Social Behavior*, Thousand Oaks, CA, US: Sage Publications, Inc, 202–21.

Mimoun, Mohammed Slim Ben and Ingrid Poncin (2015), "A Valued Agent: How ECAs Affect Website Customers' Satisfaction and Behaviors," *Journal of Retailing and Consumer Services*, 26, 70–82.

Mimoun, Mohammed Slim Ben, Ingrid Poncin, and Marion Garnier (2012), "Case Study—Embodied Virtual Agents: An Analysis on Reasons for Failure," *Journal of Retailing and Consumer Services*, 19 (6), 605–12.

Modigliani, A. (1971), "Embarrassment, Facework, and Eye Contact: Testing a Theory of Embarrassment," *Journal of Personality and Social Psychology*, 17(1), 15–24.

Nass, Clifford, Katherine Isbister, and Eun-Ju Lee (2000), "Truth Is Beauty: Researching Embodied Conversational Agents," *Embodied Conversational Agents*, 374–402.

Nass, Clifford and Youngme Moon (2000), "Machines and Mindlessness: Social Responses to Computers," *Journal of Social Issues*, 56(1), 81–103.

Nass, Clifford, Youngme Moon, and Paul Carney (1999), "Are People Polite to Computers? Responses to Computer-Based Interviewing Systems1," *Journal of Applied Social Psychology*, 29(5), 1093–1109.

Ng, Magdalene, Kovila P.L. Coopamootoo, Ehsan Toreini, Mhairi Aitken, Karen Elliot, and Aad van Moorsel (2020), "Simulating the Effects of Social Presence on Trust, Privacy Concerns Usage Intentions in Automated Bots for Finance," in 2020 IEEE European Symposium on Security and Privacy Workshops (EuroS PW), 190–99.

Nichols, Bridget Satinover, David Raska, and Daniel J. Flint (2015), "Effects of Consumer Embarrassment on Shopping Basket Size and Value: A Study of the Millennial Consumer," *Journal of Consumer Behaviour,* 14(1), 41–56.

Orlowski, Andrew (2017), "Facebook Scales Back AI Flagship after Chatbots Hit 70% F-AI-Lure Rate," https://www.theregister.com/2017/02/22/facebook_ai_fail/.

Palmer, Mark T. (1995), "Interpersonal Communication and Virtual Reality: Mediating Interpersonal Relationships," in *Communication in the Age of Virtual Reality*, Hillsdale, NJ, US: Lawrence Erlbaum Associates, Inc, 277–99.

Papadopoulou, P., A. Andreou, P. Kanellis, and D. Martakos (2000), "Enabling Trust Formation within Agent-Mediated Virtual Environments," *Virtual Reality,* 5(3), 149–59.

Puntoni, Stefano, Rebecca Walker Reczek, Markus Giesler, and Simona Botti (2021), "Consumers and artificial intelligence: an experiential perspective," *Journal of Marketing*, 85(1), 131-151.

Purington, Amanda, Jessie G. Taft, Shruti Sannon, Natalya N. Bazarova, and Samuel Hardman Taylor (2017), "'Alexa Is My New BFF': Social Roles, User Satisfaction, and Personification of the Amazon Echo," in Proceedings of the 2017 CHI Conference Extended Abstracts on Human Factors in Computing Systems, New York, NY, USA: Association for Computing Machinery, 2853–59.

Qiu, Lingyun and Izak Benbasat (2009), "Evaluating Anthropomorphic Product Recommendation Agents: A Social Relationship Perspective to Designing Information Systems," *Journal of Management Information Systems,* 25 (4), 145–82.

Reeves, B. and C. Nass (1997), *The Media Equation: How People Treat Computers, Television, and New Media Like Real People and Places*, Cambridge, UK: Cambridge university press.

Rosenberg, Morris (2015), *Society and the Adolescent Self-Image*, Princeton University Press.

Schmitt, Bernd (2019), "Speciesism: an Obstacle to AI and Robot Adoption," *Marketing Letters*, 1–4.

Skalski, Paul and Ron Tamborini (2007), "The Role of Social Presence in Interactive Agent-Based Persuasion," *Media Psychology*, 10(3), 385–413.

Song, Xiaobing, Feifei Huang, and Xiuping Li (2017), "The Effect of Embarrassment on Preferences for Brand Conspicuousness: The Roles of Self-Esteem and Self-Brand Connection," *Journal of Consumer Psychology*, 27(1), 69–83.

Sundar, S. Shyam, Anne Oeldorf-Hirsch, and Amulya Garga (2008), "A Cognitive-Heuristics Approach to Understanding Presence in Virtual Environments," in Proceedings of the 11th Annual International Workshop on Presence, Padova, Italy: CLEUP Cooperativa Libraria Universitaria Padova, 219-228.

Tan, Su-Mae and Tze Wei Liew (2020), "Designing Embodied Virtual Agents as Product Specialists in a Multi-Product Category E-Commerce: The Roles of Source Credibility and Social Presence," *International Journal of Human–Computer Interaction*, 36(12), 1136–49.

Tangney, June Price and Jessica L. Tracy (2012), "Self-Conscious Emotions," in *Handbook of Self and Identity, 2nd Ed*, ed. June Price Tangney and Mark R. Leary, New York, NY, US: The Guilford Press, 446–78.

Touré-Tillery, Maferima and Ann L. Mcgill (2015), “Who or What to Believe: Trust and the Differential Persuasiveness of Human and Anthropomorphized Messengers,” *Journal of Marketing,* 79 (4), 94–110.

Tracy, Jessica L. and Richard W. Robins (2004), “TARGET ARTICLE: ‘Putting the Self Into Self-Conscious Emotions: A Theoretical Model,’” *Psychological Inquiry*, 15(2), 103–25.

Van Pinxteren, Michelle M.E., Mark Pluymaekers, and Jos G.A.M. Lemmink (2020), “Human-like Communication in Conversational Agents: A Literature Review and Research Agenda,” *Journal of Service Management*, 31(2), 203–25.

Verhagen, Tibert, Jaap van Nes, Frans Feldberg, and Willemijn van Dolen (2014), “Virtual Customer Service Agents: Using Social Presence and Personalization to Shape Online Service Encounters*,” *Journal of Computer-Mediated Communication*, 19(3), 529–45.

Wang, Liuping, Dakuo Wang, Feng Tian, Zhenhui Peng, Xiangmin Fan, Zhan Zhang, Shuai Ma, Mo Yu, Xiaojuan Ma, and Hongan Wang (2021) “CASS: Towards Building a Social-Support Chatbot for Online Health Community,” arXiv preprint arXiv:2101.01583.

Watson, Lisa, and Mark T. Spence (2007), "Causes and consequences of emotions on consumer behaviour: A review and integrative cognitive appraisal theory," *European Journal of Marketing*, 41(5/6), 487-511.

Waytz, Adam, Carey K. Morewedge, Nicholas Epley, George Monteleone, Jia-Hong Gao, and John T. Cacioppo (2010), “Making Sense by Making Sentient: Effectance Motivation Increases Anthropomorphism,” *Journal of Personality and Social Psychology*, 99(3), 410–35.

Zhang, Lixuan, Iryna Pentina, and Yuhong Fan (2021), "Who Do You Choose? Comparing Perceptions of Human vs Robo-Advisor in the Context of Financial Services," *Journal of Services Marketing*, ahead-of-print(ahead-of-print).

Zhao, Shanyang (2003), "Toward a Taxonomy of Copresence," *Presence: Teleoperators and Virtual Environments*, 12(5), 445–55.

TABLES and FIGURES

FIGURE 1: CONCEPTUAL MODEL

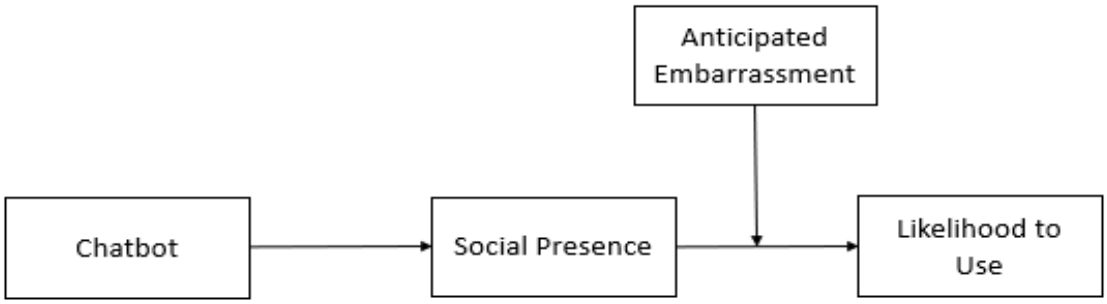
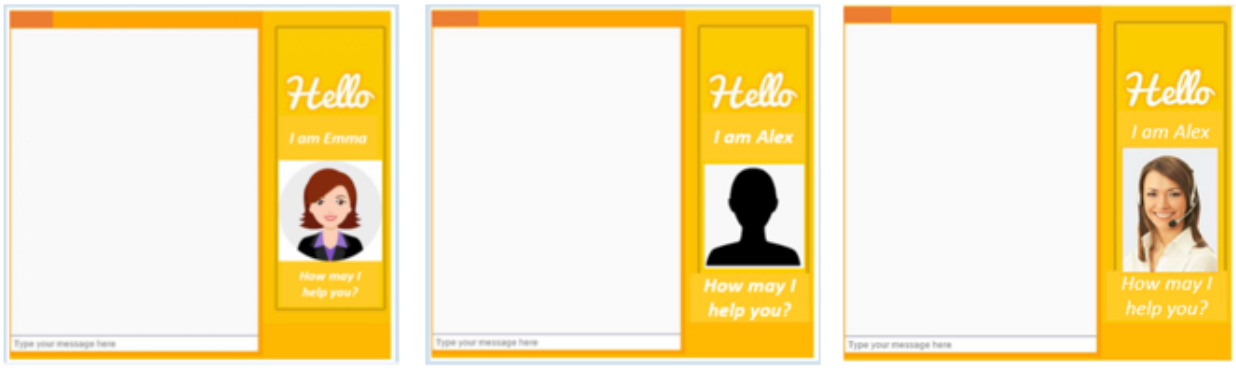


TABLE 1: PRODUCT CHOICES BY EMBARRASSMENT CONDITION IN STUDY 1

	Not Embarrassing M=2.47		Mildly Embarrassing M=6.28		Highly Embarrassing M=7.15	
	N	%	N	%	N	%
Vacuum cleaner	18	7.32%	5	2.03%	1	0.41%
Plant Kit	3	1.22%	1	0.41%	0	0.00%
Baseball cards	4	1.63%	1	0.41%	1	0.41%
Running Shoes	37*	15.04%*	8	3.25%	3	1.22%
Anti-fungal cream	1	0.41%	4	1.63%	6	2.44%
Hair removal cream	5	2.03%	2	0.81%	2	0.81%
Hemorrhoid cream	2	0.81%	12	4.88%	8	3.25%
Lice Treatment	0	0.00%	9	3.66%	13	5.28%
Adult diapers	1	0.41%	24*	9.76%*	21*	8.54%*
Condoms	6	2.44%	16	6.50%	10	4.07%
Laxatives	1	0.41%	3	1.22%	1	0.41%
Personal Lubricants	0	0.00%	9	3.66%	7	2.85%
Total	73		94		73	

* The product with the highest percentage choice in each condition.

FIGURE 2: CHATBOT IMAGES USED IN STIMULI



Study 1 and 2 Study 3 Study 4

FIGURE 3: MEAN LIKELIHOOD OF USING CHATBOT BY LEVEL OF EMBARRASSMENT IN STUDY 1

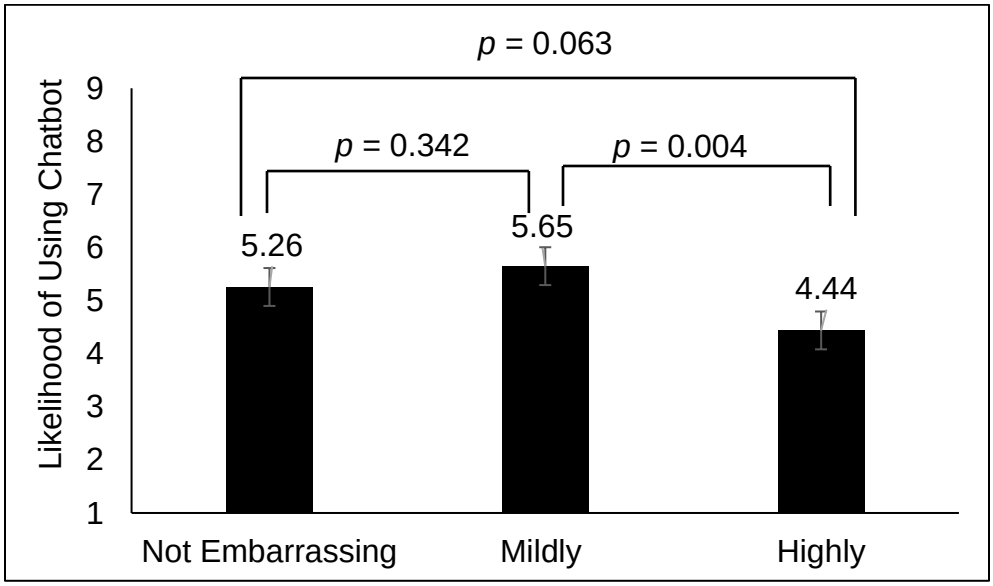
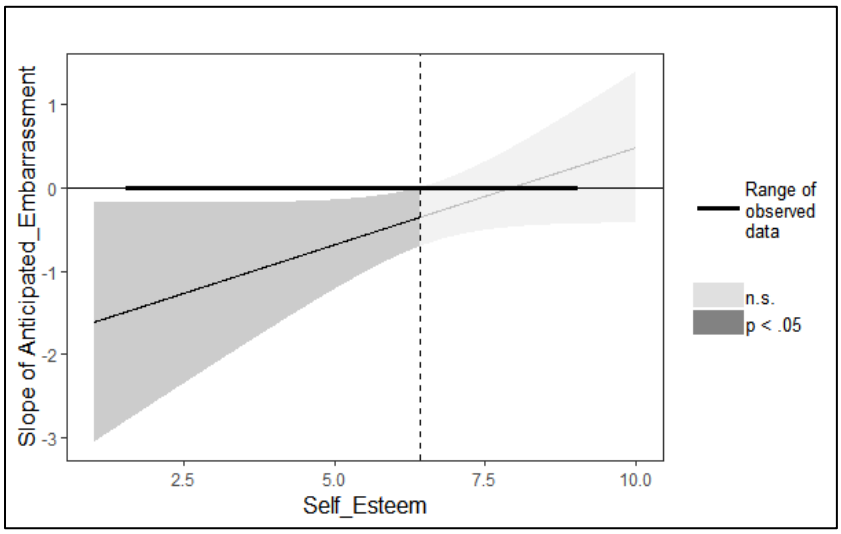


FIGURE 4A: CONDITIONAL EFFECT OF ANTICIPATED EMBARRASSMENT ON LIKELIHOOD OF USING A CHATBOT AS A FUNCTION OF SELF ESTEEM IN STUDY 2



Note: The y axis represents the slope when likelihood of using a chatbot is regressed on anticipated embarrassment (i.e., the effect of anticipated embarrassment on the likelihood of using a chatbot). The x axis represents the degree of self-esteem. Therefore, the graph plots the different values of the conditional effect of anticipated embarrassment on the likelihood of using a chatbot for different values of self-esteem.

FIGURE 4B: LIKELIHOOD OF USING CHATBOT BY ANTICIPATED EMBARRASSMENT AND SELF ESTEEM IN STUDY 2

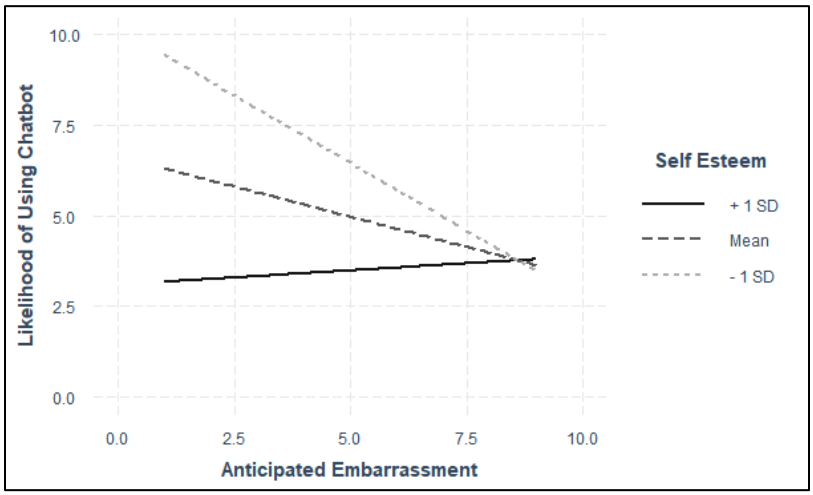


FIGURE 5: SEARCH BAR IMAGE USED IN STUDIES 3 AND 4

FIGURE 6: MEAN LIKELIHOOD OF USING SEARCH OPTION BY SEARCH TYPE AND SCENARIO TYPE IN STUDY 3

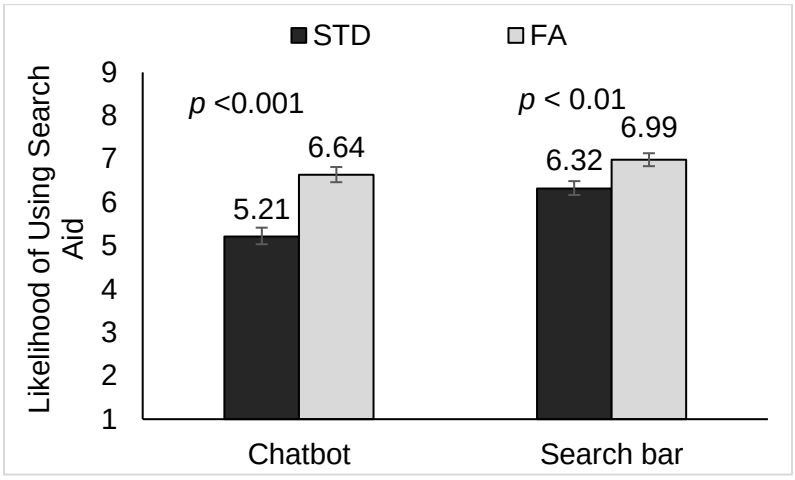


FIGURE 7: LIKELIHOOD OF USING SEARCH AID BY SCENARIO TYPE AND SEARCH AID TYPE IN STUDY 4

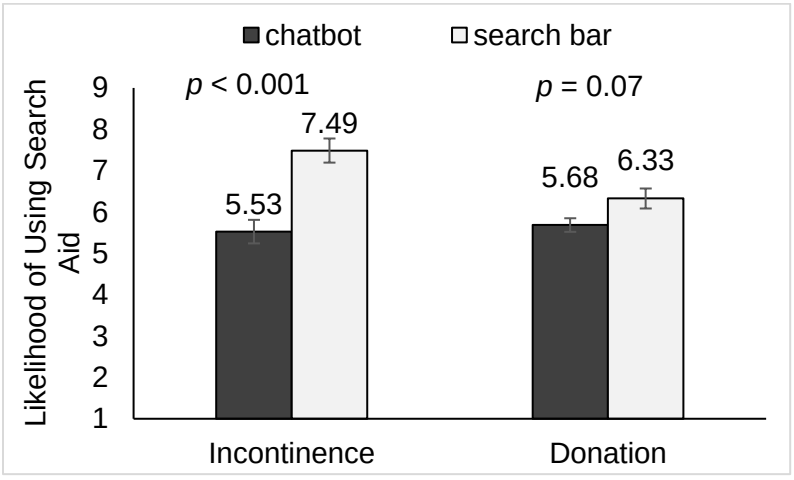
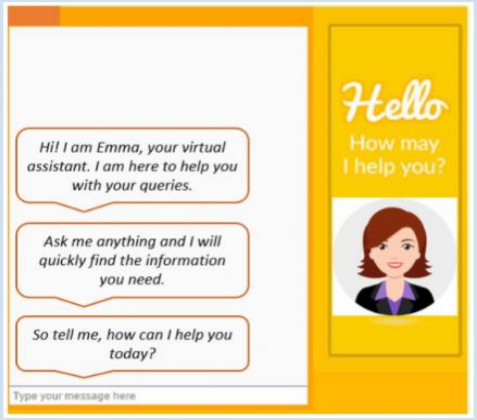


FIGURE 8: SEARCH AID IMAGE USED IN STUDY 5

A. Virtual Assistant



B. Search Bar

FIGURE 9: LIKELIHOOD OF USING SEARCH AID BY SCENARIO TYPE AND SEARCH AID TYPE IN STUDY 5

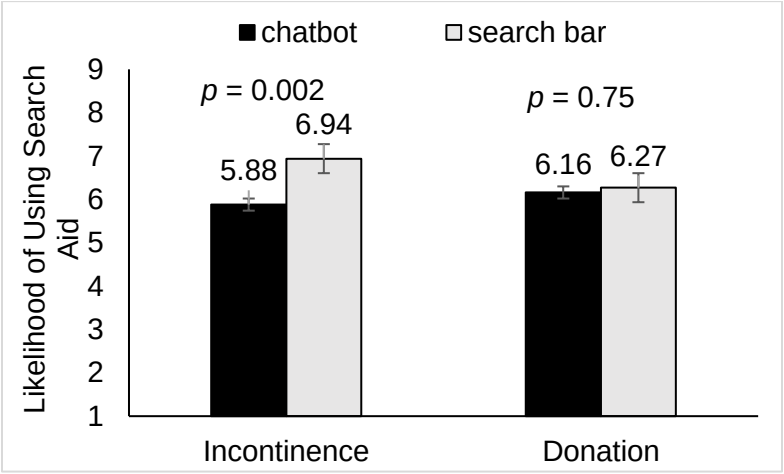
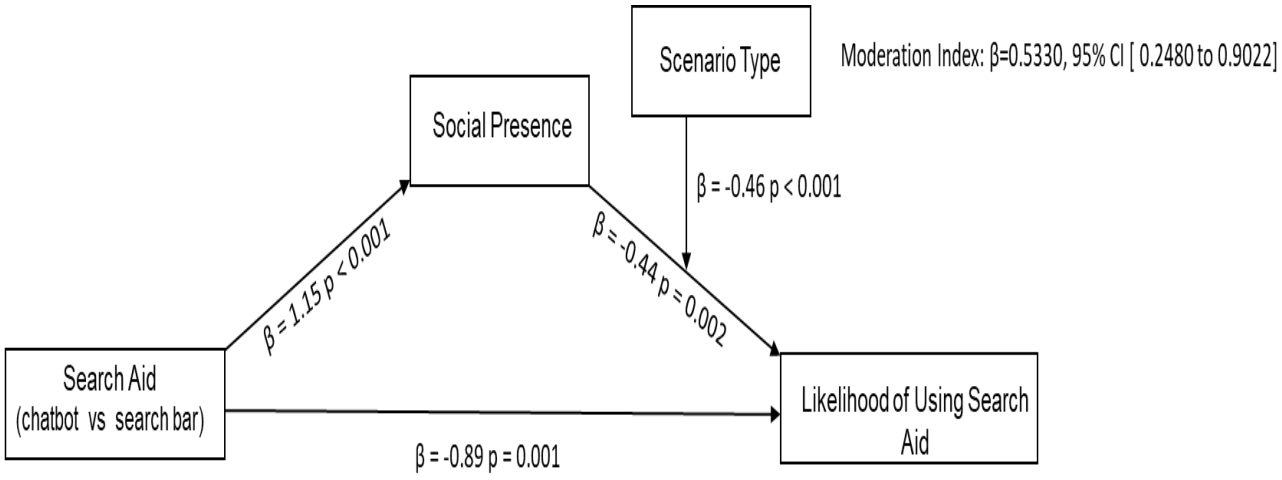


FIGURE 10: MEDIATION OF SEARCH AID TYPE AND SCENARIO TYPE ON LIKELIHOOD OF USING SEARCH AID BY PERCEIVED SOCIAL PRESENCE IN STUDY 5



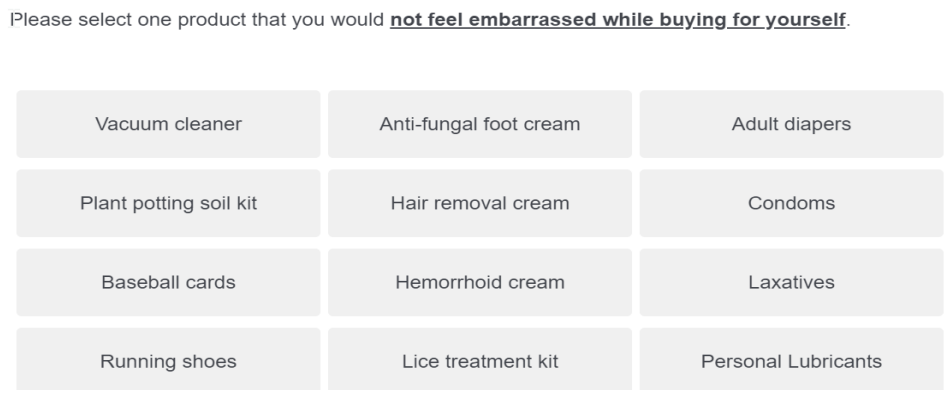
WEB APPENDIX / Supplementary Material

Web Appendix A: Stimuli

This section contains the stimuli used in all the studies.

A.1 Study 1

- Participants in the *not embarrassing* condition viewed the following screen.



- Participants in the *mildly embarrassing* condition viewed the following screen.

- Participants in the *highly embarrassing* condition viewed the following screen.

Please select one product that you would **feel extremely embarrassed while buying for yourself**.

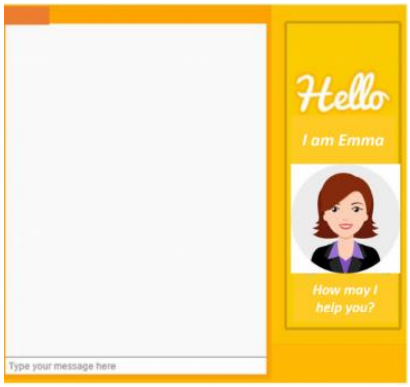
Vacuum cleaner	Anti-fungal foot cream	Adult diapers
Plant potting soil kit	Hair removal cream	Condoms
Baseball cards	Hemorrhoid cream	Laxatives
Running shoes	Lice treatment kit	Personal Lubricants

- All participants viewed the following instructions to reinforce the manipulation

In the space provided below, please provide the reason for your choice of product from the above list.

- All participants viewed the following instructions about the chatbot.

Now imagine you decide to **search for [chosen product] online**.
You land on an online store **with a dedicated section for [chosen product].**
The section has multiple options which you **will have to go through one by one** to identify a perfect fit because the filtering options are very basic. While you are browsing the options, a **virtual assistant named Emma** pops up.



You can **continue searching for [chosen product]** by either **browsing the options yourself** or you can tell **Emma** what are you looking for and she **can help you find it**.
Please indicate how likely are you to ask Emma to help you search for [chosen product]?

Not likely at all 1 2 3 4 5 6 7 8 9 Very Likely

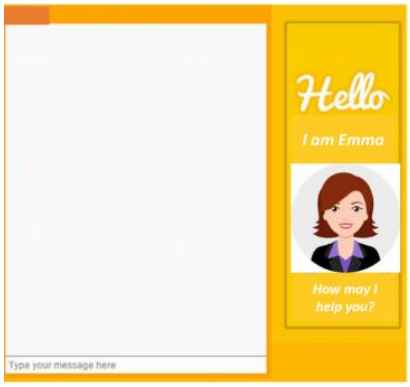
A.2 Study 2

- All participants viewed the following description about *flatulence* condition

Imagine that lately you have been experiencing **involuntary incidents of flatulence** (i.e., buildup of gas often accompanied by farting especially when you cough, sneeze, or laugh).
These incidents of involuntary passing of gas have **impacted certain aspects of your social life**. For instance, the resulting **odor and noise sometimes draw attention** in a public space.

- All participants viewed the following instructions about the chatbot.

Now imagine, you decide to **look online for more information about involuntary flatulence**, for instance, how to treat the problem, how to seek medical care, etc. You land on a medical advice website and you start browsing it.
While you are browsing the website, a **virtual assistant, Emma pops up**.



You can continue **searching for information on flatulence** by either **browsing the website yourself** or you can tell **Emma** what are you looking for and she **can help you find it**.
Please indicate how likely are you to ask Emma to help you search for more information on solutions for flatulence?

Not likely at all 1 2 3 4 5 6 7 8 9 Very Likely

A.3 Study 3

Participants in the ***STD article*** condition viewed the following screens.

Screen 1:

SCENARIO: Article on New Product

Imagine you remember seeing an article a few days ago about a new product to prevent contracting an STD. You don't recall the exact details of the product and would like to explore more about the option. You don't remember where you found that article earlier. So, you decide to look for more information about the product online.

Provide a brief description of **how you would feel searching for information on preventing STD**. What would you be thinking about while looking for the information?

Screen 2:

Now imagine, you start looking for more information about the new STD preventing product. You land on a website that is dedicated to new product release and houses latest articles about them. You start browsing it.

Imagine that you have the following query in mind

"**What is the new product that will help me prevent contracting an STD?**"

Participants in the ***furniture assembly*** condition viewed the following screens.

Screen 1:

SCENARIO: Online Delivery

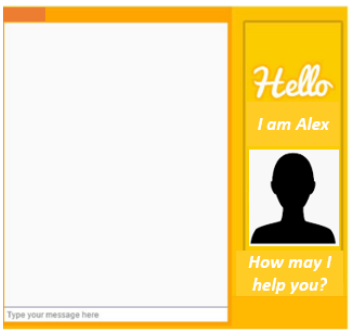
Imagine that you bought a new furniture for your home from an online store. You are required to assemble the pieces yourself. After receiving it, you noticed that the instructions provided with the parts are not very clear. You need more detailed steps for the assembling process.
Since you have purchased such DIY furniture before, you know that you can definitely find more detailed assembling steps online.
Provide a brief description of **how you would feel searching for information on furniture assembly**. What would you be thinking about while looking for the information?

Screen 2:

Now imagine, you start looking for more information about furniture assembly. You land on a website that is dedicated to helping with furniture assembly. You start browsing it.
Imagine that you have the following query in mind
"What type of hardware is required to assemble part A and B of model X456?"

Participants in the ***chatbot*** condition viewed the following screen.

Now imagine, while you were browsing the website, a virtual assistant pops up.



You can search for information on [scenario] either by browsing the website or by asking the virtual assistant.

Please indicate how likely are you to ask the virtual assistant your query –

Not likely at all 1 2 3 4 5 6 7 8 9 Very Likely

Participants in the ***search bar*** condition viewed the following screen.

Now imagine, while you were browsing the website, a search bar pops up.

You can search for information on [scenario] either by browsing the website or by using the search bar.

Please indicate how likely are you to use the search bar to ask your query -

Not likely at all 1 2 3 4 5 6 7 8 9 Very Likely

A.4 Study 4

Participants in the ***incontinence*** condition viewed the following screens.

Screen 1:

Imagine that you **have been experiencing incontinence lately (involuntary leaking of urine, especially when you cough, sneeze, or laugh)**. This loss of bladder control has been having a major impact on many aspects of your life. It has been resulting in unwanted stains and other discomforts that draw people's attention towards you.

For instance, you lost control of your bladder multiple times at work during important meetings and realized you had stained your trousers. You have to keep leaving meetings abruptly and are sure that your co-workers have noticed the reason.

Naturally, this problem is causing you a lot of embarrassment in social situations.

Screen 2:

Now imagine, you decide to look for more information about incontinence, for instance, how to treat the problem, how to seek medical care, how to get out of awkward and embarrassing social situations, etc. You land on a website dedicated to this problem and you start browsing it.
Imagine the question you would have in your mind that you would like the answer to. Now, please enter the question in the space provided below.

Participants in the ***donation*** condition viewed the following screens.

Screen 1:

Imagine that **you have started volunteering on a regular basis**. You volunteer for different causes and are proud of the impact you have made on your community. Through volunteering, you have also been able to support transformations in the lives of many people who need it.
For instance, on weekends you often volunteer with local charities to help plan and run drives including food distribution, toy drives and charity events. You have also been making sure to save a part of your monthly salary and earmark them for donations.
You are proud that you have enough saved up and your donation can make a positive difference in the society.

Screen 2:

Now imagine, you decide to look for other causes you can donate to, for instance, fighting hunger, supporting orphaned children, fighting homelessness, providing natural disaster relief, supporting cancer research, etc.
You land on a website where you can get more information regarding different causes.
Imagine the question you would have in your mind that you would like the answer to. Now, please enter the question in the space provided below.

Participants in the ***chatbot*** condition viewed the following screen.

Now imagine, while you were browsing the website, a virtual assistant pops up.

You can search for information on [scenario] either by browsing the website or by asking the virtual assistant.

Please indicate how likely are you to use the virtual assistant to ask your query –

Not likely at all 1 2 3 4 5 6 7 8 9 Very Likely

Participants in the ***search bar*** condition viewed the following screen.

Now imagine, while you were browsing the website, a search bar pops up.

You can search for information on [scenario] either by browsing the website or by using the search bar.

Please indicate how likely are you to use the search bar to ask your query -

Not likely at all 1 2 3 4 5 6 7 8 9 Very Likely

A.5 Study 5

Participants in the ***incontinence*** condition viewed the following screens.

Screen 1:

Imagine that you **have been experiencing incontinence** …… Naturally, this problem is causing you a lot of embarrassment in social situations. [Same description as Study 4]
Now, imagine yourself in the above situation and provide a brief description of how you would feel about your problem.

Screen 2:

Now imagine, you decide to look for more information about incontinence, for instance, how to treat the problem, how to seek medical care, how to get out of awkward and embarrassing social situations, etc. You land on a medical advice website and you start browsing it.
Imagine that you have the following query in mind
"**I involuntarily leak urine every time I laugh. How can I stop it?**"

Participants in the ***donation*** condition viewed the following screens.

Screen 1:

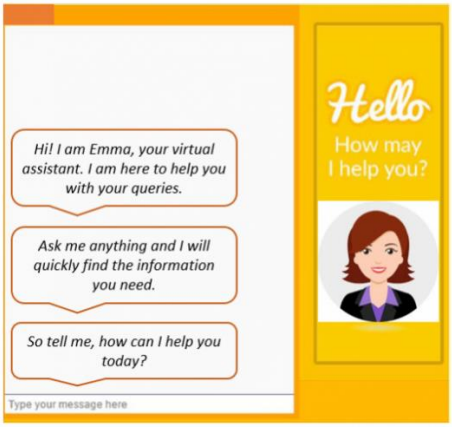
Imagine that **you have started volunteering on a regular basis**…… You are proud that you have enough saved up and your donation can make a positive difference in the society. [Same description as Study 4]
Now, imagine yourself in the above situation and provide a brief description of **how you would feel about your accomplishments.**

Screen 2:

Now imagine, you decide to look for other causes you can donate your savings to, for instance, fighting hunger, supporting orphaned children, fighting homelessness, etc.
You land on a website where you can get more information regarding different causes and you start browsing it.
Imagine that you have the following query in mind
"**I want to donate to a cause that helps the society. What are the top 3 causes that need help?**"

- Participants in the *chatbot* condition viewed the following screen.

Now imagine, while you were browsing the website, a virtual assistant pops up.



You can search for information about [scenario] either by browsing the website or by using the above virtual assistant, Emma.
Please indicate how likely are you to ask Emma your query –

Not likely at all 1 2 3 4 5 6 7 8 9 Very Likely

Participants in the ***search bar*** condition viewed the following screen.

Now imagine, while you were browsing the website, a search bar pops up.

You can search for information about [scenario] either by browsing the website or by using the above search bar.

Please indicate how likely are you to use the search bar to ask your query –

Not likely at all 1 2 3 4 5 6 7 8 9 Very Likely

Web Appendix B: Supplementary Pilot Study for Study 1

A pilot study was conducted to identify products which are usually considered to be embarrassing. Additionally, we were interested in identifying non-embarrassing products which people were likely to buy online. The study was completed by 100 participants (M_{age} = 31.37, 30% female participants) through the Prolific data collection website. Participants were asked to enter a product which they would find either mildly embarrassing or extremely embarrassing or not at all embarrassing to buy. Participants were then asked to respond to the question "How embarrassed would you feel while searching for [entered product]?" on a 9-point scale (1= Not at all embarrassed to 9 = Very embarrassed). Products were chosen based on the average embarrassment experienced for them. In addition to means, we also considered other factors such as whether the product was appealing to people irrespective of gender, degree of familiarity and similar price points for all products. Based on this pilot study the four products were chosen from each condition (non-embarrassing, mildly embarrassing and extremely embarrassing) and included in study one.

Product	Mean Embarrassment [1= Not at all embarrassed to 9 = Very embarrassed]
Not Embarrassing	
Baseball cards	1.00
Potting soil	1.00
Running shoes	1.00
Vacuum cleaner	1.00
Mildly Embarrassing	
Anti-fungal foot cream/spray	5.00
Hair removal product	6.00
Hemorrhoid creams	4.67
Lice treatment	5.00
Highly Embarrassing	
Adult diapers	9.00
Condoms	7.00
Laxatives	5.00
Lubricants	7.00

Web Appendix C: Exclusion Criteria for Study 1 & Study 5

Study 1

Condition	Excluded responses
Not-embarrassing	• Since these are based on text provided by Qualtrics, you will not be able to increase . • based on text provided by Qualtrics, you will not be able to increase ... But sometime we want to provide a choice like • It is just an embarrassing thing • I felt little embarrassed when i bought condoms in front of my friends. • RUNNING SHOES IS VERY EMBARRASSED IT IS VERY BAD SMELL,I DID NOT LIKE. • IT IS A BAD FEEL THE SMELL IT VERY EMBARRASSED FEEL I HATE THAT. • I FEEL AS IRRITAED AND ALSO FEEL VERY SHY • Yes the diapers is very deep inner wear so some embarrassed • I feel so embarrassed to buy in first time in a shop • it feels embarassing because i am too young
Mildly-embarrassing	• provide reasons why the product is superior and unique, along with an ... Effective advertising does not need to cost a fortune, provided you spend your money wisely. ... in contact with your customers can help generate referrals by keeping your name top-of-mind. ... Be very careful making your listing category choice. • Since these are based on text provided by Qualtrics, you will not be able to increase ... But sometime we want to provide a choice like • All of the examples above accomplish the same goal. ... This will dictate which features or benefits you list in your product descriptions. ... • it helps a lot for the daily routine jogging members • Whether your workout involves running, walking, sports or gym ... Improper workout footwear can cause a number of injuries. ... Worn out sport shoes do not provide your feet with adequate protection during your workout. • I am started doing my regular exercise and jogging for the past two weeks. Now I need a new shoes for running. • The cards are worthless because nobody's buying. Don't blame the card shop owner for not wanting them. They won't be able to sell them, so if they take them off your hands, they're merely adding to a potential fire hazard.

	• They may enter early at the top or middle of the funnel or join late in the ... Before you can optimize your customer's buying decision process, you must ... Customer Examples: In this phase, Sarah might be making a comparison list of multiple computers. ... They have made their decision about which product, service, brand, ...
Highly-embarrassing	• basball cards are valueless even after thirtry characters • I WANT MY ROOM WITH CLEAN.BECAUSE CLEANLINESS WAS VERY IMPORTANT TO US • i like running shoes so much. verities of model and high quality running shoes is useful to me. running and jacking also like me. • I love cleaning my house although • Vacuum cleaner easy to use of cleaning my home. Vacuum cleaner to clean hardwood floors. vacuum creates less airborne dust and doesn't damage the surface of hardwood floors. • am daily doing physical activities so I need running shoes for running habits. It is important to safe my foot and the running shoes help me from foot pain. Running shoes is important for every runner so I also need to purchase the branded running shoes. • Its very useful shoes. However, Saucony also pads the bottom with more cushioning, while Brooks uses less but tends to be more comfortable overall. Along these same lines, Brooks has more mesh and flexibility on average, while Saucony is about mid-range for athletic shoes • People buy brand name products for a variety of reasons. • THIS IS A VERY GOOD OPINION.All of the examples above accomplish the same goal. ... This will dictate which features or benefits you list in your product descriptions. ... This not only describes the make and fit of the shoes, but it also includes the benefits of each style choice: ... about fit, feel and comfort, then I want to give them a reason to pick my shoe. • leaning in to the room and It's slim, sleek, and, most importantly, sucks, but in a good way. It tackles carpet, hardwood, and pet hair superbly, plus it's quiet, as far as vacuums go. Yes, it's expensive, for a stick vac, but it is one of the better ones on the market.

Study 5

Condition	Excluded Responses
Chatbot X Pride	• Use simple, active statements. It's best to use clear statements with strong verbs to effectively outline your skills and abilities. ... • It provides guidance on how to respond to job interview questions as well as describes ... Your key objective should be to provide a clear summary about what you have ... Out of my 8-year work experience, my greatest accomplishment has been to ...
Search bar X Embarrassment	• The Unit Identification Code (UIC) is a six character alphanumeric code that uniquely identifies each United States Department of Defense entity. The first character is the Service Designator: A: US Department of Agriculture • How to answer "describe yourself" with word-for-word example answers you can use ... job description most likely), you'll want to describe yourself as someone who works ... But your only goal in the interview should be to get invited back for the next ... is to give an example of how that trait has helped you in a real situation. • How to answer "describe yourself" with word-for-word example answers you can use ... job description most likely), you'll want to describe yourself as someone who works ... But your only goal in the interview should be to get invited back for the next ... is to give an example of how that trait has helped you in a real situation. • analytical skills.innovative and creative thinking. a lateral mindset. adaptability and flexibility. level-headedness. initiative. resilience (in order to reassess when your first idea doesn't work), teamworking (if problem solving is a team effort)

Web Appendix D: Additional Analysis for Study 1

D.1 Perceived humanness

A one-sample t-test compared to 1 (= strongly disagree) revealed that the chatbot was perceived as significantly humanlike (M = 5.31, SD = 2.49; t(244) = 27.04, p < .001, d = 1.727). A subsequent one-way ANOVA found that the perceived humanness of the chatbot did not differ across the three degree of embarrassment conditions (F (2, 242) = .13, p = .88).

D.2 Familiarity and knowledge as covariate

The two measures assessing the extent to which participants were (i) familiar with and (ii) knowledgeable about the product were significantly correlated (r = 0.832, p < 0.001) and combined into a single composite measure of product familiarity for each participant. A one-way ANOVA found that product familiarity significantly differed across conditions (F (2, 242) = 32.46, p < .001, η_p^2 = .212). Participants in the highly-embarrassing condition (M_{high} = 4.00, SD = 2.55) were significantly less familiar with their chosen product than those in the not-embarrassing (M_{no} = 6.86, SD = 1.46; F (1, 242) = 63.48, p < .001, d = 1.371) and mildly-embarrassing (M_{mild} = 5.13, SD = 2.40; F (1, 242) = 10.78, p = .001, d = .455) conditions. Participants in the mildly-embarrassing condition were also significantly less familiar with their chosen products than those in the not-embarrassing condition (F (2, 242) = 26.28, p < .001, d = .868).

An additional one-way ANCOVA with likelihood of using the chatbot as the dependent variable, degree of embarrassment as the categorical predictor, and the composite product familiarity as the continuous covariate revealed that the product familiarity has a significant effect on the likelihood of using a chatbot (F (2, 242) = 47.80, p < .001, η_p^2 = .166). More importantly, the degree of embarrassment significantly influenced the likelihood of using the chatbot (F (2, 242) = 5.14, p = .006, η_p^2 = .041) when controlling for product familiarity. Participants in the mildly embarrassing condition (M_{mild} = 5.65, SD = 2.74) were significantly more likely to use the chatbot than those in the not-embarrassing condition (M_{no} = 5.26, SD = 2.59; F (1, 241) = 9.94, p = .002) and were marginally significantly more likely than those in the

highly-embarrassing condition (M_{high} = 4.44, SD = 2.72; F (1, 241) = 2.74, p = .099). No significant difference was found between the not- and highly-embarrassing conditions (F (1, 241) = 1.78, p = .18).

Web Appendix E: Perceived Humanness Analysis for Study 2

A one-sample t-test compared to 1 (= strongly disagree) revealed that the chatbot was perceived as significantly humanlike (M = 3.98, SD = 2.36; t(88) = 11.93, $p < .001$, d = 1.264). A subsequent correlation analysis between the perceived humanness and the anticipated embarrassment measures revealed that the two measures were not correlated with each other (r = .11, p = .30).

Web Appendix F: Additional Analysis for Study 3

F.1. Effect of scenario type on emotions

The following table provides the results for pair-wise t-test comparison for the six different emotions between the STD and the FA scenarios. There was a significant difference between the two scenarios for all six emotions. STD scenario resulted in greater negative affect (embarrassment, disgust and sadness), whereas FA scenario resulted in greater positive affect (pride, happiness and excitement).

	Article on STD		Assembling Furniture		
	Mean	SD	Mean	SD	p-value
Embarrassment	4.9	2.87	2.36	2.13	<0.001
Disgust	3.40	2.62	2.33	2.12	<0.001
Sadness	2.79	2.33	2.21	1.93	<0.001
Pride	2.99	2.45	3.54	2.50	<0.001
Happiness	3.46	2.59	4.39	2.60	<0.001
Excitement	3.30	2.62	4.21	2.62	<0.001

F.2 Effect of other emotions on likelihood of using the chatbot vs search bar

We also analyzed the influence of the individual emotions on using the search aid. As shown in the table below, embarrassment was the only negative emotion to have a significant influence on the use of search aid (sadness and disgust did not have a significant effect). While anticipated experience of all positive emotions (happiness, excitement, and pride) had a significant influence on the likelihood of using search aids, pride is the conceptual converse of embarrassment since it is driven by enhanced self-awareness (Leary 2007) and is most typically low in situations where embarrassment is high. This was further supported by the results in Web Appendix F.1, where participants expected to experience more pride in the *FA* scenario than in the *STD* scenario (M_{STD} = 2.99, SD = 2.45 vs. M_{FA} = 3.54, SD = 2.50; $t(397)$= 4.301, $p < .001$), which further validates the efficacy of our manipulation since pride is the converse of embarrassment. Given these results, we decided to manipulate pride in study 4 as a direct comparison to embarrassment.

Scenario: Article on STD

Emotion Type	Search Aid Type Dummy		Emotion Measure		Search Aid Type x Emotion	
	beta value	p value	beta value	p value	beta value	p value
Embarrassment	-1.191	0.000	-0.024	0.700	-0.236	0.012
Disgust	-1.126	0.000	-0.094	0.186	-0.065	0.530
Sadness	-1.111	0.000	-0.111	0.165	-0.158	0.173
Pride	-1.088	0.000	0.124	0.082	0.410	0.000
Happiness	-1.097	0.000	0.224	0.001	0.342	0.000
Excitement	-1.142	0.000	0.181	0.007	0.354	0.000

Scenario: Furniture Assembly

Emotion Type	Search Aid Type Dummy		Emotion Measure		Search Aid Type x Emotion	
	beta value	p value	beta value	p value	beta value	p value
Embarrassment	-0.344	0.129	-0.035	0.644	0.126	0.236
Disgust	-0.345	0.128	-0.072	0.350	0.148	0.167
Sadness	-0.342	0.131	-0.099	0.233	-0.148	0.209
Pride	-0.347	0.122	0.147	0.015	-0.016	0.861
Happiness	-0.298	0.179	0.097	0.098	0.156	0.069
Excitement	-0.277	0.219	-0.081	0.168	0.100	0.246

Web Appendix G: Additional Analysis for Study 4

G.1. Effect of scenario type on emotions

The following table provides the results for t-test comparison for the eleven different emotions between the incontinence and the donation scenarios. There was a significant difference between the two scenarios for all emotions. The incontinence scenario resulted in greater negative affect (embarrassment, shame, guilt, anger, disgust, fear, and sadness), whereas the donation scenario resulted in greater positive affect (pride, happiness and excitement). The incontinence scenario also resulted in greater surprise.

Emotion Type	Incontinence		Donation		p value
	Mean	SD	Mean	SD	
Embarrassment	7.83	1.961	2.13	2.067	<.001
Shame	7.26	2.298	2.05	1.847	<.001
Guilt	5.27	2.726	2.10	1.856	<.001
Anger	4.97	2.615	2.15	2.011	<.001
Disgust	6.14	2.355	1.98	1.732	<.001
Fear	5.73	2.478	2.17	1.929	<.001
Sadness	6.39	2.345	2.45	1.942	<.001
Surprise	5.24	2.648	4.06	2.535	<.001
Pride	2.24	2.329	6.73	2.354	<.001
Happiness	2.33	2.390	7.04	2.061	<.001
Excitement	2.45	2.349	5.85	2.319	<.001

G.2 Effect of other emotions on likelihood of using the chatbot vs search bar

We also analyzed the influence of the individual emotions on using the search aid. The following table contains the results of a linear regression with likelihood of using the searchaid

as the dependent variable and anticipated emotion (mean centered), dummy variable for search aid type (1 = chatbot; 0 = search bar), and their two-way interaction as the independent variables. Among the negative emotions, the interaction between search aid type and four emotions-embarrassment, shame, disgust and sadness-had a significant influence on the likelihood of using the search aid. Among the positive emotions, the interaction between search aid type and all the emotions-pride, happiness, and excitement-had a significant influence on the likelihood of using the search aid.

Emotion Type	Search Aid Type Dummy		Emotion Measure		Search Aid Type x Emotion	
	beta value	p value	beta value	p value	beta value	p value
Embarrassment	-1.312	0.000	0.163	0.001	-0.200	0.005
Shame	-1.311	0.000	0.164	0.002	-0.206	0.006
Guilt	-1.314	0.000	0.100	0.105	-0.071	0.426
Anger	-1.301	0.000	0.142	0.027	-0.135	0.143
Disgust	-1.323	0.000	0.133	0.030	-0.196	0.022
Fear	-1.310	0.000	0.131	0.032	-0.167	0.059
Sadness	-1.330	0.000	0.172	0.005	-0.234	0.006
Surprise	-1.255	0.000	0.137	0.037	0.133	0.150
Pride	-1.333	0.000	-0.091	0.091	0.221	0.004
Happiness	-1.335	0.000	-0.046	0.388	0.229	0.003
Excitement	-1.316	0.000	-0.036	0.546	0.344	0.000

Web Appendix H: Additional Analysis for Study 5

H.1. Effect of scenario type on emotions

The following table provides the results for t-test comparison for the six different emotions between the incontinence and the donation scenarios. There was a significant difference between the two scenarios for all emotions. The incontinence scenario resulted in greater negative affect (embarrassment, disgust, and sadness), whereas the donation scenario resulted in greater positive affect (pride, happiness and excitement).

Emotion Type	Incontinence		Donation		p value
	Mean	SD	Mean	SD	
Embarrassment	6.80	2.348	1.99	1.993	<.001
Disgust	4.43	2.698	1.77	1.704	<.001
Sadness	5.28	2.476	1.88	1.684	<.001
Pride	2.63	2.464	5.68	2.691	<.001
Happiness	2.55	2.415	6.51	2.171	<.001
Excitement	2.52	2.414	5.99	2.394	<.001

H.2 Effect of other emotions on likelihood of using the chatbot vs search bar

We also analyzed the influence of the individual emotions on using the search aid. The following table contains the results of a linear regression with likelihood of using the searchaid as the dependent variable and anticipated emotion (mean centered), dummy variable for search aid type (1 = chatbot; 0 = search bar), and their two-way interaction as the independent variables. Among the negative emotions, only embarrassment had a significant interaction with search aid type on the likelihood of using the search aid. Among the positive emotions, only happiness had a significant interaction with search aid type on the likelihood of using the search aid.

Emotion Type	Search Aid Type		Emotion		Search Aid Type x Emotion	
	beta value	p value	beta value	p value	beta value	p value
Embarrassment	-0.588	0.014	0.065	0.219	-0.167	0.023
Disgust	-0.592	0.013	0.058	0.370	-0.078	0.392
Sadness	-0.588	0.014	0.081	0.208	-0.155	0.078
Pride	-0.579	0.015	0.038	0.495	0.095	0.229
Happiness	-0.548	0.019	0.095	0.083	0.155	0.044
Excitement	-0.538	0.021	0.110	0.050	0.128	0.104

H.3 Likeability as covariate

The three likeability items (α =.89) were averaged to form a single composite measure. A 2 (scenario) × 2 (search aid) between-subjects ANOVA revealed no significant effect (scenario: F (1, 449) = .67, p = .412, η_p^2 = .001; search aid: F (1, 449) = .55, p = .460, η_p^2 = .001; interaction: F (1, 449) = .37, p = .542, η_p^2 = .001).

An additional 2 (scenario) × 2 (search aid) ANCOVA with likeability as covariate and likelihood of using the search aid as the dependent variable revealed that the likeability has a significant effect on the likelihood of using a chatbot (F (1, 448) = 116.00, p < .001, η_p^2 = .206). After controlling for likeability, the main effect of search aid was significant (F (1, 448) = 9.79, p = .002, η_p^2 = .021) and the main effect of scenario type was insignificant (F (1, 448) = 1.76, p = .185, η_p^2 = .004). More importantly, the interaction between the scenario and search aid type was significant (F (1, 448) = 6.54, p = .011, η_p^2 = .014) when controlling for likeability. Participants were less likely to use a chatbot (vs. search bar) to search for information in the incontinence condition (M_{chatbot} = 5.88, SD = 2.95 vs. $M_{\text{searchbar}}$ = 6.94, SD =2.07; F(1, 448) = 16.20, p < .001), while there was no significant difference in usage intent between the two search aids in the donation condition (M_{chatbot} = 6.16, SD = 2.55 vs. $M_{\text{searchbar}}$ =6.27, SD = 2.43; F(1, 448) =0.16, p = .69).

H.4 Competence as covariate

The three competence items (α =.89) were averaged to form a single composite measure. A 2 (scenario) × 2 (search aid) between-subjects ANOVA revealed a significant main effect of search aid type (F (1, 449) = 4.68, p = .03, η_p^2 = .010) such that search bar was considered as more competent ($M_{searchbar}$ = 6.76, SD = 1.69) than chatbot ($M_{chatbot}$ = 6.41, SD = 1.72). Neither the main effect of scenario type (F (1, 449) = .05, p = .82, η_p^2 = .000) nor the interaction between search aid and scenario type (F (1, 449) = .06, p = .81, η_p^2 = .000) were significant .

An additional 2 (scenario) × 2 (search aid) ANCOVA with competence as covariate and likelihood of using the search aid as the dependent variable revealed that the competence has a significant effect on the likelihood of using a chatbot (F (1, 448) = 123.20, p < .001, η_p^2 = .216). After controlling for competence, neither the main effect of search aid (F (1, 448) = 2.66, p = .104, η_p^2 = .006) nor the main effect of scenario type (F (1, 448) = .63, p = .43, η_p^2 = .001) was significant. More importantly, the interaction between the scenario and search aid type was significant (F (1, 448) = 4.57, p = .033, η_p^2 = .010) when controlling for competence. Participants were less likely to use a chatbot (vs. search bar) to search for information in the incontinence condition ($M_{chatbot}$ = 5.88, SD = 2.95 vs. $M_{searchbar}$ = 6.94, SD = 2.07; F(1, 448) = 7.109, p = .008), while there was no significant difference in usage intent between the two search aids in the donation condition ($M_{chatbot}$ = 6.16, SD = 2.55 vs. $M_{searchbar}$ =6.27, SD = 2.43; F(1, 448) =0.12, p = .73).

H.5 Privacy concern as covariate

The four privacy concern items (α =.95) were averaged to form a single composite measure. A 2 (scenario) × 2 (search aid) between-subjects ANOVA revealed a significant main effect of search aid type (F (1, 449) = 8.83, p = .003, η_p^2 = .019) such that participants were more concerned of their privacy while using a chatbot ($M_{chatbot}$ = 5.32, SD = 2.33) than while using a search bar ($M_{searchbar}$ = 4.66, SD = 2.50) and a significant main effect of scenario type (F (1, 449) = 5.43, p = .02, η_p^2 = .012) such that participants were more concerned of their privacy in the incontinence scenario ($M_{incontinence}$ = 5.25, SD = 2.43) than in the donation scenario ($M_{donation}$ =

4.74, SD = 2.41). The interaction between search aid and scenario type was not significant (F (1, 449) = .89, p = .35, η_p^2 = .002).

An additional 2 (scenario) × 2 (search aid) ANCOVA with privacy concern as covariate and likelihood of using the search aid as the dependent variable revealed that the privacy concern has a significant effect on the likelihood of using a chatbot (F (1, 448) = 5.72, p = .017, η_p^2 = .013). After controlling for privacy concern, the main effect of search aid was significant (F (1, 448) = 4.47, p = .03, η_p^2 = .010) and the main effect of scenario type was not significant (F (1, 448) = 1.16, p = .28, η_p^2 = .003). More importantly, the interaction between the scenario and search aid type was significant (F (1, 448) = 4.49, p = .035, η_p^2 = .010) when controlling for privacy concern. Participants were less likely to use a chatbot (vs. search bar) to search for information in the incontinence condition ($M_{chatbot}$ = 5.88, SD = 2.95 vs. $M_{searchbar}$ = 6.94, SD = 2.07; F(1, 448) = 9.05, p = .003), while there was no significant difference in usage intent between the two search aids in the donation condition ($M_{chatbot}$ = 6.16, SD = 2.55 vs. $M_{searchbar}$ =6.27, SD = 2.43; F(1, 448) =0.00, p = .99).