Wow, that's great!
The effect of phatic cues in chatbot conversations.

Abstract:

Firms increasingly use chatbots along the customer journey. Despite the importance of language for these conversational systems, a systematic analysis of the effects of language are missing. The present study aims to close this gap. Drawing from communications research and the fundamental functions of language, we examine how the phatic function of language - also known as the social function - affects consumers' perceptions of chatbot conversations and interactions. We test this effect in an online experiment where participants had to chat with a dating bot that used either functional language or humanized language (i.e. with phatic cues like "aha", "hm"). Results indicate that consumers interact longer and write more with a humanized chatbot using phatic cues than a more functional bot. However, results also show that the phatic language increases consumers' perceived sensitivity of content and consequently their concerns for presenting themselves in a good light.

Keywords: chatbot, language, social response theory

Track: Digital Marketing & Social Media

1. Introduction

Artificial intelligence (AI) has changed the face of today's customer service in our high-tech world. Firms are increasingly relying on chatbots and virtual agents for service interactions along the customer journey. If customers need travel advice, they can chat with Hipmunk; if they need to dispute some parking tickets, they can get simple legal counsel from the chatbot DoNotPay; and if they want to hear some uplifting words, they can talk to Woebot (Leah, 2019). While their fields of application are numerous and diverse, all chatbots enable firms to offer one-on-one interactions with their customers at a scale and offer customers easy access, greater availability and consistent service quality. Unsurprisingly, a recent study found messaging channels to be the preferred service channel for customers in the US, Korea, Singapore, and India (Dermoudy, 2018).

Given their widespread introduction and success, an increasing amount of research has examined customers' motivation to use these channels (e.g., Brandtzæg & Følstad, 2017) as well as customers' interactions with them (e.g., Araujo, 2018). However, despite the importance of language for these message-based service channels, the effect of language design has only received sparse attention thus far. We aim to close this gap. In particular, we aim to understand how a humanization of chatbot language through the phatic function of language affects consumers' perceptions and behavior, especially in terms of the length of interaction and perceived sensitivity of content.

2. Theory

2.1. The rise of chatbots

Chatbots describe computer programs that engage users in a text or audio-based dialogue. While chatbots are not a new invention – the first computer agent ELIZA was introduced in 1966 (Weizenbaum, 1966) - recent advancements in data storage, data processing and AI have led to an introduction of a whole new area of smart bots. These new conversational systems have evolved from "text-only" to "text, voice and image" communicating systems that are becoming more and more human-like (Shum et al., 2018). The introduction of Google's Assistant exemplifies this development. When Google first demonstrated the Assistant in 2018, concerns were voiced that the bot would no longer be distinguishable from human service agents unless clearly stated. One aspect that received great attention was Google's

attempt to humanize the bot's language through speed disfluencies ("hm", "aha" etc.) (Leviathan & Yossi, 2018).

Research on Human-Computer Interaction (HCI) has a long history of examining the success factors in interface designs. As such, the field offers important insights on the design of chatbot interfaces. In particular, it has shown how the use of different visuals (e.g. comic vs. realistic), agency frames, and personality types can affect user behaviour (e.g., Araujo, 2018; Nass & Lee, 2001). Similarly, marketing research on technology interactions demonstrates how design elements, such as human-like visuals and social cues, can affect consumers' perception of autonomy, interactivity, and similarity and liking of an object (e.g., Kim & McGill, 2011; Moon, 2000). More recently, however, the trend towards conversational systems has led researchers to question the focus on visual layouts and instead focus on the conversations themselves as the object of design and study (Følstad & Brandtzæg, 2017).

1.2 Language as the object of design

Language serves a number of functions, namely the informational (the message), the expressive or emotional ("Wow!"), the directive (commands and requests), the aesthetic (adjectives such as "gorgeous"), and the phatic ("hmm", "aha") function (Jakobson, 1960; Leech, 1974). Hereby the latter is also considered the "social" function of language, as its main purpose is to encourage and maintain social relationships (Malinowski, 1923). Prominent examples for phatic elements in communications include small talk about weather, gestures such as waving to start and end conversations, as well as speed disfluencies like "ahas" and "hmmms" to signal one's presence to the communication partner. These phatic elements serve as social cues in a conversation (Malinowski, 1972).

Thus far, research on the effect of phatic function of language is sparse and everything but systematic. Exceptions are studies on the use of emoticons in computer-mediated communications (Derks, Bos & Von Grumbkow, 2007) and their effect on enjoyment (Huang, Yen & Zhang, 2008), message interpretation (Walther & D'Addario, 2001), and task completion (Luor et al., 2010).

1.3 Language and anthropomorphization

To understand how phatic elements in language can affect consumers' responses to chatbot interactions, we draw from social response theory (Reeves & Nass, 1996). According to the theory, people tend to respond to technology in an automatic social manner, treating

interactions with machines like interactions with other people (Moon 2000). A mere presence of anthropomorphic cues can activate a social presence heuristic (Kim & Sundar, 2012), which provokes people to present themselves in a positive light (Shepperd, Malone, & Sweeny, 2008) and act in socially approved ways (Morkes, Kernal & Nass, 1999). As a result, people tend to lie to computers to look good (*social evaluation apprehension*; Henchy & Glass, 1968), perceive a television as more competent if it is introduced as an expert (*authority principle*) and disclose more information to a computer that shares information about itself (*reciprocity principle*; Cialdini, 1993).

As phatic elements in chatbot language can serve as social cues to consumers, we propose that this language anthropomorphization increases customers' social evaluation apprehension. As a result of this social evaluation apprehension, we expect that phatic cues in chatbot interactions will evoke the following effects: First, we expect that customers will follow social conventions and hence interact longer (chit-chat) with chatbots that use phatic elements than chatbots lacking this function of language. Second, we expect that as customers are more concerned about being socially judged in humanized chatbot interactions, they will also be more concerned to present themselves in positive light in these conversations. That is, customers will be more aware about how they present themselves (public self-awareness) in such interactions. Third, we propose that this effect arises as customers feel more vulnerable when answering sensitive questions and hence develop a heightened sense of perceived message sensitivity when anthropomorphic cues are present. Taken together, we propose:

> **Hypothesis 1 (H1):** Consumers will interact longer in terms of a) duration and b) number of words when interacting with a chatbot with phatic cues than a chatbot lacking these cues.
>
> **Hypothesis 2 (H2):** Consumers will perceive a topic as more sensitive when interacting with a chatbot that uses language with phatic cues than a chatbot lacking these cues.
>
> **Hypothesis 3 (H3):** Consumers will have greater social evaluation concerns when interacting with a chatbot that uses language with phatic cues than a chatbot lacking these cues.

2. Method

2.1 Participants

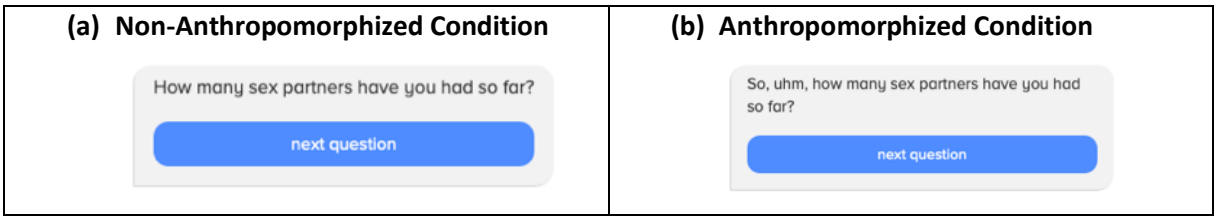
Via the network of a major European business school, we recruited 125 singles (M_{age} = 25.37, 53% female) to chat with a "dating bot". Participants were told that they would test a first beta version of a dating bot and that by testing the bot, they also would learn more about their preferences which in turn may be useful to them to search for a partner sharing their interests and preferences.

2.2 Procedure

We created a "dating bot" for three reasons: First, dating is a topic of high interest for single students. Second, the online dating industry has become an important sector with around 220 million users and a market size of 1.9 billion dollars in 2019 with platforms such as Tinder gaining in popularity, and predictions showing continuous growth in users and revenues over the next years (Statista, 2019). Third, and most important, sharing insights on one's dating preferences remains sensitive—similar to disclosing information on one's financial situation. Thus, dating appears to be a suitable context to explore whether a conversation with a human-like chatbot causes similar human feelings and behaviours as talking to a human.

To test our hypotheses, we randomly assigned participants to one of two chatbot versions that differed in its degree of anthropomorphism only. For this purpose, we built on the phatic function of language (Malinowski, 1923) whose function is not to convey any semantic meaning but to signal one's presence to the communication partner and to encourage a social relationship (Jakobson 1960), and thus is innate to human beings. More specifically, while in the *anthropomorphized* condition, participants chatted with a dating bot that used utterances such as "hm", "aha", "well", etc., participants in the *non-anthropomorphized* condition chatted with a bot having the identical functionalities, yet without utterances (see Figure 1 for an exemplary question).

Figure 1: Chatbot Manipulation (Sample Question)



For ethical reasons, participants in both conditions were told that they were chatting with a bot and not with a human. In sum, the bot asked participants to provide answers on 23

sensitive questions such as on their sexual orientation (107 heterosexuals, 3 homosexuals, 2 bisexuals, 13 NAs), the number of previous sex partners (M = 12.33, SD = 23.12, NAs = 70), or the importance they assign to family ("How important is family to you?"; 1=not important – 5=very important: M = 4.53, SD = .67; NAs = 4), among others. Due to the sensitivity of the topic, we took great care that full anonymity of the answers was guaranteed. In addition, prior to the data collection, the study was approved by the ethical committee of the first author's university.

After having chatted with one of the bot versions, participants were first asked whether they are interested in a follow-up human-human interaction (i.e., personal consultancy) to further explore their dating preferences (1=no interest – 7=strong interest; M = 2.26, SD = 1.80). Then, participants had to indicate their perceived sensitivity of the topic ("How sensitive do you consider the topic you just discussed?": 1=insensitive – 7 sensitive, 1=non-confidential – 7=confidential, 1=not delicate – 7=delicate, 1=public – 7=private; M = 5.43, SD = 1.26, α = .87) as well as their situational public self-awareness (Govern & March, 2001: "I was self-conscious about the way I look.", "I was concerned about what other people think of me.", "I was concerned about the way I present myself."; 1=do not agree at all – 7= fully agree; M = 4.06, SD = 1.71, α = .46). As a manipulation check, they were asked whether they had the impression of chatting with a bot or a human (1=The chatbot was more like a robot – 7=The chatbot as more like a human, M = 4.07, SD = 2.14). Finally, we informed them about the actual purpose of the study.

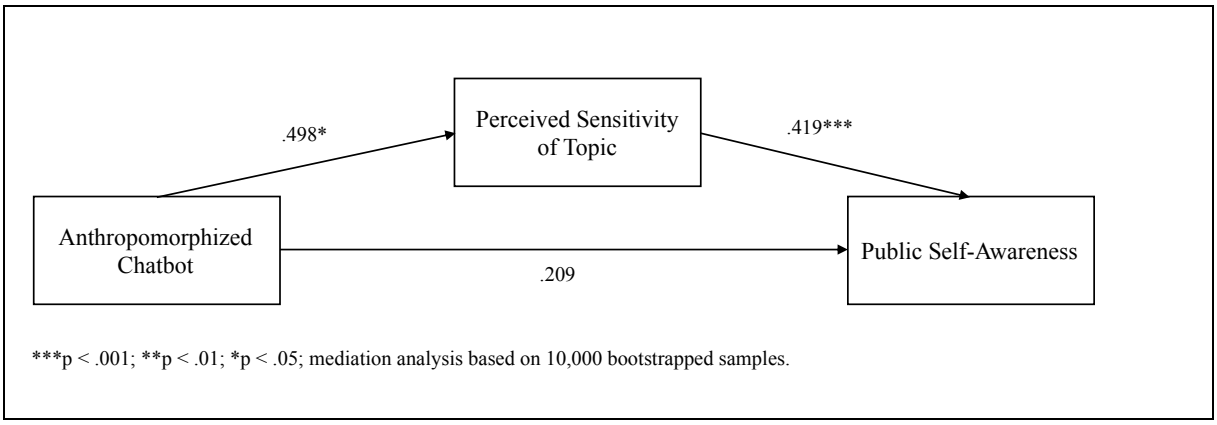
2.3 Results

Participants in the anthropomorphized condition perceived the bot significantly more human than participants in the non-anthropomorphized condition ($M_{Anthr.}$ = 4.86 vs. $M_{Control}$ = 3.43, t(123) = 3.90, $p < .001$). The manipulation thus was successful. In line with H1, we find that participants in the anthropomorphic condition chat significantly longer ($M_{Anthr.}$ = 14.36 minutes vs. $M_{Control}$ = 9.00 minutes, t(123) = 9.12, $p < .001$) and also chat more ($M_{Anthr.}$ = 53.79 words vs. $M_{Control}$ = 39.28 words, t(123) = 3.03, $p < .01$) than participants in the non-anthropomorphized condition.

However, in support of our further hypotheses (H2 and H3), anthropomorphizing chatbots only seems to have favorable effects on chit-chat in human-machine interactions. Though having chatted about the *identical* topic (i.e., dating), participants perceived the topic of dating as significantly *more sensitive* when they chatted with the anthropomorphized

versus the not anthropomorphized bot ($M_{Anthr.}$ = 5.70 vs. $M_{Control}$ = 5.20, t(123) = 2.23, p < .05). Similarly, though only marginally significant, participants' public self-awareness increased when the chatbot was anthropomorphized ($M_{Anthr.}$ = 4.05 vs. $M_{Control}$ = 3.50, t(123) = 1.60, p = .096). Bootstrapped mediation analysis provides initial evidence for an underlying process (see Figure 2). While the direct effect of the bot manipulation on public self-awareness was not significant (c' = .303, z = 1.00, p > .30), we found a significant effect of the bot manipulation on perceived sensitivity (a = .498, z = 2.30, p < .05), a significant effect of perceived sensitivity on public self-awareness (b = .419, z = 4.245, p < .001), and, most importantly, a significant indirect effect (ab = .209, z = 2.063, p < .05). Thus, anthropomorphizing a chatbot does not only increase the perceived sensitivity of a given topic, but, as a consequence, also seems to increase public self-awareness. Given that firms are increasingly using bots as "a foot in the door technique", we finally investigated whether anthropomorphizing a bot influences "consumers" likelihood to opt for a subsequent human-human interaction. In further support of a "dark side" of anthropomorphizing machines, participants' willingness to have a follow-up conversation with an expert is marginally significantly lower for those having been assigned to the anthropomorphized condition ($M_{Anthr.}$ = 1.95 vs. $M_{Control}$ = 2.51, t(123) = -1.74, p = .084).

Figure 2: Mediation Analysis



3. General Discussion

In this study, we anthropomorphized chatbots by using utterances such as "hmm", "aha", or "well", and thus capitalized on the phatic function of language intended to signal one's presence to the communication partner and to establish/maintain a social contact. In line with social response theory (Reeves & Nass, 1996), we find that people react positively to anthropomorphized bots in a sense that they both significantly chat longer and more than with

a non-anthropomorphized bot. However, we find that anthropomorphism in human-machine interactions is likely to have several negative consequences that appear to outweigh these seemingly positive effects. First, we found that anthropomorphizing chatbots increases the perceived sensitivity of an identical topic. While this finding is interesting from a psychological perspective, it also has immediate implications for business practice. Banks, for example, that aim to decrease their consumers' perceived sensitivity of talking about their financial situation, may want to establish a technical chatbot and would be ill-advised to rely on a more human-like bot. This seems to be particularly important, as our data suggests that a technical bot may not only reduce the perceived sensitivity of a given topic, but as a consequence also reduces social evaluation concerns (i.e., people are less concerned about the way they have to present themselves). Furthermore, if firms aim to use chatbots to "get a foot in the door", our results indicate that a non-anthropomorphized bot will be more effective in regard. Our results thus also have important initial implications for customer journey management (Anderl et al., 2016).

Our results, however, should be interpreted as a starting point for a range of several unanswered but important questions. For example, it remains an interesting empirical question whether a non-technical bot is in intervention that can sustainably reduce the perceived sensitivity of topics or whether the effects are rather immediate. To further explore how perceived sensitivity and public self-awareness translate in downstream consumer behavior along the customer journey would be another fruitful path for further research. On a societal level, the results finally generally question whether humans and machines really have to merge, or whether it is rather the complementary strength of humans and machine that provide value at large. Providing answers to this critical question would be of critical importance not only to marketing, but to society at large.

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