



# Too Informal? How a Chatbot's Communication Style Affects Brand Attitude and Quality of Interaction

Christine Liebrecht<sup>1</sup>✉, Lena Sander<sup>1</sup>, and Charlotte van Hooijdonk<sup>2</sup>

<sup>1</sup> Tilburg University, PO Box 90153, 5000 LE Tilburg, The Netherlands  
C.C.Liebrecht@tilburguniversity.edu

<sup>2</sup> Utrecht University, Trans 10, 3512 JK Utrecht, The Netherlands  
C.M.J.vanHooijdonk@uu.nl

**Abstract.** This study investigated the effects of (in)formal chatbot responses and brand familiarity on social presence, appropriateness, brand attitude, and quality of interaction. An online experiment using a 2 (Communication Style: Informal vs. Formal) by 2 (Brand: Familiar vs. Unfamiliar) between subject design was conducted in which participants performed customer service tasks with the assistance of chatbots developed for the study. Subsequently, they filled out an online questionnaire. An indirect effect of communication style on brand attitude and quality of interaction through social presence was found. Thus, a chatbot's informal communication style induced a higher perceived social presence which in turn positively influenced quality of the interaction and brand attitude. However, brand familiarity did not enhance perceptions of appropriateness, indicating participants do not assign different roles to chatbots as communication partner.

**Keywords:** Chatbots · Communication style · Social presence · Conversational human voice · Brand familiarity

## 1 Introduction

Conversational agents are artificial intelligent computer programs using natural language to engage in a dialogue with users (Følstad and Skjuve 2019; Laban and Araujo 2020). These agents are increasingly being deployed by organizations in customer service settings (Følstad and Skjuve 2019; Shawar and Atwell 2007) and are designed to perform simple tasks, such as sending airline tickets, as well as more complex tasks, such as providing shopping advice (Araujo 2018; Shawar and Atwell 2007). According to the Gartner Technologies in Service Bullseye 68 per cent of the service leaders expect conversational agents will become more important in the next years (Bryan 2019). The Gartner Hype Cycle predicts that by 2021, 15 per cent of all customer service interactions will be completely handled by AI.

However, organizations experience skepticism in adopting chatbot technology in customer service (Elsner 2018; Araujo 2018). Customers tend to perceive their conversations with chatbots as unnatural and impersonal (Drift, SurveyMonkey Audience,

Salesforce and Myclever 2018). A quarter of the chatbot users even indicate to refrain from using a chatbot because it was not able to chat in a friendly manner, and 43 per cent still prefer to communicate with a human assistant (Drift et al. 2018).

This skepticism highlights a challenge in designing chatbots for customer service purposes. For organizations and designers it is important to understand how a communication style influence users' perceptions about the conversational agent and their perceptions about the organizations using these agents. The current study investigates the effects of conversational agents using an (in)formal communication style on social presence, quality of interaction, and brand attitude. In line with Gretry et al. (2017), we also investigated the moderating effect of users' brand familiarity on the relation between an (in)formal communication style and perceived appropriateness. Gretry et al. (2017) found that an informal communication style in human customer service messages was perceived appropriate for familiar brands but inappropriate for unfamiliar ones. Our study extends the role of brand familiarity and examines whether this social norm in human-to-human communication also applies for human-to-chatbot communication. In summary, we propose the following research question:

**RQ:** To what extent does an (in)formal communication style in chatbot's customer service messages and participants' brand familiarity influence perceptions of social presence, appropriateness, quality of interaction, and brand attitude?

## 2 Theoretical Background

### 2.1 Customer Service Chatbots

Customer service plays an important role in providing information and assistance to customers, strengthening their engagement with an organization, and generating revenue (Følstad and Skjuve 2019). Organizations are increasingly deploying chatbots for customer service purposes because they can provide 24/7 service and save time and money by reducing the number of service employees (Gnewuch et al. 2017). For example, there are already more than 300,000 customer service chatbots available on Facebook messenger (Jovic 2020). These chatbots are designed to execute simple tasks, such as sending airline tickets, or more complex tasks, such as giving shopping advice (Araujo 2018; Shawar and Atwell 2007).

Research on users' motivations for engaging with chatbots showed that they mainly used customer service chatbots for efficiency reasons, i.e., quickly receiving information instead of searching for information themselves or waiting in line (Brandtzaeg and Følstad 2017; Følstad and Skjuve 2019). Another aspect which is highlighted in the literature is the adoption of humanlike qualities in customer service chatbots (Araujo 2018; Go and Sundar 2019; Liebrecht and van der Weegen 2019; Verhagen et al. 2014). Especially in service encounters consumers value personal interaction and a 'human touch' (Paluch 2012; Laban and Araujo 2019) which might be achieved by adopting a humanlike communication style (Liebrecht and van Hooijdonk 2020). However, customers tend to perceive their conversations with chatbots as unnatural and impersonal (Drift et al. 2018).

## 2.2 Social Reactions to Communication Technology

The Computers Are Social Actors paradigm (CASA; Nass et al. 1994) states users are likely to respond to computers in a social manner similar to their behavior towards humans. Even adults and experienced computer users seem to apply social norms and rules mindlessly to the interactions with computers (Nass et al. 1994; Nass and Moon 2000) which are triggered through social cues (Nass and Moon 2000).

A concept that is closely related to this perception in human-to-computer interaction lies in the field of human-to-human interaction and is coined as social presence. Short et al. (1976) defined social presence as the “degree of salience of the other person in the interaction” (p. 65). Lombard and Ditton (1997) distinguished two types of social presence: presence as social within medium and medium-as-social-actor presence. The former refers to people responding to the social cues presented by the characters within the medium (Lombard and Ditton 1997). This type of social presence originates from parasocial interaction (Horton and Wohl 1956). The latter refers to peoples’ responses to the medium itself. When a medium itself presents social cues, people are likely to perceive it as a real person instead as an object. Applying the notion of medium-as-social-actor presence to chatbot communication implies that a chatbot with social cues stimulates users to perceive the chatbot as a social entity to which they react similar to as in human-to-human interaction (Lombard and Ditton 1997).

Two of the possible social cues chatbots could present are language output and the ability to respond to prior outputs of users (i.e., interactivity; Nass and Moon 2000). As chatbots typically have both cues, it may be expected that users respond to them socially. Indeed, previous research applying the CASA paradigm to chatbots (Araujo 2018; Go and Sundar 2019) found social presence, or perception of humanness, of the chatbot positively affects users’ perceptions. In this study, we focus on one specific social cue, i.e., the communication style.

## 2.3 Communication Style

As chatbots often communicate rather machinelike, some researchers have already addressed the challenge of making chatbots appear more humanlike in a customer service context. They used visual and/or linguistic cues to enhance social presence which in turn affect several attitudinal and behavioral outcomes (Araujo 2018; Go and Sundar 2019; Liebrecht and van der Weegen 2019).

Go and Sundar (2019) created two versions of a chatbot that, amongst other variables, differed in visual cues: the humanlike chatbot contained a human avatar whereas the machinelike chatbot contained a dialog bubble figure. In both cases, the agent was introduced with the name Alex. The scholars found no direct effects on social presence nor an indirect effect on attitudinal and behavioral outcomes between the humanlike and machinelike avatar. Araujo (2018), on the other hand, only used linguistic elements to differentiate between the humanlike and machinelike chatbot. Participants interacted with either a humanlike chatbot named Emma that used informal language, or a machine-like chatbot named ChatBotX that used formal language, although it remains unclear how the difference in language use was operationalized. Also, in the humanlike condition participants started the conversation with ‘hello’ and closed with ‘goodbye’ while

participants in the machinelike condition used 'start' and 'quit'. Results showed participants' emotional connection with the organization was higher after interacting with a humanlike chatbot. This effect was mediated by social presence. However, no direct effects were found between the two chatbot versions on social presence, attitude, and satisfaction with the company which could be explained by the operationalizations of the concepts (Araujo 2018).

Also, Liebrecht and van der Weegen (2019) used linguistic elements to differentiate between the humanlike and machinelike chatbot. The messages of the humanlike chatbot contained many elements of the Conversational Human Voice (i.e., CHV; Kelleher 2009; Kelleher and Miller 2006) including message personalization (e.g., personal greeting of the customer: 'Hello David'), informal language (e.g., mimicking sound and using emoticons: 'woohoo 😊'), and invitational rhetoric (e.g., showing sympathy and empathy: 'nice, have fun!') (van Noort et al. 2014). The humanlike chatbot also contained a personal name ('Booky') and avatar. The messages of the machinelike chatbot did not contain elements of CHV, had an impersonal name ('Bookbot') and the brand's logo was the avatar. Also, different scales than Araujo (2018) were used to measure social presence and brand attitude. Confirming their expectations, Liebrecht and van der Weegen (2019) showed participants' brand attitude was higher after interacting with a humanlike chatbot, which was mediated by perceived social presence.

Since Liebrecht and van der Weegen (2019) used 16 linguistic elements to operationalize the humanlike chatbot, it is unclear which linguistic element(s) caused the effects. Therefore, this study focuses solely on the (in)formality of the communication style in order to replicate their findings. According to Gretry et al. (2017) an informal communication style is easier to operationalize objectively than the concept of CHV. Citing McArthur (1992) they define an informal communication style as "common, non-official, familiar, casual, and often colloquial, and contrasts in these senses with formal" (p. 77). Since the humanlike chatbot of Liebrecht and van der Weegen (2019) also contained some elements of informal language, we expect a chatbot only adopting an informal communication style will enhance social presence which in turn positively affects brand attitude, compared to a chatbot using a formal communication style. This is reflected in Hypothesis 1a.

While investigating the effects on brand attitude gives insights into the consequences for brands, it does not give insights into perceptions of the conversation itself. For chatbot development, however, it is valuable to investigate whether the communication style matches the user's needs. Derived from Jakic et al. (2017) who investigated informal language in human customer service messages, we will also measure the impact of communication style on quality of interaction. Similar to brand attitude, we expect a chatbot with an informal communication style will enhance quality of interaction, mediated by social presence (Hypothesis 1b).

**H1:** Social presence will mediate the relation between chatbots adopting an informal communication style and users' positive evaluations of a) brand attitude, and b) quality of interaction.

## 2.4 Appropriateness and Brand Familiarity

Besides the positive effects, an informal communication style can also backfire, for example when perceived as inappropriate. This has been shown in Gretry et al.'s (2017) study. They illustrated that not only the communication style can be essential for the perceived appropriateness of the customer service message, but also the sender of the message, i.e., the brand (Gretry et al. 2017). The argumentation of Gretry et al. (2017) is grounded in Role Theory (Sarbin and Allen 1968). Based on this theory, evaluation and success of interactions depend on the appropriateness of the behavior of the interaction partner in regard to their social roles. If interaction partners are strangers, a formal communication style is considered appropriate compared to interacting with an acquaintance or friend. This theory explains the results found by Gretry et al. (2017): participants perceived an informal communication style as appropriate when they were familiar with the brand, but as inappropriate when they were unfamiliar with the brand.

Liebrecht and van der Weegen (2019) included brand familiarity as a factor in their chatbot study, but did not find a moderation effect on brand attitude. Although the scholars operationalized brand familiarity in a similar way as Gretry et al. (2017), they focused on the effects of message personalization, informal language, and invitational rhetoric together instead of solely focusing on the effects of the (in)formal communication style like Gretry et al. (2017). If people respond similar to a chatbot as to a human being, as stated by the CASA paradigm (Nass et al. 1994), and thus feel their interpersonal distance is violated if the (in)formality does not correspond to the social role in the conversation, as is suggested in literature on politeness (Stephan et al. 2010), one could assume that a closer replication of Gretry et al.'s (2017) study will result in similar outcomes. That is, we expect a chatbot's informal communication style can have a negative effect on brand attitude if people are unfamiliar with the brand, whereas it can positively impact brand attitude if people are familiar with the brand. This moderation effect will be mediated by perceived appropriateness. This expectation is reflected in Hypothesis 2a.

A similar effect will be expected with regard to quality of interaction, because Jakic et al. (2017) showed customers have expectations about the communication style of the brand. If customers' expectations about the language style align with the actual style used, quality of interaction will be perceived higher (Jakic et al. 2017). The same could be true for chatbot users and their familiarity with the brand. Our hypothesis 2b is therefore that brand familiarity will moderate the effect of communication style on quality of interaction, which will be mediated by perceived appropriateness.

**H2:** Brand familiarity will moderate the effect of communication style on a) brand attitude, and b) quality of interaction, which is mediated by perceived appropriateness.

## 3 Method<sup>1</sup>

### 3.1 Design

An online experiment following a 2 (Communication Style: Informal vs. Formal) × 2 (Brand: Familiar vs. Unfamiliar) between-subject design was conducted to test the effect

<sup>1</sup> Supplementary materials of the experiment, such as the survey and illustrative videos of the chatbots can be found here: <https://doi.org/10.17605/OSF.IO/8TGNS>.

of a chatbot's communication style on brand attitude and quality of interaction. Participants were randomly assigned to one of the four chatbot conditions in which they had three chatbot conversations about customer service topics. Afterwards, brand attitude, quality of interaction, perceived social presence, and appropriateness were measured.

### 3.2 Participants

Initially, 131 participants took part in the experiment. Nine participants were removed from the dataset because they did not consent, or did not succeed in any of the chatbot conversations. The final sample of 122 participants consisted of a quite balanced gender distribution (64.8% female participants) with a mean age of 26.48 ( $SD = 7.93$ ) years (range 19–61 years). Most participants were highly educated with 66.4% participants holding a bachelor's degree or higher. The participants in the four conditions were comparable concerning gender ( $\chi^2(6) = 4.69, p = .59$ ), age (Welch's  $F(3,59.90) = 2.16, p = .10$ ), and education level ( $\chi^2(12) = 7.29, p = .84$ ), see Table 1.

**Table 1.** Characteristics of participants per experimental condition.

Condition	<i>N</i>	Education			Gender		Age
		Sec. School/other	Bachelor degree	Master degree	Male	Female	<i>M (SD)</i>
Informal* Unfamiliar	29	10	12	7	10	19	24.34 (4.05)
Formal* Unfamiliar <sup>a</sup>	34	11	19	4	10	23	25.12 (4.02)
Informal* Familiar	33	11	16	6	10	23	28.94 (11.58)
Formal* Familiar	26	8	11	7	12	14	27.54 (8.74)
Total	122	32	58	23	42	79	26.48 (7.93)

<sup>a</sup>One participant in this condition did not prefer to indicate gender.

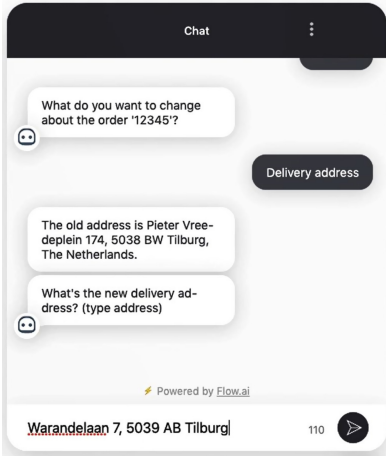
### 3.3 Chatbot Development

The chatbots were developed with Flow.ai, a platform with which conversation flows for chatbots for customer service or marketing contexts can be developed and implemented (<https://flow.ai/>, see also Liebrecht and van der Weegen 2019).

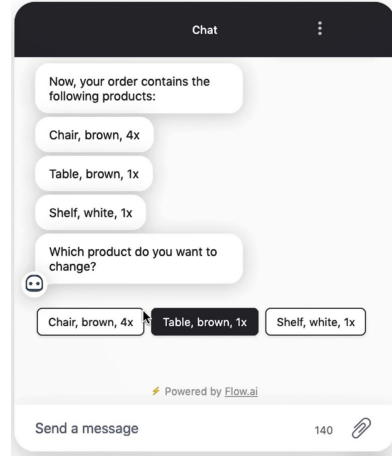
For each conversation, a conversation flow was created and trained on the most likely responses participants could give. Participants could send messages by typing their responses in the chatbot's text boxes (see Fig. 1). In order to avoid communication errors, the bots offered participants also reply buttons corresponding with the tasks that participants were asked to fulfil (see Fig. 2). To enhance the validity of the chatbot

some filler buttons were added. Buttons are oftentimes used to direct users through the chatbot's tree structure (Pricilla et al. 2018).

Furthermore, the chatbots were able to lead participants back to a previous step of the conversation flow in case they deviated from the scenario instructions, for example by stating the chosen option was out of stock. After the development of these basic chatbots, the four conditions were created in which the communication style and brand differed. Illustrative videos of the chatbots can be found in the online appendix.



**Fig. 1.** Example of the chatbot asking users to type in the answer via the text box.



**Fig. 2.** Example of directing users through the conversation flow via reply buttons.

### 3.3.1 Communication Style

The operationalization of the informal versus formal communication style was based on a selection of different linguistic elements from Gretry et al. (2017), and the operationalizations of informal language in Liebrecht and van der Weegen (2019) and Jakic et al. (2017). In their literature review on the linguistic manipulations of CHV, Liebrecht, Tsaousi and van Hooijdonk (under review) divided informal language manipulations into non-verbal and verbal cues. Non-verbal linguistic cues are used to mimic non-verbal cues from face-to-face conversations, whereas verbal cues comprise the use of words in an informal way. Following their classification, the informal language manipulations used in the current study can be labeled into four non-verbal and four verbal cues (see Table 2). Figure 3 shows differences in communication style between the chatbot conditions. A manipulation check confirmed participants in the informal chatbot conditions rated the communication style as more informal than participants in the formal chatbot conditions (on a 7-point scale:  $M = 5.48$ ,  $SD = 1.04$ , versus  $M = 3.78$ ,  $SD = 1.23$ ,  $t(120) = 8.27$ ,  $p = .001$ ).

**Table 2.** Manipulation of two different chatbot communication styles.

Linguistic element	Informal (example)	Formal (example)	Source
<i>Non-verbal cues</i>			
Emoticons	☺ ☹	-	Gretry et al. (2017); Liebrecht and van der Weegen (2019)
Capital letters	BYE, THANKS	-	Gretry et al. (2017); Liebrecht and van der Weegen (2019)
Sound mimicking	Aww, woohoo	-	Gretry et al. (2017); Liebrecht and van der Weegen (2019)
Informal punctuation	???, !!!	?, !	Gretry et al. (2017); Liebrecht and van der Weegen (2019)
<i>Verbal cues</i>			
Contractions and Shortenings	That's, ASAP	That is, as soon as possible	Gretry et al. (2017)
Active (versus passive) voice	Do you want to change something about your order?	Is there something to be changed about your order?	Gretry et al. (2017); Liebrecht and van der Weegen (2019)
Informal vocabulary	Great, awesome	-	Jakic et al. (2017); Gretry et al. (2017)
Present tense	Do	Would	Gretry et al. (2017)

### 3.3.2 Brand Familiarity

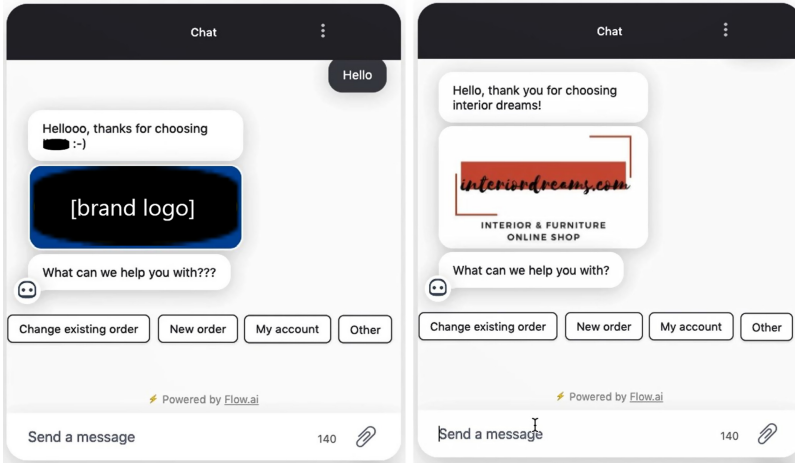
Brand familiarity was manipulated by using two different brands. Following the operationalizations of Gretry et al. (2017) and Liebrecht and van der Weegen (2019) an existing (familiar) and fictitious (unfamiliar) brand was used. Since the current study's context was furniture, we selected a well-known brand as familiar brand which was verified in a pretest. The fictitious brand was named Interiordreams.com.

Similar to Liebrecht and van der Weegen (2019), the brands were briefly presented prior to every chatbot conversation. To strengthen the presence of the brand manipulation, the companies were described as either a very successful and well-known seller of furniture or a recently founded online shop for furniture (Interiordreams.com). Furthermore, the brand logo and name were displayed in the scenario's and in the first and last message of the chatbot (i.e., 'Thank you for choosing [brand]<sup>2</sup>') (see Fig. 3). A manipulation check revealed the manipulation of brand familiarity was successful. Participants

<sup>2</sup> Brand name for purpose of publication.



rated the well-known brand as a familiar brand compared to the fictitious brand (on a 7-point scale:  $M = 5.89$ ,  $SD = 1.26$  versus  $M = 2.19$ ,  $SD = 1.32$ ,  $t(120) = 15.81$ ,  $p = .001$ ).



**Fig. 3.** Examples of brand manipulation when opening the chatbot conversation (informal\*familiar (logo for publication) versus formal\*unfamiliar).

### 3.4 Measures

All items were measured on 7-point Likert scales (1 = strongly disagree, 7 = strongly agree). Brand attitude was measured on an eight-item scale. Items were translated from the scale used by Liebrecht and van der Weegen (2019). Participants indicated whether they perceived [brand] as e.g., *likeable*, *uninterested* (reversed item), and *respectful*. The scale was found reliable (Cronbach's  $\alpha = .84$ ,  $M = 5.38$ ,  $SD = 0.85$ ).

Quality of interaction was measured on a scale adapted from Jakic et al. (2017). The scale was adjusted, so participants evaluated the communication with brands based on three items, such as: *The interaction with [brand] is excellent*. The scale was found reliable (Cronbach's  $\alpha = .93$ ,  $M = 5.27$ ,  $SD = 1.28$ ).

Social presence was measured, similar to Liebrecht and van der Weegen (2019), with five items. Participants were asked to indicate their feelings regarding the conversation with the chatbot using items such as: *I felt a sense of human contact, human warmth, and sensitivity*. The scale was found reliable (Cronbach's  $\alpha = .92$ ,  $M = 3.87$ ,  $SD = 1.39$ ).

Perceived appropriateness was assessed with a three-item scale, adapted from Gretry et al. (2017). An example of an item is: *The communication style of [brand] corresponds with how I expect to communicate with me*. The scale was found reliable (Cronbach's  $\alpha = .90$ ,  $M = 5.10$ ,  $SD = 1.28$ ).

### 3.5 Procedure

After receiving approval through the Research Ethics and Data Management Committee of Tilburg University, data were collected between November 19th and December 2nd, 2019 through an online survey in Qualtrics. Participants were recruited through network sampling, i.e., mainly through social media posts and email requests of the researchers, and the survey exchange platform 'survey circle'. After giving informed consent, participants received a general introduction into the study and general instructions on the chatbot conversations.

Participants were asked to imagine themselves as customer of a furniture brand. Using three scenarios, participants interacted with one of the four chatbot conditions about customer service issues, such as ordering new furniture products, or changing details of an existing order. Participants accessed the chatbot through a link in the survey. After the three chatbot conversations, they filled in the survey that measured the dependent and mediating variables. Lastly, the participants were thanked and debriefed regarding the purpose of the study. It was disclosed that the chatbots were developed solely for the purpose of the experiment and the brands were not involved in the study. Participation took around 14 min, and participants did not receive any compensation.

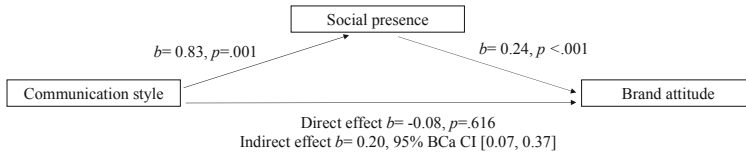
## 4 Results

### 4.1 Communication Style and Social Presence

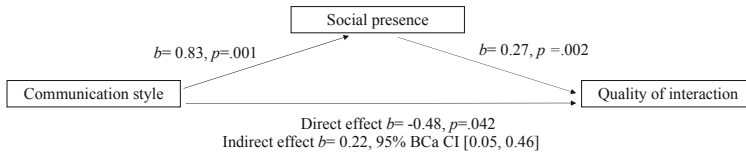
Two mediation analyses were conducted using Hayes' PROCESS model 4 (Hayes 2017) to test the effect of communication style on respectively brand attitude or quality of interaction, and the mediating effect of social presence.

The first mediation analysis revealed no significant total effect of communication style on brand attitude,  $b = 0.13$ ,  $SE = 0.15$ ,  $p = .41$ . This effect remained insignificant when adding social presence as a mediator in the model,  $b = -0.08$ ,  $SE = 0.15$ ,  $p = .62$ . However, a significant indirect effect of communication style on brand attitude through social presence was found,  $b = 0.20$ ,  $SE = 0.08$ , 95% BCa CI [0.07, 0.37]. Overall, the model summary indicated that the mediation model was significant (see Fig. 4). Thus, an informal communication style leads to higher social presence which, in turn, results in higher brand attitude. This supports Hypothesis 1a.

The second mediation analysis investigating the effect of communication style and social presence revealed an insignificant total effect of communication style on quality of interaction,  $b = -0.26$ ,  $SE = 0.23$ ,  $p = .26$ . This effect became significant when adding the mediator of social presence in the model,  $b = -0.48$ ,  $SE = 0.23$ ,  $p = .04$ . Furthermore, the indirect effect of communication style on brand attitude through social presence was significant and positive,  $b = 0.22$ ,  $SE = 0.10$ , 95% BCa CI [0.05, 0.46]. Overall, the model summary indicated the mediation model was significant (see Fig. 5). Again, informal communication resulted in higher social presence which, in turn, impacted quality of interaction. This supports Hypothesis 1b.



**Fig. 4.** Indirect effect of communication style (formal/informal) on brand attitude, mediated through social presence.

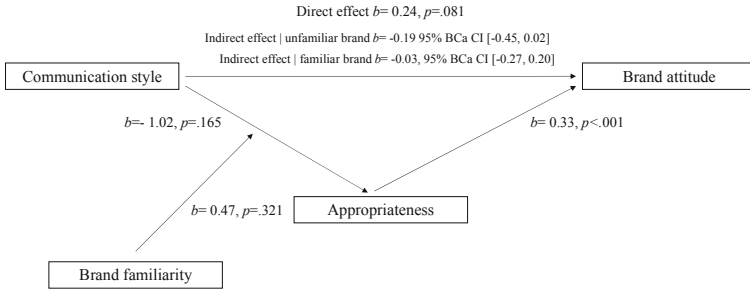


**Fig. 5.** Indirect effect of communication style (formal/informal) on quality of interaction, mediated through social presence.

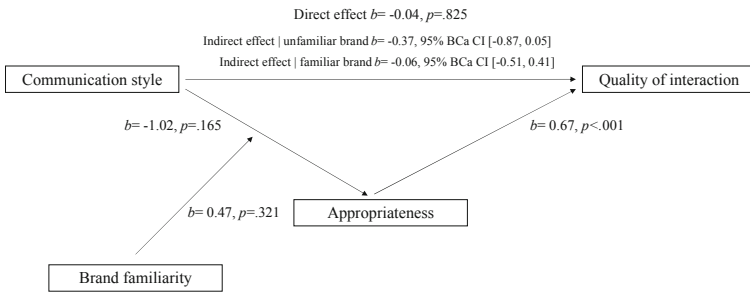
### 4.2 Appropriateness of Communication Style and Brand Familiarity

To test Hypothesis 2, two moderated mediation analyses using Hayes’ PROCESS model 7 (Hayes 2017) were conducted. In the first moderated mediation analysis appropriateness was the mediating variable between communication style and brand attitude and brand familiarity was the moderator. Figure 6 summarizes the model and its effects on brand attitude. The analysis revealed that communication style did not have a significant effect on appropriateness,  $b = -1.02, SE = 0.73, p = .17$ . Brand familiarity did not have a significant effect on appropriateness as well,  $b = -0.70, SE = 0.74, p = .35$ . Furthermore, there was no significant interaction effect of communication style and brand familiarity,  $b = 0.47, SE = 0.47, p = .32$ . There was also no significant direct effect of communication style on brand attitude when adding appropriateness as mediator and brand familiarity as moderator in the model,  $b = 0.24, SE = 0.13, p = .08$ . Furthermore, there was neither a significant indirect effect of communication style on brand attitude through appropriateness for the unfamiliar brand,  $b = -0.19, SE = 0.12, 95\% BCa CI [-0.45, 0.02]$  nor for the familiar brand,  $b = -0.03, SE = 0.12, 95\% BCa CI [-0.27, 0.20]$ . However, a significant positive effect of appropriateness on brand attitude was found,  $b = 0.33, SE = 0.05, p < .001$ . Thus, Hypothesis 2a was rejected.

The moderated mediation analysis was repeated with quality of interaction as outcome variable (see Fig. 7). Again, there was no significant direct effect of communication style on quality of interaction when adding appropriateness as mediator and brand familiarity as moderator in the model,  $b = -0.04, SE = 0.17, p = .83$ . Furthermore, there was neither a significant indirect effect of communication style on brand attitude through appropriateness for the unfamiliar,  $b = -0.37, SE = 0.24, 95\% BCa CI [-0.87, 0.05]$  nor for the familiar brand,  $b = -0.06, SE = 0.23, 95\% BCa CI [-0.51, 0.41]$ . However a positive effect of appropriateness on quality of interaction was found,  $b = 0.67, SE = 0.07, p < .001$ . Although no evidence was found for Hypothesis 2b, we did find a positive relation between appropriateness and brand attitude, and quality of interaction.



**Fig. 6.** Moderated mediation of the effect of communication style (formal/informal) on brand attitude.



**Fig. 7.** Moderated mediation of the effect of communication style (formal/informal) on quality of interaction.

## 5 Conclusion and Discussion

Since customers tend to perceive chatbot conversations as unnatural and impersonal (Drift et al. 2018) and they value a ‘human touch’ in service interactions (Paluch 2012; Laban and Araujo 2019), the current study examined which mechanisms come into play if customer service chatbots use (in)formal language. Drawing upon the CASA paradigm (Nass et al. 1994) which states that users react similar to computers as to human beings, we expected to find similar positive and negative results of an informal communication style in a human-to-chatbot context as has been found in prior research in a human-to-human customer service setting (Gretry et al. 2017).

Our study revealed a chatbot’s informal communication style positively influences quality of the interaction and brand attitude if participants perceived high levels of social presence (i.e., the perception of actually communicating with another human being; Short et al. 1976). These findings consolidate prior results in both a human-to-human (Park and Lee 2013) and human-to-chatbot context (Liebrecht and van der Weegen 2019). The findings furthermore indicate that it is relevant to investigate the (in)formal communication style of chatbots as an isolated factor (in contrast to Araujo (2018) and Liebrecht and van der Weegen (2019)) and to measure a chatbot’s social presence by means of perceived warmth, intimacy, and sociability (similar as Liebrecht and van der Weegen (2019), but different from Araujo (2018)).

Building on Role Theory (Sarbin and Allen 1968), a negative effect was expected when the communication style was perceived inappropriate which could be moderated through brand familiarity. This effect appeared in a human-to-human context (Gretry et al. 2017), but our study did not replicate this result. The informal communication style of a chatbot was not considered inappropriate, and participants' familiarity with the brand did not influence this relation. Since Liebrecht and van der Weegen (2019) did not find evidence for this moderating effect of brand familiarity as well, it can be reasoned that in a human-to-chatbot customer service setting customers apparently do not assign different roles to chatbots as communication partner.

The current study contributes to our theoretical understanding how customers perceive a chatbot's communication style and the mechanisms that could explain the effects. Participants seem to react to a certain extent similar to computers as to human beings, as is stated in the CASA paradigm (Nass et al. 1994), and the usage of a humanlike communication style could strengthen this even more because users indicate to experience a higher level of social presence (Short et al. 1976). However, boundaries could appear in assigning social roles to computers compared to a human-to-human customer service setting. Since effects of brand familiarity and appropriateness are not confirmed in human-to-chatbot interaction, customers might have less expectations regarding the role and communication style of their programmed communication partner.

Based on the present findings, practical guidelines regarding the communication style of chatbots can be formulated. In order to design a 'human touch' in the messages of customer service chatbots (non)verbal elements of an informal communication style could be added. These linguistic cues enhance the perception of social presence which in turn can improve the quality of interaction and brand attitude. In turn, brands can profit from a high quality of interaction as it is partly contributing to the whole concept of service quality (Brady and Cronin 2001) and can furthermore increase brand trust and loyalty (Zehir et al. 2011). Although informal communication style did not influence the perceived appropriateness, brands could use the present insights by reflecting on characteristics of their target groups and their expectations on chatbot communication in a customer service setting to improve social presence, quality of interaction, and brand attitude.

## 5.1 Limitations and Directions for Future Research

In order to gain a deeper understanding of mechanisms behind customers' perceptions of humanlike chatbots, more research is needed that take the following limitations into account. First of all, the participants' existing experience with chatbots could influence their perceptions of the chatbot conversation. Our participants indicated to be moderately experienced with chatbots. Given their greater experience with human-to-human interactions, it is reasonable to assume they do have expectations about social roles and appropriate communication styles in this context (as stated by Role Theory), but not yet in a chatbot context. Furthermore, based on Social Learning Theory (Bandura and Walters 1977), people learn from the observation and imitation of other humans, yet it is possible to assume that this does not apply to chatbot conversations. In fact, users might not yet have engaged in a sufficient number of chatbot conversations nor

observed enough human-to-chatbot interactions to judge whether the specific communication style of a chatbot is appropriate. Future research could investigate the perceptions of appropriateness concerning the chatbot's communication style between more and less experienced chatbot users.

Second, an additional measure in the manipulation check revealed that participants who interacted with the informal chatbots also perceived its communication style as more personalized compared to participants interacting with the formal chatbots. An explanation could be that some informal language manipulations were perceived as personal, i.e., active voice operationalizations oftentimes contained personal pronouns like 'you' and 'I' (compare: 'You ordered the item 'chair' four times' versus 'The item 'chair' was ordered four times') while in CHV research these linguistic elements are categorized as message personalization features (van Hooijdonk and Liebrecht 2018). On the other hand, this finding could indicate that informal language and message personalization are closely related, which consolidates the multiple strategies to operationalize the concept of CHV (Kelleher 2009; Kelleher and Miller 2006). Future research should therefore investigate to what extent personalization and informal speech are perceived as separated concepts.

Lastly, despite the improved manipulation of brand familiarity in the current study, no moderating effects of the brand were found, confirming Liebrecht and van der Weegen's (2019) findings. Before drawing the conclusion that brand familiarity does not affect customers' perceptions of a chatbot's communication style, it is highly recommended to take the customers' own experiences regarding the existing brand into account. After all, the brand's reputation or previous service encounter experiences with the brand could affect their perceptions of the chatbot's communication style. Furthermore, differences in brands' communication styles can be observed, both between industries and between competitors (Liebrecht et al., submitted), which could create consumers' expectations regarding the chatbot's communication style. For example, the well-known brand's communication style is rather informal in all communication channels, which rise expectations on the communication style of their chatbot. Besides alignment between the brands regular communication style and its chatbot's communication style, alignment with the customers' style could be important as well. Since Jakic et al. (2017) showed beneficial effects of language style accommodation in human customer service messages, and Liebrecht and van Hooijdonk's (2020) results are promising regarding automatization of language style accommodation, it is worthwhile to continue research that enables us to develop chatbots that tailor conversations in a human way.

## References

- Følstad, A., Skjuve, M.: Chatbots for customer service: user experience and motivation. In: Proceedings of the 1st International Conference on Conversational User Interfaces – CUI 209. ACM, New York (2019)
- Laban, G., Araujo, T.: Working together with conversational agents: the relationship of perceived cooperation with service performance evaluations. In: Følstad, A. (ed.) CONVERSATIONS 2019. LNCS, vol. 11970, pp. 215–228. Springer, Cham (2020). [https://doi.org/10.1007/978-3-030-39540-7\\_15](https://doi.org/10.1007/978-3-030-39540-7_15)
- Shawar, B., Atwell, E.: Chatbots: are they really useful? LDV Forum **22**, 29–49 (2007)

- Araujo, T.: Living up to the chatbot hype: the influence of anthropomorphic design cues and communicative agency framing on conversational agent and company perceptions. *Comput. Hum. Behav.* **85**, 183–189 (2018)
- Bryan, J.: Service leaders expect use of AI and virtual customer assistants to gain importance in the future (2019). <https://www.gartner.com/smarterwithgartner/bots-gain-importance-in-gartner-service-technologies-bullseye/>. Accessed 24 Aug 2020
- Elsner, N.: KAYAK mobile travel report: Chatbots in the UK (2017). <https://www.kayak.co.uk/news/mobile-travel-report-2017/>. Accessed 09 Nov 2020
- Drift, SurveyMonkey Audience, Salesforce, Myclever: The 2018 State of Chatbots Report. How chatbots are reshaping online experiences (2018). <https://www.drift.com/wp-content/uploads/2018/01/2018-state-of-chatbots-report.pdf>. Accessed 01 Sept 2019
- Gretry, A., Horváth, C., Belei, N., van Riel, A.: “Don’t pretend to be my friend!” when an informal brand communication style backfires on social media. *J. Bus. Res.* **74**, 77–89 (2017)
- Gnewuch, U., Morana, S., Maedche, A.: Towards designing cooperative and social conversational agents for customer service. In: Proceedings of the International Conference on Information Systems (ICIS) (2017)
- Jovic, D.: The Future is Now – 37 Fascinating Chatbot Statistics. *Smallbizgenius*, 13 August 2020. <https://www.smallbizgenius.net/by-the-numbers/chatbot-statistics/#gref>
- Brandtzaeg, P.B., Følstad, A.: Why people use chatbots. In: Kompatsiaris, I. (ed.) INSCI 2017. LNCS, vol. 10673, pp. 377–392. Springer, Cham (2017). [https://doi.org/10.1007/978-3-319-70284-1\\_30](https://doi.org/10.1007/978-3-319-70284-1_30)
- Go, E., Sundar, S.S.: Humanizing chatbots: the effects of visual, identity and conversational cues on humanness perceptions. *Comput. Hum. Behav.* **97**, 304–316 (2019)
- Liebrecht, C., van der Weegen, E.: Menselijke chatbots: een zegen voor online klantcontact? Het effect van conversational human voice door chatbots op social presence en merkattitude. *Tijdschrift voor Communicatiewetenschap* **47**, 217–238 (2019)
- Verhagen, T., van Nes, J., Feldberg, F., van Dolen, W.: Virtual customer service agents: using social presence and personalization to shape online service encounters. *J. Comput.-Mediated Commun.* **19**(3), 529–545 (2014)
- Paluch, S.: Remote service technology perception and its impact on customer-provider relationships: an empirical exploratory study in a B-to-B-setting. *Gabler Verlag, Wiesbaden* (2012)
- Liebrecht, C., van Hooijdonk, C.: Creating humanlike chatbots: what chatbot developers could learn from webcare employees in adopting a conversational human voice. In: Følstad, A. (ed.) CONVERSATIONS 2019. LNCS, vol. 11970, pp. 51–64. Springer, Cham (2020). [https://doi.org/10.1007/978-3-030-39540-7\\_4](https://doi.org/10.1007/978-3-030-39540-7_4)
- Nass, C., Steuer, J., Tauber, E.R.: Computers are social actors. In: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, pp. 72–78. ACM (1994)
- Nass, C., Moon, Y.: Machines and mindlessness: social responses to computers. *J. Soc. Issues* **56**, 81–103 (2000)
- Short, J., Williams, E., Christie, B.: *The Social Psychology of Telecommunications*. Wiley, Londen (1976)
- Lombard, M., Ditton, T.: At the heart of it all: the concept of presence. *J. Comput.-Mediated Commun.* **3**(2), JCMC321 (1997)
- Horton, D., Wohl, R.: Mass communication and para-social interaction: observations on intimacy at a distance. *Psychiatry* **19**(3), 215–229 (1956)
- van Noort, G., Willemsen, L., Kerkhof, P., Verhoeven, J.: Webcare as an integrative tool for customer care, reputation management, and online marketing: a literature review. In: Kitchen, P.J., Uzunoglu, E. (eds.) *Integrated Communications in the Post-Modern Era*, pp. 77–99. Palgrave Macmillan, London (2014)

- McArthur, T.: *The Oxford companion to the English language*. Oxford University Press, Oxford (1992)
- Jacic, A., Wagner, M.O., Meyer, A.: The impact of language style accommodation during social media interactions on brand trust. *J. Serv. Manag.* **28**(3), 418–441 (2017)
- Sarbin, T., Allen, V.: *Role Theory*. Addison-Wesley, *Handbook of Social Psychology*. Reading (1968)
- Stephan, E., Liberman, N., Trope, Y.: Politeness and psychological distance: a construal level perspective. *J. Pers. Soc. Psychol.* **98**, 268–280 (2010)
- Pricilla, C., Lestari, D.P., Dharma, D.: Designing interaction for chatbot-based conversational commerce with user-centered design. In: *5th International Conference on Advanced Informatics: Concept Theory and Applications (ICAICTA)*, pp. 244–249 (2018)
- Liebrecht, C., Tsaousi, C., van Hooijdonk, C.: Linguistic elements of conversational human voice in online brand communication: manipulations and perceptions. *J. Bus. Res.* (under review)
- Hayes, A.: *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach*. Guilford Publications, New York (2017)
- Park, H., Lee, H.: Show us you are real: the effect of human-versus-organizational presence on online relationship building through social networking sites. *Cyberpsychol. Behav. Soc. Netw.* **16**(4), 265–271 (2013)
- Kelleher, T.: Conversational style, communicated commitment, and public relations outcomes in interactive online communication. *J. Commun.* **59**, 172–188 (2009)
- Brady, M.K., Cronin, J.J., Jr.: Some new thoughts on conceptualizing perceived service quality: a hierarchical approach. *J. Mark.* **65**(3), 34–49 (2001)
- Zehir, C., Şahin, A., Kitapçı, H., Özşahin, M.: The effects of brand communication and service quality in building brand loyalty through brand trust; the empirical research on global brands. *Procedia-Soc. Behav. Sci.* **24**, 1218–1231 (2011)
- Bandura, A., Walters, R.: *Social Learning Theory*. Prentice-Hall, Englewood Cliffs (1977)
- van Hooijdonk, C., Liebrecht, C.: “Wat vervelend dat de fiets niet is opgeruimd! Heb je een zaaknummer voor mij? ^EK”. *Conversational human voice in webcare van Nederlandse gemeenten*. *Tijdschrift voor Taalbeheersing* **40**(1), 45–82 (2018)
- Kelleher, T., Miller, B.: Organizational blogs and the human voice: relational strategies and relational outcomes. *J. Comput.-Mediated Commun.* **11**, 395–414 (2006)