Can Chatbots Be Persuasive?
How to Boost the Effectiveness of Chatbot Recommendations for Increasing Purchase Intention

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Abstract

Firms increasingly invest in chatbots that provide purchase recommendations. However, customers often reject recommendations by chatbots because they find neither the contents of the recommendation (message-level persuasiveness) nor the chatbot itself (source-level persuasiveness) persuasive. To overcome these barriers and increase purchase intention, this study examines how the content of recommendation messages should be designed and which communication style the chatbot should use to provide recommendation messages. Results of a 2 (two-sided vs. one-sided recommendation message) × 3 (warm vs. competent vs. neutral communication style) between-subject online experiment show that a two-sided recommendation message increases purchase intention, but only for chatbots using a warm or competent communication style. Whereas a warm chatbot leads to higher purchase intentions of a recommendation through promoting its source persuasiveness, a competent chatbot increases recommendation effectiveness by promoting message persuasiveness. Therefore, firms should refine a chatbot's communication style for providing recommendations that persuade customers to purchase.

Keywords: persuasive communication, chatbot, two-sided recommendation message, humanization, communication style

1. Introduction

Firms increasingly use chatbots on their websites or messaging applications to enable real-time conversations with customers during the shopping process (Hildebrand & Bergner, 2021). Since 2018, firms have increased their adoption of sales-oriented artificial intelligence (AI) technologies including chatbots by 186% (Salesforce Research, 2020). Chatbots are text-based customer interfaces that use natural language processing, machine learning, and AI to imitate human-to-human communication (Rapp et al., 2021). Providing appropriate purchase recommendations has been identified as a key factor for assuring that conversational commerce through chatbots increases firm profits (Liao & Sundar, 2022). This poses new challenges for firms as customers feel currently uncomfortable seeking support for their shopping decisions through targeted product recommendations of a chatbot (Luo et al., 2019). The first challenge is that customers often perceive a recommendation message provided by a chatbot as less persuasive compared to human employees (Luo et al., 2019). Conceivably, this reaction relates to the perceived poor quality of the sales arguments, presented to the customer by the chatbot during a product recommendation (Schmitt et al., 2021). The second challenge is that customers often evaluate chatbots as a less persuasive source of product recommendations due to their lack of personal feelings and empathy (Luo et al., 2019). Customers assume that chatbots do not have autonomous goals and intentions and are merely acting in the firm's interest (Kim & Duhachek, 2020).

A well-known approach to interpersonal face-to-face (F2F) communication is the two-sided (vs. one-sided) message to address these two key challenges of less persuasive recommendations of chatbots (Eisend, 2006). Two-sided recommendation messages convey verbally positive as well as voluntarily negative product features about the recommended product. In contrast, in one-sided recommendation messages, the message sender provides only positive features of the recommended product (Crowley & Hoyer, 1994; Eisend, 2007). However, to the best of our knowledge, no study has so far examined this promising method of persuasive communication in the context of chatbots as digital shopping assistants. F2F communication is the most natural and effective way for two people to exchange interpersonal messages, so two-sided persuasive messaging works quite well in this context. But this naturalness decreases when communicating with text-based chatbots (Kock, 2005), so it is important

to examine the persuasive communication strategy in this context as well. Therefore, we aim to answer the following first research question (RQ):

RQ_1: How does a two-sided (vs. one-sided) recommendation message from the chatbot affect the customer's purchase intention through the perceived persuasiveness of the recommendation message and source?

In addition, studies from the F2F research field have also shown that communicating negative product features does not always lead to higher persuasiveness (Eisend, 2006) and purchase intention (Eisend, 2007). It was identified that source-related characteristics could affect two-sided recommendation messages leading to positive behavioral intentions due to heuristic processing (Petty & Cacioppo, 1986). Heuristic processing uses simplifying decision rules such as rules of thumb, which affect the persuasion rating of messages and sources (Petty & Cacioppo, 1986). In addition, in the sales process, customers prefer humans over chatbots (Luo et al., 2019). Because of this, firms aim to make chatbots more anthropomorphic through humanizing the chatbot's communication style (Feine et al., 2019). Therefore, it is essential to address the humanization of chatbots. Anthropomorphism is a fundamental psychological process that aims to explain social interactions between humans and non-humans (Blut et al., 2021). In human interactions, the Stereotype Content Model (SCM) defines social perceptions of the counterpart along two universal dimensions: warmth and competence (Fiske et al., 2002). Both dimensions influence different attributes, in that competently perceived social counterparts promote transactional outcomes in sales by being able to show a certain ability, and warmly perceived social counterparts foster relationship-building (Fiske et al., 2007; Güntürkün et al., 2020). In addition, research on persuasive communication has identified a so-called matching effect, which states that a connection between the message sender and the two-sided recommendation messages can increase the effectiveness of the message (Cesario et al., 2004). Meaning, both dimensions of social perception can thus shape different effects of two-sided vs. one-sided messages in terms of message- and source-level persuasiveness. Accordingly, it is of interest to investigate whether humanized chatbots (using a warm or competent communication style) can communicate the recommendation messages more persuasively than non-humanized chatbots (using a neutral communication style) and whether warm or competent communication styles have different impacts on the effect of the recommendation message. Thus, we aim to answer the following second research question:

RQ_2: How does the communication style (warm vs. competent vs. neutral) of the chatbot shape the effectiveness of a two-sided (vs. one-sided) recommendation message from the chatbot?

In answering these two research questions, our study contributes to research on conversational commerce in several ways. First, our results demonstrate that two-sided recommendation messages without humanization of the chatbot neither affect the persuasiveness of the recommendation message nor the persuasiveness of the chatbot and thus do not increase purchase intention. Second, we contribute to research on the humanization of chatbots by providing support that humanized chatbots have a positive impact on the effect of a two-sided recommendation message. Our results show that a warm communication style of the chatbot generates an effect of the two-sided message on the perceived persuasiveness of the chatbot, and a competent communication style induces an effect of the two-sided message on the perceived persuasiveness of the recommendation message. Third, both the message- and source-level persuasiveness significantly increase the intention to purchase the recommended product. Our findings indicate that firms intending to use the two-sided recommendation message approach need to humanize their chatbot to ensure a more effective persuasion message. Figure 1 illustrates our research framework.

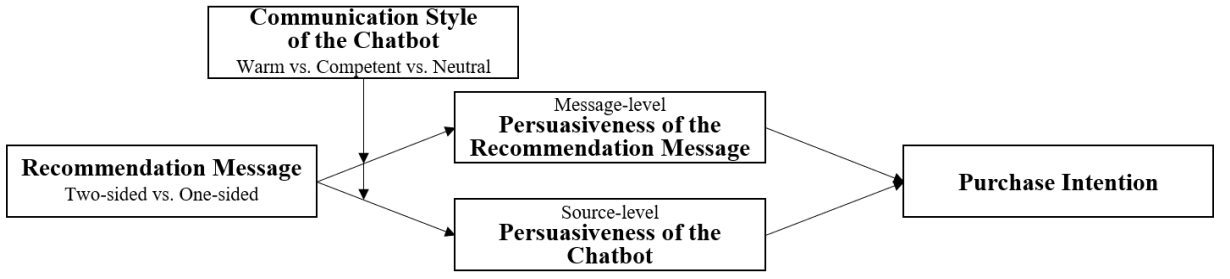

Figure 1. Research framework

2. Current state of research

2.1. Persuasive communication by chatbots

Following the definition of Perloff (1993), we define persuasive communication as a process in which the message sender uses a verbal message to convince the message receiver to change his or her behaviors about a certain issue. It is thereby postulated that the receiver of the persuasive message has in principle the freedom of choice to accept or reject the message. Persuasive communication often uses heuristics and rules of thumb that cognitively relieve the customer and help them to think and decide faster (Benner et al., 2021). Prior chatbot research focuses on three different persuasive communication strategies: persuasive requests, digital nudging, and personalized recommendations. First, study results on persuasive requests show that customers are more willing to donate when they get a personalized (vs. non-personalized) request from a chatbot they perceive as human (Shi et al., 2020), and customers who were confronted with the foot-in-the-door technique (i.e., the successive increase of explicit requests; Cialdini, 2009) and a humanized chatbot were more likely to follow the chatbot's request (Adam et al., 2021). Second, Benner et al. (2021) identify digital nudging (i.e., small design elements; Weinmann et al., 2016) as an easy-to-implement and successful persuasive technique in the context of online product recommendations. Third, the positive effect of personalized product recommendations on purchase intention has already been confirmed (e.g., Rhee & Choi, 2020; Liao & Sundar, 2022; Xiao & Benbasat, 2007). So far, there is no research on two-sided (vs. one-sided) recommendation messages in the context of chatbots. This research review shows on the one hand that different persuasive strategies can positively influence the (purchase) decisions of customers, thus this is a generally promising approach, and on the other hand that human-like design elements are important for the effectiveness of these strategies, especially in the context of text-based chatbots, where the naturalness of the conversation is low.

2.2. Social perception of chatbots

Anthropomorphism is not a new concept; indeed, it has been widely observed in a variety of contexts, including various AI-based assistants (Blut et al., 2021). The humanization of chatbots essentially contributes to satisfying two basic customer needs: the need for social relationships and understanding as well as the need for control (Epley et al., 2008). Previous studies have shown that using anthropomorphic cues has significant effects on the perceived social presence of chatbots and therefore on customers' engagement with the firm, brand, or technology (Araujo, 2018; Feine et al., 2019; Kull et al., 2021). Moreover, studies investigating the impact of humanized chatbots in a purchase context showed, first, that message interactivity positively influences the agent's evaluation, attitude toward the website, and the customer's behavioral intention to return to the website (Go & Sundar, 2019). Second, a warm (vs. a competent) conversational style leads to stronger positive attitudes towards the brand as well as a higher intention of the customer to buy the recommended product (Roy & Naidoo, 2021). Based on the SCM, the two key dimensions of warmth and competence can be identified as two universal dimensions of the social perception of the humanoid counterpart (Fiske et al., 2002). The model postulates that along these two dimensions, judgment or characterization of social counterparts take place when customers interact for the first time with them (Fiske et al., 2007). The warmth dimension describes whether the social counterpart intends something good and is often associated with friendliness, caring, as well as sincerity. The competence dimension, on the other hand, describes whether the social counterpart is capable of achieving certain goals and is associated with intelligence, efficiency, and ability (Fiske et al., 2007). Warmth and competence perceptions in text-based chatbot interactions can be fostered through humanizing the chatbot's communication style.

3. Hypotheses development

Recommendation messages can vary in terms of content quality, which in turn influences the success of such messages (Petty & Cacioppo, 1984; Petty & Wegener, 2014). When interacting with non-humanized chatbots in a shopping context, the customer can mistrust the chatbot (Benbasat & Wang, 2005) and conceivably expects that the chatbot presents the recommended product as favorably as possible using a one-sided message of positive product features. Consequently, we assume that a one-sided recommendation message from the chatbot corresponds precisely to customers' expectations and is therefore not very persuasive. If an additional negative product feature is voluntarily presented in the course of a two-sided recommendation message, however, it is contrary to customers' expectations as well as negative thoughts and thus leads to greater persuasiveness and purchase intentions. This holistic product presentation is advantageous because customers do not assume that the product has only positive features and thus do not search for counterarguments themselves anyway (Wolfe et al., 2009). Such presentation of product features leads to the

heuristic that customers were provided with a higher quality recommendation message, as the chatbot voluntarily mentions negative product features. By systematically mentioning the negative product feature, customers are conveyed that they have received higher quality information about the product, and they feel satisfied on the message-level, which makes it easier for them to make fast purchase decisions. Thus, we hypothesize the following:

H_1: Customers perceive a two-sided (vs. one-sided) recommendation message from a chatbot as more persuasive on the message-level and are therefore more likely to purchase the recommended product.

On the other hand, we assume a positive effect of the two-sided recommendation message on the persuasiveness of the source, in our case the chatbot itself. The integration of a negative product feature leads customers to conclude that the message sender is telling the truth (Eisend, 2006). The acknowledging opposing product feature is like a cue of the sender's sincerity and lack of bias (O'Keefe, 1999), so the two-sided recommendation message has rather a positive effect on the perceived persuasiveness of the chatbot. Because customers do not expect the inclusion of a negative product feature which leads them to conclude that the source is speaking truthfully (Pizzutti et al., 2016). Hence, the following hypothesis emerges:

H_2: Customers perceive a two-sided (vs. one-sided) recommendation message from a chatbot as more persuasive on the source-level and are therefore more likely to purchase the recommended product.

Moreover, prior work suggests that customers' reactions to chatbots depend on their social perceptions. More specifically, firms humanize chatbots because this promises positive behavioral outcomes (Blut et al., 2021). For years studies showed that customers respond socially to humanized chatbots (e.g., Nass et al., 1994; Nass et al., 1997; Nass & Moon, 2000) because they perceive and interact with them like another human being (Nass & Moon, 2000). Customers thus follow rules and heuristics when interacting with humanized chatbots (Nass & Moon, 2000), so that stereotypes and interpersonal impressions emerge along the communication styles of warm and competent. However, chatbots in shopping situations are perceived as less competent and intelligent compared to human service agents due to less autonomously thinking (Dietvorst et al., 2015; Luo et al., 2019). The social perception approach suggests that framing the chatbot as competent and capable elicits the customer's mental response (Nass & Moon, 2000), so that competently perceived social counterparts promote transactional outcomes in sales (Güntürkün et al., 2020). As stated above, high competence perceptions are associated with greater intelligence and ability. Therefore, customers expect chatbots, that are designed to elicit competence perceptions, to be capable of providing a certain outcome. Therefore, chatbots' communication style affects customers' persuasiveness of the recommendation message as follows:

H_3: Message-level persuasiveness of a two-sided recommendation message is higher for chatbots with a competent (vs. neutral) communication style.

Designing the chatbot warmly leads to its perception as sympathetic and empathetic, acting as a friendly social counterpart (Liao & Sundar, 2022). Therefore, warmly perceived social counterparts lead to a certain relationship-building (Güntürkün et al., 2020). Accordingly, customers trust the chatbot to think and behave on its own initiative (Lee at al., 2020). The previously absent cue of source-related characteristics helps customers to verify that the friendly chatbot wants to establish a trustworthy relationship, so the customer interprets the two-sided recommendation message primarily as a sincere gesture from the chatbot. Customers rely on heuristics that assist them in making (everyday) decisions (Kahneman, 2013). One such decision heuristic is the voluntary positioning of negative product features. However, this strategy and thus heuristic are assumably more effective if the chatbot is perceived as a friendly fellow human being since it is then assumed that it acts autonomously and the effect of the two-sided message can emerge on the source-level persuasiveness. To sum it up, chatbots that appear engaged in relationship building are perceived as more credible regarding the two-sided recommendation messages, so we assume the following hypothesis:

H_4: Source-level persuasiveness of a two-sided recommendation message is higher for chatbots with a warm (vs. neutral) communication style.

4. Study

4.1. Experimental design and sample

To test our hypotheses, we conducted a 2 (recommendation message: two-sided vs. one-sided) × 3 (communication style of a chatbot: warm vs. competent vs. neutral) between-subject online experiment. We recruited participants on social media, different research, and intranet platforms in Germany. The participants were randomly assigned to one of the six experimental groups. A total of 349 participants took

part in the online study. We dropped participants who completed the online study for an above-average or below-average length of time (7 participants), answered the attention checks (21 participants) or the treatment check (33 participants) incorrectly. Consequently, the effective sample consisted of 288 German-speaking participants (63.89% female, M_{age} = 28.75 years), and each experimental group comprised approximately the same number of participants. There are no significant differences in gender, age and prior experience with chatbots between the experimental groups. After the survey, participants had the opportunity to take part in a raffle for different shopping vouchers.

In the initial scenario description, participants were asked to imagine that they were visiting the fictitious online platform "buyago" to shop for new over-ear bluetooth headphones. Technical product categories such as headphones are suitable for investigating the effect of two-sided recommendation messages, as they have several positive and negative product features and the product is of interest to all genders (Pizzutti et al., 2016). Participants were asked to imagine using the digital shopping assistant on the fictitious online platform. Therefore, they saw a pre-prepared conversation in the form of a static screenshot. Thus, experimental designs are well established in current chatbot research (Adam et al., 2021; Roy & Naidoo, 2021). We also used a scenario-based approach to ensure that the service interactions were identical except for the particular manipulations. In this way, we were able to control for confounding influences and ensure high internal validity. The chat interaction comprised a greeting, a request about which product the customer was looking for, the price idea, the provision of a product recommendation message, and the redirection to the product page (see Figure 2). Overall, the participants perceived the scenarios as realistic (M = 6.267, SD = 0.876).

4.2. Design of the experimental treatments

We manipulated the recommendation message (independent variable) and the communication style of the chatbot (moderator). The manipulation of the recommendation message and the communication style were not mixed to distinguish the effects of the persuasive technique from the effects of humanizing the chatbot.

Following the previous research results of the two-sided vs. one-sided message in the F2F domain, we have considered the manipulation of the recommendation message accordingly in the chatbot context. Therefore, the negative message is placed at the end of the overall recommendation message where it has the most positive effect (Eisend, 2006). The proportion of the negative message is important for the effectiveness of the two-sided message (Crowley & Hoyer, 1994; Golden & Alpert, 1987), so in this study, the chatbot communicated significantly more positive than negative product features. In addition, it is known from previous research that the negative message should include a product feature with low importance (Pizzutti et al., 2016). Therefore, we identified the product features and their respective perceived importance in a pre-study as well as in the main study itself. The participants perceived the positive product features as significantly more important than the negative product feature within the main study ($M_{positiveFeature}$ = 5.932, SE = 0.045; $M_{negativeFeature}$ = 4.427, SE = 0.099; t = 14.770, $p < 0.001$). Figure 2 shows the positive as well as the negative product features.

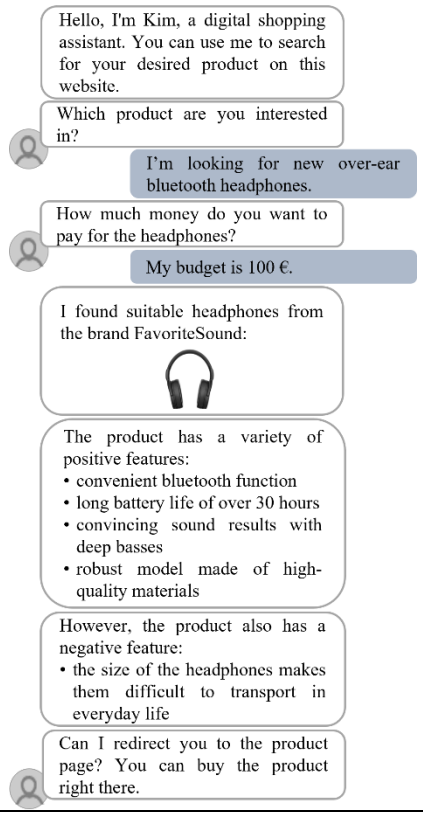

Figure 2. Scenario with the experimental treatments: two-sided recommendation message × neutral communication style

To manipulate the warm and competent communication style of the chatbot, we added warm and competent cues to the neutral communication style. Following Kull et al. (2021) and Mozafari et al. (2022), the warm chatbot included friendly and helpful verbal elements, whereas the competent chatbot communicated its efficiency and performance capabilities. Figure 2 shows also the manipulation of the neutral

communication style and the Appendix (Table 2) contains a detailed overview of the warm and competent communication style manipulation.

4.3. Measurements

After the scenario, we continued with the questionnaire which included the manipulation check, mediators, dependent variable, and treatment check. All following measurements were conducted on a 7-point Likert scale ranging from strongly disagree [1] to strongly agree [7].

The manipulation checks of the perceived communication style of the chatbot relied on the ten items from Güntürkün et al. (2020) and Fiske et al. (2002) and has a Cronbach's alpha of .938 for the five perceived warmth items (e.g., "During the conversation, the digital shopping assistant was friendly") and .965 for the five perceived competence items (e.g., "During the conversation, the digital shopping assistant was efficient").

We measured the persuasiveness of the recommendation message with four items from the scale of the authors Bhattacherjee and Sanford (2006) following Sussman and Siegal (2003) (e.g., "The product information provided during the conversation were persuasive"; α = .944). For persuasiveness of the chatbot, we used the scale of the authors Sussman and Siegal (2003) (e.g., "The digital shopping assistant was credible"; α = .927). We measured purchase intention as a behavioral component by three items from the online purchase intention scale of Hsiao et al. (2010) (e.g., "I am willing to buy the presented product"; α = .898). For the treatment check, we adapted the two items from the authors Veirman and Hudders (2020) to check whether participants received a one-sided or two-sided recommendation message. The two items were "The product recommendation contained only arguments with positive features that were in favor of the presented product" and "The product recommendation contained arguments with positive features as well as arguments with negative features that were related to the presented product".

4.4. Method and results

The manipulation check, results of ANOVA, for perceived warmth and competence show that the chatbot with a warm design is perceived as significantly warmer than the chatbot with a competent design (M_{warm} = 5.820, SE = 0.152; $M_{competent}$ = 4.324, SE = 0.155; t = 1.496, $p < 0.001$) as well as with neutral design ($M_{neutral}$ = 4.207, SE = 0.161; t = 1.613, $p < 0.001$). The chatbot with competent design is perceived as significantly more competent than the chatbot with warm design (M_{warm} = 4.162, SE = 0.168; $M_{competent}$ = 5.557, SE = 0.172; t = -1.394, $p < 0.001$) as well as with neutral design ($M_{neutral}$ = 4.138, SE = 0.178; t = 1.419, $p < 0.001$).

We estimated a path model using the Seemingly Unrelated Regression (SUR) function in STATA to assess the overall system of the four hypotheses. The SUR was used to test the individual effects of the established research framework (Zellner, 1962). Moreover, the SUR allows the simultaneous estimation of direct and indirect effects of different regressions, to assess mediation effects (Preacher & Hayes, 2004; Wallace, D., & Silver, J. L., 1988). In doing so the SUR accounts for correlated errors and corrects for overestimation of standard errors. Accordingly, the following equations presented are simultaneously estimated:

(1) $PRMi = \beta_0 + \beta_1 TRMi + \beta_2 WARMi + \beta_3 COMPi + \beta_4 TRMi \times WARMi + \beta_5 TRMi \times COMPi + \varepsilon_{1i}$

(2) $PCi = \gamma_0 + \gamma_1 TRMi + \gamma_2 WARMi + \gamma_3 COMPi + \gamma_4 TRMi \times WARMi + \gamma_5 TRMi \times COMPi + \varepsilon_{2i}$

(3) $PIi = \delta_0 + \delta_1 TRMi + \delta_2 WARMi + \delta_3 COMPi + \delta_4 TRMi \times WARMi + \delta_5 TRMi \times COMPi + \delta_6 PRMi + \delta_7 PCi + \varepsilon_{3i}$

where PRMi is persuasiveness of the recommendation message, PCi is persuasiveness of the chatbot, PIi is purchase intention, TRMIi is two-sided recommendation message, WARMi is the warm communication style and COMPi is the competent communication style. ε_{1i}, ε_{2i}, and ε_{3i} are the disturbance terms for each subject i. Equation (1) represents the model of the persuasiveness of the recommendation message, equation (2) represents the model of the persuasiveness of the chatbot, and equation (3) represents the model of purchase intention. Table 1 contains the results for the three equations.

Rejecting H1, customers perceive a two-sided (vs. one-sided) recommendation message as not significantly more persuasive at the message-level (β_1 = 0.197, $p = 0.549$) within the neutral communicating (non-humanized) chatbot. We also have to reject H2, because there is no direct significant effect of the two-sided (vs. one-sided) recommendation message on the persuasiveness of a neutral communicating chatbot (source-level) (γ_1 = 0.169, $p = 0.598$). Furthermore, the results of the SUR show a direct significant effect of the persuasiveness of the recommendation message (δ_6 = 0.160, $p < 0.01$) and the chatbot (δ_7 = 0.406, $p < 0.001$) on purchase intention.

A positive significant interaction effect of the two-sided recommendation message and the competent communication style vs. the neutral communication style (β_5 = 1.184, $p < 0.01$) on message persuasiveness supports H3. In addition, we also performed an analysis of planned contrasts of predictive margins. The results

also show that, compared to the neutral communication style, the competent communication style positively moderates the effect of the two-sided message on the persuasion of the recommendation message ($M_{competent}$ = 5.691, SE = 0.243; $M_{neutral}$ = 4.369, SE = 0.243; t = 3.89, $p < 0.001$); also, compared to the warm communication style the positive effect of the competent communication style is observed (M_{warm} = 4.470, SE = 0.205; t = 3.88, $p < 0.001$). Finally, supporting H4, a positive significant interaction effect of the two-sided recommendation message and the warm communication style vs. the neutral communication style on source persuasiveness is shown (γ_4 = 1.103, $p < 0.05$). Again, we performed a further analysis of planned contrasts of predictive margins. This also shows that the warm communication style compared to the neutral communication style positively moderates the effect of the two-sided message on the persuasion of the chatbot (M_{warm} = 5.367, SE = 0.199; $M_{neutral}$ = 3.683, SE = 0.236; t = 5.51, $p < 0.001$); also compared to the competent communication style the positive effect of the warm communication style emerges ($M_{competent}$ = 4.397, SE = 0.236; t = 3.18, $p < 0.01$).

Moreover, using the bootstrapping procedure of a sample of 5,000 iterations (Hayes, 2018), we find a significant positive moderated mediation between the two-sided recommendation message and competent communication style over the recommendation message's persuasiveness on purchase intention ($CI_{95\%}$ = [0.146, 0.621]). Results indicate also a significant moderated mediation between two-sided recommendation message and warm communication style over the chatbot's persuasion on purchase intention ($CI_{95\%}$ = [0.044, 0.316]).

5. Discussion

Our study results show that the transmission of two-sided persuasive communication without the use of anthropomorphic design elements (warm or competent communication style) in the chatbot context is not sufficient to achieve the desired effect of behavioral change. The two-sided (vs. one-sided) recommendation message of the neutral communicating and therefore non-humanized chatbot did neither affect perceived persuasion at the message- nor source-level.

First, there is no positive effect of the two-sided recommendation message of the non-humanized chatbot on the message-level. Therefore, other factors might also matter leading to successful persuasive communication. In particular, in the case of a two-sided and one-sided recommendation message, task importance occupies a crucial role (Chaiken & Maheswaran, 1994). But it is unknown how customers evaluate the importance of purchasing headphones via chatbots. Furthermore, in a new sales environment, additional (external) cues are necessary to provide customers a sense of reliability and control (Yang et al., 2006), so that customers are willing to acknowledge and

Table 1. Results of seemingly unrelated regression

	(1) Persuasiveness of the Recommendation Message		(2) Persuasiveness of the Chatbot		(3) Purchase Intention	
	Coeff.	*SE*	Coeff.	*SE*	Coeff.	*SE*
Constant	4.172***	0.225	3.514***	0.219	1.290***	0.261
Independent Variable						
Recommendation Message*1	0.197	0.329	0.169	0.320	-0.014	0.252
Moderator						
Communication Style						
Warm*2	0.364	0.329	0.581	0.320	0.086	0.253
Competent*3	0.137	0.308	0.129	0.299	0.168	0.236
TRM×Warm	-0.263	0.455	1.103*	0.442	0.435	0.357
TRM×Competent	1.184**	0.459	0.586	0.446	0.307	0.355
Mediators						
Persuasiveness of the Recommendation Message					0.160**	0.059
Persuasiveness of the Chatbot					0.406***	0.061
R^2	0.087		0.168		0.387	
VIF	3.15		3.15		2.86	

Notes: n = 288; Coeff. = coefficient; *SE* = standard error; TRM = two-sided recommendation message;
*$p \leqslant 0.05$; **$p \leqslant 0.01$; ***$p \leqslant 0.001$;
*1 1 = two-sided, 0 = one-sided; *2 1 = warm, 0 = not warm; *3 1 = competent, 0 = not competent

process the message quality. The non-human chatbot is attributed to a lack of ability or expertise (Jussupow et al., 2020) and therefore the customer cannot explain the increased message quality. Humanizing chatbots offers a solution approach in this regard (Epley et al., 2008). In addition, our results show that a competent communication style of the chatbot evokes the effect of the two-sided recommendation message on the message-level by increasing the persuasiveness of the recommendation message.

Second, the positive expected effect of the two-sided recommendation message on the source-level does not occur. Accordingly, the non-human chatbot is neither positively nor negatively interpreted as using persuasive communication strategies. However, persuasiveness of chatbots or sales assistants are considered to play a significant role when it comes to product commerce (Palmatier et al., 2007), thus firms should have an interest in increasing the persuasiveness of the chatbot. The source-level is also equated with relationship building, which can be strengthened by humanizing chatbots (Epley et al., 2008). Our results show that the warm communication style leads to the effect of the two-sided recommendation message on the persuasiveness of the chatbot.

These findings underline the necessity of anthropomorphic design elements to release the impact of two-sided recommendation messages in the chatbot context. Our study results provide a differentiated approach in which form the chatbot's communication style should be designed as a specific anthropomorphic design element. In line with theory and previous research findings, the competently perceived chatbot enhances the content of recommendations, and the warmly perceived chatbot strengthens the relationship building (Güntürkün et al., 2020). Our results also show that both persuasion levels, message- and source-level, can increase purchase intention. Firms should use a warmly designed chatbot if they want to strengthen the customer-chatbot relationship and competently designed chatbots if they want to strengthen message quality.

6. Limitations and future research

To the best of our knowledge, our study is the first that investigates two-sided recommendation messages as a persuasive communication technique in the chatbot shopping context, which, however, seems promising to address the two challenges of low persuasiveness of the recommendation message and the chatbot (Luo et al., 2019). The discussion of the research results already indicates that more research on (different) persuasive communication techniques is needed to provide more specific implications to firms.

Under which circumstances the dimensions of warmth and competence co-occur or not is unclear for the chatbot domain. Therefore, further studies should investigate how these dimensions influence each other and if the combination of the two communication styles has a positive effect on both the message- and source-level or if a deleveraging effect occurs. Furthermore, customer characteristics (e.g., prior attitude toward chatbots) and situational factors such as task and product importance play a crucial role in the effectiveness of persuasive communication (Chaiken & Maheswaran, 1994) and have to be considered in further studies. Moreover, to consider variables measuring long-term behavior (e.g., repetitive usage intention of the chatbot or repetitive purchase intention) is of interest because message and source persuasiveness could trigger different short- or long-term behavioral changes (Petty & Cacioppo, 1986). Besides the missing long-term behavioral changes, our study did not consider the interaction between the two levels, but further studies should investigate it in more detail.

Our study design also has certain limitations due to a vignette study and the lack of a real-time dialogue, which limits external validity (Aguinis & Bradley, 2014). In this regard, it would be conceivable to implement an experiment with a chatbot for dynamic dialogues to strengthen external validity. Moreover, the interaction length differs a bit for the warm/competent vs. neutral communication style, which further studies should further equalize.

As a result, our study was able to provide initial evidence that firms can also use persuasive communication in the chatbot shopping context. However, the two-sided recommendation message is only effective if firms observe certain boundary conditions, such as the humanized design of chatbots.

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8. Appendix

Table 2. Manipulation of the warm and competent communication style

Warm	*Competent*
Hello, I'm Kim, your personal digital shopping assistant. I'm very happy to welcome you. Certainly, I would like to help you to find a suitable product for you on this website.	Hello, I'm Kim, your smart digital shopping assistant. Due to the latest technology and years of experience, I'm able to quickly and efficiently find the best product for you on this website.
Which product are you interested in? I am happy to support you with your request.	Which product are you interested in? I will show you my capabilities immediately.
I'm glad to assist you. How much money do you want to pay for the headphones?	I have understood this. How much money do you want to pay for the headphones?
The two-sided and one-sided recommendation messages were identical in the manipulation of the communication styles.	
I'm very glad that I could be of service to you. Can I redirect you to the product page? You can buy the product right there.	I hope that I could convince you of my abilities. Can I redirect you to the product page? You can buy the product right there.