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Assessing how Emotional and Social Communication shapes Chatbot Perceived Competencies

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Extended abstract

The era of Artificial Intelligence (AI) has changed interactions between businesses and users, triggering fundamental inquiries into consumer behavior. Among the various applications of AI (metaverse, voice assistants, augmented reality, mixed reality, etc.), this work focuses on chatbots as conversational text assistants. A chatbot is defined as a software application that engages in a conversation with a human using natural language to respond to a consumer's question in real-time (Rese et al., 2020). Chatbots are commonly employed by companies to interact with customers at various touchpoints throughout the customer journey, spanning different contexts such as travel, medical services, and retail (Crollic et al., 2022).

CASA (Computers Are Social Actors) paradigm (Nass et al., 1994; Nass & Moon, 2000; Reeves & Nass, 1996) has been widely adopted in the field of Human-Computer Interaction (HCI), positing that users interact with machines as if they were social agents,

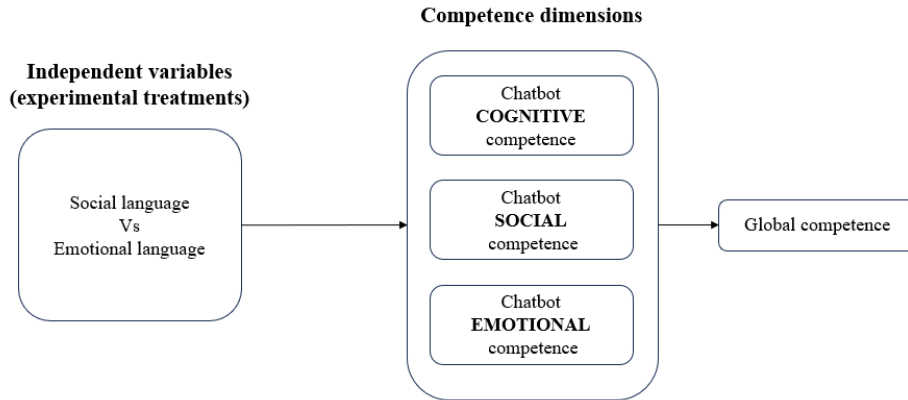
attributing to them anthropomorphic traits and behaviors. Despite a clear awareness of the non-human nature of these machines, individuals tend to treat them based on the same social rules they would apply in human interactions. This tendency, especially evident in the case of chatbots, underscores the importance of understanding how user perceptions towards these technologies are formed and influenced (Chen et al., 2023; Nguyen et al., 2023).

There is a call for literature to investigate how to calibrate the communication style used by the chatbot to optimize customer service experiences (Bleier et al., 2019; Thomas et al., 2018; Xu et al., 2022). Within HCI, especially in communication, task-oriented and socially oriented language has been addressed. Task-oriented style where chatbots prioritize task efficiency, diligently striving to achieve a successful outcome, conveying competence, and frequently utilizing formal conversational elements (Chattaraman et al., 2019). Although there is consensus on task-oriented language, a research gap has been identified in social language that needs to be investigated. Social-oriented style aim to achieve social goals and involve informal and relational exchanges normally with positive expressions. However, some literature also includes emotional needs (Xu et al., 2022), or emotional concerns (Chattaraman et al., 2019; Maar et al., 2022). Emotional concerns are indicative of emotional language because they involve recognizing the user's emotion or concern (Chandra et al., 2022). Therefore, there is an integration of both social and emotional components, leading to a mixed communication style. This work purposes to provide an in-depth analysis of what is perceived as social language and social-emotional (emotional) communication, and how these types of languages differently affect the perceived competence of the chatbot. Differentiating between social and emotional communication provides a more holistic perspective on how chatbots can facilitate more natural and meaningful interactions.

In this context, the Stereotype Content Model (SCM) (Fiske et al., 2002, 2007) gains particular interest. This model, applied in the analysis of social interactions among humans, distinguishes two fundamental dimensions in social perception: competence and warmth. Competence is related to intelligence, efficiency, and capacity whereas warmth is associated with friendliness, helpfulness, and trustworthiness (Fiske et al., 2007; Grewal et al., 2020; Kim & Hur, 2023). Therefore, this study broadens the evaluation of chatbot competence, traditionally focused on utilitarian competence (Choi & Zhou, 2023; Kull et al., 2021), to encompass cognitive, social, and emotional competencies (human competencies) (Brown et al., 2016; Chandra et al., 2022).

Consequently, the objectives are: (1) to study the differences between social and emotional language, and (2) how these languages affect perceptions of the different competencies (cognitive, social, and emotional). Figure 1 shows the proposed model.

Figure 1. Proposed model



The methodology involves conducting an online experiment with a between-subjects questionnaire design to analyze the relationships showed in Figure 1, utilizing stimuli consisting of an interactive conversation between a chatbot and a customer, manipulating social versus emotional language types. However, a series of preliminary studies were necessary to validate the manipulations.

Three preliminary studies were conducted. The *first* aimed to identify the main attributes associated with each type of communication. With a sample of 88 subjects via Prolific (47% men; 53% women; age mean 35.7), it was found that the social attributes are: relational, engaging, responsive, and user-friendly, whereas the emotional attributes are: compassionate, empathetic, and supportive. Subsequently, to facilitate a between-subjects questionnaire experiment, a *second* preliminary assessed whether scenarios/stimuli are perceived differently (social vs emotional). Following the creation of experimental stimuli analysis through Linguistic Inquiry and Word Count (LIWC) confirmed that each scenario was perceived as social or emotional. For the social behavior LIWC category, the mean score for the social scenario was 9.49 (SD = 4.05), which was higher than the mean for the emotional scenario, which stood at 2.23 (SD = 2.47). Conversely, in the emotion LIWC category, the social scenario yielded a lower mean of 1.19 (SD = 2.06) compared to the emotional scenario, which had a mean of 9.84 (SD = 1.69). *Third* preliminary study, a between-subjects experiment was conducted to validate both scenarios, with a sample of 68 participants sourced from Prolific (35 social and 33 emotional; 44% men, 55% women; age mean 38.8). This pretest demonstrated that the scenarios are indeed perceived differently. The mean social scale for social scenario was 4.99 (SD = 1.09), compared to a mean of 5.25 (SD = 1.03), for emotional scenario. Regarding the mean emotional scale for social scenario was 4.46 (SD = 1.18), compared to a mean of 4.77 (SD = 1.05) for emotional scenario, suggesting a trend where emotional communication is perceived as richer in both social and emotional attributes. Scales previously validated in the literature have been used, social scale (van Dolen et al., 2007) and emotional scale (Lou et al., 2022; Yim, 2023).

We are currently collecting data for the main analysis, which will evaluate how the type of language affects the different perceived competencies.

Theoretically, this study enriches the SCM in HCI by unveiling the differences and similarities between social and emotional communication, enhancing comprehension, and providing a nuanced exploration of users' cognitive, social, and emotional competence

perceptions towards chatbots. Managerially, the findings offer insights for refining chatbot communication strategies to enhance customer service by fostering more empathetic and engaging interactions, ultimately boosting customer satisfaction and operational efficiency.

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