THE INFLUENCE OF CONGRUENT EMOJIS ON CHATBOT PERCEIVED COMPETENCE AND CUSTOMER SATISFACTION

Mafalda Pescatore, PhD student in Management - University of Bologna, Via Capo di Lucca, 34, 40126 Bologna BO, Italia – +39 3934848457, mafalda.pescatore2@unibo.it

Stefania Farace, Senior Assistant Professor of Marketing - University of Bologna, Corso D'Augusto, 237, 47921 Rimini RN, Italia – stefania.farace@unibo.it

ABSTRACT

Focusing on non-facial emojis, this research investigates how and why congruent text-emojis affects the user-chatbot communication. The pilot study shows that high congruency (vs. low congruency) text-emojis increases customer satisfaction in a context of customer support but not in situations involving customer failure. Study 1 replicates these findings and provides empirical evidence that perceived competence is driving the positive relationship between congruent text-emojis and satisfaction. These findings provide actionable insights for designing more effective virtual assistants, emphasizing the importance of incorporating paralinguistic elements to enhance user experience within online contexts.

Keywords: Chatbots, emojis, competence, paralanguage, satisfaction

INTRODUCTION

Virtual assistants or chatbots simulate dialogues with human users, using Natural Language Process (NLP) techniques. Projections point out a significant growth in the global chatbot market, with an anticipated compound annual growth rate (CAGR) of 23.3% from 2023 to 2030 (Grand View Research, 2023). Forecasts indicate a substantial shift in online service interactions, with an expected 95% transition to AI chatbots by 2028 (Chong et al., 2021). Chatbots serve numerous functions across marketing areas such as customer service (Smutny and Schreiberova 2020) and allow for language versatility that suits varying needs and settings. Moreover, chatbots swiftly address user's requests (Gnewuch et al. 2018) and maintain round-the-clock availability for inquiries (Li and Zhang 2023). Clearly, chatbots not only are beneficial for customers but also employees, who see their workload gets alleviated (Deloitte, 2019).

However, chatbots are not flawless. According to CGS (2019), *86%* of consumers prefer interacting with a human agent. This preference is driven by miscommunication that often takes place between users and chatbots (Sheehan et al. 2020), which has consequences on user's perceived competence, that is, the ability to execute tasks efficiently (Cuddy et al. 2008). Past studies on customer support provided by human agents have defined perceived competence as one of the most relevant antecedents of customer satisfaction (Grandey et al., 2005). Luangrath and Barger (2017) study the effect that paralanguage has on consumer behavior and highlight the importance of textual paralanguage as a critical indicator of sentiment valence and intensity.

As one type of visual paralanguage, emojis play a crucial role in adding emphasis to messages' emotional or contextual meaning, thereby enhancing the communication's appeal to the recipient (Bai et al. 2019). When paired with text, emojis can showcase a human face, such as, "I'm happy 😊", or objects such as, "I picked a flower 🌸". Both examples represent semantically congruent messages that combine paralanguage (i.e., emojis) with written text. Most research on chatbots' use of emojis focuses on facial ones, with some studies linking them to warmth perceptions (e.g., Yu and Zhao, 2024; Li et al., 2019). Instead, little research focuses on non-facial emojis and whether and how their combination with text messages can affect perceived competence. We thus move the focus to non-facial emojis to fill a gap in a research stream that mostly focuses on emotional responses triggered by facial emojis.

This work contributes to the existing literature on paralanguage (Luangrath, Xu and Wang 2023) by extending knowledge on the influence of semantically congruent emojis that are related to non-facial features. We also contribute to the literature on chatbots effectiveness by showing that non-facial emojis must be combined carefully with congruent text message to optimize virtual assistants' effectiveness. We suggest that perceived competence is an important psychological mechanism that explains the positive effect of congruent emojis and text messages on customer satisfaction.

LITERATURE REVIEW

Congruent emojis

Emojis are graphic symbols with predefined names and codes (Unicode), that encompass representations of facial expressions, abstract concepts, emotions, animals, plants, activities, gestures, and objects (Rodrigues et al. 2018). They can be divided into two main categories: human-face emojis, such as 😊, 😞, and 😠, and non-human face emojis, which encompass objects, symbols, gestures, body parts, plants, and animals, such as ⚽, 🚫, 👍🏼, 🌸, and 🦁 (Jaeger et al. 2019). The widespread adoption of emojis can be attributed to the ability to convey emotional or

contextual nuances in meaning exchange (Bai et al. 2019), appeal enhancement (Cramer et al. 2016), and heightened emotional intensity and valence (Erle et al. 2022). Because emojis are often paired with text, it becomes crucial to understand whether and how different levels of congruence influence consumer perceptions. Emojis can align semantically e.g., "I need a new dress 👗" or emotionally, e.g., "I am angry for this 😡" with the accompanying sentence. Non-face emojis enhance semantic congruence by reinforcing the meaning conveyed by the text (e.g., "This is a brilliant idea 💡"). Past research has shown that semantically congruent emojis enhance message processing ease and fluency (Choi and Kang, 2013), thereby improving clarity (Reber et al. 2004). This effect is particularly pronounced with non-facial emojis, which convey non-verbal communicative aspects while reducing message ambiguity (Riordan 2017). Barach et al. (2021) demonstrate that using congruent non-facial emojis (e.g., a coffee cup emoji in the statement "My tall coffee is just the right temperature ☕") instead of incongruent ones (e.g., a beer emoji in the same statement "My tall coffee is just the right temperature 🍺") improves message comprehension. These findings are consistent with research demonstrating that textual paralanguage can evoke vivid mental images of gestures, sounds, or facial expressions, thereby making the message more concrete and realistic (Borst and Kosslyn 2010). Emojis play a pivotal role in facilitating positive perceptions and responsiveness (Coyle and Carmichael, 2019). Congruent text-emojis reduce message ambiguity and enhance of reader's confidence (Riordan, 2017). Furthermore, non-facial emojis make the text more vivid (Peng and Zhao, 2021) that contributes to language concreteness (Hansen and Wänke, 2010) and increases customer satisfaction (Packard and Berger, 2021). In line with this, we predict that:

H_1: Text-emojis by a chatbot that show high (vs. low) congruency increase (vs. decrease) customer satisfaction.

Congruent text-emojis and perceived competence

Competence perceptions include attributes like intelligence, skill, confidence, and efficacy, with this notion being relatively consistent across cultures (Cuddy et al., 2009). Hu et al. (2021) show that user's assessments of an AI assistant's warmth and competence are pivotal factors in their ongoing engagement with the AI. In the domain of customer service facilitated by chatbots, competence is often gauged through textual interactions. Users may evaluate a chatbot's competence based on its ability to convey confidence and clarity in its responses. According to Følstad and Brandtzaeg (2020), users regard chatbots as competent when they are perceived as capable, knowledgeable, and reliable. Employing polite and reasoned arguments can be a strategy to demonstrate competence in online customer service (Baltrukonis 2023). However, in contexts where customers prioritize prompt responses (Følstad and Skjuve 2019), lengthy messages may hinder effectiveness. Therefore, integrating emojis could be beneficial to maintain message coherence without compromising response time.

Past studies show that consumers' satisfaction is influenced by perceived competence (Coulter and Coulter, 2002). Likely this applies to chatbots, too. It has been demonstrated that satisfaction with a chatbot's performance depends primarily on the fulfillment of its functions (Akhtar et al. 2019). This capability is clearly linked to the chatbot's competence, which has been emphasized by previous research as the promptness of correct answers and understanding of the user, leading to greater user satisfaction (Ashktorab et al. 2019). We argue that the use of facial congruent emojis by chatbots contributes to enhancing perceived competence, in turn increasing satisfaction. We thus predict:

H_2: Perceived competence mediates the relationship between text-emojis that show high (vs. low) congruency and customer satisfaction.

In the next section, we present a pilot study in which we start to explore text-emojis (in)congruency on satisfaction in different contexts (customer support – Pilot study 1a, service failure – Pilot study 1b). In Study 1, we replicate the findings of Pilot study 1a and provide evidence for the mechanism driving the positive relationship between text-emoji congruence and customer satisfaction. Experiments were specifically designed to run these analyses, as this approach is critical to test the causal relationship between the independent variable and the dependent one. By employing experimental methods, we ensured control over confounding variables, thereby isolating the effect of congruence on satisfaction.

PILOT STUDY: Main effect of text-emojis congruence on customer satisfaction

Pilot study 1a. Eighty-six respondents (M_{age} = 45.51, SD = 13.33; 46.51% female; $M_{duration}$ = 199.69s, SD = 152.97) were randomly assigned to one of three conditions (high-congruency, text only, low congruency). Respondents were first told that they would interact with a virtual travel assistant in a scenario where they would be provided with customer support to book their flight or hotel. The chatbot provided solutions for completing the desired task, such as choosing an accommodation or editing a previous booking. Respondents then rated their satisfaction with the chatbot using two items (r=.931, p<.001), a manipulation check regarding their perceived congruency, demographics, and were thanked for their participation.

A one-way ANOVA reveals a marginally significant effect, $F_{(2, 87)}$=1.707, p=.09 (one-sided), suggesting that higher congruence between text and emojis increases satisfaction. Satisfaction was higher in the high congruence (M=5.38, SD=1.46), followed by text-only (M=4.83, SD=1.72), and low congruence (M=4.58, SD=1.89) condition. Planned comparisons indicated that the difference between high congruence and low congruence was positive and significant (p =.04, one-sided), supporting the positive impact of using high congruent text-emojis on customer satisfaction.

Pilot study 1b. Ninety respondents (M_{age}=46.77, SD=14.45; 56.67% female; $M_{duration}$ = 160.12s, SD = 109.05), participants who took part in the previous study were not included in this one. We used the same procedure and measurements as in Study 1a, though, the context was a chatbot providing help after experiencing service failure. The virtual assistant provided potential solutions for solving the issue, such as asking for a refund for a delayed flight or requesting maintenance for a room.

A one-way ANOVA did not reveal a significant effect of text-emoji congruence on customer satisfaction, $F_{(2,83)}$ = 1.418, p = .248. The mean satisfaction scores were similar across all conditions: high congruency (M = 4.80, SD = 1.53), text only (M = 4.34, SD = 1.42), and low congruency (M = 4.18, SD = 1.40). While the findings in Study 1a highlight the positive impact of congruent emojis in enhancing satisfaction during customer support, the lack of significant results in Study 1b suggests that in more sensitive situations, such as service failures, other factors may overshadow the benefits of congruent emojis.

STUDY 1: Mediating effect of perceived competence

Study 1 includes two-hundred seventy-eight participants (M_{age} = 27.06, SD = 8.72; 74.8% female; $M_{duration}$ = 158.19s, SD = 79.32). Participants who took part in the previous studies were not included in this one. They were recruited via social media and randomly assigned to one of three conditions (high congruency emojis vs. text only vs. low congruency emojis) between-subjects design. The same stimuli, procedure and measurements as in Study 1a were used. We

additionally measure perceived competence using two items (r=.848, p<.001). Considering the findings of Study 1b, that is, the absence of effects in a service failure context, we only focused on a customer support context.

The results of the one-way ANOVA replicated what was founded in Study 1a, showing a significant main effect ($F_{(2, 275)} = 63.663$, $p < .001$), confirming that higher congruence between text and emojis increases satisfaction. Satisfaction was higher in the high congruence condition (M = 5.75, SD = 1.62), followed by the text-only condition (M = 4.58, SD = 1.18), and lowest in the low congruence condition (M = 3.34, SD = 1.55). Planned comparisons indicated that the difference between high congruence and low congruence was significant ($p < .001$), as well as for high congruence and text only conditions ($p < 0.001$) and for text only and low congruence ($p < .001$).

SPSS PROCESS Model 4 for multi-categorical variable analysis (10.000 bootstrap samples) tested whether perceived competence (continuous variable) mediates the effect of congruency (3 levels: high congruency, text only, low congruency) on customer satisfaction (continuous variable). We generated dummy codes to compare high congruency with text only (X1) and low congruency with text only (X2) conditions. The bootstrapping technique for indirect effects confirmed mediation, as the 95% confidence interval (CI) for perceived competence excluded zero for both the high congruency vs. text only condition (indirect effect = 1.0331, BootSE = .1577; 95%CI: 0.7215, 1.3452) and low congruency vs. text only (indirect effect = -1.4411, BootSE = 0.2059; 95%CI: -1.8430, -1.0482) comparisons, providing support for H_2.

GENERAL DISCUSSION

The present study has some limitations. For instance, the online experiment involved a simulated interaction rather than a real-life scenario. Additionally, a convenience sample was used, which did not target specific population segments. Furthermore, we observed contrasting results regarding the text-only condition, suggesting the need for further research to clarify these findings. Despite these limitations, the research offers important contributions. It integrates the exploration of anthropomorphic and linguistic cues for optimized consumer-chatbot interactions, extending the analysis on competence and non-facial emojis to the domain of virtual assistants. We show that chatbots using congruent text-emojis has a positive effect on customer satisfaction, offering a potential practical solution to address challenges associated with chatbot usage, in an uncomplicated and cost-effective way. In follow-up studies, we plan to manipulate perceived competence to provide further support of our mechanism. This highlights the importance of designing chatbots' conversations such that competence can be conveyed through paralanguage and, ultimately, improve user-chatbots interactions.

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