Influence of the Use of Emojis by Chatbots on Interaction Satisfaction

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Chatbots are widely used for online consumer service. However, how consumers react to chatbots using emojis in human-robot interaction is not fully examined. Through two experiments, this study investigated how and when using chatbot emojis in human-robot interaction affected consumer satisfaction. Study 1 showed that emojis significantly increased interaction satisfaction, which is mediated by intimacy. Study 2 showed that consumers with hedonic consumption goals were more satisfied in the emoji-present condition than those in the emoji-absent condition. However, such differences did not emerge among consumers with utilitarian goals. These findings deepen our understanding of how chatbots using emojis affect consumer response and provide insights into how to deploy chatbots with emojis in customer service.

Keywords: emoji, interaction satisfaction, intimacy, hedonic, utilitarian

INTRODUCTION

Defined as "software that accepts natural language as input and generates natural language as output, engaging in a conversation" (Griol et al., 2013), AI-enabled chatbots have become a promising service tool. They are widely used in various industries (Jan et al., 2023). Many companies have started utilizing chatbots to deliver automated customer support and interactive experiences. Chatbots provide an opportunity to reduce labor costs, improve efficiency, and drive commercial success (Liu et al., 2023). Researchers have highlighted that chatbots will play vital roles in the customer experience (Lu et al., 2019; Tung & Law, 2017).

According to the CASA paradigm (Nass & Moon, 2000), users interact and develop relationships with robots similarly to how they would interact with other humans (Ho et al., 2018). Recent studies found that users' interactions with humanlike robots can enhance perceived value, improve service delivery, and impact behavioral outcomes (de Kervenoael et al., 2020; Pillai & Sivathanu, 2020; Van Doorn et al., 2017). However, despite these findings, researchers have found some resistance against AI-enabled technologies, particularly in the service setting (Wang et al., 2023; Yang et al., 2023). Depending on stereotypical views about machines in users' minds (Sundar, 2008), users tend to think robots are cold and unemotional (Longoni et al., 2019; Nadarzynski et al., 2019). As emotional expressions are essential aspects of social interaction (Russell et al., 2003), researchers agree that it is essential for robots to be able to express emotions to increase the naturalness of the interaction (Becker et al., 2022). Consequently, improving the

consumer interactive experience and increasing satisfaction have emerged as critical challenges while promoting chatbot services.

As a metacommunicative pictorial representation of facial expressions, emojis are used in digital communications to express emotion (Derks et al., 2008; Manganari & Dimara, 2017). Through laboratory and field experiments, Li et al. (2019) indicated that customers perceive service employees who use emojis as higher in warmth but lower in competence than those who do not. Based on the Emotions as Social Information (EASI) theory, Maiberger et al. (2024) found that emojis influence the persuasion of electronic word of mouth by affecting emotional arousal and perceived ambiguity. The research of Smith and Rose (2020) verified a positive relationship between emojis and perceptions of relationship strength.

Recently, scholars argued for integrating emotional expression by using emojis in chatbots to enhance human-robot interactions and improve service evaluation (Zhang et al., 2024). A few studies on chatbots using emojis suggest that emojis could compensate for the lack of emotional expression for chatbots and build social presence, boost user trust, and recover consumer attitudes after service failure (Beattie et al., 2020; Liu et al., 2023; Shams et al., 2024). However, the mechanisms and boundary conditions of how chatbots using emojis affect consumer perception remain unclear (Park et al., 2023).

Previous studies have shown that emotional expression is related to positive interpersonal perceptions of the conversational partner, such as intimacy (Collins & Miller, 1994; Lee & Choi, 2017). We suggest that for chatbots employing emojis, it is most likely that consumers may generate emotional connections for them in some contexts and increase interaction satisfaction. Therefore, a key content of our study is to investigate the mediation effect of intimacy between chatbots using emojis and consumer response.

Although the positive significance of emojis in shaping customer perception and attitude has been validated in previous studies, there have been contrasting results on the effectiveness of emojis in communication. Glikson et al. (2018) showed that service agents using emojis do not affect perceived warmth and reduce perceived competence. Abell et al. (2024) reported that emojis in restaurant logos decrease healthfulness perceptions. Some researchers suggested that the efficacy of emojis remains an enigma (Madadi et al., 2024), and further research is needed to clarify the function and consequences of emojis. Specifically, it is necessary to clarify the matching relationship between the chatbots' usage of emojis and utilitarian versus hedonic consumption goals (Maiberger et al., 2024; Baek et al., 2022; Yan et al., 2024). Hence, the current research examines the interaction effect of chatbots using emojis and consumption context in human-robot communication.

In summary, we aim to understand how consumers react to chatbots using emojis through two experiments. Our findings will broaden our understanding of the underlying mechanisms and boundary conditions of how chatbots using emojis affect consumer response. Practically, the study guides service providers on improving the effectiveness of human-robot interaction through emojis.

THEORETICAL FRAMEWORK AND HYPOTHESES

Chatbots' Emoji Usage

Luangrath et al. (2017) defined emojis as "written manifestations of nonverbal audible, tactile, and visual elements." Emojis are used to supplement or replace written language through symbols representing facial expressions or objects, transforming how messages unfold and are received (Orazi et al., 2023).

To fill the gaps in nonverbal communication that occur in online communication, emojis are often used to facilitate interaction (Gibson et al., 2018) and express the sender's emotions (Bai et al., 2019). Previous research suggests that emojis may arouse consumers, affect warmth and competence perceptions of the service provider (Li et al., 2019), and therefore increase persuasion (Maiberger et al., 2024).

Recently, scholars focusing on human-robot interaction have paid more attention to how users evaluate and accept robots that employ emojis. Several researchers predicted the positive effect of emojis on consumers' responses. Zhang et al. (2024c) declared that emojis make robot communication more humane and natural. Robots with emojis seem to try to contextualize and clarify messages, which enhances users' perceptions of competence. Users regard chatbots with emojis as more credible than those without (Yu & Zhao, 2024). In service failure contexts, the use of humorous emojis by chatbots can help increase

the perception of chatbots' intelligence and social presence, thereby improving service recovery satisfaction and willingness to reuse chatbots after service failures (Liu et al., 2023; Shams, 2024). From the point of view of emotional expression, previous studies have shown that robots that provide emotional support can positively affect interaction satisfaction (Becker et al., 2022; Gelbrich et al., 2021). Emotional expression improves user perception of robots' abilities (Rizomyliotis et al., 2022), makes them believe the robot is professional and excellent, and enhances their trust (Chiang & Chou, 2023). Zhang et al. (2024a) found that chatbots' emotional expressions by using text and emojis affect customer satisfaction.

H1: *The use of emojis by chatbots has a positive effect on interaction satisfaction.*

The Mediation Effect of Intimacy

Intimacy is "a psychosocial process with communicative and emotional characteristics" (Huaman-Ramirez et al., 2022). Perlman and Fehr (1987) point out that intimacy is the experience of an individual's interaction with others and their mutual familiarity and dependence, which provide a sense of emotional warmth. In human-robot interaction, Intimacy is regarded as an emotion humans can feel towards robots (Park et al., 2023). Previous research has consistently highlighted the significance of intimacy as a crucial factor influencing the perceived usability and acceptance of technology. Venkatesh (2000) identified intimacy as a key element within the framework of the Technology Acceptance Model, further underscoring its importance in user-technology interactions.

Emotional contagion theory explains how emotions are transmitted in social interactions (Hatfield et al., 1993). Exposure to others' emotional expressions causes people to develop similar emotions (Lee & Theokary, 2021). Researchers have found that there is also an emotional contagion effect between robots and users (Chuah & Yu, 2021; Han et al., 2022). Through machine learning algorithms and sentiment analysis techniques based on Instagram data, Chuah and Yu (2021) found that the emotional expressions of anthropomorphic robots can positively impact potential consumers. Han et al. (2022) showed that an AI agent's expressed positive emotion through textual cues increases customer positive emotion, which, in turn, enhances service evaluations. Emojis are a visual cue of positive emotional expression from chatbots. We expect that emojis may convey positive emotions to consumers. According to the theory of affect infusion, an individual's emotional state can influence social judgment (Forgas, 1995). Consumers may feel more comfortable and connected with chatbots employing emojis.

In addition, previous studies found that highly anthropomorphic robots are perceived as more intimate (Almaguer et al., 2024; Smith & Rose, 2020). Employing the Computers are Social Actors paradigm in human-robot interactions, Beattie et al. (2020) found that chatbots with emojis are perceived as more humanlike and more socially appealing than those without emojis. Sindhu and Bharti (2024) pointed out that using emojis by chatbots triggers a sense of social presence. Perceived similarities in human-robot interactions allow customers to regard chatbots with emojis as in-group members, stimulate the feeling of familiarity, and ultimately cultivate a sense of intimacy (Damiano & Dumouchel, 2018; Dark et al., 2016).

H2: *The use of emojis by chatbots increases consumer intimacy.*

A high user intimacy with chatbots implies that humans perceive the chatbots as willing to solve their problems by responding promptly (Ashfaq et al., 2020). People may want to develop strong, long-term relationships with these chatbots (Stern, 1997). Several researchers indicated consumer intimacy with robots significantly impacts customers' perceived service quality (Chiang & Chou, 2023) and increases interaction satisfaction (Lee & Choi, 2017; Xie et al., 2023).

H3. *Chatbots' use of emojis positively influences interaction satisfaction via user intimacy.*

The Moderating Effect of Consumption Goals

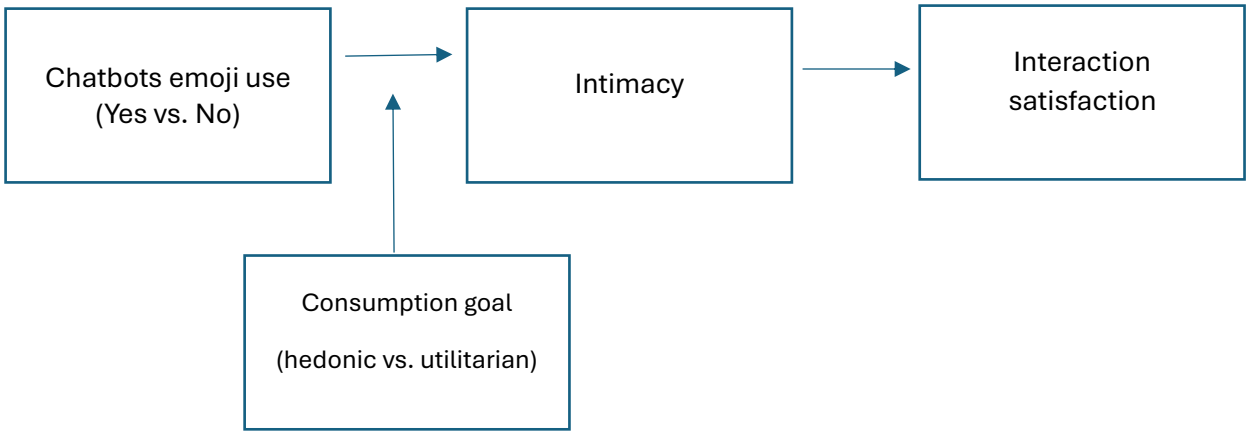
Chernev (2004) classified consumption types as hedonistic or utilitarian, depending on different consumption goals. Customers tend to care about the alignment of messages with consumption goals in processing messages (Wang et al., 2023). Individuals with utilitarian motivation focus more on the quality of information provided, such as convenience and efficiency, while individuals with hedonic use motivation pay more attention to entertainment value (Jones et al., 2006).

Hedonic and utilitarian considerations are often revealed to have a moderating influence on consumers' attitudes and behavior. Chen et al. (2024) showed that compared with those with hedonic consideration, consumers with utilitarian consideration perceive attribute-based reviews (vs. experience-based reviews) as more helpful for shopping decisions. Kronrod and Danziger (2013) also indicated that, compared with utilitarian consumption contexts, emotional figurative language leads to more favorable attitudes in hedonic consumption contexts. Regarding emojis as a tool for expressing emotional information, Maiberger et al. (2023) argue that given the emotional nature of purely hedonic products, emojis may generate a higher persuasive effect in the case of hedonic products than utilitarian products. Das et al. (2019) also found that emojis in advertisements are more effective at increasing positive affect and purchase intentions for hedonic rather than utilitarian products. Therefore, we hypothesize as follows.

H4: *Consumption goals moderate the relationship between chatbots with emojis and interaction satisfaction. This relationship is more significant in the hedonic shopping context than in the utilitarian shopping context.*

Figure 1 illustrates the theoretical framework.

FIGURE 1
THEORETICAL FRAMEWORK



STUDY 1

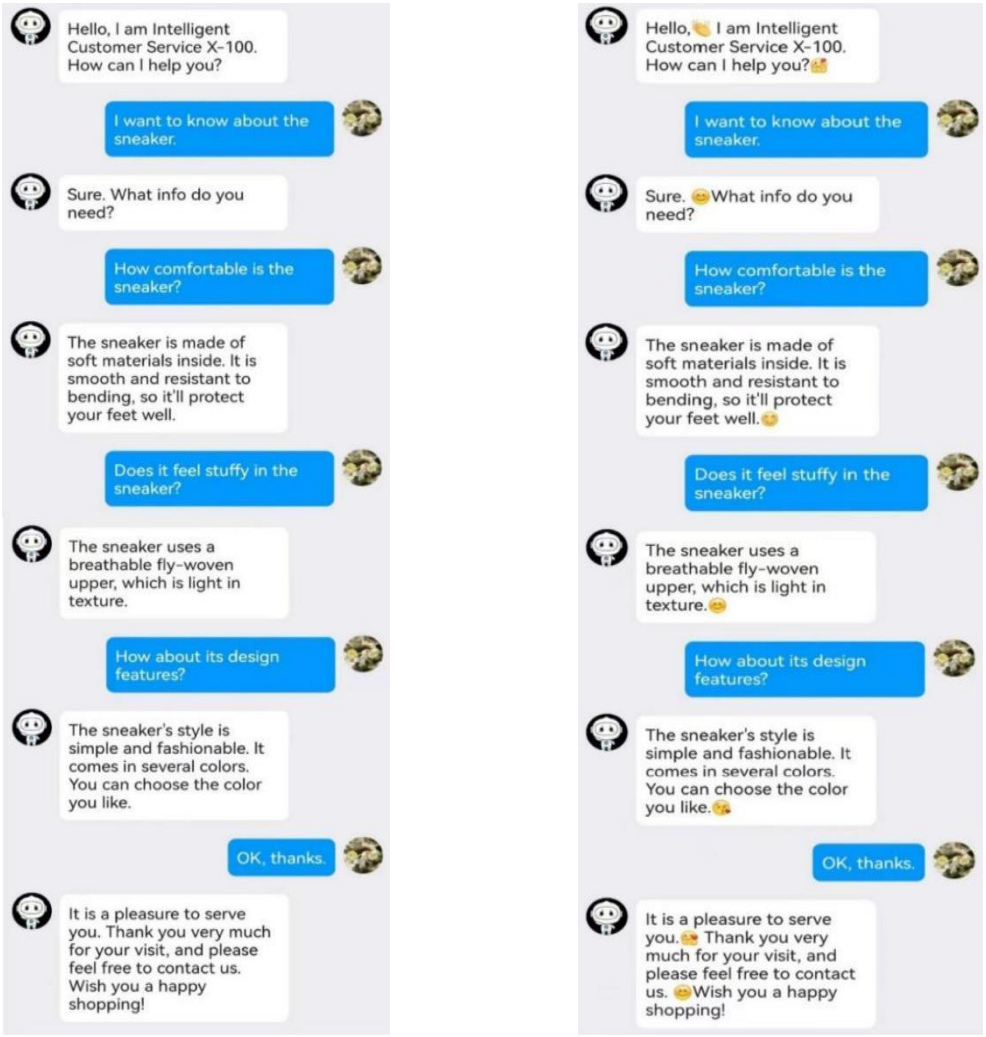
The main purpose of Study 1 was to examine the effect of emoji presence (vs. absence) on interaction satisfaction and the mediating role of intimacy. This study employed a two-cell (emoji: presence vs. absence) between-subject design.

Participants and Design

We recruited 148 participants to participate in the experiment through the Credamo platform (www.credamo.com), a professional data collection platform in China similar to Amazon Mechanical Turk. Among them, 70% were female, and 89% were aged between 21 and 40. Participants were randomly assigned to one of the two conditions.

All the participants read an introduction to a chatbot interaction in a scenario involving the online purchase of shoes. After reading the introduction, participants witnessed an interaction with the chatbot through screenshots. In experimental group 1, we did not add emojis; in experimental group 2, we added emojis in dialogues. The experimental material for Study 1 is shown in Fig. 2.

FIGURE 2
THE EXPERIMENTAL MATERIAL (STUDY 1)



The participants then answered questions regarding intimacy and interaction satisfaction. Intimacy was measured by three items (Song et al., 2022): "I feel very close to the chatbot"; "Interacting with the chatbot reduces the sense of unfamiliarity between us"; and "The chatbot seems authentic to me." ($\alpha = 0.701$). Interaction satisfaction was measured by four items (Johnson & Grier, 2013): "Interacting with the website is satisfying, "; "Interacting with the website makes me happy"; "Interacting with the website is interesting," and "I am pleased to interact with the chatbot" ($\alpha = 0.812$). Finally, participants were asked to answer demographic questions (gender, age, and education level). Moreover, scenario realism was measured: "How difficult was it for you to imagine yourself in the interaction scenario?" (1 = difficult, 7 = easy).

Results

To enhance data quality, before the analysis, we performed the following steps: (a) we removed participants who failed the normative appeals attention check; (b) surveys that were completed in an excessively long or short time were excluded; (c) some data showed specific patterns, such as selecting only the last option for all questions, we also excluded these samples; (d) participants who incorrectly identified the stimulus materials presented were removed. The realism check showed that subjects perceived the experiment scenario as highly realistic and had no difference between the two conditions ($M_{no\ emoji} = 6.03$ vs. $M_{emoji} = 6.12$; $t(146) = 0.674$, $p = 0.501$).

A one-way ANOVA was conducted to investigate the effect of emojis on intimacy. As predicted, the main effect of emoji on intimacy was significant ($F(1, 147) = 9.080$, $p = 0.003$). Specifically, participants in the emoji present condition ($M = 5.64$) reported higher intimacy than those in the emoji absent condition ($M = 5.22$). These results support H2.

A one-way ANOVA was conducted to investigate the effect of emojis on interaction satisfaction. As predicted, the main effect of emoji on interaction satisfaction was significant ($F(1, 147) = 11.488$, $p = 0.001$). Specifically, participants in the emoji present condition ($M = 5.43$) reported stronger satisfaction than those in the emoji absent condition ($M = 4.96$). These results support H1.

To determine whether intimacy mediated the relationship between the presence of emoji and interaction satisfaction, we conducted a mediation analysis using SPSS PROCESS Macro Model 4 with 95% bias-adjusted confidence intervals and 5000 bootstrapped samples. The results showed that the presence of emoji increased interaction satisfaction through increased intimacy ($b = 0.30$, 95% CI [0.10, 0.50]). Therefore, H3 was supported.

Discussion

The results of Study 1 provide evidence that the presence of emoji has a significant effect on interaction satisfaction. Furthermore, intimacy mediates this effect; participants in the emoji present condition reported higher intimacy with the chatbot than those in the emoji absent condition, resulting in higher interaction satisfaction.

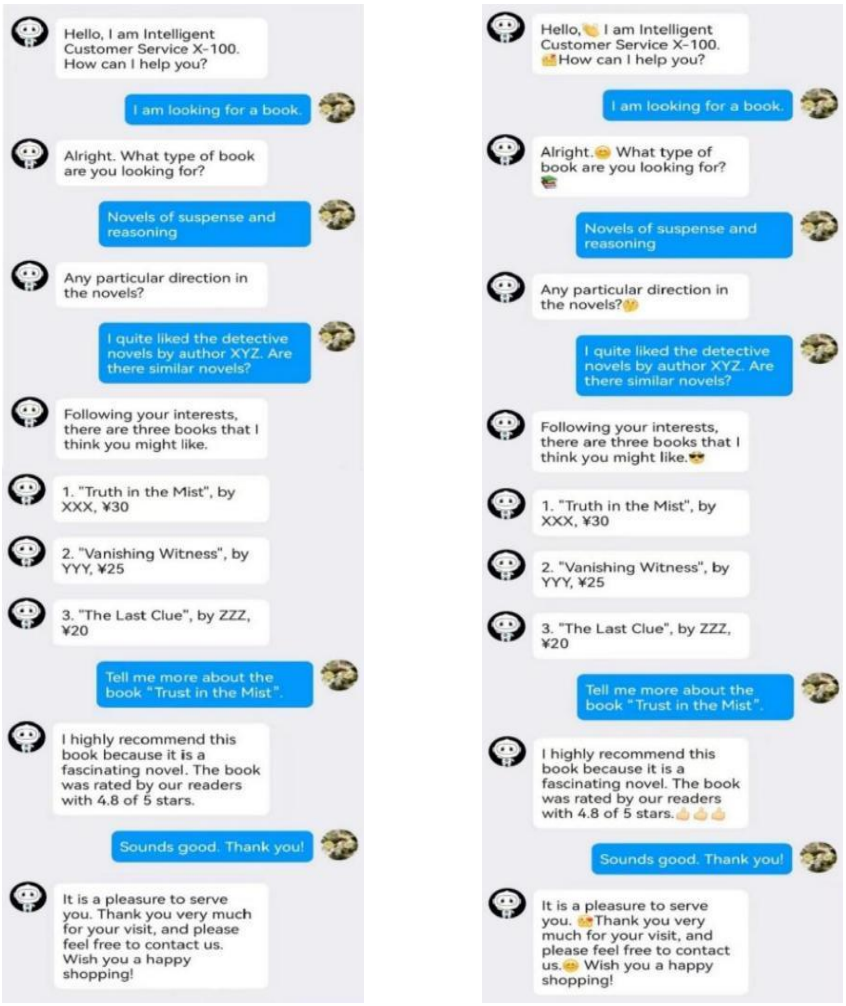
STUDY 2

Study 2 had two goals. First, to ensure the robustness of the effect observed in Study 1, we transferred the study context to online book shopping. Second, we assess the moderating role of consumption goals in the effect of emojis on interaction satisfaction.

Participants and Design

We recruited 234 participants (67.8% females and 89% aged between 21- 40) through the Credamo platform (www.credamo.com). This study employed a 2 (emoji: absence vs. presence) * 2 (consumption goals: utilitarian vs. hedonic) between-subjects design. All the participants read an introduction to a chatbot interaction in a scenario involving the online purchase of books. After reading the introduction, participants witnessed an interaction with the chatbot through screenshots (see Fig. 3). The consumption contexts were either utilitarian or hedonic, and each context appeared with and without emojis. We followed the study by (Konya-Baumbach et al., 2023) to manipulate the consumption goals. In the utilitarian condition, participants were asked to imagine chatting with the chatbot about book choice for a book related to human resources management for work purposes. In contrast, participants in the hedonic condition were instructed to shop for detective fiction for personal pleasure.

FIGURE 3
THE EXPERIMENTAL MATERIAL (STUDY 2)



After presenting the screenshots, participants reported their perceptions of intimacy and satisfaction. These two measures were measured with the same scales used in study 1 ($\alpha_{intimacy}$= 0.751; $\alpha_{satisfaction}$= 0.794). Demographic information, including age, gender, and education level, was also collected. Furthermore, scenario realism was measured: "How difficult was it for you to imagine yourself in the interaction scenario?" (1 = difficult, 7 = easy).

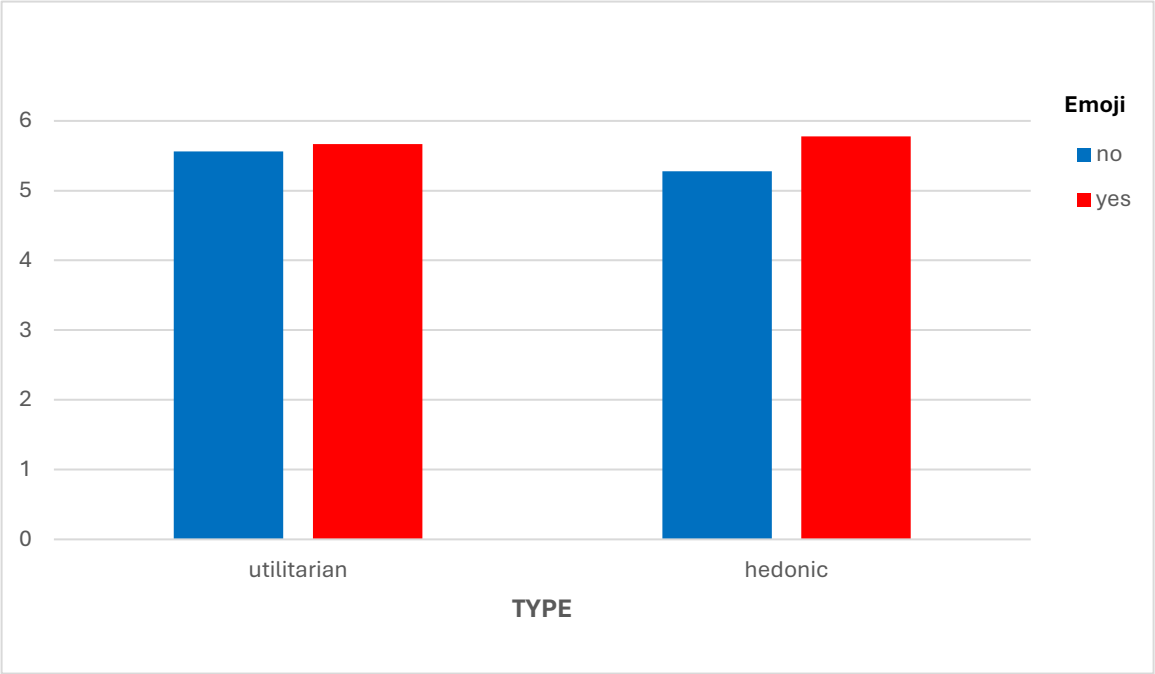
Results

Before the analysis, we performed the same three steps in Study 1 to enhance data quality. We conducted a manipulation check to confirm the validity of manipulating consumption goals. Participants in the hedonic condition perceived shopping purpose as more hedonic (less utilitarian) than those who are in the utilitarian condition ($M_{hedonic}$ = 4.73 vs. $M_{utilitarian}$ = 3.44, p < .000). The realism check showed that subjects perceived the experiment scenario as highly realistic and had no difference between the two conditions ($M_{no\ emoji}$ = 6.32 vs. M_{emoji} = 6.28; p = 0.665). The results showed that our manipulation of consumption goals was successful.

A two-way ANCOVA was conducted with intimacy as a dependent variable. The results revealed that emoji had a main effect (F (1, 233) = 9.130, p = 0.003), but consumption goals did not (F (1, 233) = 0.806, p = 0.370). We found a marginally significant interaction effect (F (1, 233) = 3.689, p = 0.056). As seen in

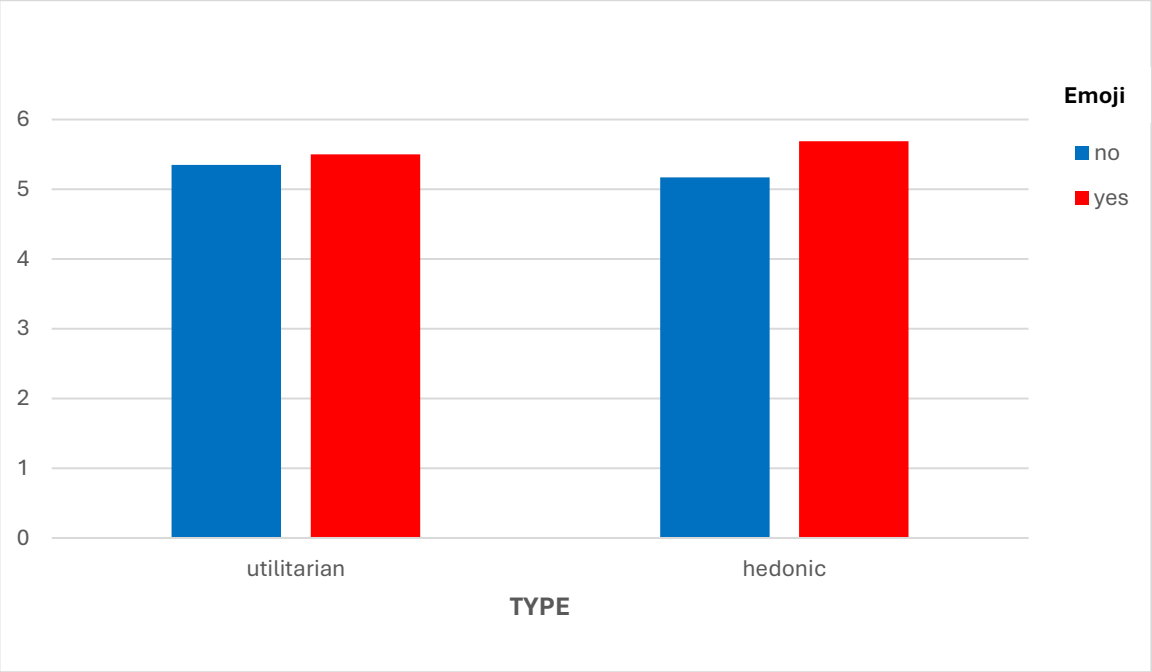
Figure 4, a follow-up test showed that in the hedonic context, there was a significant effect of the presence of the emoji (F (1, 230) = 12.491, p = 0.000), such that participants in the emoji present condition (M_{emoji}= 5.78) reported stronger intimacy than those in the emoji absent condition ($M_{no\ emoji}$= 5.28). However, such differences did not emerge among participants in the utilitarian context (M_{emoji} = 5.56, $M_{no\ emoji}$ = 5.67, F (1, 230) = 0.593, p = 0.442).

FIGURE 4
INTERACTION OF CONSUMPTION GOALS AND EMOJI ON INTIMACY



A two-way ANOVA was conducted with interaction satisfaction as a dependent variable. Results revealed a significant main effect of emoji (F (1, 233) = 12.016, p < 0.001), but consumption goals did not (F (1, 233) = 0.00, p = 0.964). We found a marginally significant interaction effect (F (1, 233) = 3.539, p = 0.061). As seen in Figure 5, follow-up tests showed that in the hedonic context, there was a significant effect of the presence of the emoji (F (1, 230) = 14.623, p < 0.000), such that participants in the emoji present condition (M_{emoji}= 5.69) reported stronger satisfaction than those in the emoji absent condition ($M_{no\ emoji}$= 5.17). However, such differences did not emerge among participants in the utilitarian context (M_{emoji} = 5.50, $M_{no\ emoji}$ = 5.35, F (1, 230) = 1.229, p = 0.269).

FIGURE 5
INTERACTION OF CONSUMPTION GOALS AND EMOJI ON SATISFACTION



To determine whether intimacy mediated the relationship between the presence of emoji and interaction satisfaction, we conducted a mediation analysis using SPSS PROCESS Macro Model 4 with 95% bias-adjusted confidence intervals and 5000 bootstrapped samples. The results showed that the presence of emojis increased interaction satisfaction through increased intimacy (b = 0.20, 95% CI [0.08, 0.34]). Therefore, H3 was supported.

To investigate whether intimacy mediates the effect of emojis by consumption goals interaction on satisfaction, we used PROCESS model 7 (Hayes, 2017) with 5,000 bootstrap samples. Bootstrapping results showed that intimacy mediated the impact of emoji on interaction satisfaction only in the hedonic context (indirect effect = 0.32, 95% CI [0.14, 0.52]). However, no mediation was found through intimacy in the utilitarian context (indirect effect = 0.07, 95% CI [-0.10, 0.25]). Thus, H4 was supported.

GENERAL DISCUSSION

This study investigated whether using chatbot emojis in human-robot interaction affected consumer satisfaction. The study also explored the moderating effect of consumption goals. Study 1 showed that emojis significantly increased interaction satisfaction, which is mediated by intimacy because emojis increase the closeness between consumers and chatbots, resulting in higher satisfaction. Study 2 showed that consumers with hedonic consumption goals were more satisfied in the emoji-present condition than those in the emoji-absent condition. However, such differences did not emerge among consumers with utilitarian goals. Emojis appear ineffective at increasing interaction satisfaction for utilitarian consumption goals because they do not increase the sense of intimacy.

Theoretical Contributions

From a theoretical perspective, this research generates several contributions. Firstly, this research extends the study of chatbots' emotional expression through emojis in human-robot interactions. Emojis are used to represent facial expressions or abstract feelings and emotions. Their dominance in emotional expression makes them an effective tool to achieve positive outcomes (Das et al., 2019; McShane

et al., 2021). Previous studies showed that chatbots often fail to deliver satisfying emotional customer service (Becker et al., 2022; Zhou et al., 2022). This paper explores the role of emojis in enhancing consumers' satisfaction in human-robot interaction, expanding the scope of chatbots' emotional expression study.

Secondly, we extend our understanding of intimacy and its role in explaining the influence of emojis on consumer responses in human-robot interaction. The limited existing literature explains the mechanism of influence of chatbots using emojis on service satisfaction (Yu & Zhao, 2024). Our research introduces intimacy as a mediating variable and finds a relationship between emojis and perceived intimacy, improving interaction satisfaction. Our study presents a new theoretical framework that describes the influence of emotional expression by chatbots through emojis on interaction satisfaction.

Thirdly, we contribute to the literature on specific shopping contexts by examining the moderating effect of consumption goals on the impact of chatbots employing emojis on customer response. While one stream of research emphasized the positive effect of using emojis (Huang et al., 2020; Qiu et al., 2023) on customer perception and evaluation, another stream recognized that they can backfire and be detrimental to consumer responses (Glikson et al., 2018; Li & Shin, 2023). Our research responds to recent calls for a deep understanding of the usage of emoji designs and nuances in various contexts (Maiberger et al., 2024). Our study explores the interaction of employing emojis and consumption goals and found that emojis in human-robot interaction are more effective in shaping the positive effect of consumer reaction towards chatbots when used in hedonic contexts than in utilitarian contexts. Our findings enrich human-robot interactions by confirming that it is feasible to improve consumer evaluation by matching the usage of emojis and shopping contexts of chatbots.

Managerial Implications

This work provides valuable guidance for practitioners interested in deploying emojis in human-robot interactions. This study presents emojis as a promising means for chatbots to express emotions. According to the findings, adding emojis to a chatbot increases interaction satisfaction because it creates a sense of closeness, a positive effect that only applies to consumers with hedonic goals. Since it is easy and cheap for chatbots to add emojis, our findings suggest companies proactively identify emojis as a non-verbal tool to enhance human-robot interaction efficacy, especially in hedonic contexts.

We also find evidence that emojis nurture intimacy between chatbots and consumers. This close relationship can contribute to a satisfying user experience. Companies are encouraged to develop more ways to develop close connections between chatbots and consumers, such as directly addressing the customer's name or putting humorous content in human-robot interactions and enhancing the interaction quality of chatbots.

Limitations and Future Research

Our research has several limitations. Firstly, we used several frequently used emojis in our research. Prior studies have shown that overusing emojis might cause a saturation effect, harming online interactions (Orazi et al., 2023). Future research might examine the optimal number of emoji chatbots used in human-robot interaction. Secondly, we did not investigate the effects of emoji position on consumer response. Future studies might extend our research by examining whether emoji position changes consumer evaluation. Thirdly, this study utilized intimacy as its theoretical foundation to investigate the impact of chatbots using emojis on interaction satisfaction. Future research could explore other potential mediators, such as processing fluency. Fourthly, our research shows that consumption goals are a significant moderator for the relationship between chatbot usage of emojis and consumer response. Future research could also benefit from investigating other boundary conditions, such as relationship norms. Finally, this study used screenshots of conversations as experimental stimuli. Future research could use diverse methods to verify the findings of this research, such as field experiments or longitudinal studies.

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