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Individual and contextual determinants of emoji usage and its impact on communication outcomes

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PhD in Psychology

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December, 2023

CIÊNCIAS SOCIAIS
E HUMANAS

Departament of Social and Organizational Psychology

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To my family.

Acknowledgments

Like most things in life, a PhD is not a race, but a marathon. A painful one. It's just like most marathons, anyway. Studying was always something I enjoyed doing, and so pursuing a PhD was a natural step. My curiosity and will to keep learning brought me here. The last four years unfolded in a totally different way than what I envisioned. The process that got me here was much tougher than I expected. But it was worth it. I leave this journey as a better psychologist, a better researcher, and, most importantly, a more knowledgeable and overall better person. But I only got here thanks to those who supported me for the last four years. So here goes a list of appreciations.

First, to my supervisors:

To Marília Prada  first, and foremost, for the opportunity. But also, for being understanding and supportive, and for all the guidance, and teachings. Thank you.

To David Rodrigues  , for the insanely fast feedback and unlimited availability, and all the guidance, and teachings (you taught me so much about Statistics). Thank you.

More broadly, to both my supervisors: I appreciate all the help, flexibility and work you put into my project. And, especially, thank you for all the fun meetings that started with discussions about emoji and ended with conversations about drag queens  —some of the moments I hold dearest from my PhD happened during these meetings.

Second, to my family:

To my parents and brother  , and also my grandma  , for my life, and education, and for setting me up for success. I shall always do the best I can with what you gave me. I will never forget where I came from and that you always ensured I had everything I needed. Without you this Thesis would never be possible.

Specifically to my brother, Gonçalo  , for being my beacon of light. Thank you for never letting me forget why I am here and for being wherever you are whenever I need you. Long live Sir Harkon.

To Lúcia  , for the emotional support and for always believing in me and my capacities. I appreciate the reality checks when I got overly pessimistic. I appreciate the consultancy service. I appreciate the partnership.

To Xavier  for bringing perspective to my life and reminding me this is just a Thesis.

To Ana  and David  for the fun afternoons and nights playing board games when I just needed to chill.

Finally, to my friends  :

To Eduardo Reis for the advice and for just listening, really.

To David Guedes for sharing this journey with me, for listening to me and always trying to make things seem less daunting.

To Rui for the opportunity and for believing in me. You have no idea how much you have helped me.

To Pedro for the reminder that there are happier places to be.

To Grilo for being an example of what it really means to be a self-made man and showing me a different perspective of success.

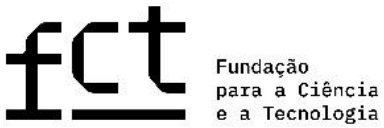
To Robin and Gabriel for all the fun and relaxing streams.

Finally, to all professors, researchers, and students that I met during this journey, and to all the participants that made this work possible.

Sintra, 2023.

Funding

This research was supported by a doctoral grant from FCT – Fundação Portuguesa para a Ciência e a Tecnologia (SFRH/BD/146388/2019).



Resumo

As pessoas utilizam comunicação-mediada por computador (CMC) recorrentemente. Especificamente nos canais textuais de CMC, a expressão de pistas sociais, afetivas e não verbais pode ser limitada, comprometendo a comunicação. A inclusão de pistas pictóricas—como emoji—na comunicação escrita pode ajudar a ultrapassar estas limitações, ao auxiliarem utilizadores a transmitirem informação emocional e clarificarem os conteúdos das suas mensagens. No presente trabalho, recorremos a metodologias complementares para examinar os efeitos do uso de emoji enquanto ferramenta de comunicação, mapeando sob que condições o uso de emoji pode impactar positivamente (ou negativamente) processos de comunicação. Especificamente, apresentamos num conjunto de cinco artigos: a) um estudo experimental que examinou a adequabilidade percebida de uso de emoji em diversos contextos, com mensagens de valência diferente (Artigo 1); b) um estudo correlacional focado em contextos de comunicação de marcas e respetiva adequabilidade de uso de emoji (Artigo 2); c) um estudo correlacional que examinou se dimensões individuais, relacionais e motivacionais determinam a frequência de uso de emoji com diferentes interlocutores (Artigo 3); d) dois estudos experimentais em que testámos o efeito da reciprocidade de uso de emoji na perceção de pessoas e comunicação (artigo 4); e e) dois estudos experimentais que analisaram o papel mediador da presença social entre uso de pistas pictóricas e perceção de pessoas e comunicação. Sumariando, este trabalho contribui para mapear características contextuais e individuais que se relacionam com uso de emoji, mostrando simultaneamente o impacto do uso de emoji em dimensões importantes de perceção de pessoas e comunicação.

Palavras-chaves: presença social, emoji, comunicação-mediada por computador, contexto, diferenças individuais

PsycINFO Classification Categories and Codes:

2700 Communication Systems

3040 Social Perception & Cognition

Abstract

People use computer-mediated communication (CMC) recurrently in their everyday interactions. Particularly in the case of text-based CMC, the expression of social, affective, and non-verbal cues may be limited and lead to poorer communication outcomes. Including pictorial cues—such as emoji—in written communication may overcome these potential limitations, by helping users convey emotional information and clarify the contents of their messages. In the current work, we use complementary methodological approaches to examine the effects of emoji use as a communicational tool and map under which conditions emoji use may impact positively (or negatively) communication processes. Specifically, we present a collection of five articles: a) an experimental study examining the perceived adequacy of emoji use across several contexts and message valence (Article 1); b) a correlational study focused on brand communication settings and perceived adequacy of emoji use (Article 2); c) a correlational study examining individual, relational and motivational determinants of emoji use frequency with different interlocutors (Article 3); d) a set of two experimental studies testing the effects of reciprocity of emoji use on person perception and communication outcomes (Article 4); and e) a set of two experimental studies investigating the mediating role of perceived social presence on the implications of pictorial cues use for person perception and communication outcomes. Overall, this work contributes by mapping important contextual and individual features related to emoji use, as well as by showing the impact of emoji use on important interpersonal dimensions and overall communication.

Keywords: social presence, emoji, computer-mediated communication, context, individual differences

PsycINFO Classification Categories and Codes:

2700 Communication Systems

3040 Social Perception & Cognition

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Introduction

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1.1. General Introduction

Computer-mediated communication (CMC) is ubiquitous, with different interpersonal relationships occurring through asynchronous text-based CMC, and can sometimes replace face-to-face interactions (e.g., first-dating interactions may occur online; Knapp et al., 2014). However, concerns about the potential limitations of text-based CMC channels emerged early on, including the absence of certain information (e.g., facial expression, tone of voice). For example, the cues-filtered-out perspective posits that certain CMC channels (e.g., text-based) filter out important nonverbal cues (e.g., eye contact, tone of voice), in comparison to face-to-face interactions (for an overview, see Culnan & Markus, 1987). This perspective goes further in describing nonverbal cues as important to regulate social interactions (e.g., the lack of nonverbal cues could lead to increased interruptions during conversations), give information for impression formation (e.g., evaluating interlocutor's responses), and provide contextual information (e.g., the context of interaction).

Nonverbal cues are, indeed, relevant for interpersonal interactions by serving multiple communication functions (e.g., communicating friendliness, interest, playfulness, or even dominance and status) and being fundamental to managing everyday conversations and relationships (Knapp et al., 2014). Such cues can interact with verbal information and complement it, namely by amplifying parts of the message (e.g., emphasizing a point), substituting parts of the verbal message (e.g., demonstrating an emotion, without verbalizing it), or regulating a conversation (e.g., showing a lack of interest in a discussion topic). And yet, the notion that text-based CMC, compared to face-to-face communication, is limited due to the lack of nonverbal cues has been challenged over the years (cf. Walther, 2011; Walther et al., 2015).

Users of text-based CMC have adapted and found ways to complement and improve their written communications. For example, individuals have been resorting to diverse paralinguistic cues, including emoticons and emoji (Luangrath et al., 2017). Emoticons are symbols resulting from the combination of symbols (e.g., punctuation, numbers), whereas emoji are graphic symbols with predefined names and designs, representing a wide variety of contents (e.g., faces, emotions, animals; for an overview, see Rodrigues et al., 2018). Emoticons, in particular, have been recognized as a type of nonverbal cue that help enrich text-based CMC (e.g., to

disambiguate the message, express emotions, regulate the interaction), serving similar purposes of certain nonverbal behaviors during face-to-face interactions (e.g., smiles; for a review, see Derks et al., 2008). Likewise, emoji have been described by CMC users as useful to improve messages and aid in emotional expression (Tandyonomanu & Tsuroyya, 2018). Emoji can also be used to convey affect and contextual information that improve the interpretation of emotional information present in text-based messages (e.g., a user that includes a negative emoji is understood as being in a negative emotional state; Boutet et al., 2021). Arguably, this is due to emoji's ability to represent emotions or affective information similar to human faces (Fischer & Herbert, 2021; Kaye et al., 2021). Emoji can also influence evaluations made about its senders (e.g., emoji users perceived as warmer; Boutet et al., 2021) and even induce specific behavioral intentions (e.g., stronger intentions of making reservations at a restaurant; Prada et al., 2022). Research on this topic also suggests that emoji use and its consequent impact on perceptions and communication outcomes may relate to individual variables (e.g., user's age, gender, and personality; Oleszkiewicz et al., 2017). Furthermore, emoji use may also depend on the context in which the interaction occurs (e.g., regarded as inappropriate in formal work communications; Riordan & Glikson, 2020), and/or depend on the type of relationship between emoji users (e.g., emoji are most frequently used with friends; Thomson et al., 2018).

In sum, research focusing on the impact of nonverbal cues on communication, particularly emoticons and emoji, has substantially expanded over the years. Notably, this topic of research has received contributions from different fields, namely psychology, communication, linguistics, marketing, information technologies, and cognitive sciences. The current work addresses emoji (and similar cues) as tools that aid communication processes, while also offering information for individuals to make inferences about emoji users. In Articles 1 and 2, we explored how emoji use is perceived in different contexts of interaction (Chapters 2 and 3, respectively). In Article 3, we identified individual characteristics associated with emoji use frequency (Chapter 4). Finally, in Articles 4 and 5, we explored variables that could significantly contribute to explaining the impact of emoji on person perception and communication outcomes (Chapters 5 and 6, respectively).

1.1.1. The users of technology, emoticons, and emoji: Does age, gender, and personality matter?

For a better understanding of the users of emoticons and emoji, we must start by focusing on CMC users in general. Researchers have identified significant individual dimensions relevant to technology use. For example, younger individuals use technology (e.g., text messaging,

emailing) more often than older individuals (Koçak & Yüksek Vergiveren, 2019; Rosen et al., 2013; Staddon, 2020). A recent review supports these findings and reports that social networking sites (e.g., Facebook, Instagram, WhatsApp) are mostly used by younger people (i.e., between the ages of 18 and 29; Gambo & Özad, 2020). Younger individuals also report more positive attitudes toward technology (e.g., believing technology can provide solutions to problems; Rosen et al., 2013). Moreover, motivations to use these platforms seem to differ according to age. Younger individuals report using these platforms to pass their time/procrastinate (Orchard et al., 2014), for specific personal motives (e.g., sharing personal issues, gossiping; Koçak & Yüksek Vergiveren, 2019), and to establish new relationships (e.g., making new friends; Orchard et al., 2014). Older individuals, on the other hand, often report using these platforms as a way to conform to social expectations (i.e., because other people expect them to use these platforms; Orchard et al., 2014). Interestingly, a parallel with patterns of pictorial cues use can be made. For example, the frequency and motivations to use emoji are also associated with age. Oleszkiewicz et al. (2017) collected data from Facebook users and found that younger (vs. older) users tend to post emoji more frequently. Prada et al. (2018) asked participants about their frequency of emoticons and emoji use and found that younger (vs. older) individuals reported using both cues more frequently. A study analyzing naturalistic data (i.e., WhatsApp messages) conducted by Koch et al., (2022), showed a similar pattern, with younger individuals using emoticons more often, as well as a broader range of both emoticons and emoji (e.g., used a larger number of different emoji). Regarding motivations to use emoji, younger (vs. older) individuals reported identifying more with motives to use emoticons and emoji (e.g., express feelings, strengthen the content of a message) and reported more positive attitudes toward emoji (e.g., evaluating them as more useful, fun; Prada et al., 2018). Finally, interpreting emoji meaning is also associated with age, such that younger individuals tend to interpret emoji less literally and as serving specific functions (e.g., softening the message, modifying the tone), whereas older individuals tend to interpret emoji more literally (e.g., as literal virtual actions; Herring & Dainas, 2020).

Gender differences are also relevant to properly understanding technology use. Men report more favorable attitudes toward technology use (e.g., believing in its usefulness for society) compared to women (for a review, see Cai et al., 2017). Interestingly, however, women use social networking sites (e.g., Facebook, Instagram, WhatsApp) more often than men, particularly for relational motives (e.g., maintenance of social relationships with friends; Gambo & Özad, 2020; Koçak & Yüksek Vergiveren, 2019; Orchard et al., 2014). In contrast, men more are motivated to acquire general information (Gambo & Özad, 2020),

share political content (Koçak & Yüksek Vergiveren, 2019), or pretend to be someone else when using technology (e.g., lie about their personal information; Orchard et al., 2014). Importantly, women (vs. men) use more emoticons (for a review, see Tang & Hew, 2018) and report an overall higher frequency of emoji use in their messages (Jones et al., 2020; Prada et al., 2018), including in platforms such as WhatsApp (Koch et al., 2022; Pérez-Sabater, 2019) and Facebook (Herring & Dainas, 2020; Oleszkiewicz et al., 2017). Congruently, women also evaluate emoji as more familiar, clear, and meaningful than men (Rodrigues et al., 2018). This may stem from the evidence that women (vs. men) hold more positive attitudes toward emoji use (e.g., evaluate them as more useful, and fun; Prada et al., 2018). Overall, women resort to text-based CMC and emoji to develop their relationships and build intimacy, whereas men see these elements as unnecessary for already established relationships (Pérez-Sabater, 2019).

Finally, personality traits have also been associated with technology use and can predict motivations to use social networking sites. Specifically, higher extraversion has been associated with higher use of these platforms to form new connections and because it is fun, whereas higher neuroticism has been associated with higher use of these platforms for entertainment (i.e., forget about responsibilities; Orchard et al., 2014). Previous studies also examined how personality traits are associated with emoji use. For example, Marko (2022) found neuroticism and extraversion to be negatively associated with emoticons and emoji use, and openness to experience to be positively associated with emoji use. However, other studies report the opposite regarding neuroticism, finding this trait to be positively associated with emoji use (Völkel et al., 2019). Regarding the motivations driving emoji use, participants scoring higher on neuroticism or lower on extraversion tend to use emoji to avoid awkward interactions, whereas those who score higher on agreeableness tend to use emoji to express emotions, clarify messages, and show a sense of humor (Liu & Sun, 2020).

To sum up, it is crucial to consider individual dimensions (particularly age, gender, and personality) when analyzing text-based CMC and consequent emoji use. But some of the highlighted differences, particularly in what refers to motivations for emoji use (e.g., women reporting resorting to them to build friendships; Pérez-Sabater, 2019), hint at the possibility that considering interlocutors and contexts of communication may also be important.

1.1.2. Emoticons and emoji use: Why, with whom, and when?

Several studies have identified reasons for individuals to use emoticons and emoji when communicating through text-based CMC. Overall, emoticons and emoji serve various purposes, such as expressing or clarifying emotions, reinforcing or clarifying the meaning of messages (for a review, see Bai et al., 2019; Tang & Hew, 2018), or even lightening the mood (e.g., joking; Kaye et al., 2016; Thomson et al., 2018). Further studies have explored these functions. For example, Riordan (2017a) found that messages with non-facial emoji (e.g., 🎉) were rated as displaying more positive emotions (e.g., joyfulness) when compared to text-only messages. Other studies have found that emoji can make communication more efficient, such that the presence of emoji increases understanding of the message's content (Holtgraves & Robinson, 2020). The presence (vs. absence) of emoji in more (or less) ambiguous messages can also reduce message ambiguity, leading participants to better understand the intent of a message (Riordan, 2017b). This corroborates the idea that both emoticons and emoji can contribute to communication processes. However, using these cues may be bound to the context of interaction. For instance, individuals use both emoticons and emoji more often with closer interlocutors (e.g., friends, and romantic partners; Derks, Bos, et al., 2008; Jones et al., 2020; Thomson et al., 2018) and less so with more distant interlocutors (e.g., professors, supervisors; Jones et al., 2020). Thus, these effects are not straightforward and may depend on with whom individuals communicate (e.g., friends vs. supervisors). Indeed, including emoji in text-based CMC is usually done to display closeness (Sampietro, 2019), help increase intimacy (e.g., increase emotional closeness; Kim et al., 2022) and warmth (e.g., Aretz & Mierke, 2019; Boutet et al., 2021). These goals and functions of emoji are more aligned when individuals communicate with closer (vs. more distant) interlocutors, and/or based on their relationship goals (e.g., certain emoji are more capable of signaling friendship intentions vs. others more useful to signal romantic intentions; Rodrigues et al., 2022).

Another dimension worth considering is the valence of a message, as both emoticons (Derks, Bos, et al., 2008) and emoji (for a review, see Tang & Hew, 2018) tend to be used more often in positive (vs. negative) contexts. Coyle and Carmichael (2019) manipulated emoji use (vs. no use) by an interlocutor sending messages and the participant receiving the messages, examining message valence separately. Results revealed that when both interlocutors used emoji, perceptions of responsiveness and positive impressions were elicited (e.g., friendlier, warmer), but only for positive messages. This suggests that valence may be a relevant moderator for emoji use in text-based CMC. Similarly, Rodrigues et al. (2017) manipulated emoji use (vs. emotional text vs. no emotional cue) and the severity of an issue (less vs. more

severe) in a conversation between two romantic partners. Results revealed that emoji use can have positive effects when used in messages addressing less severe issues (e.g., increased interest in the relationship) and derogative effects in the case of a more severe conflict (i.e., lower interest in the relationship). In other words, using emoji in messages perceived as more negative was detrimental and reduced perceptions of interest in the relationship. This pattern of results seems to carry over to different scenarios of communication. For example, by manipulating emoji presence (with vs. without) and the valence of hotel reviews (positive vs. negative), Manganari and Dimara (2017) found that participants reported more positive attitudes toward a hotel when the review was positive and included positive emoji, when compared to a negative review. This reveals that the valence of the situation or the message can be a determining factor for the impact of emoji use, even across different contexts of interaction.

Both the contexts of communication and the interlocutors can relate to emoji use. For example, a study by Thomson et al. (2018) found that participants reported using emoji frequently with friends (e.g., in humorous ways) or romantic partners (e.g., to flirt). For contexts with more distant interlocutors, individuals report less frequent emoji use (e.g., in professional e-mails), particularly with figures of authority (e.g., supervisors, tutors), as they consider emoji inappropriate in such interactions (Kaye et al., 2016). However, a recent study by Shandilya et al. (2022) found evidence of frequent emoji use in a professional setting. Importantly, participants also reported feeling unsure about how their colleagues could perceive them, thus feeling insecure about emoji use at work. These feelings are not unwarranted, as using pictorial cues is not straightforward in these contexts, such that several studies have suggested that emoji use may have negative effects in professional settings. For instance, Aretz and Mierke (2019) conducted a study in a work-related setting and manipulated the presence (vs. absence) of emoticons or emoji on a text-based message. The authors found that senders who used emoticons or emoji were perceived as warmer, but also as less assertive. Glikson et al. (2018) found a similar pattern, with the presence (vs. absence) of emoji in work-related messages resulting in the sender being perceived as warmer when the context of interaction was informal but less competent in a formal context. These effects were explained by the perceived appropriateness of emoji use in that context (i.e., perceived as less appropriate to use emoji in formal settings). Likewise, Riordan and Glikson (2020) found that emoji presence (vs. absence) reduced the perceived effectiveness of a manager, but only when participants reported working in a formal work setting. In educational settings, similar results have been reported. For instance, Li and colleagues (2018) found that participants perceived a coordinator (i.e., a formal context) who used emoji in an e-mail as warmer but less competent, when compared to a

coordinator who did not use emoji. Similarly, Vareberg and Westerman (2020) conducted a study that required participants to read e-mails sent by instructors welcoming new students, manipulating the presence of visual cues (i.e., emoji, emoticon, or control). Results revealed that instructors who included emoticons or emoji were perceived as more caring, but less competent.

The use of pictorial cues use is not exclusive to interpersonal relationships, with brands also relying on them to gain consumers' attention (Kwon & Sung, 2011). Recent research supports this idea. For example, Casado-Molina et al. (2019) analyzed Twitter posts of beer brands and found that brands use emoji to emphasize emotional information and reduce negativity/lighten the mood of an interaction, mimicking motives and functions for emoji use in interpersonal interactions. Relatedly, research has also studied emoji use by brands in settings that closely resemble typical interpersonal relationships. For instance, Li et al. (2018) found that a customer service representative using emoji when addressing a customer inquiry was rated as warmer, but less competent. In another study, researchers manipulated emoji presence (vs. absence) and found that restaurant replies to a customer's reservation request that included emoji led to the restaurant being evaluated as more informal and positive (e.g., warmer, more competent, more modern) and stronger intentions of making a new reservation in that restaurant (Prada et al., 2022). These results are interesting as they present an overall positive impact of emoji use on brand perceptions, without negative impact.

To sum up, when analyzing emoji use for communication purposes, different dimensions should be considered, including contextual information that may condition such use (e.g., the valence of messages, the interlocutors with whom we communicate) and individual motivations to use emoji. Importantly, it seems the capacity to adapt to the circumstances, specifically to our interlocutors, is of particular relevance.

1.2. Explanations and Mechanisms to Understand Emoticons and Emoji

1.2.1. Reciprocity of communication

An important aspect of communication is our capacity to adapt to others. Communication accommodation theory (Giles & Smith, 1979) suggests accommodation between interlocutors is fundamental for interactions, and that individuals will adapt more to their interlocutors the more they want to affiliate with them and/or be more easily understood (Dragojevic et al., 2015). One way through which individuals may accommodate to their interlocutors is by converging their communication style (i.e., adopting communicative behaviors similar to those

of their interlocutors; Dragojevic et al., 2015). Even though interlocutors are unable to see or hear each other during asynchronous text-based CMC, these principles of accommodation (and convergence) to specific communication patterns still occur while individuals exchange messages (for a review, see Giles et al., 2023). For example, Adams and Miles (2023) examined a corpus of text messages and found conversational partners converge to their interlocutors by using similar digital cues, specifically phrase-shorteners (e.g., "btw" for "by the way"), word substitutions (e.g., "2nite" for "tonight") and emoji. The latter are specifically useful as emoji are efficient (i.e., fast) and easy to use while allowing for the display of specific information (e.g., using 👍 for "liking" and "approval"). Overall, accommodating to an interlocutor by converging to their communication styles (e.g., similar features used, lexical mimicry) may reduce social distancing, and increase satisfaction and mutual understanding between communication partners (Dragojevic et al., 2015; Giles et al., 2023).

Research in the field of CMC has also explored how individuals converge to their interlocutors when emoji are used. For example, Coyle and Carmichael (2019) found that interlocutors converging in emoji use were perceived as more responsive and evaluated more positively (e.g., perceived as more patient and warmer) when compared to situations in which emoji use patterns were not reciprocated. Moreover, Stein (2023) found participants used emoji more often when replying to interlocutors who also used emoji, particularly if they were closer interlocutors (e.g., best friends). In the context of online dating, Nexø and Strandell (2020) found that individuals expect a level of convergence of emoji use (e.g., use a similar number of emoji), or else they may experience insecurity or disinterest in the interaction. Wagner et al. (2022) analyzed a corpus of text-based messages and observed a match in the frequency of emoji use between interlocutors in flirtatious texts, with participants justifying that emoji were used to reciprocate the other person's communication style (e.g., replying with emoji to a text containing emoji). This suggests individuals may also consciously converge their emoji use patterns, just like they may consciously converge in general communication processes (e.g., by adjusting the accent, posture; Dragojevic et al., 2015). Marko (2022) paired students to interact with each other through a texting application and manipulated emoji use by assigning the role of leader to one of the students, who was instructed to use (or not use) emoji. Results revealed that when participants leading the conversation used emoji, replies included significantly more emoji. When asked to indicate the reasons for reciprocating emoji use, participants acknowledged using emoji to consciously try to converge to their interlocutor's communication style. Overall, these findings support the importance of accommodating communication

patterns, particularly through converging to their communication patterns, even in text-based CMC.

1.2.2. Perceived social presence in CMC contexts?

Understanding the impact of emoji use on person perception and communication outcomes involves identifying mechanisms that can help in explaining relationships. One potential mechanism that has emerged in the literature is perceived social presence. In the context of CMC, social presence refers to the extent to which an interlocutor is understood by another as being real and the relationship as salient (Short et al., 1976). In other words, this concept refers to the degree to which users experience human interaction and feelings of being with the other person when exchanging text-based messages (Biocca et al., 2003), as they are perceived as being present in the specific CMC channel and, thus, as viable interaction partners (Öztok & Kehrwald, 2017). This is relevant as research focused on CMC has suggested that social presence is an important dimension for interpersonal relationships and communication outcomes (e.g., persuasion; for a review, see Oh et al., 2018).

Text-based CMC channels are often considered restricted in terms of the available nonverbal information, compared with face-to-face interactions, and as such, limited in their social presence (Aldunate & González-Ibánez, 2017). To overcome these limitations and increase social presence, individuals may use different communication styles (e.g., a communication style that emphasizes empathy and intimacy; Song & Hollenbeck, 2015). In a previous study, chatbots designed to mimic human communication (e.g., speaking in the first vs. third person) were perceived as being more socially present (e.g., participants felt more human contact), which then elicited stronger perceptions of trust (Konya-Baumbach et al., 2023). Therefore, it seems that certain communication styles can make an interlocutor be perceived as more human and present during a text-based CMC interaction. Another strategy consists of the inclusion of pictorial cues, such as emoticons and emoji (Aldunate & González-Ibánez, 2017; Tang & Hew, 2020). By allowing individuals to complement messages and add expressiveness (e.g., communicate emotional states, and clarify intentions) emoji use also promotes perceptions of social presence (for a review, see Aldunate & González-Ibánez, 2017). For example, previous studies have found that including emoji in text messages (vs. only text vs. text and picture) in the context of customer support chat improved evaluations of the customer service agent due to stronger perceptions of social presence (Park & Sundar, 2015). Another study found that emoji use (vs. no use) in text messages increased perceived social presence, resulting in higher social support (Petrocchi et al., 2020). When interpreting these

results, a common argument is that cues such as emoji elicit perceptions of social presence as they enrich text-based CMC interactions (e.g., by providing better emotional expression, and clearer intentions; Aldunate & González-Ibánez, 2017; Petrocchi et al., 2020). This is achievable even if users are not interacting with actual humans or humanized entities. For instance, emoticons or emoji use (vs. text-only) by a brand replying to a customer review resulted in a higher perceived social presence for that brand's response (e.g., message perceived as more personal), which then resulted in more positive attitudes towards the brand and increased purchase intentions (Hayes et al., 2020).

1.3. Aims and Overview

The current thesis consists of a collection of five scientific articles that contribute to systematizing previous research on emoji, while examining individual and contextual determinants of emoji use. Particularly, we sought to: (1) identify the perceived adequacy of emoji use with different interlocutors with messages that varied in valence (Chapter 2 - Article 1); (2) further explore interactions with a specific interlocutor, particularly identifying the contexts of brand communication deemed more or less adequate for emoji use (Chapter 3 - Article 2); (3) identify individual, relational, and motivational variables associated with emoji use with different interlocutors (Chapter 4 - Article 3); (4) experimentally test variables that potentially moderate (i.e., reciprocity, Chapter 5 - Article 4) or mediate (i.e., social presence, Chapter 6 - Article 5) emoji use and its communication outcomes.

Article 1, entitled "Evaluating the Adequacy of Emoji Use in Positive and Negative Messages from Close and Distant Senders" (Cavalheiro, Prada, Rodrigues, Lopes, et al., 2022, published on *Cyberpsychology, Behavior, and Social Networking*), focused on examining the perceived adequacy of emoji use across several communication scenarios. Knowing that emoji use tends to be more frequent with friends and romantic partners (Thomson et al., 2018), while its use was deemed inappropriate in other settings (e.g., professional; Glikson et al., 2018; Kaye et al., 2016), the impact of such use can be context-dependent. Furthermore, previous studies also highlighted valence as a determinant variable, as emoji are more often used in positive interactions (e.g., Tang & Hew, 2018) and/or even result in negative outcomes when used in very negative situations (e.g., Rodrigues et al., 2017). Thus, in Article 1 we considered an extensive set of interlocutors with whom individuals may communicate over text-based CMC, such as professors (e.g., Kim et al., 2022), supervisors (e.g., Riordan & Glikson, 2020), or even organizations and brands (e.g., Prada et al., 2022). We also assessed if the perceived adequacy

of emoji use varied depending on the valence of the messages. Results showed emoji use is deemed more inadequate with distant (vs. close) interlocutors, and for negative (vs. positive) messages. The strongest contribution of this work was the systematization of the perceived adequacy of emoji use across several communication scenarios (from closer to more distant interlocutors) of difference valence (positive vs. positive). This work can serve as a basis for future studies, as we offer a wide evaluation of scenarios categorized as adequate (or not) for emoji use.

Article 2, entitled "With or without Emoji? Perceptions about Emoji Use in Different Brand-Consumer Communication Contexts" (Cavalheiro, Prada, Rodrigues, Garrido, et al., 2022, published on *Human Behavior and Emerging Technologies*) follows up by examining perceptions about emoji use in different brand communication scenarios. Brands and organizations also rely on emoji, creating attachment to their products (e.g., Arya et al., 2018), making them seem more modern and even influencing behavioral intentions (e.g., increased willingness to make a reservation at a restaurant; Prada et al., 2022). Thus, in Article 2, we explored perceptions of the adequacy of emoji use by brands across five scenarios (e.g., when calling back a defective product, when advertising in social media posts). We further explored if individual variables (e.g., age and gender), self-reported frequency of emoji use, and views about emoji use (e.g., useful, fun, good) were predictors of the adequacy of emoji use by brands in the listed scenarios. Results revealed that emoji use was considered more adequate in certain brand communication contexts than in others (e.g., more adequate to use when advertising on social media, and less adequate when communicating about defective problems). Being younger, using emoji more frequently, and finding emoji more useful and formal also impacted evaluations of the adequacy of emoji use. These findings shed light on how emoji use by brands should be carefully considered. Indeed, not all contexts of interaction were deemed adequate for emoji use. It also suggests individual differences (e.g., age) and behaviors (i.e., frequency of emoji use) may determine perceptions of the adequacy of emoji use. Finally, our results suggest that individuals' views on emoji use (e.g., understanding them as useful) may determine the extent to which they are more, or less, adequate for brands to use. Overall, this study provides relevant insights into how organizations and brands may tailor their online communication to better serve their goals.

Article 3, entitled "Who (and with Whom) Uses More Emoji? Exploring Individual, Relational, and Motivational Characteristics Driving Emoji Use" (Cavalheiro et al., 2023, published on *Telematics and Informatics*) expands our previous findings related to emoji use adequacy with different interlocutors (Article 1) and the role played by individual differences

(Article 2). Previous research has suggested that the way people use pictorial cues and the motivations to use them may vary according to individual characteristics (e.g., age, and gender; Prada et al., 2018). However, most studies have typically focused on some of these variables separately. We innovated by integrating age (e.g., Jones et al., 2020; Prada et al., 2018), gender (e.g., Prada et al., 2018), personality (e.g., Liu & Sun, 2020; Marko, 2022; Völkel et al., 2019), and motives to use emoji (e.g., Prada et al., 2018) into a single model. As relational dimensions have been hinted as relevant (e.g., emoji may be used to foster affiliation and intimacy; Sampietro, 2019), we also included for the first time relatedness to others (i.e., need to belong and connect with others; Ryan & Deci, 2000) as a potentially relevant predictor of emoji use frequency. Finally, research in this field tends to focus on single contexts of interaction, from intimate interpersonal relationships (e.g., Rodrigues et al., 2017), to professional (e.g., Glikson et al., 2018) or educational (e.g., Kim et al., 2022) settings. Therefore, Article 3 focused on mapping how different individual (i.e., age, gender, personality), relational (i.e., relatedness to others), and motivational (i.e., establish personal contact, decrease loneliness, social ease) variables associated with emoji use frequency, with different interlocutors (i.e., closer and more distant others). We found that age (e.g., being younger), personality (e.g., higher conscientiousness), and specific motivations (e.g., resorting to emoji use for personal contact) were correlates of emoji use frequency with certain interlocutors (e.g., closer ones, such as friends). These findings tie together the findings of both Articles 1 and 2, showing the importance of individual, relational, and motivational variables for emoji use with different interlocutors and, thus, across different contexts of interaction.

Article 4, entitled "Examining the Effects of Reciprocal Emoji Use on Interpersonal and Communication Outcomes" (Cavalheiro et al., 2023, in press on *Journal of Social and Personal Relationships*) presents two experimental studies in which we tested the role of reciprocating communication styles (namely, emoji use) on communication outcomes. Previous research has found that individuals seek convergence of emoji use (e.g., using a similar number of emoji; Nexø & Strandell, 2020), to the point that reciprocating such use can have positive impacts on interlocutors (e.g., perceived as more responsive and evaluated as warmer; Coyle & Carmichael, 2019). In the first study, we tested if the use of different emoji in a work-related context impacted person perception dimensions and communication outcomes. Warmth and competence are important dimensions associated with person perception and interpersonal evaluations (e.g., Cuddy et al., 2008; Fiske et al., 2007) and previous research has already shown the impact of using emoji on such dimensions (e.g., Boutet et al., 2021). Besides assessing social perception, we also evaluated communication outcomes (e.g., message

efficacy) as it is known that emoji may improve communication by complementing it (e.g., Tandyonomanu & Tsuroyya, 2018). We further tested if the reciprocity of emoji use moderated the impact of using emoji. In Study 2, we tested if the conflict level between interlocutors moderated the effects, in line with previous research (Rodrigues et al., 2017). Similar to Study 1 (and contrary to our expectations), reciprocating emoji use did not present a significant impact across our main variables. Nonetheless, our results replicated previous findings, by showing that emoji use positively impacted person perception (e.g., warmth) and communication outcomes (e.g., message positivity). Our results also add to this field of research by reinforcing the importance of emoji valence for communication outcomes, while also suggesting in certain situations (e.g., when conflict is latent or explicit) emoji use may not be as impactful.

Finally, Article 5, entitled "Show Yourself?! Social Presence as a Mechanism for the Effects of Using Different Pictorial Cues in Text-Based Computer-Mediated Communication" (Cavalheiro et al., 2023, under review) explored a potential mechanism for the impact of emoji use on person perception and communication outcomes – social presence (e.g., Aldunate & González-Ibánez, 2017). In two experimental studies, we tested if social presence mediated the effect of using pictorial cues on person perception (e.g., warmth) and communication outcomes (e.g., message efficacy). We further extended prior studies (e.g., Petrocchi et al., 2020) by including different pictorial cues (i.e., emoticons, emoji, memoji) and assessing the impact on important dimensions related to person perception and communication. To test whether the effects were driven by a positivity effect, in the second study we included negative emoji. Results in both studies showed that social presence was a mechanism capable of explaining the impact of pictorial cues on person perception and communication outcomes. We replicated these results with a negative emoji, suggesting that the capacity of emoji to elicit social presence was not bound to a positivity effect. Lastly, we replicated these effects with different pictorial cues varying in the extent they represent a human face.

The last Chapter of this thesis (Chapter 7 – Concluding Remarks) presents a summary of the overall findings, reflects on the theoretical implications for CMC and other relevant fields of research, and reflects on the practical implications of our results. We first present an overall discussion of the main findings of each study. We also discuss the implications for the field of text-based CMC research, as well as applied areas adjacent to this research subject. We highlight the contributions of the current work in offering a wide understanding of emoji use adequacy according to individual and contextual features. We finally discuss the evidence regarding the impact of emoji use on person perception and communication outcomes, and on how social presence emerged as a mechanism explaining this relationship. Overall, we discuss

the importance of the current work for the field of CMC and emoji studies, as well as for fields such as marketing and communication. O primeiro parágrafo está alinhado com o título da secção.

1.4. References

Adams, A., & Miles, J. (2023). Examining textism convergence in mediated interactions. *Language Sciences*, *99*, 101568. https://doi.org/10.1016/j.langsci.2023.101568

Aldunate, N., & González-Ibánez, R. (2017). An integrated review of emoticons in computer-mediated communication. *Frontiers in Psychology*, *7*(2061), 6. https://doi.org/10.3389/fpsyg.2016.02061

Aretz, W., & Mierke, K. (2019). Seriously?! Prevalence and motives of using emojis in job-related communication and their effect on perceived executive characteristics. *Journal of Business and Media Psychology*, *10*(1), 43–48.

Arya, V., Sethi, D., & Verma, H. (2018). Are emojis fascinating brand value more than textual language? Mediating role of brand communication to SNS and brand attachment: An insight from India. *Corporate Communications*, *23*(4), 648–670. https://doi.org/10.1108/CCIJ-03-2018-0036

Bai, Q., Dan, Q., Mu, Z., & Yang, M. (2019). A systematic review of emoji: Current research and future perspectives. *Frontiers in Psychology*, *10*, 2221. https://doi.org/10.3389/fpsyg.2019.02221

Biocca, F., Harms, C., & Burgoon, J. K. (2003). Toward a more robust theory and measure of social presence: Review and suggested criteria. *Presence: Teleoperators and Virtual Environments*, *12*(5), 456–480. https://doi.org/10.1162/105474603322761270

Boutet, I., LeBlanc, M., Chamberland, J. A., & Collin, C. A. (2021). Emojis influence emotional communication, social attributions, and information processing. *Computers in Human Behavior*, *119*(2020), 106722. https://doi.org/10.1016/j.chb.2021.106722

Cai, Z., Fan, X., & Du, J. (2017). Gender and attitudes toward technology use: A meta-analysis. *Computers & Education*, *105*, 1–13. https://doi.org/10.1016/j.compedu.2016.11.003

Casado-Molina, A. M., Rojas-de Gracia, M. M., Alarcón-Urbistondo, P., & Romero-Charneco, M. (2019). Exploring the opportunities of the emojis in brand communication: The case of the beer industry. *International Journal of Business Communication*, 1–19. https://doi.org/10.1177/2329488419832964

Cavalheiro, B. P., Prada, M., Rodrigues, D. L., Garrido, M. V., & Lopes, D. (2022). With or without emoji? Perceptions about emoji use in different brand-consumer communication contexts. *Human Behavior and Emerging Technologies*, *2022*, 1–8. https://doi.org/10.1155/2022/3036664

Cavalheiro, B. P., Prada, M., Rodrigues, D. L., Lopes, D., & Garrido, M. V. (2022). Evaluating the adequacy of emoji use in positive and negative messages from close and distant senders. *Cyberpsychology, Behavior, and Social Networking*, 25(3), 194-199.

Cavalheiro, B. P., Prada, M., Rodrigues, D. L. (in press). Examining the effects of reciprocal emoji use on interpersonal and communication outcomes. *Journal of Social and Personal Relationships.*

Cavalheiro, B. P., Rodrigues, D. L., & Prada, M. (2023). Who (and with whom) uses more emoji? Exploring individual, relational, and motivational characteristics driving emoji use. *Telematics and Informatics*, *83*, 102023. https://doi.org/10.1016/j.tele.2023.102023

Coyle, M. A., & Carmichael, C. L. (2019). Perceived responsiveness in text messaging: The role of emoji use. *Computers in Human Behavior*, *99*(2019), 181-189. https://doi.org/10.1016/j.chb.2019.05.023

Cuddy, A. J. C., Fiske, S. T., & Glick, P. (2008). Warmth and competence as universal dimensions of social perception: The stereotype content model and the BIAS map. In *Advances in Experimental Social Psychology* (Vol. 40, pp. 61–149). Elsevier. https://doi.org/10.1016/S0065-2601(07)00002-0

Culnan, M. J., & Markus, M. L. (1987). Information Technologies. In F. M. Jablin, L. L. Putnam, K. H. Roberts, & L. W. Porter (Eds.), *Handbook of organizational communication: An interdisciplinary perspective* (pp. 420–443). Sage.

Derks, D., Bos, A. E. R., & von Grumbkow, J. (2008). Emoticons in computer-mediated communication: Social motives and social context. *CyberPsychology & Behavior*, *11*(1), 99–101. https://doi.org/10.1089/cpb.2007.9926

Derks, D., Fischer, A. H., & Bos, A. E. R. (2008). The role of emotion in computer-mediated communication: A review. *Computers in Human Behavior*, *24*(3), 766–785. https://doi.org/10.1016/j.chb.2007.04.004

Dragojevic, M., Gasiorek, J., & Giles, H. (2015). Communication accommodation theory. *The International Encyclopedia of Interpersonal Communication, First Edition.*, 1–21. https://doi.org/10.1002/9781118540190.wbeic006

Fischer, B., & Herbert, C. (2021). Emoji as affective symbols: Affective judgments of emoji , emoticons , and human faces varying in emotional content. *Frontiers in Psychology*, *12*, 1–11. https://doi.org/10.3389/fpsyg.2021.645173

Fiske, S. T., Cuddy, A. J. C., & Glick, P. (2007). Universal dimensions of social cognition: Warmth and competence. *Trends in Cognitive Sciences*, *11*(2), 77–83. https://doi.org/10.1016/j.tics.2006.11.005

Gambo, S., & Özad, B. O. (2020). The demographics of computer-mediated communication: A review of social media demographic trends among social networking site giants. *Computers in Human Behavior Reports*, *2*, 100016. https://doi.org/10.1016/j.chbr.2020.100016

Giles, H., Edwards, A. L., & Walther, J. B. (2023). Communication accommodation theory: Past accomplishments, current trends, and future prospects. *Language Sciences*, *99*, 101571. https://doi.org/10.1016/j.langsci.2023.101571

Giles, H., & Smith, P. M. (1979). Accommodation theory: Optimal levels of convergence. In H. Giles & R. N. St. Clair (Eds.), *Language and social psychology* (pp. 45–65). Blackwell.

Glikson, E., Cheshin, A., & Kleef, G. A. van. (2018). The dark side of a smiley: Effects of smiling emoticons on virtual first impressions. *Social Psychological and Personality Science*, *9*(5), 614–625. https://doi.org/10.1177/1948550617720269

Hayes, J. L., Britt, B. C., Applequist, J., Ramirez, A., & Hill, J. (2020). Leveraging textual paralanguage and consumer–brand relationships for more relatable online brand communication: A social presence approach. *Journal of Interactive Advertising*, *20*(1), 17–30. https://doi.org/10.1080/15252019.2019.1691093

Herring, S. C., & Dainas, A. R. (2020). Gender and age influences on interpretation of emoji functions. *ACM Transactions on Social Computing*, *3*(2), 1–26. https://doi.org/10.1145/3375629

Holtgraves, T., & Robinson, C. (2020). Emoji can facilitate recognition of conveyed indirect meaning. *PLOS ONE*, *15*(4), e0232361. https://doi.org/10.1371/journal.pone.0232361

Jones, L. L., Wurm, L. H., Norville, G. A., & Mullins, K. L. (2020). Sex differences in emoji use, familiarity, and valence. *Computers in Human Behavior*, *108*, 106305. https://doi.org/10.1016/j.chb.2020.106305

Kaye, L. K., Rodriguez-Cuadrado, S., Malone, S. A., Wall, H. J., Gaunt, E., Mulvey, A. L., & Graham, C. (2021). How emotional are emoji?: Exploring the effect of emotional valence on the processing of emoji stimuli. *Computers in Human Behavior*, *116*, 106648. https://doi.org/10.1016/j.chb.2020.106648

Kaye, L. K., Wall, H. J., & Malone, S. A. (2016). “Turn that frown upside-down”: A contextual account of emoticon usage on different virtual platforms. *Computers in Human Behavior*, *60*, 463–467. https://doi.org/10.1016/j.chb.2016.02.088

Kim, M., Knotts, T. L., Albers, N. D., & James, K. E. (2022). Emoji use as a catalyst for relationship building and sustaining attention in online classes: An empirical study. *Education Sciences*, *12*(12), 874. https://doi.org/10.3390/educsci12120874

Koçak, A., & Yüksek Vergiveren, Ö. (2019). Group-based communication: Contents and practices of WhatsApp group use by generations and genders. *Online Journal of Communication and Media Technologies*, *9*(4). https://doi.org/10.29333/ojcmt/5900

Koch, T. K., Romero, P., & Stachl, C. (2022). Age and gender in language, emoji, and emoticon usage in instant messages. *Computers in Human Behavior*, *126*, 106990. https://doi.org/10.1016/j.chb.2021.106990

Kwon, E. S., & Sung, Y. (2011). Follow me! Global marketers ’ Twitter use. *Journal of Interactive Advertising*. 37–41. https://doi.org/10.1080/15252019.2011.10722187

Li, X. (Shirley), Chan, K. W. A., & Kim, S. (2018). Service with emoticons: how customers interpret employee use of emoticons in online service encounters. *Journal of Consumer Research*, *12*(1), 1–50. https://doi.org/10.1093/jcr/ucy016

Liu, S., & Sun, R. (2020). To Express or to end? Personality traits are associated with the reasons and patterns for using emojis and stickers. *Frontiers in Psychology*, *11*, 1–11. https://doi.org/10.3389/fpsyg.2020.01076

Luangrath, A. W., Peck, J., & Barger, V. A. (2017). Textual paralanguage and its implications for marketing communications. *Journal of Consumer Psychology*, *27*(1), 98–107. https://doi.org/10.1016/j.jcps.2016.05.002

Manganari, E. E., & Dimara, E. (2017). Enhancing the impact of online hotel reviews through the use of emoticons. *Behaviour & Information Technology*, *36*(7), 674–686. https://doi.org/10.1080/0144929X.2016.1275807

Marko, K. (2022). “Depends on who I’m writing to”—the influence of addressees and personality traits on the use of emoji and emoticons, and related implications for forensic authorship analysis. *Frontiers in Communication*, *7*, 840646. https://doi.org/10.3389/fcomm.2022.840646

Nexø, L. A., & Strandell, J. (2020). Testing, filtering, and insinuating: Matching and attunement of emoji use patterns as non-verbal flirting in online dating. *Poetics*, *83*, 101477. https://doi.org/10.1016/j.poetic.2020.101477

Oleszkiewicz, A., Karwowski, M., Pisanski, K., Sorokowski, P., Sobrado, B., & Sorokowska, A. (2017). Who uses emoticons? Data from 86 702 Facebook users. *Personality and Individual Differences*, *119*, 289–295. https://doi.org/10.1016/j.paid.2017.07.034

Orchard, L. J., Fullwood, C., Galbraith, N., & Morris, N. (2014). Individual Differences as Predictors of Social Networking. *Journal of Computer-Mediated Communication*, *19*(3), 388–402. https://doi.org/10.1111/jcc4.12068

Öztok, M., & Kehrwald, B. A. (2017). Social presence reconsidered: Moving beyond, going back, or killing social presence. *Distance Education*, *38*(2), 259–266. https://doi.org/10.1080/01587919.2017.1322456

Park, E. K., & Sundar, S. S. (2015). Can synchronicity and visual modality enhance social presence in mobile messaging? *Computers in Human Behavior*, *45*, 121–128. https://doi.org/10.1016/j.chb.2014.12.001

Pérez-Sabater, C. (2019). Emoticons in relational writing practices on Whatsapp: some reflections on gender. In P. Bou-Franch & P. Garcés-Conejos Blitvich (Eds.), *Analyzing Digital Discourse* (pp. 163–189). Springer International Publishing. https://doi.org/10.1007/978-3-319-92663-6_6

Petrocchi, S., Marciano, L., Annoni, A. M., & Camerini, A.-L. (2020). “What you say and how you say it” matters: An experimental evidence of the role of synchronicity, modality, and message valence during smartphone-mediated communication. *PLOS ONE*, *15*(9), e0237846. https://doi.org/10.1371/journal.pone.0237846

Prada, M., Rodrigues, D. L., Garrido, M. V., Lopes, D., Cavalheiro, B., & Gaspar, R. (2018). Motives, frequency and attitudes toward emoji and emoticon use. *Telematics and Informatics*, *35*(7), 1925–1934. https://doi.org/10.1016/j.tele.2018.06.005

Prada, M., Saraiva, M., Cruz, S., Xavier, S., & Rodrigues, D. L. (2022). Using emoji in response to customer reservation requests and service reviews. *Human Behavior and Emerging Technologies*, *2022*, 1–10. https://doi.org/10.1155/2022/1433055

Riordan, M. A. (2017a). Emojis as tools for emotion work: communicating affect in text messages. *Journal of Language and Social Psychology*, *36*(5), 549–567. https://doi.org/10.1177/0261927X17704238

Riordan, M. A. (2017b). The communicative role of non-face emojis: Affect and disambiguation. *Computers in Human Behavior*, *76*, 75–86. https://doi.org/10.1016/j.chb.2017.07.009

Riordan, M. A., & Glikson, E. (2020). On the hazards of the technology age: How using emojis affects perceptions of leaders. *International Journal of Business Communication*. https://doi.org/10.1177/2329488420971690

Rodrigues, D. L., Cavalheiro, B. P., & Prada, M. (2022). Emoji as icebreakers? Emoji can signal distinct intentions in first time online interactions. *Telematics and Informatics*, *69*, 101783. https://doi.org/10.1016/j.tele.2022.101783

Rodrigues, D., Lopes, D., Prada, M., Thompson, D., & Garrido, M. V. (2017). A frown emoji can be worth a thousand words: Perceptions of emoji use in text messages exchanged between romantic partners. *Telematics and Informatics*, *34*(8), 1532–1543. https://doi.org/10.1016/j.tele.2017.07.001

Rodrigues, D., Prada, M., Gaspar, R., Garrido, M. V., & Lopes, D. (2018). Lisbon emoji and emoticon database (LEED): Norms for emoji and emoticons in seven evaluative dimensions. *Behavior Research Methods*, *50*(1), 392–405. https://doi.org/10.3758/s13428-017-0878-6

Rosen, L. D., Whaling, K., Carrier, L. M., Cheever, N. A., & Rokkum, J. (2013). The media and technology usage and attitudes scale: An empirical investigation. *Computers in Human Behavior*, *29*(6), 2501–2511. https://doi.org/10.1016/j.chb.2013.06.006

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*.

Sampietro, A. (2019). Emoji and rapport management in Spanish WhatsApp chats. *Journal of Pragmatics*, *143*, 109–120. https://doi.org/10.1016/j.pragma.2019.02.009

Shandilya, E., Fan, M., & Tigwell, G. W. (2022). “I need to be professional until my new team uses emoji, GIFs, or memes first”: New collaborators’ perspectives on using non-textual communication in virtual workspaces. *CHI Conference on Human Factors in Computing Systems*, 1–13. https://doi.org/10.1145/3491102.3517514

Staddon, R. V. (2020). Bringing technology to the mature classroom: Age differences in use and attitudes. *International Journal of Educational Technology in Higher Education*, *17*(1), 11. https://doi.org/10.1186/s41239-020-00184-4

Tandyonomanu, D. & Tsuroyya. (2018). Emoji: Representations of nonverbal symbols in communication technology. *IOP Conference Series: Materials Science and Engineering*, *288*, 012052. https://doi.org/10.1088/1757-899X/288/1/012052

Tang, Y., & Hew, K. F. (2018). Emoticon, emoji, and sticker use in computer-mediated communications: Understanding its communicative function, impact, user behavior, and motive. In *New Media for Educational Change: Selected Papers from HKAECT 2018*

International Conference (pp. 191-201). Springer. https://doi.org/10.1007/978-981-10-8896-4_16

Thomson, S., Kluftinger, E., & Wentland, J. (2018). Are you fluent in sexual emoji?😉: Exploring the use of emoji in romantic and sexual contexts. *The Canadian Journal of Human Sexuality*, 1–11. https://doi.org/10.3138/cjhs.2018-0020

Völkel, S. T., Buschek, D., Pranjic, J., & Hussmann, H. (2019). Understanding emoji interpretation through user personality and message context. *Proceedings of the 21st International Conference on Human-Computer Interaction with Mobile Devices and Services, MobileHCI 2019*. https://doi.org/10.1145/3338286.3340114

Walther, J. B. (2011). Theories of computer-mediated communication and interpersonal relations. *The Handbook of Interpersonal Communication*, *4*, 443–479.

Walther, J. B., Van Der Heide, B., Ramirez Jr, A., Burgoon, J. K., & Peña, J. (2015). Interpersonal and hyperpersonal dimensions of computer-mediated communication. *The handbook of the psychology of communication technology*, 1-22. https://doi.org/10.1002/9781118426456.ch1

CHAPTER 2

Evaluating the Adequacy of Emoji Use in Positive and Negative Messages from Close and Distant Senders

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Cavalheiro, B. P., Prada, M., Rodrigues, D. L., Lopes, D., & Garrido, M. V. (2022). Evaluating the adequacy of emoji use in positive and negative messages from close and distant senders. *Cyberpsychology, Behavior, and Social Networking*, *25*(3), 194-199. https://doi.org/10.1089/cyber.2021.0157

2.1. Abstract

Computer-mediated communication allows people to communicate across several contexts (e.g., friends, professional settings) by using video-based or text-based channels. In the latter case, communication lacks nonverbal cues (e.g., tone of voice) that are critical to message interpretation. Including emoji can help express emotion and reinforce or clarify the meaning of a message. However, the benefits of using emoji are likely to depend on the context (e.g., the relationship between interlocutors) and the messages' features (e.g., the valence of the message). To date, studies have not systematically and empirically examined how the use of emoji is perceived across different communication scenarios. In the current study, we asked 175 participants (49.5% women; M_{age} = 36.32, SD = 12.22) to imagine receiving either a negative or a positive message from 22 senders (e.g., friend; bank manager) and to indicate, for each case, how much they would like to receive an emoji and how useful and appropriate they considered the use of emoji. These ratings were combined into a single index of emoji use adequacy. Based on factor analysis, the 22 scenarios were aggregated in distant and close scenarios. Overall, results showed that participants considered emoji use more inadequate in distant (vs. close) scenarios and for negative (vs. positive) messages. These findings suggest that the perceived benefits of emoji use for text-based communication may not be generalized to all text-based communication contexts, such that relationship proximity and message valence should not be overlooked. Implications for the fields of consumer psychology and communication are discussed.

Keywords: computer-mediated communication, emoji, user perception, context, text-based communication, digital communication

2.2. Introduction

Computer-Mediated Communication (CMC) allows asynchronous and fast communication, being a valuable tool to contact family, friends, work colleagues, but also service providers and brands (Hayes et al., 2019). Users often include emoji in CMC (Tang & Hew, 2019). Emoji includes pictorial representations of different categories, including facial expressions (Rodrigues et al., 2018), and may help in adding an emotional tone to text-based communication, softens the seriousness of messages, decreases their negativity, reduces discourse ambiguity, and strengthens senders' intent (Kaye et al., 2016; Sampietro, 2019; Tang & Hew, 2019). For example, research has shown that users include emoji to convey sarcasm, humor, and flirt with partners (Thomson et al., 2018). Emoji use may not always be perceived as appropriate for all communicative situations (e.g., sending a ''kissing-face'' emoji in a message to a co-worker; Butterworth et al., 2019). Valence, particularly, has been suggested as a potential moderator of emoji effects (Coyle & Carmichael, 2019; Rodrigues et al., 2017). For example, participants reading a positive review of a hotel with (vs. without) emoji reported more positive attitudes toward the hotel, whereas the reverse was observed for a negative review (Manganari & Dimara, 2017). Moreover, the same emoji can positively impact messages addressing moderate conflicts while producing adverse effects for more severe conflicts (Rodrigues et al., 2017). These differences arguably occur because emoji are perceived as fun and less serious,11 and therefore inadequate to be used in more serious contexts. Indeed, people tend to use positive emoji more frequently (Novak, et al., 2015), especially when communicating positive information (Chen & Siu, 2016). Previous research also suggests that emoji are more frequently used with friends and romantic partners (Thomson et al., 2018), which may mimic societal norms of emotional expression (Dunlap et al., 2016). However, emoji can be used beyond close social circles. For instance, researchers (Donovan, 2016; Skiba, 2016) have argued that the communication between health care professionals and patients can be facilitated by using emoji. Research in educational settings showed that students evaluate an instructor as more caring but less competent when the instructor uses emoji (Vareberg & Westerman, 2020). Likewise, research (Glikson, et al., 2017) found that using emoji in work-related e-mails was seen as inappropriate, and senders were perceived as less competent. This goes in line with research suggesting that emoji use may be inappropriate in professional communication (Butterworth et al., 2019; Kaye et al., 2016) and perceived as unprofessional (Tigwell & Flatla, 2016). Brands also often rely on informal language (e.g., emoji) when communicating with consumers (Luangrath, et al., 2017) to foster customer loyalty (Kwon &

Sung, 2011). Previous research (Das et al., 2019) showed that emoji use can positively affect consumers' perceptions of the brand, increase buying intention, and promote the experience of positive affect in consumers. Notably, other studies (Li et al., 2018) also show that emoji use by brands may be inappropriate in some communication contexts. In summary, the research presents mixed findings regarding emoji use across different communication contexts. To our knowledge, researchers have overlooked how varying contextual cues (e.g., the relationship between interlocutors) and messages' features (e.g., valence) impact the perceived adequacy of using emoji. An exception is a work by Völkel et al. (2019) who tested emoji use in different scenarios (varying in valence, situation, and interlocutor). However, this study focused on the senders' perspective and not on how a receiver perceives emoji as adequate or not in a given scenario. To the best of our knowledge, our study is the first to systematically examine the perceived adequacy of emoji use across a comprehensive set of communication scenarios. These scenarios vary according to sender (e.g., receiving emoji from friends to share news) and valence (e.g., receiving emoji from friends sharing [good vs. bad] news). Because emoji are typically perceived as fun and informal (Prada et al., 2018), their use may be deemed more adequate with close interlocutors. Lastly, previous studies have shown relevant individual differences in emoji use (e.g., women and younger people use emoji more often; Oleszkiewicz et al., 2017; Prada et al., 2018), shaping how people perceive and react to emoji. Hence, we will control for these variables in our analyses.

2.3. Methods

2.3.1. Participants and design

A sample of 175 Portuguese adults[1] volunteered to participate in a web survey: 58.3% women, aged between 18 and 64 (M = 36.32, SD = 12.22), 79.3% had at least Bachelor's degree and were either workers (70.3%), students (20.6%), working students (5.1%), or unemployed (4%). The design was a 22 (scenarios) x 2(valence of the message: positive, negative), with scenarios being a within-participants factor and valence of the message being a between-participants factor.

[1] A sample of 174 of participants was determined by an a priori power analysis (G*Power; Faul et al., 2007), using as reference a medium effect size (η_p^2 = 0.06) and a power 1-β = 0.85 to detect the interaction between valence (negative vs. positive) and measurement (liking, appropriateness, usefulness; within participants).

2.3.2. Materials

We developed scenarios with varied interlocutors (identified in previous research; Bai et al., 2019; Das et al., 2019; Rodrigues et al., 2018; Vareberg & Westerman, 2020), in which emoji use was plausible and allowed messages to be framed positively and negatively. The positive and negative versions of the messages for the 22 scenarios are presented in Table 2.1.

2.3.3. Procedure and measures

The study was conducted following the ethical guidelines of Iscte-Instituto Universitário de Lisboa. People were invited through social media platforms and e-mailing services to collaborate on a web survey regarding emoji use. Participants were informed about the general objectives and assured the confidentiality and voluntary nature of the study. After providing informed consent, participants were asked to indicate their opinions about emoji use across different contexts. Participants were then randomly assigned to one of the valence conditions (positive vs. negative messages) and presented with the 22 scenarios in random order. Specifically, each participant was presented with either negative (e.g., a health professional [e.g., a doctor] communicating an unfavorable diagnosis) or positive messages (e.g., a health professional [e.g., a doctor] communicating a favorable diagnosis). After each scenario, participants were asked to indicate how much they would like to receive an emoji in that scenario (1 = *Dislike* to 7 = *Like*), how appropriate was the use of emoji in that scenario (1 = *Not appropriate at all* to 7 = *Very appropriate*), and how useful was the inclusion of an emoji in that scenario (1 = *Useless* to 7 = *Useful*). These variables were averaged into a single score of emoji use adequacy (a = .92), with higher scores indicating perceptions of greater adequacy of emoji use.

After evaluating the 22 scenarios, participants were asked to indicate how frequently they use emoji in their daily text-based interactions (1 = *Rarely* to 7 = *Frequently*). Finally, participants answered demographic questions (gender, age, education level, and employment status) and they were thanked and debriefed.

Table 2.1. *Positive and Negative Version of the Emoji Use Scenarios*

	Valence	
Sender	Positive	Negative
Service Provider:		
Message with emoji from…	… positive information	… negative information
a healthcare professional (e.g., doctor) communicating...	(e.g., favorable diagnosis)	(e.g., unfavorable diagnosis)
a personal accountant (e.g., bank, insurance) communicating…	(e.g., lower prices or increase of services offered)	(e.g., higher prices or decrease of services offered)
a telecommunications provider communicating...	(e.g., lower prices or increase of services offered)	(e.g., higher prices or decrease of services offered)
a gymnasium communicating…	(e.g., lower prices or increase of services)	(e.g., higher prices or decrease of services)
a public service provider (e.g., water, energy) communicating...	(e.g., lower prices or increase of services)	(e.g., higher prices or decrease of services)
Professional Setting:		
Message with emoji from a potential employer to candidate communicating…	… positive information (e.g., refusing an interview; refusing to hire)	… negative information (e.g., scheduling interview; hiring proposition)
Message with emoji from a candidate to a potential employer communicating…	… positive information (e.g., accepting the offer)	… negative information (e.g., declining the offer)
Message with emoji from employees communicating to work colleagues...	…positive results (e.g., winning important client; approval of project)	…negative results (e.g., loss of an important client; refusal of project)
Message with emoji from employee communicating to supervisors…	…positive results (e.g., winning important client; approval of project)	…negative results (e.g., loss of an important client; refusal of project)
Message with emoji from supervisors communicating…	…positive results (e.g., increase of annual bonus)	…negative information (e.g., decrease of annual bonus)
Educational Setting:		
Message with emoji from a professor communicating to student(s)…	… positive information (e.g., very high grades)	… negative information (e.g., very low grades)
Message with emoji from a student(s) communicating to a professor…	… positive information (e.g., very positive performance evaluation)	… negative information (e.g., very negative performance evaluation)
Message with emoji from a student(s) communicating to colleagues…	… positive information (e.g., good grade on group assignment)	… negative information (e.g., bad grade on group assignment)
Interpersonal Setting:		
Message with emoji from friends communicating…	… good news (e.g., marriage, new job)	… bad news (e.g., divorce, unemployment)
Message with emoji from romantic partner communicating…	…happy news (e.g., scheduling vacation)	…unhappy news (e.g., canceling vacation)
Message with emoji from potential romantic partner communicating…	…positive information (e.g., acceptance of invitation to go on a date)	…negative information (e.g., refusal of the invitation to go on a date)
Message with emoji from family communicating…	…good news (e.g., marriage, new job)	…bad news (e.g., divorce, unemployment)
Brands/Marketing:		

Message with emoji from company/brand (e.g., flyers, newsletters) communicating…	…positive information (e.g., disclosure of new product)	…negative information (e.g., product callback)
Message with emoji from company/brand replying…	…to positive comment on social media (e.g., amazing experience at restaurant/hotel)	…to negative comment on social media (e.g., awful experience at restaurant/hotel)
Message with emoji from company/brand replying…	…to positive comment on private chat/e-mail (e.g., amazing experience at restaurant/hotel)	…to negative comment on private chat/e-mail (e.g., awful experience at restaurant/hotel)
Message with emoji from company/brand…	…confirming customer request (e.g., acceptance of specific service)	…refusing customer request (e.g., cancel of specific service)
Message with emoji from company/brand…	…communicating success of operation (e.g., confirmation of online order)	…communicating failure of operation (e.g., cancelation of online order)

2.4. Results

2.4.1. Preliminary analyses: frequency of emoji use, gender, and age

Participants reported using emoji frequently in their daily text-based interactions ($M = 4.71$, $SD = 2.10$), 95% confidence interval (CI) [4.39–5.02]. Women ($M = 5.09$, $SD = 2.03$) reported using emoji more often than men ($M = 4.18$, $SD = 2.09$), $t(172) = -2.89$, $p = .004$. We found a negative correlation between age and frequency of using emoji, $r = -.398$, $p < .001$, with older individuals reporting using emoji less often.

2.4.2. Principal components analysis

We conducted a principal components analysis (Promax rotation) with the 22 scenarios regardless of the valence of the message (Table 2.2). Based on the eigenvalues, we extracted two components that explained 71.3% of the variance (Kaiser-Meyer-Olkin =.96), presenting high internal consistency (Table 2.2). The first component was designated ‘‘distant scenarios’’ and the second ‘‘close scenarios.’’ One-sample t-tests against the scale midpoint (i.e., 4) showed that participants rated the adequacy of emoji use for distant scenarios below the scale midpoint ($M = 2.37$, $SD = 1.33$), $t(174) = -16.22$, $p < .001$, whereas for close scenarios the rating were above this point ($M = 4.47$, $SD = 1.73$), $t(174) = 3.60$, $p < .001$.

Table 2.2. *Principal Component Analysis*

	C1	C2	Corrected Item-total correlations
Items			
S5: Public service provider (e.g., water, energy) to customer	**.97**	-.18	.74
S2: Personal accountant (e.g., bank, insurance company) to customer	**.95**	-.11	.78
S3: Telecommunications provider to customer	**.92**	-.09	.77
S7: Candidate to potential employer	**.90**	-.18	.67
S6: Potential employer to candidate	**.89**	-.03	.78
S21: Brand/company answering customer's request	**.85**	-.01	.77
S11: Employee to supervisors	**.85**	-.04	.75
S9: Student to professor	**.82**	-.04	.72
S1: Healthcare-professional to patient	**.79**	.01	.72
S13: Supervisor to employee	**.76**	.14	.80
S8: Professor to student	**.71**	.19	.79
S22: Brand/company communicating about operation (e.g., online order)	**.69**	.15	.74
S18: Brand/company communicating (e.g., flyers, newsletters)	**.69**	.14	.73
S4: Gymnasium communicating to customer	**.68**	.21	.78
S20: Brand/company replying to customer on private chat/e-mail	**.64**	.26	.78
S19: Brand/company replying to customer's social media comment	**.57**	.29	.74
S15: Romantic partner	-.10	**.98**	.66
S16: Potential romantic partner	-.06	**.96**	.67
S14: Friend	-.02	**.93**	.69
S17: Family member	-.05	**.93**	.66
S10: Student to colleague	-.01	**.84**	.62
S12: Employee to work colleague	.21	**.68**	.70
Eigenvalue	12.76	2.92	
Explained variance	58.0	13.3	
Cronbach's alpha	.97	.95	

Note. Saturation values above 0.40 are indicated in boldface.

2.4.3. Adequacy of emoji use

We computed a 2 (valence of the message: positive vs. negative) x 2 (gender: women vs. men) x 2 (type of scenario: close vs. distant) mixed analysis of variance. The latter variable was entered in the model as repeated measures, and age and frequency of using emoji as co-variates. We found a main effect of the scenario, $F(1,157) = 12.29$, $p = .001$, $\eta_p^2 = .07$, such that participants perceived greater adequacy of emoji use in close ($M = 4.47$, $SD = 1.74$) than in distant scenarios ($M = 2.36$, $SD = 1.34$).

We also found a main effect of valence, $F(1,157) = 99.86$, $p < .001$, $\eta_p^2 = .39$, such that participants perceived greater adequacy of emoji use when the message was positive ($M = 4.42$, $SE = .130$) than negative ($M = 2.71$, $SE = .110$). The interaction between valence and type of scenario was also significant, $F(1,157) = 12.98$, $p < .001$, $\eta_p^2 = .08$. Planned contrasts showed that although the impact of distance for negative messages was significant, $t(99) = 13.13$, $p < .001$, it was stronger for the positive messages, $t(74) = 14.56$, $p < .001$ (Fig. 2.1).

Finally, we found a main effect of frequency of emoji use, $F(1,157) = 4.14$, $p = .043$, such that participants who use emoji more frequently evaluated overall emoji use as more adequate. There were no main effects of gender or age on emoji use perceived adequacy, $ps \geq .476$, nor any interactions with valence or scenario, $ps \geq .060$.

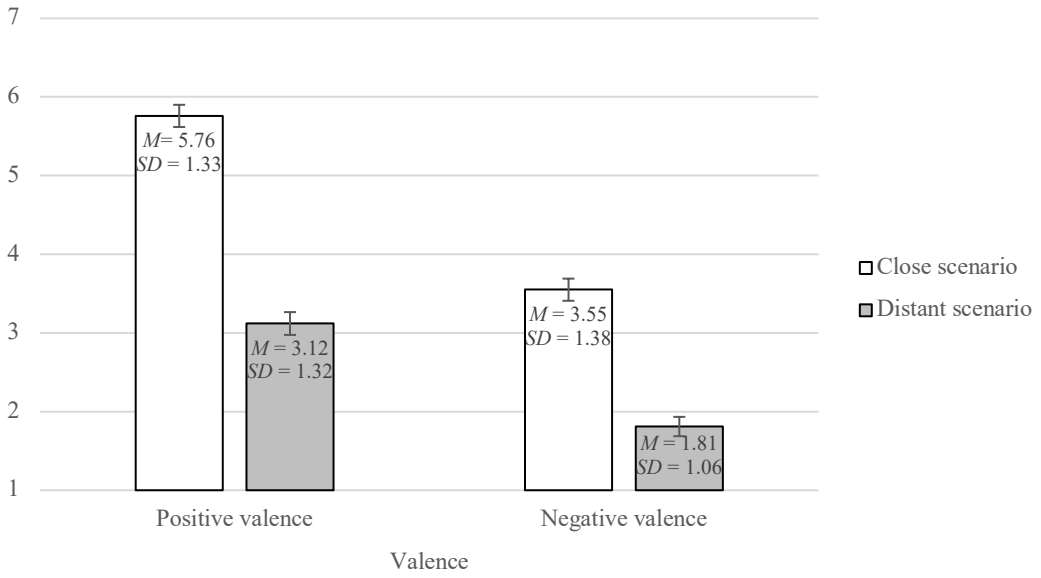

Figure 2.1. *Relationship Between Valence and Scenario on the Perceived Adequacy of Using Emoji*

2.4.4. Supplementary analyses: rating norms

Data were coded and analyzed according to each of the 22 scenarios with negative messages and the 22 scenarios with positive messages. We calculated means, standard deviations, standard errors, and CIs for each evaluative dimension (i.e., liking, appropriateness, and usefulness) and for the overall adequacy index. Scenarios were categorized as ‘‘low adequacy’’ when the upper bound of the CI was below the scale midpoint ($n_{negative}$ = 20; $n_{positive}$ = 12); ‘‘moderate adequacy’’ when the CI included the response scale midpoint ($n_{negative}$ = 2; $n_{positive}$ = 4); and ‘‘high adequacy’’ when the lower bound of the CI was above the scale midpoint ($n_{negative}$ = 0; $n_{positive}$ = 6). These ratings are available as supplementary data at Open Science Framework (https://osf.io/w49a5/?view_only=57650f5f41db4f8b81c36f497eb89802).

2.5. Discussion

This experimental study tested the effect of the type of scenario (distant or close) and the valence of the messages (negative vs. positive) on the perceived adequacy of emoji use. Results showed that emoji use was considered more adequate when communicating positive information and/or with closer interlocutors (e.g., friends vs. work supervisor). Noteworthy, participants rated emoji use in all distant scenarios as inadequate. Our findings align with past research showing that using emoji may be seen as more adequate in some situations than others (e.g., close interpersonal vs. professional settings; Butterworth et al., 2019; Glikson et al., 2017; Kaye et al., 2016).

This may be one of the reasons why people use emoji more frequently with their close ones (e.g., friends; Thomson et al, 2018). Moreover, similarly to other studies (Coyle & Carmichael, 2019; Rodrigues et al., 2017) we found that the valence of a message determines how people evaluate the adequacy of emoji use. For example, Rodrigues et al. (2017) also found that emoji use was perceived less favorably for communication outcomes in negative (vs. positive) messages, particularly when addressing more (vs. less) severe conflicts. Our study did not account for within-valence differences (e.g., messages about ‘‘canceling a vacation’’ may not be as negative as messages sharing the news about a ‘‘divorce’’), and future studies should seek to assess whether the intensity of different positive and negative scenarios modulates emoji use evaluations.

The scenarios used in our study included two relevant cues: valence and sender. Still, overall, the situation description was quite abstract (e.g., ‘‘sharing good/bad news’’), and messages did not include actual emoji. Therefore, we did not control for the way participants construed each specific situation (e.g., expectations of emoji use according to sender8) nor the emoji they envisioned, which raises concerns for the generalizability of our findings. For example, identifying a specific emoji may be important as they vary in several characteristics, namely valence, familiarity, and even attributed meaning (Rodrigues et al., 2018).

Even controlling for this, emoji may interact with other contextual cues. For instance, both the ‘‘smiling face’’ and ‘‘red heart’’ emoji are highly positive and familiar but using the latter in communication with co-workers may be perceived as inappropriate (Butterworth et al., 2019). Future experimental studies could use more ecological scenarios (e.g., simulated text messages; Rodrigues et al., 2017) to extend our current findings and further explore whether participants would include emoji in their CMC with different interlocutors (Völkel et al., 2019).

Besides closeness, patterns in CMC may depend on other features of the relationship between interlocutors (e.g., communicating with a professor/supervisor may be more frequent than communicating with other distant interlocutors such as a bank account manager). Therefore, future studies should also assess the frequency or likelihood of contact with each sender.

Moreover, in line with previous studies (Prada et al., 2018), women and younger participants reported using emoji more often. However, frequency of using emoji, age, and gender did not moderate the evaluation of emoji use in the set of scenarios presented, suggesting that these individual differences may be secondary when contextual cues are available.

This study is one of the first to systematically evaluate how emoji use is perceived across communication scenarios. Our main contribution is the demonstration that contextual cues related to the valence of the message and the relationship between interlocutors influence how individuals perceive the adequacy of emoji use. By providing a scenario-level analysis, we also contribute to the field, allowing researchers to select specific scenarios in which emoji use is deemed more/less adequate.

Our findings can also have practical implications by helping professionals in different fields (e.g., marketing, health communication, education) to efficiently integrate emoji in their communication strategies (Bai et al., 2019). For example, receivers may be more open to emoji use whenever the content of the message is positive. However, in negative messages, we recommend restricting emoji use to communication between closer interlocutors (e.g., a professor could only include an emoji in an e-mail sharing low grades after building rapport with students).

2.6. References

Bai, Q., Dan, Q., Mu, Z., & Yang, M. (2019). A systematic review of emoji : Current research and future perspectives. *Frontiers in Psychology*, *10*. https://doi.org/10.3389/fpsyg.2019.02221

Butterworth, S. E., Giuliano, T. A., White, J., Cantu, L., & Fraser, K. C. (2019). Sender gender influences emoji interpretation in text messages. *Frontiers in psychology*, *10*, 784. https://doi.org/10.3389/fpsyg.2019.00784

Coyle, M. A., & Carmichael, C. L. (2019). Perceived responsiveness in text messaging: The role of emoji use. *Computers in Human Behavior*, *99*(2019), 181–189. https://doi.org/10.1016/j.chb.2019.05.023

Das, G., Wiener, H. J. D., & Kareklas, I. (2019). To emoji or not to emoji? Examining the influence of emoji on consumer reactions to advertising. *Journal of Business Research*, *96*(2019), 147–156. https://doi.org/10.1016/j.jbusres.2018.11.007

Donovan, D. (2016). Mood, emotions and emojis: conversations about health with young people. *Mental Health Practice*, *20*(2).

Dunlap, J. C., Bose, D., Lowenthal, P. R., York, C. S., Atkinson, M., & Murtagh, J. (2016). What sunshine is to flowers. In S. Y. Tettegah, & M. Gartmeier (Eds.), *Emotions, technology, design, and learning* (pp. 163-182). Elsevier. https://doi.org/10.1016/B978-0-12-801856-9.00008-6

Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G* Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, *39*(2), 175-191. https://doi.org/10.3758/BF03193146

Glikson, E., Cheshin, A., & van Kleef, G. A. (2017). The Dark Side of a Smiley. *Social Psychological and Personality Science*, 1-12. https://doi.org/10.1177/1948550617720269

Hayes, J. L., Britt, B. C., Applequist, J., Ramirez, A., & Hill, J. (2020). Leveraging textual paralanguage and consumer–brand relationships for more relatable online brand communication: A social presence approach. *Journal of Interactive Advertising*, *20*(1), 17–30. https://doi.org/10.1080/15252019.2019.1691093

Kaye, L. K., Wall, H. J., & Malone, S. A. (2016). "Turn that frown upside-down": A contextual account of emoticon usage on different virtual platforms. *Computers in Human Behavior*, *60*, 463–467. https://doi.org/10.1016/j.chb.2016.02.088

Kwon, E. S., & Sung, Y. (2011). Follow me! Global marketers' Twitter use. *Journal of Interactive Advertising*, *12*(1), 4-16. https://doi.org/10.1080/15252019.2011.10722187

Li, X., Chan, K. W., & Kim, S. (2019). Service with emoticons: How customers interpret employee use of emoticons in online service encounters. *Journal of Consumer Research*, *45*(5), 973-987. https://doi.org/10.1093/jcr/ucy016

Luangrath, A. W., Peck, J., & Barger, V. A. (2017). Textual paralanguage and its implications

for marketing communications. *Journal of Consumer Psychology*, *27*(1), 98–107. https://doi.org/10.1016/j.jcps.2016.05.002

Manganari, E. E., & Dimara, E. (2017). Enhancing the impact of online hotel reviews through the use of emoticons. *Behaviour & Information Technology*, *36*(7), 674-686. https://doi.org/10.1080/0144929X.2016.1275807

Novak, P. K., Smailović, J., Sluban, B., & Mozetič, I. (2015). Sentiment of emojis. *PLoS ONE*, *10*(12), 1–23. https://doi.org/10.1371/journal.pone.0144296

Oleszkiewicz, A., Karwowski, M., Pisanski, K., Sorokowski, P., Sobrado, B., & Sorokowska, A. (2017). Who uses emoticons? Data from 86 702 Facebook users. *Personality and Individual Differences*, *119*, 289-295. https://doi.org/10.1016/j.paid.2017.07.034

Prada, M., Rodrigues, D. L., Garrido, M. V., Lopes, D., Cavalheiro, B., & Gaspar, R. (2018). Motives, frequency and attitudes toward emoji and emoticon use. *Telematics and Informatics*, *35*(7), 1925–1934. https://doi.org/10.1016/j.tele.2018.06.005

Rodrigues, D., Lopes, D., Prada, M., Thompson, D., & Garrido, M. V. (2017). A frown emoji can be worth a thousand words: Perceptions of emoji use in text messages exchanged between romantic partners. *Telematics and Informatics*, *34*(8), 1532–1543. https://doi.org/10.1016/j.tele.2017.07.001

Rodrigues, D., Prada, M., Gaspar, R., Garrido, M. V., & Lopes, D. (2018). Lisbon Emoji and Emoticon Database (LEED): Norms for emoji and emoticons in seven evaluative dimensions. *Behavior Research Methods*, *50*(1), 392–405. https://doi.org/10.3758/s13428-017-0878-6

Sampietro, A. (2019). Emoji and rapport management in Spanish WhatsApp chats. *Journal of Pragmatics*, *143*, 109-120. https://doi.org/10.1016/j.pragma.2019.02.009

Skiba, D. J. (2016). Face With Tears Of Joy is word of the year: Are emoji a sign of things to come in health care?. *Nursing education perspectives*, *37*(1), 56-57. https://doi.org/10.1097/01.NEP.0000476112.24899.a1

Tang, Y., & Hew, K. F. (2019). Emoticon, emoji, and sticker use in computer-mediated communication: A review of theories and research findings. *International Journal of Communication*, *13*, 27.

Thomson, S., Kluftinger, E., & Wentland, J. (2018). Are you fluent in sexual emoji?😉: Exploring the use of emoji in romantic and sexual contexts. *The Canadian Journal of Human Sexuality, 27*(3), 226-234. https://doi.org/10.3138/cjhs.2018-0020

Tigwell, G. W., & Flatla, D. R. (2016, September). Oh that's what you meant! Reducing emoji misunderstanding. In *Proceedings of the 18th international conference on human-computer interaction with mobile devices and services adjunct* (pp. 859-866). https://doi.org/10.1145/2957265.2961844

Vareberg, K. R., & Westerman, D. (2020). To:-) or to ☺, that is the question: a study of students' initial impressions of instructors' paralinguistic cues. *Education and Information Technologies*, *25*, 4501-4516. https://doi.org/10.1007/s10639-020-10181-9

Völkel, S. T., Buschek, D., Pranjic, J., & Hussmann, H. (2019, October). Understanding emoji interpretation through user personality and message context. In *Proceedings of the 21st international conference on human-computer interaction with mobile devices and services* (pp. 1-12). https://doi.org/10.1145/3338286.3340114

CHAPTER 3

With or without Emoji? Perceptions about Emoji Use in Different Brand-Consumer Communication Contexts

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Cavalheiro, B. P., Prada, M., Rodrigues, D. L., Garrido, M. V., & Lopes, D. (2022). With or without emoji? Perceptions about emoji use in different brand-consumer communication contexts. *Human Behavior and Emerging Technologies*, 2022, 1-8. https://doi.org/10.1155/2022/3036664

3.1. Abstract

Brands are increasingly using emoji in their computer-mediated communication (CMC). However, research on how consumers perceive such use, and the determinants of those perceptions, is scarce and results may be inconsistent. In a cross-sectional study (N = 540) we examined how appropriate participants considered to be the use of emoji by brands, across five brand-consumer communication contexts. We additionally examined whether these perceptions were determined by demographic and individual variables (e.g., gender and frequency of emoji use), as well as individual views about emoji use in written CMC. Overall, perceptions toward the use of emoji by brands depended on the context, with participants considering more appropriate for brands to use emoji when publicizing on social media and less appropriate when making callbacks of defective products. Results further showed that such perceptions were more favorable among younger participants and those who used emoji more frequently, but also among those who considered emoji use more useful and formal. These findings contribute to the CMC field by highlighting how perceptions of emoji use by brands are shaped, while also informing how brands can enhance CMC with consumers.

Keywords: emoji, computer-mediated communication, marketing, individual differences, paralinguistic cues.

3.2. Introduction

The development of internet services and technology has provided new ways for people to communicate, including instant messaging (e.g., Gmail and WhatsApp), social media (e.g., Facebook, Instagram, and Twitter), discussion platforms (e.g., Reddit), and video hosting and live streaming services (e.g., Youtube and Twitch). These platforms rely on computer-mediated communication (CMC; Dunlap et al., 2016) and allow users to communicate using different formats (e.g., video, image, and text). The use of these platforms is not limited to communicating with close others (Pittman & Reich, 2016; Rodrigues et al., 2017), but also with work colleagues or supervisors (e.g., managers; Riordan & Glikson, 2020), and even by companies or brands (Das et al., 2019; Li, Chan, et al., 2019). Hence, these communication platforms have changed not only the way people interact with each other but also with brands or service providers.

Because some of these platforms rely solely on text-based communication, the availability of (conventional) nonverbal cues may be limited (Subrahmanyam et al., 2020). This may hinder communication outcomes, making it difficult to understand the emotion and/or intention of a written message (see Boutet et al., 2021; Coyle & Carmichael, 2019). To overcome this potential limitation, paralinguistic cues such as emoji may be used (e.g., 🙂; Luangrath et al., 2017).

Emoji depicts a myriad of contents (e.g., facial expressions; Novak et al., 2015; Rodrigues et al., 2018) and can help enhance communication by increasing the expressiveness of written messages (Novak et al., 2015; Riordan, 2017; Sampietro, 2019). Indeed, research suggests that emoji may serve different functions, such as to disambiguate or enrich a message (Bai et al., 2019), convey emotions (Chen et al., 2018; Fakhruroji, 2021), promote playful interactions (McShane et al., 2021), soften the negativity of a message (Rodrigues et al., 2017), or even help the sender to interpret the meaning of the message (Holtgraves & Robinson, 2020; Völker & Mannheim, 2021). Emoji use frequently occurs when reacting to social media content (Gomes & Casais, 2018) on platforms such as Instagram (Riordan, 2017), Facebook (Oleszkiewicz et al., 2017), and Twitter (Li, Cheng, et al., 2019). However, emoji use is not always perceived as appropriate or suitable across contexts (Cavalheiro et al., 2022; Kaye et al., 2016). For example, Vareberg and Westerman (2020) have shown instructors may be evaluated as more caring, but as less competent, by students when they use emoji. Similarly, Glikson and colleagues (2017) showed that the sender of a message that included (vs. did not include) an emoji in a formal (vs. informal) setting was perceived as less competent. This effect was partially mediated by the

perception that emoji use was inappropriate in that specific setting. In the context of brand communication, researchers found that service providers were perceived as less competent when their online communication included emoji (Li, Chan, et al., 2019). However, research also showed that emoji use by brands could have positive outcomes, helping to increase the intention to buy specific products (Das et al., 2019). Thus, although brands frequently include emoji in their communication with consumers (Bai et al., 2019), the implications of such use are not straightforward and can be deemed inappropriate by consumers. Therefore, we examined how appropriate people perceive emoji use across different contexts of brand-consumer communication and explored the determinants of such perceptions.

3.2.1. Brands on Social Media: Engagement and Emoji Use

The online presence of brands has increased in recent years, allowing consumers not only to access information about products more easily but also to purchase them (e.g., e-commerce platforms such as Amazon). Moreover, brands make direct online advertisements (e.g., ads on Facebook) and are frequently present on social media platforms (e.g., branded-owned pages and digital influencers promoting products). Such presence is aimed at enhancing consumer relationship and involvement with the brand and building or sustaining emotional and social ties (Alalwan, et al., 2017). Specifically, social media allows brands to reach a wider audience (Yakın & Eru, 2017), facilitates the interaction with actual and prospective consumers (e.g., advertising and promotion), and enables consumers to easily access consumer support and interaction with the brand (Alalwan et al., 2017).

Brands frequently include emoji in marketing activities aimed at increasing consumer involvement. Including emoji in marketing communication might help brands and organizations to be perceived as more innovative (Bai et al., 2019; Yakın & Eru, 2017) and make their messages clearer (Bai et al., 2019), thus promoting consumer attachment to their products or messages (Arya et al., 2018). For example, brands have developed custom emoji (e.g., Starbucks Emoji Keyboard; Peters, 2016) so that their emoji, and the brand itself, becomes part of everyday conversations (Conversation Media, 2021). Some brands have even requested the approval of specific emoji to the Unicode Consortium (e.g., condom emoji by Durex; Bolton, 2020). Brands can also promote new products using emoji (e.g., the advertisement for the new Deadpool movie; Conversation Media, 2021), create keyboards that invite individuals to explore and discover new emoji related to their products (e.g., Disney Emoji Blitz; Star Wars, 2020), or even use emoji as add-on elements in users' experience (e.g., Netflix Spain; Fernández Gómez & Martín Quevedo, 2018).

Consumers may develop more positive attitudes toward brands that use emoji and have stronger purchase intentions of their products (Hayes et al., 2020). However, the findings regarding the impact of emoji use by brands are inconsistent. For example, studies showed that participants had more positive attitudes toward an advertisement campaign that included emoji in comparison to a campaign that only included text and that emoji use was perceived as signaling more creativity and innovation (Alalwan, 2017). Subsequently, the same authors found that participants reported more positive attitudes toward emotional advertising messages (e.g., highlighting a hedonic claim) that included (vs. did not include) emoji (Oya & Yakın, 2019). However, no differences were found for rational advertising messages (e.g., highlighting a feature of the product). These findings suggest that not all contexts/types of messages benefit from emoji use. For example, the presence (vs. absence) of emoji in an advertisement presenting technical characteristics of a product (i.e., camera) had a positive impact on brand/product perception and increased purchase intentions (Das et al., 2019). In contrast, other studies showed that employees were perceived as less competent when their replies to consumer inquiries via Facebook included emoji, but only when there was a transactional (vs. friendship-like) relationship with the service provider (Li, Chan, et al., 2019). Overall, these findings highlight the need to further examine which contexts are perceived as appropriate for brands to use emoji. Moreover, a deeper understanding of these perceptions should also be informed by evidence suggesting that emoji use can be determined not only by individual characteristics such as age or gender (Prada et al., 2018) but also by the way people perceive and use emoji in their daily CMC.

3.2.2. Patterns of Emoji Use

Previous research showed age differences in emoji use frequency, with younger people using emoji more frequently than older people (Oleszkiewicz, et al., 2017; Prada et al., 2018; Settanni & Marengo, 2015). There are also gender differences in emoji perception and use. For example, research showed that women (vs. men) evaluate emoji as more familiar, meaningful, and clearer (Rodrigues et al., 2018), and use them more frequently (Oleszkiewicz et al., 2017; Prada et al., 2018). A recent study further showed an interplay between gender and age in emoji use, with women reporting more positive attitudes toward emoji use and more frequent emoji use than men, but only if they were younger (Prada et al., 2018). No gender differences emerged for older respondents.

Previous studies also showed that people who perceive emoji as more useful, interesting, fun, easy, informal, and good (i.e., positive attitudes toward emoji use) are more likely to use emoji more frequently in their CMC (Prada et al., 2018; Rodrigues et al., 2017) and to perceive a message with emoji as more efficient (Rodrigues et al., 2017). Taken together, these findings indicate that individual variables (i.e., age and gender), frequency of emoji use in CMC, and the attributions people make to emoji (e.g., usefulness) might shape the perceptions and patterns of emoji use. Therefore, these variables are also likely to shape specific perceptions, such as the appropriateness of brands using emoji in their communication with consumers.

3.2.3. Study Overview

Previous studies presented mixed findings regarding the impact of using emoji in brand-consumer communication outcomes. Whereas some studies showed that the use of emoji might exert positive effects (Das et al., 2019), other studies showed a detrimental effect of such use (Li, Chan, et al., 2019). The current study examined if some of these inconsistencies could be related to the context in which brands communicate with consumers. Specifically, we explored participants' perceptions of how appropriate it was for brands to use emoji across five different contexts (e.g., answer to a consumer comment on social media; communicating the callback of a defective product). Additionally, we explored if the perceived appropriateness of emoji use by brands was determined by individual variables (i.e., age and gender), by the frequency of emoji use, and by the participants' views about emoji use (e.g., interesting, fun) in daily CMC.

3.3. Method

3.3.1. Participants

The sample included 540 participants (70.4% women) aged between 18 and 49 years (M = 27.29, SD = 7.04) who voluntarily participated in a web survey. Most participants had a university degree (80.9%) and were either workers (55.3%) or students (34.9%).

3.3.2. Procedure and Measures

This study was conducted following the ethical guidelines issued by Iscte-Instituto Universitário de Lisboa, and informed consent was obtained from all participants. Participants were invited through social media and mailing services to collaborate on a web survey (Qualtrics web platform) about emoji use. Instructions stated that all data collected would be treated anonymously and that participants could abandon the study at any point by closing the browser without their responses being considered for the analysis.

After providing sociodemographic information (i.e., age, gender, education level, and current occupation), participants were presented with a set of questions regarding emoji use and emoji perception. We asked participants to indicate how frequently they use emoji in their daily CMC using a single item (1 = *Rarely* to 7 = *Frequently*) and to rate emoji in seven dichotomous items (1 = *Useless* to 7 = *Useful*; 1= *Uninteresting* to 7 = *Interesting*; 1 = *Boring* to 7 = *Fun*; 1 = *Hard* to 7 = *Easy*; 1 = *Formal* to 7 = *Informal*; 1= *Bad* to 7 = *Good*; 1 = *Inadequate* to 7 = *Adequate*, retrieved from (Prada et al., 2018; Rodrigues et al., 2017). Participants were then asked to indicate how appropriate (1 = *Not appropriate at all* to 7 = *Very appropriate*, retrieved from Cavalheiro et al., 2022) was the use of emoji by brands in each of the five communication contexts: (1) advertising social media posts (Facebook, Instagram, etc.); (2) directly replying to a consumer's comment on social media; (3) directly answering a consumer's service request; (4) communicating about the disclosure of a new product; and (5) communicating the callback of a defective product. In the end, participants were thanked and debriefed. The survey took, on average, 12 minutes to complete.

3.3.3. Data Analytic Plan

Only completed surveys were retained for analysis, and therefore there were no missing cases. In the preliminary analyses, we present descriptive information regarding the frequency of emoji use and views about emoji use in daily CMC. We also correlated these variables with age, tested for gender differences using independent samples-tests, and tested possible interactions between age and gender. Then, we examined participants' perceptions regarding the appropriateness of emoji use by brands for each of the five contexts. Lastly, we computed a hierarchical linear regression with individual variables (i.e., age, gender, and their interaction) (Step 1), frequency of emoji use (Step 2), and views about emoji (Step 3) as predictor variables. The outcome variable resulted from computing the ratings of appropriateness across the five contexts into a single index (α = .81).

3.4. Results

3.4.1. Preliminary Analyses

Descriptive statistics and overall correlations are shown in Table 3.1. Participants reported using emoji frequently and considered emoji to be useful, interesting, fun, easy, informal, good, and adequate. Participants who reported using emoji more frequently also perceived emoji as more useful, interesting, fun, easy, good, and adequate, all $p < .001$. Moreover, younger participants reported using emoji more frequently, $p < .001$, and perceived emoji as more useful, interesting, easy to use, good, and adequate, all $p = .021$. In contrast, age was not significantly correlated with the perceptions of emoji as more fun or informal, all $p \geq .089$.

Table 3.1. *Descriptive Statistics and Correlations*

Measure	Descriptive statistics				Gender differences		Correlations							
	Overall		Women	Men										
	M (*SD*)	95% CI	(*M*) (*SD*)	(M) (*SD*)	*t*(538)	*p*	1.	2.	3.	4.	5.	6.	7.	8.
1. Frequency using emoji	5.73 (1.70)	[5.59, 5.87]	5.91 (1.61)	5.31 (1.81)	3.83	.001	-							
2. Useful	5.28 (1.53)	[5.15, 5.41]	5.38 (1.53)	5.06 (1.51)	2.25	.025	.48***	-						
3. Interesting	5.25 (1.48)	[5.13, 5.38]	5.29 (1.51)	5.16 (1.40)	0.99	.321	.44***	.70***	-					
4. Fun	5.85 (1.37)	[5.74, 5.97]	5.93 (1.37)	5.66 (1.35)	2.11	.035	.45***	.58***	.64***	-				
5. Easy	5.95 (1.36)	[5.84, 6.06]	6.04 (1.36)	5.74 (1.32)	2.30	.022	.35***	.53***	.53***	.63***	-			
6. Informal	2.32 (1.51)	[2.19, 2.44]	5.69 (1.44)	5.68 (1.54)	0.04	.967	-.04	.12**	.13**	-.01	-.05	-		
7. Good	5.35 (1.48)	[5.22, 5.47]	5.42 (1.50)	5.18 (1.40)	1.77	.077	.48***	.67***	.72***	.65***	.55***	.11**	-	
8. Adequate	4.95 (1.40)	[4.83, 5.07]	4.97 (1.44)	4.89 (1.30)	0.65	.513	.42***	.64***	.65***	.54***	.48***	.19***	.70***	
9. Age	27.29 (7.04)		27.08 (7.14)	27.79 (6.81)			-.31***	-.17***	-.13**	-.07	-.12**	.07	-.17***	-.10*

Note. $^{***}p < .001$, $^{**}p < .010$, $^{*}p < .050$.

Gender differences are also presented in Table 3.1. As can be seen, women (vs. men) reported using emoji more frequently and perceived emoji to be more useful, fun, and easy to use, all $p \leq .035$. No other differences reached significance, all $p \geq .977$. Moreover, no significant interactions between gender and age emerged for the frequency of emoji use, $p = .307$, or for any of the views about emoji, all $p \geq .136$.

3.4.2. Appropriateness of Emoji Use by Brands

Figure 3.1 presents a detailed analysis regarding the appropriateness of emoji use by brands for each of the five contexts. Overall, perceived appropriateness was moderate when contexts were examined together ($M = 3.98$, $SD = 1.30$, 95% CI [3.88, 4.09]). However, a closer inspection of each context separately showed that participants considered emoji use more appropriate when brands publicize on social media posts ($M = 5.46$, $SD = 1.39$, 95% CI [5.35,5.58]), directly reply to a consumer's comment on a social media platform ($M = 4.32$, $SD = 1.80$, 95% CI [4.17, 4.47]), and disclose new products ($M = 4.35$, $SD = 1.76$, 95% CI [4.20, 4.50]). In contrast, participants perceived emoji use as less appropriate when brands directly answer a consumer's service request ($M = 3.46$, $SD = 1.82$, 95% CI [3.31, 3.62]) or make the callback of defective products ($M = 2.73$, $SD = 1.76$, 95% CI [2.58, 2.88]).

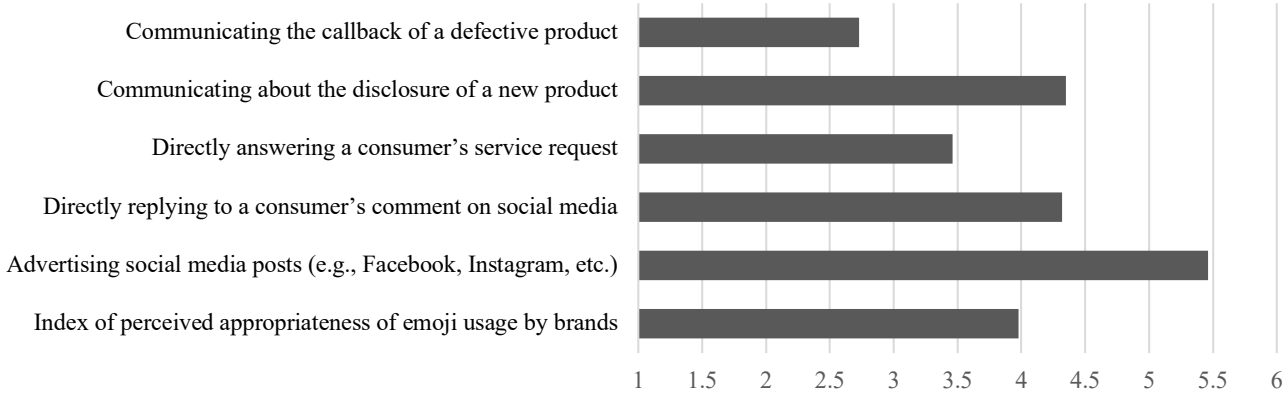

Figure 3. 1. *Appropriateness of Emoji Use by Brands Across Different Contexts*

3.4.3. Determinants of Appropriateness of Emoji Use by Brands

The results of the hierarchical linear regression are summarized in Table 3.2. Including the predictors in each step significantly increased the explained variance of the model, all $p < .001$, therefore indicating the relevance of each block of variables to the model. Results showed that emoji use by brands was perceived as more adequate among younger participants, $p = .024$,

those who use emoji more frequently in their CMC, $p = .010$, and those who consider emoji more useful, $p = .030$, and formal, $p < .001$. No other results reached significance, all $p \geq .062$.

Table 3.2. *Determinants of Perceived Appropriateness of Emoji Use by Brands (Standardized Regression Coefficients and Significance)*

	Perceived Appropriateness of Emoji Use by Brands[a]		
	Step 1	Step 2	Step 3
Individual variables			
Age	-.178***	-.090	-.119**
Gender	.132	.136	-.010
Age x Gender	-.112	-.158	-.142
Emoji use			
Frequency of Using Emoji		.269***	.123*
Views about Emoji			
Useful			.131*
Interesting			.097
Fun			-.030
Easy			-.063
Informal			-.194***
Good			.079
Adequate			.098
Adjusted R^2	.033	.095	.217
ΔR^2	.038	.063	.131
ΔF	7.15***	37.82***	12.86***

Note. [a]Higher scores denote greater perceived appropriateness for brands to use emoji. Gender coded as -1 = Men, 1 = Women. $^{***}p < .001$, $^{**}p < .010$, $^{*}p < .050$.

3.5. Discussion

The increased popularity of emoji prompted brands to include them in their communication with consumers (Bai et al., 2019; Yakın & Eru, 2017). We examined how potential consumers perceive this strategy in different brand-consumer communication contexts and investigated potential determinants of such perceptions.

Our findings emphasize the importance of the specific context in which brands communicate with consumers using emoji. Specifically, results indicated that emoji use by brands on social media advertisements, replies to consumers' social media posts, and announcement of new products was perceived as more appropriate. In contrast, emoji use by brands when answering a consumer's request for a service or announcing the callback of defective products was perceived as less appropriate. This suggests a greater acceptance of brands using emoji when the presence of emoji is more familiar or typical (e.g., on social media ads) or when the brand makes positive announcements (e.g., the launch of new products). However, people may be less receptive to emoji use in situations that involve greater seriousness or responsibility from a brand (e.g., the callback of defective products). This converged with previous research suggesting that using emoji when dealing with certain

relationship conflicts has negative consequences for communication (Glikson et al., 2017; Rodrigues et al., 2017). In the context of brand-consumer communication, such use also seems to have negative consequences for the brand (e.g., perceiving a consumer representative as less competent; Li, Chan et al., 2019). Our findings also support the idea that, although emoji may convey positivity to a message (Das et al., 2019), this is not always the case and the success of using emoji may depend on the context or strategy of communication (Casado-Molina et al., 2019).

Our results also showed that people who use emoji more frequently in their daily CMC were also more likely to perceive emoji use by brands as more appropriate. This finding is not entirely surprising and may result from a greater familiarity with the use of these paralinguistic cues in their daily communication (Coyle & Carmichael, 2019). Replicating past research, our findings further show that emoji use in daily CMC was more frequent among younger people and women (Hauk et al., 2018; Oleszkiewicz et al., 2017; Prada et al., 2018), despite the absence of an interaction effect. Extending the link between age and emoji use to marketing communication, younger participants perceived brand emoji use as more appropriate. Arguably, younger people are more likely to be exposed to emoji because they use them more frequently in their daily CMC (Scott et al., 2017). Such perceptions, however, did not vary according to gender. Although women arguably rely more on CMC to communicate for interpersonal motives (e.g., to contact someone) and men use CMC for more functional purposes (e.g., to convey concrete information; Rosen et al., 2013), these differences do not seem to extend to the consumer context.

Importantly, our study revealed the importance of the views about emoji use in daily CMC for marketing communication. Brands' emoji use was perceived as more appropriate when participants considered overall emoji use as more useful and formal. In line with past research, our findings indicate that people prefer emoji use in a consumer context when the emoji can help clarify a message (Kaye et al., 2017) and serve a functional purpose of adding relevant (i.e., useful) information to marketing communication (Casado-Molina et al., 2019; Wang, 2015). In contrast, people who consider emoji use informal do not perceive their use as appropriate in a brand communication context. These findings parallel the outcomes of a marketing campaign by Chevrolet in 2015, in which the brand revealed their new car using a press release entirely composed of emoji. Because people struggled to understand the message, a subsequent press release translated the emoji message (Wang, 2015). Although the brand may have used emoji to portray an image of innovation (e.g., Bai et al., 2019; Yakın & Eru, 2017), the message failed its intent by not adding (any) useful information and for its (unexpected)

informality and overuse of emoji (Conversation Media, 2021). This also aligns with the findings reported by Casado-Molina et al. (2019), who showed that brands with clearer and more defined strategies when using emoji had a better brand engagement.

The current study has limitations that must be acknowledged. For example, our sample comprised predominantly women, participants with a relatively narrow age range (i.e., 18-49), who use emoji frequently, and with high levels of education, therefore limiting the generalizability of our results. Thus, future studies should seek a more diverse sample of participants. We also explored a limited number of contexts, and future research could seek to expand the contexts in which emoji may be used, specifically for brands and organizations. Future studies could also seek to extend our findings by examining if emoji use by brands is perceived as appropriate across different brands (e.g., supermarket vs. bank), product types (e.g., hedonic vs. utilitarian; Das et al., 2019), and emoji types (e.g., objects to convey specific information vs. face-like emoji to convey emotions) that can vary in usefulness and formality. Aside from perceptions about emoji use, future studies could also seek to understand how different communications from brands (e.g., highlighting sales, disclaiming a new product) may influence actual consumers' attitudes (e.g., brand image) and behaviors toward the brand (e.g., purchase intentions).

In a nutshell, this study suggests that the use of emoji by brands is not necessarily associated with positive outcomes (Li, Chan et al., 2019), despite its prevalent use nowadays (Casado-Molina et al., 2019; Das et al., 2019). By examining which contexts are deemed more appropriate for using emoji and the determinants of such perceptions, our findings provide relevant information regarding how brands might enhance brand-consumer communication.

3.6. References

Alalwan, A. A., Rana, N. P., Dwivedi, Y. K., & Algharabat, R. (2017). Social media in marketing: A review and analysis of the existing literature. *Telematics and Informatics*, *34*(7), 1177–1190. https://doi.org/10.1016/j.tele.2017.05.008

Arya, V., Sethi, D., & Verma, H. (2018). Are emojis fascinating brand value more than textual language? Mediating role of brand communication to SNS and brand attachment: An insight from India. *Corporate Communications*, *23*(4), 648–670. https://doi.org/10.1108/CCIJ-03-2018-0036

Bai, Q., Dan, Q., Mu, Z., & Yang, M. (2019). A systematic review of emoji : Current research and future perspectives. *Frontiers in Psychology*, *10*. https://doi.org/10.3389/fpsyg.2019.02221

Bolton, D. (2015, November 22). *Durex calls for a condom emoji to be created to spread awareness about safe sex*. Independent. https:// www.independent.co.uk/life-style/gadgets-and-tech/news/ durex-calls-for-a-condom-emoji-to-be-created-to-spreadawareness-about-safe-sex-a6744266.html.

Boutet, I., LeBlanc, M., Chamberland, J. A., & Collin, C. A. (2021). Emojis influence emotional communication, social attributions, and information processing. *Computers in Human Behavior*, *119*, 106722. https://doi.org/10.1016/j.chb.2021.106722

Casado-Molina, A. M., Rojas-de Gracia, M. M., Alarcón-Urbistondo, P., & Romero-Charneco, M. (2019). Exploring the opportunities of the emojis in brand communication: the case of the beer industry. *International Journal of Business Communication*, 1–19. https://doi.org/10.1177/2329488419832964

Cavalheiro, B. P., Prada, M., Rodrigues, D. L., Lopes, D., & Garrido, M. V. (2022). Evaluating the adequacy of emoji use in positive and negative messages from close and distant senders. *Cyberpsychology, Behavior, and Social Networking*, *25*(3), 194-199. https://doi.org/10.1089/cyber.2021.0157

Chen, Z., Lu, X., Ai, W., Li, H., Mei, Q., & Liu, X. (2018). Through a gender lens: Learning usage patterns of emojis from large-scale android users. *Proceedings of the 2018 world wide web conference*, 763-772.

Conversation Media (2021). *How these 7 brands nailed emoji marketing campaigns and what to learn from them*. Conversation Media. https://www.conversationmedia.org/ post/how-these-7-brands-nailed-emoji-marketingcampaigns-and-what-to-learn-from-them.

Coyle, M. A., & Carmichael, C. L. (2019). Perceived responsiveness in text messaging: The role of emoji use. *Computers in Human Behavior*, *99*(2019), 181–189. https://doi.org/10.1016/j.chb.2019.05.023

Das, G., Wiener, H. J. D., & Kareklas, I. (2019). To emoji or not to emoji? Examining the influence of emoji on consumer reactions to advertising. *Journal of Business Research*, 96(2019), 147–156. https://doi.org/10.1016/j.jbusres.2018.11.007

Dunlap, J. C., Bose, D., Lowenthal, P. R., York, C. S., Atkinson, M., & Murtagh, J. (2016). What sunshine is to flowers. In S. Y. Tettegah, & M. Gartmeier (Eds.), *Emotions, technology, design, and learning* (pp. 163-182). Elsevier. https://doi.org/10.1016/B978-0-12-801856-9.00008-6

Fakhruroji, M. (2021). Texting condolences on WhatsApp as a mediatized mourning practice. *Human Behavior and Emerging Technologies*, 677–686. https://doi.org/10.1002/hbe2.309

Fernández Gómez, E., & Martín Quevedo, J. (2018). Connecting with audiences in new markets: Netflix´s Twitter strategy in Spain. *Journal of Media Business Studies*, *15*(2), 127–146. https://doi.org/10.1080/16522354.2018.1481711

Ge, J., & Gretzel, U. (2018). Emoji rhetoric: A social media influencer perspective. *Journal of Marketing Management*, *2018*, 1–24. https://doi.org/10.1080/0267257X.2018.1483960

Glikson, E., Cheshin, A., & van Kleef, G. A. (2017). The Dark Side of a Smiley. *Social Psychological and Personality Science*, 1-12. https://doi.org/10.1177/1948550617720269

Gomes, R. F., & Casais, B. (2018). Feelings generated by threat appeals in social marketing: text and emoji analysis of user reactions to anorexia nervosa campaigns in social media. *International Review on Public and Nonprofit Marketing*, *15*(4), 591–607. https://doi.org/10.1007/s12208-018-0215-5

Hauk, N., Hüffmeier, J., & Krumm, S. (2018). Ready to be a Silver Surfer? A meta-analysis on the relationship between chronological age and technology acceptance. *Computers in Human Behavior*, *84*, 304-319. https://doi.org/10.1016/j.chb.2018.01.020

Hayes, J. L., Britt, B. C., Applequist, J., Ramirez, A., & Hill, J. (2020). Leveraging textual paralanguage and consumer–brand relationships for more relatable online brand communication: A social presence approach. *Journal of Interactive Advertising*, *20*(1), 17–30. https://doi.org/10.1080/15252019.2019.1691093

Holtgraves, T., & Robinson, C. (2020). Emoji can facilitate recognition of conveyed indirect meaning. *PLoS ONE*, *15*(4), 1–13. https://doi.org/10.1371/journal.pone.0232361

Kaye, L. K., Malone, S. A., & Wall, H. J. (2017). Emojis: Insights, affordances, and possibilities

for psychological science. *Trends in Cognitive Sciences*, *21*(2), 66–68. https://doi.org/10.1016/j.tics.2016.10.007

Kaye, L. K., Wall, H. J., & Malone, S. A. (2016). "Turn that frown upside-down": A contextual account of emoticon usage on different virtual platforms. *Computers in Human Behavior*, *60*, 463–467. https://doi.org/10.1016/j.chb.2016.02.088

Li, M., Chng, E., Chong, A. Y. L., & See, S. (2019). An empirical analysis of emoji usage on Twitter. *Industrial Management and Data Systems*, *119*(8), 1748–1763. https://doi.org/10.1108/IMDS-01-2019-0001

Li, X., Chan, K. W., & Kim, S. (2019). Service with emoticons: How customers interpret employee use of emoticons in online service encounters. *Journal of Consumer Research*, *45*(5), 973-987. https://doi.org/10.1093/jcr/ucy016

Luangrath, A. W., Peck, J., & Barger, V. A. (2017). Textual paralanguage and its implications for marketing communications. *Journal of Consumer Psychology*, *27*(1), 98–107. https://doi.org/10.1016/j.jcps.2016.05.002

McShane, L., Pancer, E., Poole, M., & Deng, Q. (2021). Emoji, playfulness, and brand engagement on Twitter. *Journal of Interactive Marketing*, *53*(1), 96–110. https://doi.org/10.1016/j.intmar.2020.06.002

Novak, P. K., Smailović, J., Sluban, B., & Mozetič, I. (2015). Sentiment of emojis. *PLoS ONE*, *10*(12), 1–23. https://doi.org/10.1371/journal.pone.0144296

Oleszkiewicz, A., Karwowski, M., Pisanski, K., Sorokowski, P., Sobrado, B., & Sorokowska, A. (2017). Who uses emoticons? Data from 86 702 Facebook users. *Personality and Individual Differences*, *119*, 289–295. https://doi.org/10.1016/j.paid.2017.07.034

Oya, E. R. U., & Yakın, V. (2019). Research on determining perceptions and attitudes towards emoji use in digital marketing campaigns. *Çukurova Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 28(2), 83-100.

Peters, L. (2016, April 25). *How to get the starbucks emoji keyboard*. Bustle. https://www.bustle.com/articles/156697-how-to-getthe-starbucks-emoji-keyboard-because-your-life-isntcomplete-without-a-cat-face.

Pittman, M., & Reich, B. (2016). Social media and loneliness: Why an Instagram picture may be worth more than a thousand Twitter words. *Computers in Human Behavior*, *62*, 155–167. https://doi.org/10.1016/j.chb.2016.03.084

Prada, M., Rodrigues, D. L., Garrido, M. V., Lopes, D., Cavalheiro, B., & Gaspar, R. (2018). Motives, frequency and attitudes toward emoji and emoticon use. *Telematics and Informatics*, *35*(7), 1925–1934. https://doi.org/10.1016/j.tele.2018.06.005

Riordan, M. A. (2017). The communicative role of non-face emojis: Affect and disambiguation. *Computers in Human Behavior*, *76*, 75–86. https://doi.org/10.1016/j.chb.2017.07.009

Riordan, M. A., & Glikson, E. (2020). On the Hazards of the Technology Age: How Using Emojis Affects Perceptions of Leaders. *International Journal of Business Communication*, 2329488420971690. https://doi.org/10.1177/2329488420971690

Rodrigues, D., Lopes, D., Prada, M., Thompson, D., & Garrido, M. V. (2017). A frown emoji can be worth a thousand words: Perceptions of emoji use in text messages exchanged between romantic partners. *Telematics and Informatics*, *34*(8), 1532–1543. https://doi.org/10.1016/j.tele.2017.07.001

Rodrigues, D., Prada, M., Gaspar, R., Garrido, M. V., & Lopes, D. (2018). Lisbon Emoji and Emoticon Database (LEED): Norms for emoji and emoticons in seven evaluative dimensions. *Behavior Research Methods*, *50*(1), 392–405. https://doi.org/10.3758/s13428-017-0878-6

Rosen, L. D., Whaling, K., Carrier, L. M., Cheever, N. A., & Rokkum, J. (2013). The Media and Technology Usage and Attitudes Scale: An empirical investigation. *Computers in Human Behavior*, *29*(6), 2501–2511. https://doi.org/10.1016/j.chb.2013.06.006

Sampietro, A. (2019). Emoji and rapport management in Spanish WhatsApp chats. *Journal of Pragmatics*, *143*, 109–120. https://doi.org/10.1016/j.pragma.2019.02.009

Scott, C. F., Bay-Cheng, L. Y., Prince, M. A., Nochajski, T. H., & Collins, R. L. (2017). Time spent online: Latent profile analyses of emerging adults' social media use. *Computers in Human Behavior*, *75*, 311–319. https://doi.org/10.1016/j.chb.2017.05.026

Settanni, M., & Marengo, D. (2015). Sharing feelings online: Studying emotional well-being via automated text analysis of Facebook posts. *Frontiers in Psychology*, *6*(JUL), 1–7. https://doi.org/10.3389/fpsyg.2015.01045

Star Wars. (2020, February 13). *The Mandalorian and the child coming to Disney emoji blitz*. Star Wars. https://www.starwars.com/news/the-mandalorian-and-the-child-coming-to-disney-emoji-blitz

Subrahmanyam, K., Frison, E., & Michikyan, M. (2020). The relation between face-to-face and digital interactions and self-esteem: A daily diary study. *Human Behavior and Emerging Technologies*, *2*(2), 116–127. https://doi.org/10.1002/hbe2.187

Vareberg, K. R., & Westerman, D. (2020). To: -) or to ☺, that is the question: a study of students' initial impressions of instructors' paralinguistic cues. *Education and Information Technologies*, *25*, 4501-4516. https://doi.org/10.1007/s10639-020-10181-9

Völker, J., & Mannheim, C. (2021). Tuned in on senders' self-revelation: Emojis and emotional intelligence influence interpretation of WhatsApp messages. *Computers in Human Behavior Reports*, *3*, 100062. https://doi.org/10.1016/j.chbr.2021.100062

Yakın, V., & Eru, O. (2017). An application to determine the efficacy of emoji use on social marketing ads. *International Journal of Social Sciences and Education Research*, *3*(1), 230–230. https://doi.org/10.24289/ijsser.270652

Wang, A. (2015, June 24). *Chevy issues press release written entirely in emojis, tries way too hard*. Slate. https://slate.com/technology/2015/06/general-motors-chevy-all-emoji-press-release-misses-the-mark.html

CHAPTER 4

Who (and with whom) uses more emoji? Exploring individual, relational, and motivational characteristics driving emoji use

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https://doi.org/10.1016/j.tele.2023.102023

4.1. Abstract

Emoji use, despite being pervasive in digital communication, is often dependent on individual characteristics (e.g., gender, age, personality), relational dimensions (e.g., intimacy with specific others), motives for using them (e.g., because emoji allow to better express emotions), and the context in which they are used (e.g., emoji use is considered more appropriate with closer interlocutors, such as friends). However, research has yet to examine if and how these variables associate with emoji use frequency when considered together. In a correlational study (N = 444), we explored the relative contribution of individual characteristics, perceived relatedness to others, and motives to explain the frequency of emoji use with different interlocutors. Hierarchical linear regressions showed that being younger, scoring higher on conscientiousness, and resorting to emoji for personal contact were correlates of emoji use frequency with closer interlocutors (e.g., family and friends). In contrast, being older, scoring lower on agreeableness, and perceiving more relational intimacy were correlates of emoji use frequency with more distant interlocutors (e.g., supervisors and doctors). Overall, results highlight the need to account for multiple variables at different levels to examine emoji use patterns in digital communication.

Keywords: emoji, online communication, computer-mediated communication, individual differences, Text-based communication, context

4.2. Introduction

The available set of emoji has been greatly improved in recent years, with around 2,000 emoji available in 2018 (Rodrigues et al., 2018) and 3,745 emoji in 2022 (emojipedia.org). The current set of emoji includes a wider representation of contents (e.g., emotions, activities, objects) and symbols (e.g., specific cultural symbols, such as flags), helping individuals to express and/or represent themselves (e.g., variations in skin tones) and meet their goals when communicating digitally. According to Unicode, 92% of the world's population who used the internet in 2021 also used emoji (Daniel, 2022). Research has made several efforts to understand when and why individuals use emoji with different interlocutors. Overall, the patterns of emoji use have been shown to differ according to individual characteristics (e.g., age, gender, personality; Liu and Sun, 2020, Prada et al., 2018), motives to use emoji (e.g., clarify messages or express emotions; Kaye et al., 2016, Liu and Sun, 2020), and contextual cues (e.g., distance between interlocutors; Cavalheiro et al., 2022). However, researchers have mainly focused on single (or restricted number of) variables and contexts when exploring emoji use patterns. We argue this approach offers a limited understanding of digital communication and, thus, conducted a study considering multiple variables from different levels at the same time. Our goal was to explore if and how each variable contributes to emoji use frequency.

4.2.1. Differences in emoji use

Past research has shown differences in emoji use according to distinct variables and/or interlocutors. Overall, when asked about the reasons for including emoji in their communication, individuals indicated that emoji helped them improve self-expression (i.e., attribute an emotional tone to messages) and reduce ambiguity in written communication (e.g., making sure the other person understood what was meant; Kaye et al., 2016). Other studies indicated that individuals use emoji to match their interlocutor's communication style, signal compatibility, and improve interest in the interaction (Nexø & Strandell, 2020), and even to convey specific intentions when meeting potential partners (Rodrigues et al., 2022). More broadly, individuals report a tendency to use emoji more often when they communicate with closer interlocutors (Thomson et al., 2018) and less so when they communicate with more distant interlocutors (e.g., authority figures in work settings; Kaye et al., 2016, Riordan and Glikson, 2020). Supporting this, a recent study showed that participants deemed emoji use more appropriate in communications with closer interlocutors (e.g., family, friends) than with more distant ones (e.g., professors, doctors; Cavalheiro et al., 2022).

Considering individual differences, Prada et al. (2018) found that younger individuals and women reported using emoji more frequently in their daily digital communications. Younger participants also identified more strongly with motives to use emoji, including helping them to express their feelings, strengthen the content of messages, or even soften the content of a message. Likewise, Jones et al. (2020) found that women tend to use emoji more often when communicating with their family and friends, whereas men tend to use emoji more often when communicating with their co-workers. According to the authors, these findings align with previous research showing that women use smartphones more for social purposes, whereas men use them more for informational purposes (e.g., communicating with co-workers, J. Roberts et al., 2014).

Certain individual characteristics or traits have been associated with the frequency of (or motives for) emoji use. However, the findings are far from straightforward. For example, Völkel et al. (2019) found that individuals who scored higher on neuroticism (i.e., lower level of emotional stability; Liu & Sun, 2020) reported using emoji more frequently, whereas Marko (2022) found the opposite. Moreover, this author found emoji use to be positively associated with openness to experience (i.e., appreciation of new experiences) and negatively associated with extraversion (i.e., preference for social interactions). Extending these findings, Liu and Sun (2020) examined the relationship between personality traits and motives for using emoji. The authors found that individuals who scored higher on neuroticism or lower on extraversion used emoji to avoid awkward interactions in online conversations. The authors also found that individuals who scored higher on agreeableness (i.e., being soft-hearted, and trusting; Nunes et al., 2018) used emoji to express their emotions, clarify messages, lighten up the mood, and show a sense of humor. These studies did not specifically test the relationship between personality traits and emoji use with different interlocutors. This is relevant given that Cavalheiro et al. (2022) showed that distance between interlocutors is likely to shape emoji use, such that individuals consider more appropriate to use emoji when communicating with closer interlocutors (e.g., friends) when compared to more distant interlocutors (e.g., doctors). Hence, we explored if (and which) personality traits were associated with emoji use depending on interlocutors' distance. Finally, previous studies have also shown that emoji can be used for specific relational motives. For example, Sampietro (2019) analyzed a corpus of WhatsApp messages and found that participants reported using emoji to foster affiliation and intimacy (e.g., to provide interpersonal support). In a similar line, Minseong Kim et al. (2022) asked participants to read a fictitious welcoming letter from a professor to new students, which included (or not) emoji. Results revealed that the use of emoji led to the professor being rated

higher on perceived intimacy (e.g., warmer, emotionally closer). However, we are unaware of research systematically examining the association between different relational motives and emoji use. To this end, in the current study, we sought to assess how relatedness to others (i.e., the need to feel belongingness and connectedness with others; Ryan & Deci, 2000) is associated with emoji use depending on interlocutors' distance. More specifically, we assessed acceptance (i.e., the feeling of belonging, being socially supported, respected, and included in a given context) and intimacy (i.e., the feeling of closeness or inclusion by others; J.-I. Kim et al., 2018).

Briefly, we conducted an exploratory study to systematically examine if and how individual (i.e., age, gender, personality traits), relational (i.e., perceived relatedness to others), and motivational variables (i.e., to establish personal contact, decrease loneliness, and social ease) contribute to emoji use frequency, distinguishing the communication between closer and more distant interlocutors.

4.3. Method

4.3.1. Participants

A sample of 444 participants volunteered to take part in this study. Participants were aged between 18 and 67 (M = 33.73, SD = 13.96), most were women (57.0%), had a higher education (53.2%), and were workers (52.8%).

4.3.2. Procedures and measures

This study was approved by the Ethics Committee at Iscte-Instituto Universitário de Lisboa (#97/2021). The survey was designed in Qualtrics, and distributed online through social media platforms, e-mailed to different organizations (e.g., public sector departments, student organizations, local libraries), and shared with students from the host institution. Participants were asked to report demographic information (age, gender, education level, occupation), how often they use their smartphones, computers, and tablets to communicate (1 = *Rarely* to 7 = *Frequently*), how comfortable they feel with technology (1 = *Not comfortable at all* to 7 = *Very comfortable*), and how frequently they send emoji (1 = *Rarely* to 7 = *Frequently*). We then presented the Portuguese version of the Ten-Item Personality Inventory (Nunes et al., 2018) and asked participants to indicate to what extent they identify with 10 characteristics, using a 7-point rating scale (1 = *Strongly disagree* to 7 = *Strongly agree*). Responses were averaged into five personality traits: extraversion ("extraverted, enthusiastic"; "reserved, quiet"; rs = .71), agreeableness ("sympathetic, warm"; "critical, quarrelsome"; rs = .36), conscientiousness

("dependable, self-disciplined"; "disorganized, careless"; *rs* = .38), emotional stability ("calm, emotionally stable"; "anxious, easily upset"; *rs* = .41), and openness to experience ("open to new experiences, complex"; "conventional, uncreative"; *rs* = .55). Because in the current inventory, each personality subscale was measured by two items, internal consistency was assessed using the Spearman-Brown coefficient (Eisinga et al., 2013).

Using separate items, we then asked participants to indicate how frequently they use emoji with their friends, family, romantic partners, work colleagues, school colleagues, supervisors, professors, and doctors (each item from 1 = *Rarely* to 7 = *Frequently*). Based on past research (Cavalheiro et al., 2022), responses to friends, family, romantic partners, work colleagues, and school colleagues were averaged into an index of emoji use frequency with closer interlocutors (α = .79). Responses to supervisors, professors, and doctors were averaged into an index of emoji use frequency with more distant interlocutors (α = .74). For each interlocutor, participants were also presented with the Need for Relatedness Scale (Richer & Vallerand, 1998) to assess their perceived acceptance (five items, e.g., "In my relationships with my supervisors, I feel supported") and intimacy (five items, e.g., "In my relationships with my friends, I feel close to them"; 1 = *Do not agree at all* to 7 = *Very strongly agree*). Again, responses were averaged into their respective subscale for closer ($\alpha_{acceptance}$ = .66 and $\alpha_{intimacy}$ = .61) and more distant interlocutors ($\alpha_{acceptance}$ = .64 and $\alpha_{intimacy}$ = .74).

Lastly, we presented participants with an adapted version of the Instant Messaging Motives Scale (Bardi & Brady, 2010) to assess personal contact motives (three items, α = .76; e.g., "Because emoji allow me to better express my emotions"), decrease loneliness motives (four items, α = .91; e.g., "Because emoji help me feel less lonely") and social ease motives to use emoji (four items, α = .87; e.g., "To feel less inhibited when I communicate"). Responses were given in 7-point scales (1 = *Strongly disagree* to 7 = *Strongly agree*) and averaged into the respective subscale. At the end of the survey, participants were thanked, debriefed, and provided with the contact of the responsible researcher.

4.3.3. Analytic plan

First, we present descriptive statistics of the frequency of emoji use with closer and more distant interlocutors, personality traits, perceived relatedness with closer and more distant others, and motives for emoji use. We also examined gender differences across these variables using independent samples t-tests. Next, we present the correlations between these variables with age and frequency of emoji use for closer and more distant interlocutors. Lastly, we computed two hierarchical linear regressions (one for each type of interlocutor) to examine the relative

contribution of known correlates of emoji use frequency. In both analyses, age, gender, their interaction (Prada et al., 2018), and personality traits were entered in Step 1, perceived relatedness scores were entered in Step 2, and motives for emoji use were entered in Step 3.

4.4. Results

4.4.1. Preliminary analysis

Overall, participants reported being comfortable with technology use (M = 6.10, SD = 1.08, CI 95% [6.00, 6.20]), reported using smartphones (M = 6.72, SD = 1.05, CI 95% [6.62, 6.82]) and computers often (M = 5.85, SD = 1.74, CI 95% [5.69, 6.01]), and tablets to a lesser extent (M = 2.35, SD = 2.18, CI 95% [2.15, 2.56]). As shown in Table 4.1, participants reported a higher frequency of emoji use with closer (vs. more distant) interlocutors, $t(367) = 52.48$, $p < .001$, $d = 2.76$. Participants also reported higher levels of acceptance and intimacy with closer (vs. more distant) others, respectively, $t(386) = 16.28$, $p < .001$, $d = 0.83$, and $t(385) = 27.69$, $p < .001$, $d = 1.41$.

Table 4.1. *Overall Statistics and Gender Differences*

	Descriptive statistics		Gender differences			
	Overall sample		Women	Men		
	M (*SD*)	95% CI [LB; UB]	*M* (*SD*)	*M* (*SD*)	t^*	*p*
Frequency of emoji use						
Closer interlocutors	5.78 (1.37)	[5.65, 5.91]	5.85 (1.31)	5.68 (1.44)	1.29	.198
More distant interlocutors	1.63 (1.24)	[1.50, 1.76]	1.72 (1.36)	1.51 (1.05)	1.57	.117
Personality						
Extraversion	4.67 (1.60)	[4.52, 4.82]	4.83 (1.58)	4.45 (1.60)	2.52	.012
Agreeableness	5.94 (0.91)	[5.86, 6.03]	5.97 (0.95)	5.90 (0.87)	0.74	.457
Conscientiousness	5.58 (1.16)	[5.47, 5.69]	5.73 (1.14)	5.37 (1.15)	3.23	.001
Openness to experience	3.76 (1.40)	[3.63, 3.89]	3.83 (1.27)	3.66 (1.55)	1.26	.208
Emotional stability	5.52 (1.12)	[5.42, 5.62]	5.58 (1.14)	5.44 (1.07)	1.32	.186
Perceived relatedness						
Acceptance closer	5.61 (0.88)	[5.53, 5.69]	5.68 (0.91)	5.52 (0.83)	1.83	.068
Acceptance more distant	4.78 (1.07)	[4.68, 4.89]	4.82 (1.17)	4.74 (0.94)	0.68	.497
Intimacy closer	5.66 (0.83)	[5.58, 5.74]	5.73 (0.86)	5.57 (0.79)	1.93	.055
Intimacy more distant	3.81 (1.36)	[3.67, 3.95]	3.99 (1.37)	3.60 (1.34)	2.86	.005
Motives for emoji use						
Personal contact	4.27 (1.50)	[4.13, 4.41]	4.22 (1.54)	4.34 (1.43)	-0.82	.412
Decrease loneliness	2.66 (1.56)	[2.52, 2.81]	2.54 (1.56)	2.82 (1.57)	-1.88	.061
Social ease	3.01 (1.64)	[2.86, 3.17]	2.74 (1.59)	3.37 (1.64)	-4.04	< .001

Note. Degrees of freedom for gender comparisons varied between 366-442; CI = confidence interval, LB = lower-bound, UB = upper-bound

Overall, participants reported a higher tendency to use emoji for personal contact motives, and a lower tendency to use emoji for decrease loneliness or social ease motives. Results showed no gender differences across our measures, with the exception that women (vs. men) scored higher on extraversion and conscientiousness, reported higher intimacy with more distant interlocutors, and were less likely to use emoji for social ease motives.

Results of the correlations (Table 4.2) further showed age was negatively correlated with frequency of emoji use with closer interlocutors, $p < .001$, and positively correlated with emoji use with more distant interlocutors, $p < .001$. Age was also negatively correlated with emoji use for personal contact and social ease motives, both $p < .001$. Examining correlations with personality traits, conscientiousness was positively correlated with emoji use for closer

interlocutors, $p = .031$, whereas extraversion was positively correlated with emoji use for distant interlocutors, $p = .028$. In contrast, agreeableness was negatively correlated with emoji use for distant interlocutors, $p = .002$. Extraversion was negatively correlated with emoji use for decrease loneliness and social ease motives, both $p \leq .005$. Similarly, conscientiousness, openness to experience, and emotional stability were negatively correlated with emoji use for social ease motives, all $p \leq .004$.

Table 4.2. *Correlations of Frequency of Emoji Use with Age, Personality, Perceived Relatedness and Motives for Emoji Use for Closer and More Distant Interlocutors*

	Correlations											
	1.	2.	3.1.	3.2.	3.3.	3.4.	3.5.	4.1.	4.2.	5.1.	5.2.	5.3.
1.Frequency of emoji use	-	.24***	.11*	-.16**	-.00	.04	.08	.12*	.25***	.09	.14**	.07
2.Age	-.26***	-	.10*	.06	.20***	.33***	.08	.07	.37***	-.18***	-.06	-.24***
Personality												
3.1.Extraversion	.06	.10*	-	.04	.13**	.17***	.38***	.19***	.20***	-.06	-.13**	-.28***
3.2.Agreeableness	.07	.06	.04	-	.30***	.16***	.18***	.17**	.16**	.01	.02	-.07
3.3.Conscientiousness	.10*	.20***	.13**	.30***	-	.19***	.17***	.09	.13*	-.07	-.09	-.18***
3.4.Openness to experience	-.04	.33***	.17***	.16***	.19***	-	.13**	.14**	.20***	-.02	-.04	-.14**
3.5.Emotional stability	.03	.08	.38***	.18***	.17***	.13**	-	.15**	.18***	-.02	-.04	-.18***
Perceived relatedness												
4.1.Acceptance	.17***	.09	.28***	.29***	.29***	.35***	.19***	-	.66***	.15**	.04	-.03
4.2.Intimacy	.19***	.05	.31***	.28***	.24***	.23***	.22***	.90***	-	.16**	.18***	-.00
Motives for emoji use												
5.1.Personal contact	.38***	-.18***	-.06	.01	-.07	-.02	-.02	.03	.07	-	.61***	.53***
5.2.Decrease loneliness	.24***	-.06	-.13**	.02	-.09	-.04	-.04	-.06	-.03	.61***	-	.73***
5.3.Social ease	.24***	-.24***	-.28***	-.07	-.18***	-.14**	-.18***	-.19***	-.16**	.53***	.73***	-

Note. Correlations for closer interlocutors are below the diagonal ($df = 438$) and for more distant interlocutors above the diagonal ($df = 368$).
*$p \leq .050$; **$p \leq .010$; ***$p \leq .001$.

Results additionally showed that higher perceptions of acceptance and intimacy were positively correlated with emoji use for closer, both $p < .001$, and more distant interlocutors, both $p \leq 0.030$. Perceived feelings of acceptance and intimacy with closer others were also negatively correlated with emoji use for social ease motives, both $p \leq .001$. Perceived feelings of acceptance with more distant interlocutors were positively correlated with emoji use for personal contact, $p = .004$, whereas perceived feelings of intimacy with more distant interlocutors were positively correlated with emoji use for personal contact and to decrease loneliness, both $p \leq .002$. Lastly, the frequency of emoji use was positively correlated with motives to decrease loneliness with closer and more distant interlocutors, both $p \leq .006$, whereas a positive correlation between the frequency of emoji use and both personal contact and social ease motives emerged for closer interlocutors only, both $p < .001$.

4.4.2. Correlates of emoji use

As shown in Table 4.3, participants who used emoji more frequently with closer interlocutors were younger, $p < .001$, scored higher on conscientiousness, $p = .007$, and used emoji for personal contact motives, $p < .001$. In contrast, participants who used emoji more frequently with more distant interlocutors were older, $p = .006$, scored lower on agreeableness, $p < .001$, and felt more intimate with distant interlocutors, $p = .038$.

Table 4.3. *Correlates of Emoji Use Frequency for Closer and More Distant Interlocutors*

	Closer interlocutors			More distant interlocutors		
	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3
Individual variables						
Age	-.334***	-.324***	-.268***	.226***	.148*	.188**
Gender	-.028	.006	.022	-.144	-.108	-.123
Age x gender	-.114	-.142	-.169	.124	.083	.081
Personality						
Extraversion	.064	.026	.071	.053	.025	.063
Agreeableness	.058	.028	.020	-.179**	-.208***	-.203***
Conscientiousness	.118	.099	.130**	-.020	-.017	-.002
Openness to experience	.001	-.018	-.035	-.018	-.033	-.030
Emotional stability	-.045	-.053	-.051	.087	.070	.080
Perceived relatedness						
Acceptance		.001	.062		-.030	.004
Intimacy		.155	.091		.236**	.177*
Motives for emoji use						
Personal contact			.258***			.016
Decrease loneliness			.043			.048
Social ease			.083			.124
Adjusted R^2	.103	.119	.224	.075	.107	.123
ΔR^2	.121	.020	.108	.100	.037	.025
ΔF	6.93***	4.56*	19.07***	4.04***	6.13**	2.79*

Note. $^{*}p \leq .050$; $^{**}p \leq .010$; $^{***}p \leq .001$.

4.4. Discussion

Aiming to better understand the determinants of emoji use with different interlocutors, in the current study we examined a comprehensive set of potential correlates. We replicated past findings by showing a higher frequency of emoji use among younger individuals (e.g., Prada et al., 2018) and those who score higher on conscientiousness (Wall et al., 2016). More importantly, we extend that evidence by suggesting that such associations are restricted to communication with closer interlocutors. On the one hand, these findings resonate with recent evidence showing that individuals generally report feeling comfort and disinhibition when interacting with close friends and adapt their behavior online to better express themselves emotionally in these contexts (e.g., by using emoji; Scott et al., 2022). On the other hand, the conscientiousness trait is characterized by social norm adherence and acting in goal-oriented ways (B.W. Roberts et al., 2014). Given that individuals use emoji more often with closer interlocutors (Cavalheiro et al., 2022, Thomson et al., 2018), a social norm relative to emoji use patterns may exist. Our results could be due to individuals with higher levels of conscientiousness seeing emoji use with closer interlocutors as part of typical communication patterns and intending to conform with these norms. Regarding motives for emoji use, we found personal contact motives to be one of the correlates of emoji use frequency with closer interlocutors. Previous qualitative studies have already argued that emoji can be a good tool to portray emotions in computer-mediated communication (Kaye et al., 2016), as well as capable of fostering closeness and intimacy (Sampietro, 2019). For instance, emoji may be used to help strengthen the emotional content of a message and nurture their relationship when supporting a family member (i.e., closer other) on a given life event (e.g., wishing good luck; Sampietro, 2019). Therefore, our study adds to the field by replicating and systematizing previous qualitative findings.

Regarding interactions with distant interlocutors, we found age to be positively (although weakly) associated with a higher frequency of emoji use. This was an unexpected finding, particularly considering that previous research found older individuals to have lower confidence in their capacity to use emoji and more difficulty in understanding their intended meaning (Herring & Dainas, 2020). From our perspective, our findings may actually reflect this misunderstanding, be it in perceiving emoji use with more distant interlocutors as somewhat appropriate (Cavalheiro et al., 2022) or having a different understanding of what is expected when communicating with these individuals. We also found a higher frequency of emoji use with distant interlocutors among less agreeable individuals. Agreeableness is associated with

self-transcendence (i.e., general concern with others) and relational investment (i.e., the motivation to maintain positive relationships, even with distant others, such as leaders), while associated with adherence to social norms (Wilmot & Ones, 2022). Given that emoji use is generally deemed less appropriate when communicating with distant interlocutors (Cavalheiro et al., 2022), it could be that these individuals are less concerned with complying with the pattern of emoji use with specific interlocutors. Still, overall scores on this personality trait were fairly high, and thus results should be interpreted with caution. It is also worth mentioning that these questions were assessed in general terms in the current study, not defining the specificities of the communication context. Hence, it is possible that different participants evoked different emoji when responding about its use with specific interlocutors. For example, one person may use fewer emoji when communicating with a more distant interlocutor to signal specific information and at the same time use more emoji with a closer interlocutor to portray emotions. Hence, different types of emoji (e.g., informative vs. emotionally charged) may be used more (or less) with specific interlocutors, irrespective of distance. Future research could seek to test this possibility using experimental scenarios. Lastly, individuals who perceive themselves to be more intimate with distant interlocutors tend to use emoji more frequently with them. These results are aligned with previous work suggesting that emoji help stimulate more intimate interactions (e.g., Sampietro, 2019, Wiseman and Gould, 2018). Thus, even though such use has been identified as less appropriate (Cavalheiro et al., 2022), that could be challenged in situations in which the person feels closer to interlocutors that are typically considered more distant (e.g., supervisors, professors, doctors). Nevertheless, our findings are intriguing (and potentially contradictory) as we found that less agreeable individuals tend to use emoji more often with more distant interlocutors (which may suggest a lack of interest in establishing a closer relationship), while those who felt more intimate with more distant interlocutors reported higher frequency of emoji use. Noteworthy, emoji use with distant interlocutors was, overall, very low. Therefore, due to this potential floor effect, results should be interpreted with caution.

Our novel contributions notwithstanding, we must acknowledge some limitations of the current study. First, although we asked participants about emoji use according to different interlocutors, it would also be important to explore the overall frequency and means of communication (e.g., email; instant messaging) in each case. For instance, an individual may report not using an emoji with a doctor not because they see it as inappropriate, but rather because they seldom communicate with them through computer-mediated communication. As such, future research could seek to disentangle a possible confound between the frequency of emoji use with distant interlocutors and the frequency of digital communication itself with these

interlocutors. We also evaluated emoji use generally and based on self-reported measures. Future studies could benefit from exploring the role played by our variables (i.e., age, gender, personality, perceived relatedness) in more realistic settings, namely examining messages exchanged with specific interlocutors (e.g., simulating a message exchange; Coyle & Carmichael, 2019), including closer (i.e., friends, family) and/or more distant interlocutors (e.g., professors, service providers; Prada et al., 2022, Vareberg and Westerman, 2020). Another limitation is the way we measured personality characteristics. Short measures such as the TIPI can have limitations (e.g., lower capacity of measuring multi-faceted constructs; Gosling et al., 2003), despite their adequate psychometric characteristics, and thus be considered a valid measure of personality traits (Nunes et al., 2018).

This study offered a systematic approach by including different individual (i.e., age, gender, personality), relational (i.e., perceived relatedness to others), and motivational variables (i.e., personal contact, decrease loneliness and social ease motives), and showing their relative contribution to explain emoji use frequency with closer and more distant interlocutors. These findings may contribute to the fields of social and communication psychology, by offering insights about the importance of individual and motivational factors to communication patterns in digital mediums. Our findings are particularly relevant by highlighting the need to have tailored messages when addressing and communicating with different interlocutors (e.g., regular interaction with work colleagues, when a service provider addresses a specific customer). For example, senders may need to consider whether to include emoji when writing messages for different age groups. The relationship rapport between interlocutors should also be considered: as emoji use seems to be especially relevant during personal contact with closer ones, it may be necessary to foster closeness with specific (distant) interlocutors to benefit from emoji use (e.g., develop a more intimate relationship with a supervisor before sending them emoji).

4.5. References

Bardi, C. A., & Brady, M. F. (2010). Why shy people use instant messaging: Loneliness and other motives. *Computers in Human Behavior*, *26*(6), 1722–1726. https://doi.org/10.1016/j.chb.2010.06.021

Cavalheiro, B. P., Prada, M., Rodrigues, D. L., Lopes, D., & Garrido, M. V. (2022). Evaluating the adequacy of emoji use in positive and negative messages from close and distant senders. *Cyberpsychology, Behavior, and Social Networking*, *25*(3), 194-199. https://doi.org/10.1089/cyber.2021.0157

Coyle, M. A., & Carmichael, C. L. (2019). Perceived responsiveness in text messaging: The role of emoji use. *Computers in Human Behavior*, *99*(2019), 181–189. https://doi.org/10.1016/j.chb.2019.05.023

Eisinga, R., Grotenhuis, M. te, & Pelzer, B. (2013). The reliability of a two-item scale: Pearson, Cronbach, or Spearman-Brown? *International Journal of Public Health*, *58*(4), 637–642. https://doi.org/10.1007/s00038-012-0416-3

Gosling, S. D., Rentfrow, P. J., & Swann, W. B. (2003). A very brief measure of the Big-Five personality domains. *Journal of Research in Personality*, *37*(6), 504–528. https://doi.org/10.1016/S0092-6566(03)00046-1

Herring, S. C., & Dainas, A. R. (2020). Gender and age influences on interpretation of emoji functions. *ACM Transactions on Social Computing*, *3*(2), 1–26. https://doi.org/10.1145/3375629

Jones, L. L., Wurm, L. H., Norville, G. A., & Mullins, K. L. (2020). Sex differences in emoji use, familiarity, and valence. *Computers in Human Behavior*, *108*, 106305. https://doi.org/10.1016/j.chb.2020.106305

Kaye, L. K., Wall, H. J., & Malone, S. A. (2016). 'Turn that frown upside-down': A contextual account of emoticon usage on different virtual platforms. *Computers in Human Behavior*, *60*, 463–467. https://doi.org/10.1016/j.chb.2016.02.088

Kim, J.-I., Chung, M. K., & Dray, B. J. (2018). Students' relatedness needs in a teacher education course. *Multicultural Education*, *25*, 29-36.

Kim, M., Knotts, T. L., Albers, N. D., & James, K. E. (2022). Emoji use as a catalyst for relationship building and sustaining attention in online classes: An empirical study. *Education Sciences*, *12*(12), 874. https://doi.org/10.3390/educsci12120874

Liu, S., & Sun, R. (2020). To express or to end? Personality traits are associated with the reasons and patterns for using emojis and stickers. *Frontiers in Psychology*, *11*, 1–11. https://doi.org/10.3389/fpsyg.2020.01076

Marko, K. (2022). "Depends on who I'm writing to"—The influence of addressees and personality traits on the use of emoji and emoticons, and related implications for forensic authorship analysis. *Frontiers in Communication*, *7*, 840646. https://doi.org/10.3389/fcomm.2022.840646

Nexø, L. A., & Strandell, J. (2020). Testing, filtering, and insinuating: Matching and attunement of emoji use patterns as non-verbal flirting in online dating. *Poetics*, *83*, 101477. https://doi.org/10.1016/j.poetic.2020.101477

Nunes, A., Limpo, T., Lima, C. F., & Castro, S. L. (2018). Short scales for the assessment of personality traits: Development and validation of the Portuguese Ten-Item Personality Inventory (TIPI). *Frontiers in Psychology*, *9*, 461. https://doi.org/10.3389/fpsyg.2018.00461

Prada, M., Rodrigues, D. L., Garrido, M. V., Lopes, D., Cavalheiro, B., & Gaspar, R. (2018). Motives, frequency and attitudes toward emoji and emoticon use. *Telematics and Informatics*, *35*(7), 1925–1934. https://doi.org/10.1016/j.tele.2018.06.005

Prada, M., Saraiva, M., Cruz, S., Xavier, S., & Rodrigues, D. L. (2022). Using emoji in response to customer reservation requests and service reviews. *Human Behavior and Emerging Technologies*, *2022*, 1–10. https://doi.org/10.1155/2022/1433055

Richer, S. F., & Vallerand, R. J. (1998). Construction et validation de l'Échelle du sentiment d'appartenance sociale. *Revue Européenne de Psychologie Appliquée*, *48*, 1995–1996.

Riordan, M. A., & Glikson, E. (2020). On the hazards of the technology age: How using emojis affects perceptions of leaders. *International Journal of Business Communication*, 2329488420971690. https://doi.org/10.1177/2329488420971690

Roberts, B. W., Lejuez, C., Krueger, R. F., Richards, J. M., & Hill, P. L. (2014). What is conscientiousness and how can it be assessed? *Developmental Psychology*, *50*(5), 1315–1330. https://doi.org/10.1037/a0031109

Roberts, J., Yaya, L., & Manolis, C. (2014). The invisible addiction: Cell-phone activities and addiction among male and female college students. *Journal of Behavioral Addictions*, *3*(4), 254–265. https://doi.org/10.1556/JBA.3.2014.015

Rodrigues, D. L., Cavalheiro, B. P., & Prada, M. (2022). Emoji as icebreakers? Emoji can signal distinct intentions in first time online interactions. *Telematics and Informatics*, *69*, 101783. https://doi.org/10.1016/j.tele.2022.101783

Rodrigues, D., Prada, M., Gaspar, R., Garrido, M. V., & Lopes, D. (2018). Lisbon Emoji and Emoticon Database (LEED): Norms for emoji and emoticons in seven evaluative dimensions. *Behavior Research Methods*, *50*(1), 392–405. https://doi.org/10.3758/s13428-017-0878-6

Ryan, R. M., & Deci, E. L. (2000). Self-Determination Theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*.

Sampietro, A. (2019). Emoji and rapport management in Spanish WhatsApp chats. *Journal of Pragmatics*, *143*, 109–120. https://doi.org/10.1016/j.pragma.2019.02.009

Scott, R. A., Stuart, J., & Barber, B. L. (2022). Connecting with close friends online: A qualitative analysis of young adults' perceptions of online and offline social interactions with friends. *Computers in Human Behavior Reports*, *7*, 100217. https://doi.org/10.1016/j.chbr.2022.100217

Terracciano, A., Löckenhoff, C. E., Zonderman, A. B., Ferrucci, L., & Costa, P. T. (2008). Personality predictors of longevity: Activity, emotional stability, and conscientiousness. *Psychosomatic Medicine*, *70*(6), 621–627. https://doi.org/10.1097/PSY.0b013e31817b9371

Thomson, S., Kluftinger, E., & Wentland, J. (2018). Are you fluent in sexual emoji?: Exploring the use of emoji in romantic and sexual contexts. *Canadian Journal of Human Sexuality*, *27*(3), 226–234. https://doi.org/10.3138/cjhs.2018-0020

Vareberg, K. R., & Westerman, D. (2020). To: -) or to ☺, that is the question: A study of students' initial impressions of instructors' paralinguistic cues. *Education and Information Technologies*, *25*, 4501-4516. https://doi.org/10.1007/s10639-020-10181-9

Völkel, S. T., Buschek, D., Pranjic, J., & Hussmann, H. (2019). Understanding emoji interpretation through user personality and message context. *Proceedings of the 21st International Conference on Human-Computer Interaction with Mobile Devices and Services, MobileHCI 2019*. https://doi.org/10.1145/3338286.3340114

Wall, H. J., Kaye, L. K., & Malone, S. A. (2016). An exploration of psychological factors on emoticon usage and implications for judgement accuracy. *Computers in Human Behavior*, *62*, 70–78. https://doi.org/10.1016/j.chb.2016.03.040

Wilmot, M. P., & Ones, D. S. (2022). Agreeableness and its consequences: A quantitative review of meta-analytic findings. *Personality and Social Psychology Review*, *26*(3), 242-280. https://doi.org/10.1177/10888683211073007

Wiseman, S., & Gould, S. J. (2018, April). Repurposing emoji for personalised communication: Why 🍕 means "I love you". *Proceedings of the 2018 CHI conference on human factors in computing systems* (pp. 1-10).

CHAPTER 5

Examining the Effects of Reciprocal Emoji Use on Interpersonal and Communication Outcomes

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Cavalheiro, B. P., Prada, M., & Rodrigues, D. L. (in press). Examining the effects of reciprocal emoji use on interpersonal and communication outcomes. *Journal of Social and Personal Relationships*.

5.1. Abstract

Research has shown that emoji can determine how interlocutors who use them are perceived (e.g., warmer) and help complement written communication (e.g., clarify the meaning of a message). We argue that reciprocal emoji use may be particularly beneficial for user perceptions and communication outcomes. In two experiments ($N = 568$), we examined if using emoji, and reciprocating emoji use, in a work context (i.e., message between colleagues) influenced inferences about interlocutors and communication outcomes (Study 1), and if such effects differed according to the level of conflict between interlocutors (Study 2). Study 1 showed that using 💪 (vs. ✍) resulted in higher perceptions of warmth, playfulness, and message's positivity, whereas no benefits of using 👎 (vs. ✍) were observed. Likewise, reciprocating emoji use (👷 vs. no emoji) resulted in higher perceptions of warmth, playfulness, and communication positivity. Study 2 showed only an effect of conflict in the scenario, such that, regardless of reciprocal emoji use, in the lower (vs. higher) conflict situation, perceptions of the interlocutor (e.g., warmer, more competent, more playful), and the conversation (e.g., messages more positive, less confrontational) were more favorable. Overall, our results reinforce the importance of emoji valence for person perception and communication outcomes, while also suggesting some emoji may not impact communication under specific circumstances (e.g., during situations of conflict).

Keywords: communication, emoji, computer-mediated communication, experimental design, social psychology

5.2. Introduction

A recent report on global digital trends revealed that 64.4% of the world population uses the internet, mostly to stay in touch with close others (e.g., friends, family), through chats and messaging applications, and to connect to others through social media platforms (Kemp, 2023). And yet, research focusing on how specific cues included in text-based computer-mediated communication (CMC), such as emoji, may influence social and personal relationships is still scarce, particularly with an experimental approach.

Text-based CMC lacks nonverbal cues typically present in face-to-face communication (e.g., facial expression, accent; Chew & Ng, 2021), which facilitates decoding the sender's intentions (e.g., tone of voice) or message's contents (e.g., sarcasm). Individuals often overcome this by using multiple paralinguistic cues, including vocalizations (e.g., "hmm"), or typographic marks to convey meaning or reactions (e.g., adding exclamation points to emphasize a state of heightened emotion, "happy!!!!", or using "#$%^" to signal censorship; Luangrath et al., 2017). Another common way is to include pictorial cues in messages, such as gifs, stickers, or emoji. Particularly, emoji have been shown to help complement messages (e.g., enhance affective tone; Kaye et al., 2016), improve communication outcomes (e.g., improve understanding; Holtgraves & Robinson, 2020; Prada et al., 2018), or even signal senders' intentions (e.g., clarify that the sender has friendship/sexual/romantic intentions on a first interaction; Rodrigues et al., 2022). Emoji have also been shown to determine how users are perceived (e.g., warmer; Boutet et al., 2021).

Reciprocity is crucial for communication outcomes (e.g., Toma, 2014). In text-based CMC, individuals also tend to adapt their communication style to that of their interlocutors (e.g., by having a similar use of emoji; Stein, 2023; Wagner et al., 2022), and perceive this as a relevant driver for their communication with others (e.g., to signal interest in the interaction; Nexø & Strandell, 2020). However, few studies have experimentally examined the impact of reciprocity. Hence, in Study 1 we explored if perceptions about two interlocutors and their communication outcomes in a work context were influenced by using emoji and, more specifically, when emoji use was reciprocal. In Study 2 we explored if the level of conflict in the same work context was a boundary condition for any of the effects.

5.2.1. Impact of Emoji on Social and Work Outcomes

Research has shown that emoji influence perceptions about users and their intentions (e.g., Boutet et al., 2021; Rodrigues et al., 2022). For example, Beattie et al. (2020) manipulated the

agent of a conversation (i.e., human vs. chatbot) and the type of message (i.e., verbal-only vs. with emoji), and assessed social attraction (i.e., the degree to which a person likes or wants to be around another), CMC competence, and source credibility (e.g., trustworthiness). Interestingly, regardless of whether the agent was a human or a chatbot, messages with emoji resulted in the sender being perceived as more socially attractive, more competent in CMC, and more credible. In another study, Boutet et al. (2021) found that senders who used positive emoji (vs. negative; vs. neutral; vs. no emoji) were always perceived as warmer, regardless of the valence of the message (i.e., positive, neutral, or negative). Kim et al. (2022) expanded this line of research to the context of online classes. In this study, participants were asked to read a fictitious e-mail sent by a professor welcoming new students, that could include (or not) emoji. Results revealed that the professor who used (vs. did not use) emoji was perceived as more authentic (e.g., honest) and intimate (e.g., warmth, emotional closeness).

Notwithstanding, this positive impact of emoji use is likely to vary according to contextual features, such as the setting (e.g., work settings) or the interlocutors' relationship (e.g., work colleagues vs. work supervisors). For example, Glikson et al. (2018) found that using (vs. not using) emoji in a work message resulted in higher perceived warmth when the context was informal (vs. formal), and lower perceived competence when the context was formal (vs. informal). Consistently, Aretz and Mierke (2019) showed that including emoticons or emoji in work messages (vs. text only) resulted in perceptions of higher warmth and lower assertiveness. Another study by Riordan and Glikson (2020) found that including emoji in work e-mails decreased the perceived effectiveness of a manager (but not their likability), with this effect being mediated by the perceived appropriateness of emoji use in that situation. It is worth noting, that when the communication occurred in an informal (vs. formal) context, the negative impact of emoji on appropriateness was attenuated. Cavalheiro et al. (2022) showed that emoji use was perceived as more adequate with closer interlocutors (e.g., friends, work colleagues) when compared to more distant interlocutors (e.g., doctors, work supervisors). Interestingly, while the abovementioned research shows causal evidence that emoji use can be considered inadequate (e.g., Glikson et al., 2018) or have derogatory effects in certain work settings (e.g., lower perceived effectiveness; Riordan & Glikson, 2020), recent studies show that emoji are still used in these settings (e.g., Sampietro, 2019). For example, Shandilya et al. (2022) found that new collaborators reported using nonverbal cues (i.e., emoji, gifs, and memes) in text-based CMC at work, with emoji being the most often used. Participants indicated that such cues allow them to add humor, express emotions, clarify their intentions, or even soften the tone of conversations. Still, they also reported uneasiness in using these cues, driven by their

unfamiliarity with the culture of the organization and their work team and feeling unsure about how they could be perceived (e.g., as unprofessional). Overall, emoji use in a work setting can have both positive (e.g., higher perceptions of warmth) and negative outcomes (e.g., lower perceptions of competence).

Contextual features may also be important to help with emoji interpretation (Völkel et al., 2019; cf. Miller et al., 2017), as some emoji are perceived as ambiguous (Rodrigues et al., 2018). For example, Weissman (2019) compared the interpretation of emoji representing food that are more (vs. less) ambiguous (i.e., emoji that also have – or not - sexual connotations, like 🍆 and 🍿, respectively). The authors also paired the emoji with messages biasing towards literal (i.e., food-related, reducing sexual connotation: "What are you getting at the grocery store?") versus euphemistic interpretations (i.e., ambiguous, opening possibility of sexual connotation: "What are you doing this weekend?"). Results for the more ambiguous emoji revealed that providing a literal context helped to access the literal meaning of these emoji (i.e., providing a context allows participants to understand them as being food). Therefore, emoji understanding and interpretation are likely to depend, at least in part, on the context of communication. Like so, the impact of emoji is likely to vary according to other contextual features.

Message valence has also emerged as a relevant contextual feature to understand the impact of emoji use. For instance, emoji use was perceived as more adequate in positive (vs. negative) interactions, regardless of whether interlocutors were close or distant (Cavalheiro et al., 2022). In another study, Rodrigues et al. (2017) found that emoji use between romantic partners was perceived to contribute to relationship quality in a positive (vs. negative) scenario. When looking specifically at negative scenarios, however, the authors found that using emoji only resulted in higher perceived message positivity when the relationship conflict scenario was less (vs. more) severe. Interestingly, other studies have also explored the idea of conflict being a relevant feature regarding emoji use, as message clarification facilitated by these cues can be a way to prevent potential negative impacts on interlocutors' relationships. For example, a study by Kaye et al. (2016) showed that individuals report using emoji to reduce the ambiguity of their written communication. This includes adding an emoji to signal a joke or to avoid being misconstrued as rude, or irritable. Tandyonomanu and Tsuroyya (2018) found similar results, with participants also reporting including emoji in written messages to avoid misunderstandings and reduce ambiguity. In another study, Riordan (2017) manipulated the presence of non-facial emoji on (more or less) ambiguous messages to test the possibility that different emoji can

contribute to the disambiguation of messages. Results revealed that, for example, adding 🍸 to a more ambiguous message "Got a shot" resulted in lower ambiguity (i.e., adding an emoji provided context and led participants to better understand the intent of the message in comparison with only text), corroborating this function of emoji. Yet, little research has experimentally explored emoji use in a context of conflict (for an exception, see Rodrigues et al., 2017). Building upon existing evidence, we conducted two experimental studies to explore if emoji use influences the inferences made about an interlocutor and the communication outcomes in a written interaction. In Study 1, participants saw a written interaction between two work colleagues. In Study 2, we manipulated the level of conflict to disentangle if this particular contextual feature mitigates or enhances the expected effects of emoji use.

Taken together, these findings emphasize the need to account for multiple contextual features when examining the impact of emoji use, including the type of relationship and communication style (e.g., closer relationships, informal communication styles). Interlocutors are motivated to match their recipient's communication style (see communication accommodation theory, Giles et al., 1991), and reciprocating the other person's linguistic style is among the most important strategies in communication (e.g., to promote feelings of trust between interlocutors; Toma, 2014). For example, even with non-human interlocutors (virtual agents), people seem to prefer matching conversational styles (Shamekhi et al., 2016). Accordingly, it becomes relevant to better understand the role of reciprocity in emoji for communication outcomes.

5.2.2. Reciprocity in Emoji Use

Research has suggested that individuals expect some level of reciprocity in emoji use between interlocutors (e.g., use a similar number of emoji) in online dating, otherwise, they are likely to experience insecurity and negatively impact communication outcomes (Nexø & Strandell, 2020). Likewise, Coyle and Carmichael (2019) found that individuals were perceived as more responsive when they matched their interlocutor's communication style (i.e., when both used emoji), particularly when positive information was disclosed. When examining how both interlocutors were perceived, situations when both used emoji or both used only text (i.e., reciprocity) resulted in more positive perceptions (e.g., interlocutors were perceived as more patient and warmer), when compared to situations in which only one interlocutor used emoji. Moreover, Wagner et al. (2022) analyzed naturalistic data (i.e., screenshots of text messages exchanged by participants in a dating context) and observed a match in the frequency of emoji use between interlocutors. When asked about their motivations to include emoji in flirtatious

texts, participants indicated that emoji were used to mirror the other person's communication style (e.g., replying with emoji to a text containing emoji). A recent experimental study (Stein, 2023) manipulated closeness (i.e., the extent to which individuals have closer or more distant ties, more or less familiarity, with specific interlocutors, such as a best friend vs. a neighbor) between two interlocutors (i.e., close vs. distant) and emoji presence (i.e., with vs. without emoji) in messages, and asked participants to reply to said messages. Results revealed that participants used emoji more often when replying to messages that also included emoji, particularly when interacting with closer interlocutors. These findings indicate that individuals tend to reciprocate nonverbal behaviors with those who are closer to them, even in text-based CMC. Despite these recent findings suggesting reciprocity as a relevant variable to understand the impact of emoji use on user perceptions and communication outcomes, causal evidence is still scarce.

As previously highlighted, the context in which individuals communicate seems to be a determinant of the perception, evaluation, and effects of the emoji used. Particularly, work contexts are often considered inappropriate for emoji use. However, in recent years text-based CMC and emoji use became more pervasive. Specifically regarding work contexts, a recent report by Adobe reveals that 78% of younger generations use emoji at work (Adobe, 2022). And yet, few researchers have analyzed emoji use in this specific context. An exception is the recent study of Shandilya et al. (2022) that analyzed the collaborator's perspectives about the use of non-textual responses in CMC. The authors found that, overall, participants seek to use non-textual (e.g., emoji) responses in text-based CMC, and that they do so to connect and bond with their teammates. Another recent study (Lu et al., 2022) analyzed naturalistic data from GitHub, focusing on remote workers. The authors found that emoji use patterns can predict turnover (i.e., not using emojis denotes a higher risk of dropping out). Consequently, despite past findings suggesting emoji use is not deemed appropriate or productive in work contexts, recent research suggests this behavior occurs frequently. Accordingly, in a set of studies, we seek to expand the current literature by experimentally testing emoji use in a work context while also assessing if the reciprocity of emoji use can be determinant for communication outcomes.

5.2.3. Overview of Studies

In Study 1, we experimentally tested if the use of different emoji in an ambiguous (i.e., with a potential underlying conflict) work context had effects on the inferences made about two interlocutors (i.e., perceived warmth, competence, accusation level, cooperation, and

playfulness) and on communication outcomes, namely messages' quality (i.e., efficacy, positivity), and conversation quality (i.e., positivity, emoji role). Critically, we also tested if the reciprocal use of emoji benefitted some of these effects. In Study 2, we tested if the effects of reciprocity were moderated by the level of conflict depicted in the scenario.

5.3. Study 1

We expected a positive effect of emoji on how the interlocutor using it was perceived (e.g., warmer, more playful) and on communication outcomes (e.g., messages perceived as more positive and more efficient). However, these effects were expected to be stronger when emoji use was reciprocal.

5.3.1. Method

5.3.1.1. Participants and Design

A sample of 369 individuals living in Portugal volunteered to participate in an online survey. Participants were, on average, 31 years old (M = 31.27, Mdn = 26.00, SD = 13.00, range: 18-71 years), and most identified as women (74.2%), had a university degree (89.7%), and were working (45.7%) or studying (42.4%).

Participants were randomly assigned to one of the experimental conditions in a 3 (interlocutor B's emoji type: 👎 [negative], ✍️ [baseline], 💪 [positive]) x 2 (interlocutor A's emoji use: no emoji vs. 🤷) between-participants design.

5.3.1.2. Materials

We selected emoji that could be plausible in a work context scenario. We strived to, as much as possible, maintain the similarity between icons in terms of body parts represented, while varying in valence. In a post-test, the selected emoji were deemed moderate to high in familiarity, adequacy to use in a work context (except 🤷, which was evaluated as low in adequacy), and low to moderate in perceived interpersonal conflict, while varying in valence as expected (see Appendix A). Specifically, 👎 was perceived as negative, followed by 🤷, ✍️, whereas 💪 was perceived as positive. Moreover, participants described 👎 as signaling "disagreement", "rejection/negation", or "something bad"; ✍️ as signaling "writing", "working on something", or "paying attention"; 💪 as signaling "strength", "motivation/encouragement", or "general positivity"; and 🤷 as signaling "lack of knowledge" or "indifference".

5.3.1.3. Measures

In all experimental conditions, participants evaluated both interlocutors, their messages, and the overall conversation (for details, see Table 5.1). The same set of questions was presented for interlocutor A and interlocutor B, with all responses being given on 7-point scales (from 1 = *Not at all* to 7 = *Extremely*).

Table 5.1. *Measures Applied, Reliability, and Scale Anchors*

Dimensions/Instructions/Items	
Perceptions about interlocutors (Durante et al., 2013)	
"To what extent do you consider interlocutor [A/B] as…"	
Warmth	"warm", "well-intentioned" (2 items; r_{I_A}= .50, p < .001; r_{I_B}= .60, p < .001)
Competence	"competent", "capable" (2 items; r_{I_A}=.74, p < .001; r_{I_B}= .72, p < .001)
"To what extent do you consider interlocutor [A/B] is…"	
Playfulness	"playful"
Cooperation	"cooperative"
Accusation level	"accusatory"
Perceptions about messages (Rodrigues et al., 2017)	
"To what extent do you consider the messages from interlocutor [A/B] are…"	
Positivity	"positive"
Efficacy	"effective", "clear" (2 items; r_{I_A}= .68, p < .001; r_{I_B}= .73, p < .001)
Perceptions about the conversation	
"In general, you consider this messages' exchange was…"	
Positivity	"positive"
"Regarding the use of emoji in this situation, do you consider that it…"	
Emoji Role	"is adequate", "adds information", "improves the message", "clarifies the message" (4 items; α = .87)

Note. I_A and I_B refer to Interlocutors A and B, respectively.

5.3.1.4. Procedure

This study was approved by the Ethics Committee at Iscte-Instituto Universitário de Lisboa (#97/2021). Data were collected through Qualtrics. Prospective participants were invited to take part in an online study about digital interpersonal communication through a link shared via e-mail, on social media, and the participants pool available at the university. The general instructions informed about the purpose of the study, expected duration, and ethical aspects (i.e., all data were confidential and anonymous; participants could withdraw from the study at any point without their responses being considered for analysis). Agreement with informed consent was required before proceeding to the study. In all experimental conditions, participants were shown a page with the following information at the top: "This interaction occurred between two colleagues who are preparing a report together". Below this information, participants were shown an image depicting a scenario of a conversation between two

interlocutors on a chat service. The contents of the conversation were similar across experimental conditions, with interlocutor A writing "How's the report?", followed by interlocutor B's reply "Still needs a lot of work…", and ending with interlocutor A's reply "It could be done already…if you did your part". The first factor of the experimental design was manipulated by adding one of the following emoji to interlocutor B's reply: 👎, ✍️, 💪. The second factor of the experimental design was manipulated in interlocutor A's reply, i.e., the last message could be text only (i.e., control condition) or text followed by the emoji 🤦. For a depiction of the materials, see Figure 5.1.

Note. The left panel represents conditions without reciprocity and the right panel reciprocity conditions. Emoji valence is manipulated in interlocutor B response (i.e., 👎, ✍️, 💪). Labels identifying interlocutors A and B (see dashed text boxes in the left top scenario) were not presented to participants.

Figure 5.1. *Experimental Scenarios (Study 1)*

After seeing the hypothetical scenario, participants were asked to answer our dependent variables (see Measures section). After this, participants answered a control question, in which they were asked to indicate "…if both interlocutors used emoji", "…if only one interlocutor used emoji", "…if no interlocutor used emoji", or "…if they didn't remember of anyone using emoji". Lastly, participants provided standard sociodemographic information (i.e., age, gender, occupation, level of education, nationality), were thanked, debriefed, and provided with the contact information of the research team.

5.3.1.5. Data Analytic Plan

First, we present a preliminary analysis regarding the control question. We then computed a series of 3 (interlocutor B's emoji type: 👎, ✍️, 💪) x 2 (interlocutor A's emoji use: no emoji vs. 🤷) MANOVAs to examine perceptions about both interlocutors and their respective conversation. Specifically, we analyzed the main effect of interlocutor B's emoji type and interlocutor A's emoji use on the perceptions about the respective interlocutors. We then analyzed the interaction between interlocutor B's emoji type and interlocutor A's emoji use on communication outcomes. When statistically significant differences or interactions were found, we computed pairwise comparisons with Bonferroni correction.

5.3.2. Results

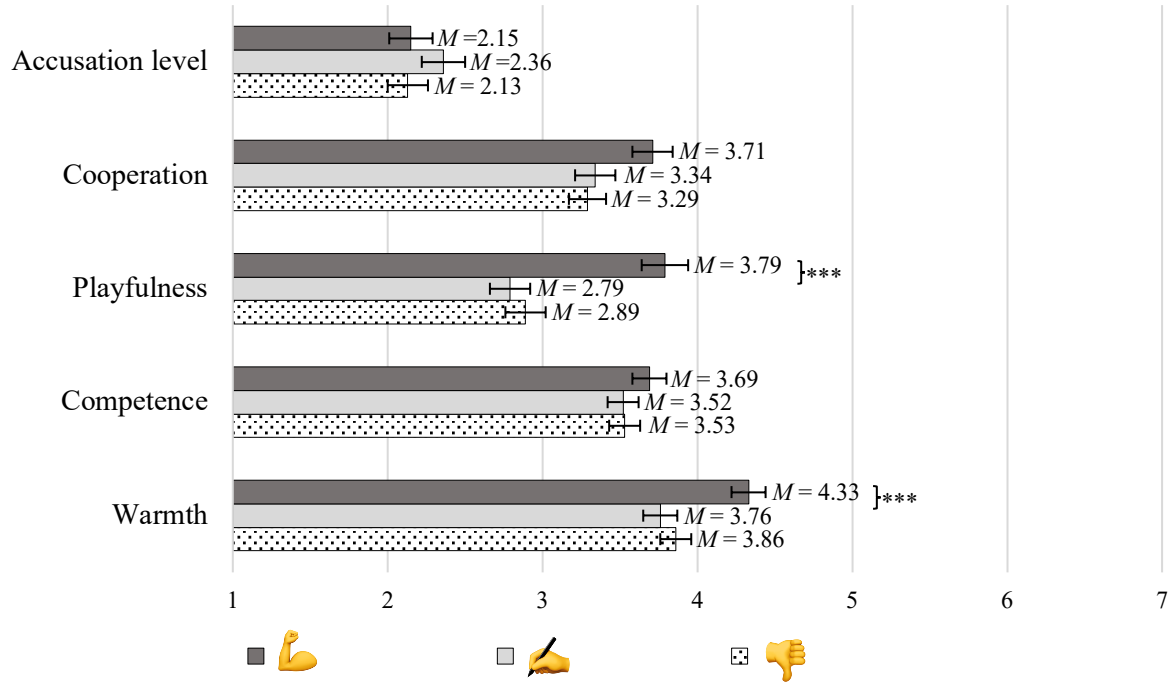
The final sample included 369 participants, most of whom (84.6%) recalled being exposed to emoji in the conversation[2].

5.3.2.1. Impact of Emoji Use on the Perceptions About the Interlocutors

5.3.2.1.1. Perceptions of Interlocutor B. Results are shown in Figure 5.2. We found a main effect of emoji type on perceived warmth, $F(2, 363) = 8.07$, $p < .001$, $\eta^2_p = .043$, playfulness, $F(2, 363) = 15.14$, $p < .001$, $\eta^2_p = .077$, and cooperation, $F(2, 363) = 3.16$, $p = .044$, $\eta^2_p = .017$. Specifically, interlocutor B was perceived as warmer when using 💪 (vs. ✍️), $p < .001$, whereas no differences emerged between ✍️ and 👎, $p = 1.00$. A similar pattern was observed for playfulness, $p < .001$ and $p = 1.00$, respectively. Despite the main effect on perceived cooperation, no significant comparisons between conditions were found, all $p \geq .061$. No main

[2] Analyzes excluding the participants who reported not remembering if they had seen an emoji in Study 1 ($n = 37$) showed that the overall pattern of results remained the same. Specifically, only two effects became non-significant, namely the effect on Interlocutor A's perceived warmth and the effect on Interlocutor A's contribution to conversation positivity.

effects emerged for perceived competence, $F(2, 363) = 1.03$, $p = .358$, $\eta^2_p = .006$, or accusation level, $F(2, 363) = 0.73$, $p = .485$, $\eta^2_p = .004$.



Note. Error bars indicate standard errors.
$^{*}p \leq .050$; $^{**}p \leq .010$; $^{***}p \leq .001$

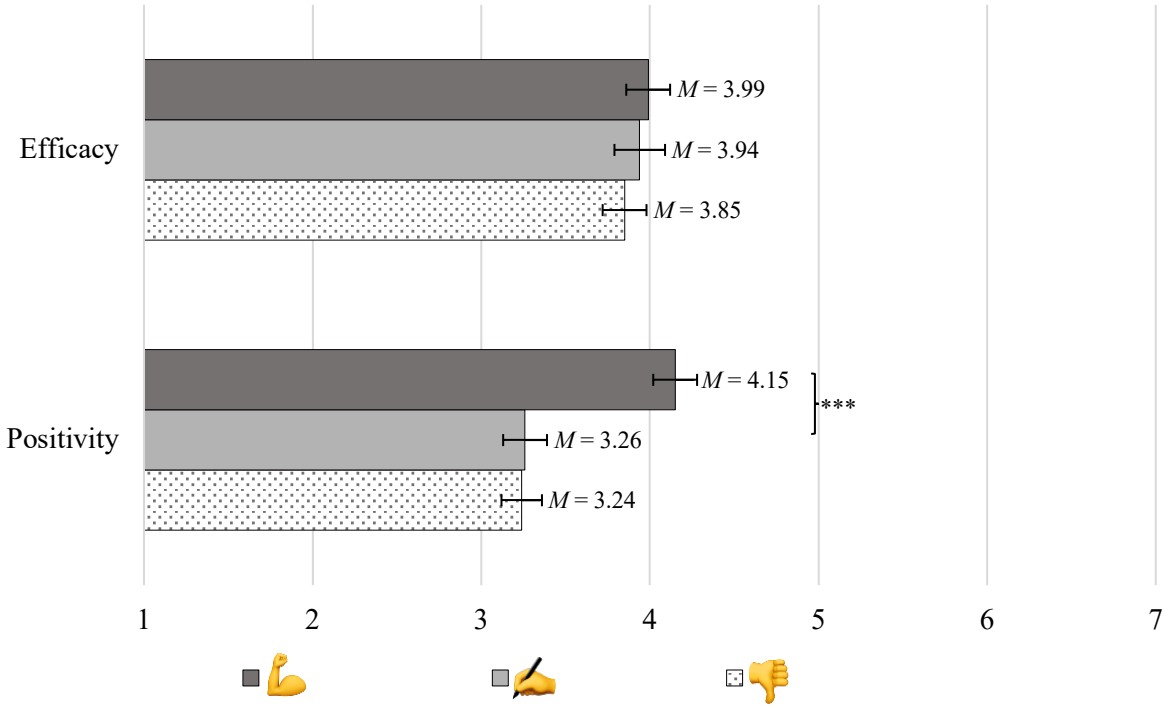
Figure 5.2. *Perceptions About Interlocutor B According to Interlocutor B's Emoji Type*

5.3.2.1.2. Perceptions of Interlocutor A. Results showed a main effect of emoji use on perceived warmth, $F(1, 363) = 4.00$, $p = .046$, $\eta^2_p = .011$, and playfulness, $F(1, 363) = 8.82$, $p = .003$, $\eta^2_p = .024$. Specifically, interlocutor A was perceived as warmer when using 🤷 ($M = 3.08$, $SE = 0.10$) compared to not using emoji ($M = 2.85$, $SE = 0.08$). A similar pattern was observed for playfulness ($M = 2.30$, $SE = 0.11$ vs. $M = 1.90$, $SE = 0.08$, respectively). No main effects emerged for perceived competence, $F(1, 363) = 1.29$, $p = .256$, $\eta^2_p = .004$, cooperation, $F(1, 363) = 1.80$, $p = .180$, $\eta^2_p = .005$, or accusation level, $F(1, 363) = 0.41$, $p = .552$, $\eta^2_p = .001$.

5.3.2.2. Perceptions About the Messages Exchanged

5.3.2.2.1. Interlocutor B: Message's Positivity and Efficacy. Results are shown in Figure 5.3. We found a main effect of emoji type on message positivity, $F(2, 363) = 16.73$, $p < .001$, $\eta^2_p = .084$, but not message efficacy, $F(2, 363) = 0.37$, $p = .691$, $\eta^2_p = .002$. Comparisons showed that

interlocutor B's messages were perceived as more positive when 💪 (vs. ✍️) was included, $p < .001$. No differences emerged when comparing messages with ✍️ and 👎, $p = 1.00$.



Note. Error bars indicate standard errors.
*$p \leq .050$; **$p \leq .010$; ***$p \leq .001$

Figure 5.3. *Perceptions About Interlocutor B's Message According to Interlocutor B's Emoji Type*

5.3.2.2.2. Interlocutor A: Message's Positivity and Efficacy. We found a main effect of emoji use on message positivity, $F(1, 363) = 5.09$, $p = .025$, $\eta^2_p = .014$, but not message efficacy, $F(1, 363) = 0.390$, $p = .533$, $\eta^2_p = .001$. Comparisons showed that interlocutor A's messages were perceived as less negative with 🤦 ($M = 2.76$, $SE = 0.11$) than without emoji ($M = 2.43$, $SE = 0.09$).

5.3.2.3. Perceptions About the Conversation

We found no main effects of the type of emoji used by interlocutor B on perceived positivity of the conversation, $F(2, 363) = 2.65$, $p = .072$, $\eta^2_p = .014$, neither on the role of emoji use for communication, $F(2, 363) = 0.65$, $p = .522$, $\eta^2_p = .004$. In contrast, we found a main effect of emoji use from interlocutor A (i.e., reciprocal emoji use) on perceived positivity of the conversation, $F(1, 363) = 5.93$, $p = .015$, $\eta^2_p = .016$, such that the conversation was perceived

as less negative when interlocutor A used 🤦 ($M = 2.73$, $SE = 0.11$) when compared to no emoji use ($M = 2.40$, $SE = 0.08$). We did not find a main effect of interlocutor A's emoji use on the role of emoji for communication, $F(1, 363) = 2.11$, $p = .148$, $\eta^2_p = .006$.

Contrary to our expectations, the interaction between emoji type and emoji use was non-significant for both perceived positivity of the conversation, $F(2, 363) = 1.06$, $p = .346$, $\eta^2_p = .006$, and emoji role for communication, $F(2, 363) = 1.73$, $p = .179$, $\eta^2_p = .009$.

5.3.3 Discussion

Our results showed that emoji type can improve the perceptions made about the interlocutors (i.e., perceived as warmer, more playful, and more cooperant), particularly in the case of positive emoji (i.e., 💪 used by interlocutor B), message perceptions (i.e., messages perceived as more positive), and conversation quality (i.e., messages perceived as less negative). A similar pattern of results emerged when Interlocutor A included (vs. did not include) emoji, except for perceptions of cooperation. Noteworthy, an argument can be made about the low effect sizes obtained in our study and the small differences in magnitude between experimental groups. However, our results are in line with previous research showing that emoji use leads to more positive perceptions in relational dimensions such as warmth (e.g., Boutet et al., 2021), playfulness (e.g., McShane et al., 2021), and message/interaction positivity (e.g., Rodrigues et al., 2017). As such, finding a similar pattern of results to that of previous studies boosts our confidence in our results. Arguably, these effects may be bound to the context of interaction, as well as the relationship between interlocutors. For example, emoji use is deemed more adequate when used with a friend versus a professor (Cavalheiro et al., 2022), which suggests impression formations and evaluations of individuals may be influenced by the context of interaction and relationship rapport. However, we must acknowledge that even though statistically significant differences were found when comparing groups (e.g., using 💪 resulted in the interlocutor being perceived as warmer and more playful vs. using ✍️), in most cases average scores were still below the scale mid-point or close to it. Still, results should be interpreted with caution because, in both cases, interlocutor B is not either evaluated as being warm or playful. Looking at our experimental materials and the overall means, the scenarios depicting conversations in a work context with a potential underlying conflict may have determined how both interlocutors and their communication were perceived. Of note, we did not observe an interaction between emoji type and emoji use on perceptions about the conversation, which is likely to be a consequence of the most evident contextual features (i.e., a potentially quarrelsome, work-related,

interaction). Building upon the differences between conflict levels reported by Rodrigues et al. (2017), in Study 2 we tested if reciprocity in emoji use would benefit interlocutor and communication perceptions when the conflict level was lower (vs. higher). As in Study 1 only the 💪 emoji differed from the baseline condition, we kept this emoji constant across conditions, manipulating only the level of conflict and the presence/absence of the 🤷‍♂️ emoji (i.e., reciprocity).

5.4. Study 2

As in the previous study, we expected a main effect of emoji use on interlocutor perception and ratings of communication outcomes. Specifically, when interlocutor A uses an emoji, they are perceived as warmer and more playful, and the message is rated as more positive and more efficient. We also explored if the positive effects of emoji use on communication outcomes were stronger when both interlocutors used emoji (i.e., reciprocal). Moreover, we explored whether the level of conflict between interlocutors moderated the impact of reciprocal emoji use across variables.

5.4.1. Method

5.4.1.1. Participants and Design

A sample of 199 individuals living in Portugal volunteered to participate in an online survey. Participants were, on average, 35 years old (M = 34.99, Mdn = 34.00, SD = 8.94, range: 19-67 years), and most identified as women (54.3%), had a university degree (69.7%), and were working (68.3%) or unemployed (14.1%).

Participants were randomly assigned to one of the experimental conditions in a 2 (conflict: lower vs. higher) x 2 (interlocutor A's emoji use: no emoji vs. 🤷‍♂️) between-participants design.

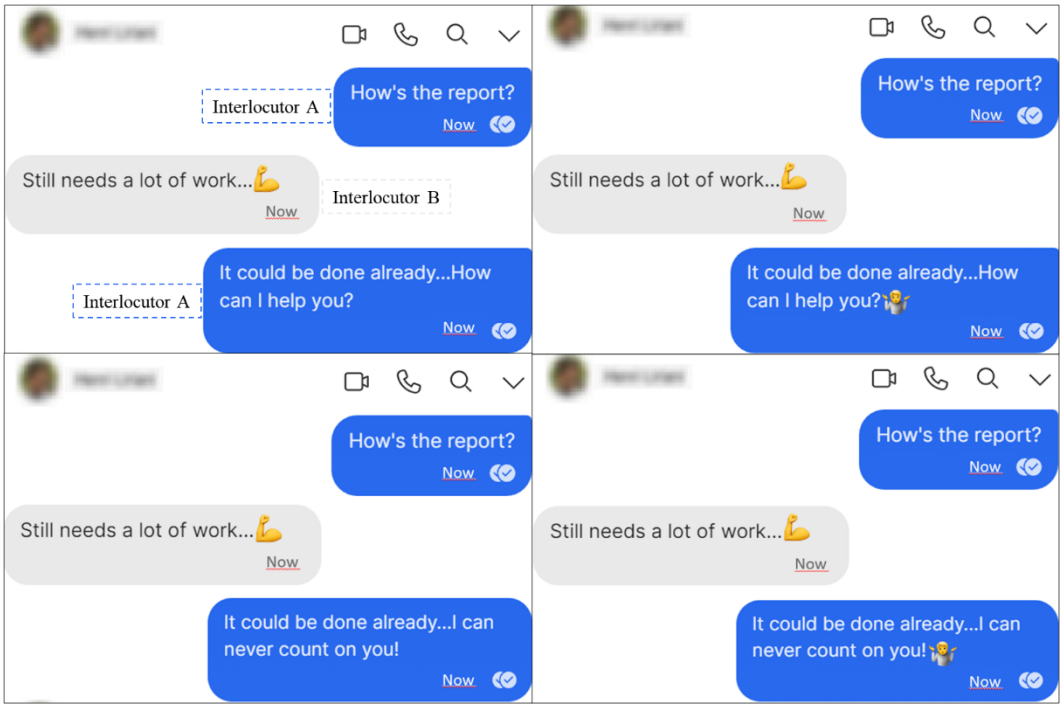
5.4.1.2. Measures

Measures replicated Study 1 with the addition of the following four items (all using 7-point rating scales): a) "In general, you consider that this message exchange was confrontational?" (from 1 = *Not at all* to 7 = *Extremely*); b) "To what extent do you consider that the interlocutors…" and presented them three options "have known each other for a long time", "are close (e.g., are friends)", "would like to work together again" (from 1 = *A little* to 7 = *A lot*).

5.4.1.3. Procedure

This study was approved by the Ethics Committee at Iscte-Instituto Universitário de Lisboa (#97/2021). Data were collected through Qualtrics. Prospective participants were invited to take part in an online study about digital interpersonal communication through a link shared on ClickWorker platform. In this study, participants were rewarded with a monetary incentive (€1 each).

Overall, procedures and depicted scenarios were similar to those of Study 1, except for the manipulation of the conflict level on the last message by interlocutor A. Specifically, using the same scenario (i.e., the interaction between two colleagues preparing a report together), the first factor was manipulated in the final message by interlocutor A: "It could be done already…How can I help you?" [lower conflict] or "It could be done already…I can never count on you!" [higher conflict]". Like Study 1, this final message could be text only (i.e., control condition) or include the 🤦 emoji. For a depiction of the materials, see Figure 5.4.



Note. The left panel represents conditions without reciprocity and the right panel reciprocity conditions. Top scenarios represent lower conflict conditions and bottom scenarios the higher conflict conditions. Labels identifying interlocutors A and B (see dashed text boxes in the left top scenario) were not presented to participants.

Figure 5.4. *Experimental Scenarios (Study 2)*

After seeing the hypothetical scenario, participants were asked to answer a set of dependent variables similar to those of Study 1 (with a few exceptions, see Measures section), and were thanked, debriefed, and provided with the contact information of the research team.

5.4.1.4. Data Analytic Plan

First, we present preliminary analysis regarding the control questions. We then computed a series of 2 (conflict: lower vs. higher) x 2 (interlocutor A's emoji use: no emoji vs. 🤦) MANOVAs to examine perceptions about interlocutor A and the conversation. Specifically, we analyzed main effects of conflict and interlocutor A's emoji use on perceptions about interlocutor A. We then analyzed the interaction between conflict and interlocutor A's emoji use on communication outcomes. When statistically significant differences or interactions were found, we computed pairwise comparisons with Bonferroni correction.

5.4.2. Results

The final sample included 199 participants, most of whom (76.3%) recalled being exposed to emoji in the conversation[3].

Overall, participants considered that interlocutors likely knew each other for a long time (M = 4.34, SD = 1.54, CI 95% [4.13,4.56]), were moderately close (M = 3.93, SD = 1.47, CI 95% [3.72,4.14]), and unlikely to want to work together again (M = 2.81, SD = 1.56, CI 95% [2.59,3.03]). Lastly, we found a main effect on confrontational level, with higher perceived confrontation when the conflict was higher (M = 5.07, SD = 1.60) than when it was lower (M = 3.27, SD = 1.48), $F(1, 197) = 68.01$, $p < .001$, $\eta^2_p = .257$, confirming that our conflict manipulation was successful.

5.4.2.1. Impact of Emoji Use and Conflict Level

5.4.2.1.1. Perceptions of Interlocutor A. We did not find a significant main effect of emoji use on any of the variables, namely: perceived warmth, $F(1, 195) = 0.87$, $p = .353$, $\eta^2_p = .004$, competence, $F(1, 195) = 0.00$, $p = .953$, $\eta^2_p = .000$, playfulness, $F(1, 195) = 0.96$, $p = .327$, $\eta^2_p = .005$, cooperation, $F(1, 195) = 0.19$, $p = .663$, $\eta^2_p = .001$, or accusation level, $F(1, 195) = 3.21$, $p = .075$, $\eta^2_p = .016$.

[3] Analyzes excluding the participants who reported not remembering if they had seen an emoji in Study 2 (n = 21) showed that the findings remained the same.

In contrast, we observed a main effect of level of conflict across variables. Specifically, when the conflict level was lower (vs. higher), interlocutor A was perceived as warmer (M = 3.99, SE = 0.12 vs. M = 2.60, SE = 0.12), $F(1, 195) = 63.95$, $p < .001$, $\eta^2_p = .247$, more competent (M = 4.60, SE = 0.12 vs. M = 3.59, SE = 0.15), $F(1, 195) = 27.02$, $p < .001$, $\eta^2_p = .122$, more playful (M = 2.31, SE = 0.13 vs. M = 1.71, SE = 0.13), $F(1, 195) = 10.43$, $p = .001$, $\eta^2_p = .05$, more cooperant (M = 4.57, SE = 0.13 vs. M = 2.44, SE = 0.15), $F(1, 195) = 115.79$, $p < .001$, $\eta^2_p = .373$, and less accusatory (M = 4.28, SE = 0.18 vs. M = 5.89, SE = 0.15), $F(1, 195) = 47.48$, $p < .001$, $\eta^2_p = .196$.

We found no interaction effects between conflict and interlocutor A's emoji use on perceptions of warmth, all $F < 1$.

5.4.2.1.2. Perceptions About the Messages Exchanged. We did not find main effects of interlocutor A's emoji use on perceived positivity, $F(1, 195) = 0.79$, $p = .376$, $\eta^2_p = .004$, or perceived efficacy, $F(1, 195) = 1.03$, $p = .313$, $\eta^2_p = .005$. Again, we observed a main effect of conflict on perceived positivity, such that interlocutor A's messages were seen as more positive when conflict was lower (M = 3.82, SE = 0.15) than when conflict was higher (M = 2.27, SE = 0.15), $F(1, 195) = 53.07$, $p < .001$, $\eta^2_p = .214$. We did not observe a main effect of conflict on message efficacy, $F(1, 195) = 2.61$, $p = .108$, $\eta^2_p = .013$, nor any interaction effects between conflict and interlocutor A's emoji use on perceptions of message positivity or efficacy, all $F < 1$.

5.4.2.1.3. Perceptions About the Conversation. In contrast with our predictions, interlocutor A's emoji use did not influence perceptions about the positivity of the conversation, the role of emoji use for communication, or confrontation level, all $F < 1$.

We found a main effect of conflict on perceptions of positivity, such that the conversation was seen as more positive when conflict was lower (M = 3.76, SE = 0.14), versus higher (M = 2.24, SE = 0.13), $F(1, 195) = 60.95$, $p < .001$, $\eta^2_p = .238$. Regarding the role of emoji, no main effect of conflict was observed, $F(1, 195) = 0.46$, $p = .499$, $\eta^2_p = .002$.

Again, there were no significant interactions between conflict and interlocutor A's emoji use on these three variables, all $F < 1$.

5.4.3. Discussion

Our results showed that emoji use did not impact either perceptions about interlocutor A, message perceptions, or conversation quality. We did find, however, that level of conflict is a relevant variable: when conflict level was lower, interlocutor A was evaluated as warmer and more competent, more playful, more cooperant, and less accusatory. Regarding message perceptions, we observed that for lower conflict, messages from interlocutor A were perceived as more positive. Similar to Study 1, although comparisons between experimental groups were statistically significant, we must acknowledge that some of our evaluations were below the response scale mid-point (particularly, those related to the effects of conflict level on perceptions of warmth, playfulness, and messages and conversation's positivity). In other words, even though the evaluations of interlocutor A's warmth and playfulness were higher in the condition of lower (vs. higher) conflict they were still not evaluated as being warm or playful. Similarly, message's and conversation's positivity were higher in the condition of lower (vs. higher) conflict, but were, overall, still evaluated as negative. This seems to suggest that despite the lower conflict condition allowing for slightly more positive inferences about the interlocutor and the interaction, these perceptions were still mostly perceived as negative. This is likely to be a consequence of the interaction occurring in a work context that is simultaneously potentially negative (as interlocutor B is always, as implied by A, late on their assignment).

We did not observe any interactions between emoji use and conflict. Taken together, these results seem to suggest 🤷‍♂️ may lack attributes to significantly contribute to influencing perceptions about an interlocutor using it. More, 🤷‍♂️ is unable to influence perceptions about an interlocutor using it irrespectively of conflict level. It is possible that, even when conflict was lower, emoji use can still be overshadowed by the subject at hand and, thus, be irrelevant.

5.5. General Discussion

In two experimental studies, we aimed at evaluating if reciprocity (i.e., interlocutors matching communication style by both using emoji) could relate to impact of emoji type on inferences made about interlocutors and communication outcomes, particularly in a work setting, with potential underlying conflict. In the first study, we assessed this possibility by manipulating emoji type used by interlocutor B (👎, ✍️, 💪), and then by having interlocutor A reciprocate (or not) emoji use, by including an arguably neutral emoji (i.e., 🤷‍♂️). In the second study, interlocutor B always used the same emoji (i.e., 💪), while interlocutor A still reciprocated (or

not) the emoji use, and additionally manipulated the level of conflict (lower vs. higher) in the scenario.

Study 1 showed that, regarding interlocutor B, only the 💪 (vs. ✍️) emoji produced significant effects, with the interlocutor being perceived as warmer, more playful, and more cooperant, and the messages as more positive. These results seem to align with previous research, as positive emoji are expected to have such positive impact (Boutet et al., 2021). These results are also corroborated by our post-test in which the 💪 was reported to be more positive than any of the other emoji. Regarding interlocutor A, when they used emoji (i.e., 🤷‍♂️), the interlocutor was seen as warmer, more playful, their messages as more positive, and the overall conversation as more positive. This matches previous research that reports emoji may add positivity to messages (Rodrigues et al., 2017), as well as influence perceptions of playfulness (McShane et al., 2021). However, as the use of 🤷‍♂️ by interlocutor A was simultaneously how we signaled reciprocity, the positive effects abovementioned could also be due to reciprocity. The way we manipulated reciprocity was, therefore, a potential limiting factor. More, reciprocity was signaled by 🤷‍♂️. Our post-test revealed this emoji to be neutral, as we expected. But at the same time, it also carries a degree of ambiguity. Taking the emojipedia.org definition as a reference, this emoji is described as indicating a lack of knowledge about a subject; however, the definition expands and opens the possibility of 🤷‍♂️ having different meanings, such as communicating a lack of worry about a certain situation's outcome. Indeed, previous research has explored this idea and found emoji interpretation may depend on different elements, such as message content (Weissman, 2019). Congruently, when we asked participants in the post-test how adequate using 🤷‍♂️ would be in a work context, they considered it inadequate, despite also considering it to be neutral in terms of both conflict level and valence. This seems to reinforce the idea of the emoji having a degree of ambiguity to it. We decided to use the 🤷‍♂️ emoji because it fits the tone of the message written by interlocutor A, without being overtly negative. However, because this emoji can also denote "lack of worry/knowledge" (aligned with emojipedia's definition and the results of our post-test), the context may have conditioned how participants interpreted its meaning. Moreover, the 🤷‍♂️ emoji is more visually complex when compared to a typical facial emoji, as it depicts a person with gestures and facial expressions. Hence, comparisons with other emoji must be taken with some caution. Research in this field could benefit from future normative studies focused on the evaluation of a broader set of emoji (cf. Rodrigues et al., 2018). This would allow for an informed decision on which

different type of emoji may convey a similar meaning to that attached to the 🤦 emoji, as well as under which conditions (e.g., specific settings of communication and/or specific interlocutors). As such, we signaled reciprocity by using different emoji, varying both in terms of semantic meaning and valence (i.e., 👎, ✍️ and 💪 vs. 🤦). It is possible that to properly elicit a reciprocal communication style, it may be necessary to use similar emoji (either equivalent emoji, emoji with equal valence, or both). It is also worth noting that, in line with previous research (e.g., Glikson et al., 2018), we found a positive impact of using emoji in a work context, particularly on interpersonal dimensions (e.g., warmth, cooperation) and overall positivity of the messages. Previous research suggests emoji use is considered adequate with work colleagues (Cavalheiro et al., 2022), and it can be argued this should be especially true if such colleagues are friends. Previous organizational studies have found a positive relationship between symmetrical communication cultures (i.e., between peers and when they show respect and reciprocate each other's feelings and ideas) and emotionally positive communication cultures (e.g., of expressing love, joy, and gratitude; Men & Yue, 2019) in work contexts. Emoji are often described as cues capable of conveying emotions (Lu et al., 2022), particularly in the case of positive ones (e.g., Pfeifer et al., 2022). Rodrigues et al. (2022) also found emoji as potentially important for the formation of relationships. As such, future work could assess if emoji use during symmetrical interactions in work contexts could elicit positive outcomes, particularly when organizations also foment positive emotional expression as discussed above. Other studies on organizational communication have suggested informal communication (e.g., having more personal conversations) may result in increased affective commitment and job satisfaction (Koch & Denner, 2022). Emoji use has been identified as useful to foster affiliation between individuals (Sampietro, 2019) or even as able to increase perceptions of intimacy (even with more distant interlocutors; Kim et al., 2022). Consequently, when work-related interactions occur through text-based CMC, one could expect emoji to be a useful tool to foster personal conversations at work and contribute to positive job and organizational outcomes. Nonetheless, and as discussed, emoji use does not always result in positive outcomes, particularly in work settings (e.g., it may reduce perceptions of competence; Glikson et al., 2018). Arguably, the impact of emoji use may depend on the type of relationship between individuals (e.g., perceived intimacy, closeness) and/or the organizational communication climate (e.g., formal vs. informal; Riordan & Glikson, 2020).

In Study 2 we aimed at exploring if the conflict level conveyed in the interaction could help to further understand the findings of Study 1. However, our results revealed only effects of

conflict level on all measured parameters and the absence of effects of emoji use by interlocutor A. In a way, these results may suggest 🤦‍♂️ lacks the semantic and emotional value to assume importance in a quarrelsome interaction, either it being of higher or lower levels of conflict. It may also suggest using 🤦‍♂️ to signal reciprocity may not be appropriate (as discussed above), especially as 🤦‍♂️ is not seen as a positive emoji (particularly in comparison to 💪; see Supplemental Material).

It is worth mentioning, as previously discussed in each Study, differences emerged when we compared specific groups (e.g., 💪 vs. any other emoji; low vs. high conflict), with an arguably positive impact of emoji use or lower conflict on evaluations of certain dimensions (e.g., in terms of playfulness or positivity). However, the overall ratings in some cases were still low. This may have been a consequence of the scenario we chose. First, we decided to evaluate an interaction in a work context with few elements for participants to accurately evaluate playfulness and even positivity. Moreover, in all interactions, there was a certain level of conflict, as Interlocutor A was always suggesting that Interlocutor B was underperforming (e.g., by being late with their work). Thus, we believe our results are relevant, particularly for emoji use, given the observed differences indicating that certain emoji influenced inferences about interlocutors and communication outcomes. Still, it is important to replicate these same studies in different contexts, with different characteristics (e.g., more levels of conflict, or even different levels of cooperation instead of conflict). Future studies could also seek to examine other variables (besides reciprocity) that can determine the effects of emoji use on communication outcomes. For example, previous studies have found that a professor using emoji leads students to perceive the professor as more intimate, which then results in increased attention during that professor's classes (Kim et al., 2022). Other studies found relational (e.g., intimacy) and motivational (e.g., expressing emotions) dimensions as predictors of emoji use (Cavalheiro et al., 2023). Therefore, relational and motivational variables may play an important role in explaining the impact of emoji use on communication outcomes, even in work settings. Future studies could benefit from measuring such dimensions and exploring them as potential explaining factors. As organizations may employ individuals of different age groups, age may also be an important variable to consider. Recent evidence shows convergence exists between different age groups regarding their preferred channels of communication within organizations (except that younger, vs. older, individuals preferred messaging applications, such as WhatsApp, over SMS; Woodward & Vongswasdi, 2017). These are, arguably, some of the channels in which individuals may resort more to emoji to communicate, and age has been

revealed as a relevant variable for understanding emoji use (e.g., Prada et al., 2018). Thus, future studies could additionally analyze if, within organizations, individuals from different age groups understand emoji use differently, and if that impacts their evaluations of work colleagues and consequent communication outcomes.

We must acknowledge a potential limitation related to our experimental designs. Our procedure does not allow us to clearly disentangle whether our findings are due to the emoji used or due to the reciprocity in emoji use. For example, the interpretation of the interaction can be influenced by the particular combination of 🤦 with each of the other three (i.e., 👎, ✍️, 💪) emoji (Weissman, 2019). However, the lack of significant interactions between the factors (i.e., emoji type and emoji use) suggests that the positive impact of using emoji by each interlocutor does not seem to be dependent on each other's emoji use. In other words, participants may not have noticed or attributed importance to the reciprocity of emoji use in this interaction. Instead, it seems that it was the isolated use of each emoji that elicited different perceptions about the conversation. Regarding the specific emoji we used, it is also worth mentioning that emoji interpretation may depend on different factors such as context or individual differences (e.g., Völkel et al., 2019). For this reason, even with our post-test assessing different dimensions of the used emoji, one can argue that including each emoji in a message, within a given context and/or relationship rapport, may result in different outcomes. This may help explain the inconsistent results between our studies regarding the impact of 🤦 and reciprocity. On the one hand, the scenarios were different across studies (particularly in the level of conflict). This may have interfered with participants' interpretations of 🤦 and consequently their evaluations. On the other hand, interlocutors used different emoji, which may have hindered perceptions of emoji use as reciprocal. To disentangle these issues, future studies could follow up on this idea and systematically test the impact of reciprocal emoji use (e.g., similarity in valence or semantic value) using similar scenarios of interaction. Another possible limitation is the task presented to the participants, as we asked them to evaluate a fictitious conversation as third-party viewers. Although in our view it was a more ecologically valid procedure than asking participants to "imagine being Person B", this may have resulted in participants feeling less invested in the interaction and, hence, in the evaluation of the interlocutors and conversation. Future research could benefit from asking participants to take different perspectives in a conversation (e.g., by inviting them to an online conversation with an interlocutor) and determining if (or how) our current findings changed.

It is also worth noting that we did not collect certain demographic information (e.g., race/ethnicity, city of residence, sexual orientation, information related to disabilities). Given the focus of the current research on social and interpersonal interactions held through CMC, future studies could find this demographic information worth collecting.

Overall, our findings seem to partially align with research on how impactful using specific emoji can be (e.g., benefits of using emoji) for interpersonal communication occurring in text-based CMC. Not only that, but we also expand the field by replicating this idea in a different context where social relationships proliferate and in which emoji use seems to be on the rise (i.e., work context, where emoji use was generally deemed inappropriate). It is worth noting that, in our studies, the presented interactions were always associated with a certain level of conflict, and we still found a positive impact of emoji use. Hence, our results can open the door for future studies focused on examining whether using emoji in this context may facilitate social and interpersonal interactions, particularly for individuals working remotely, as interactions may be more grounded on CMC, particularly text based.

5.6. References

Adobe (2022). The Future of Creativity: 2022 U.S. Emoji trend report: A survey of U.S. emoji users conducted by Adobe. https://acrobat.adobe.com/link/track?uri=urn%3Aaaid%3Ascds%3AUS%3Ae9a97193-e287-4aac-b8ee-7d1e098ec9a2&viewer%21megaVerb=group-discover

Boutet, I., LeBlanc, M., Chamberland, J. A., & Collin, C. A. (2021). Emojis influence emotional communication, social attributions, and information processing. *Computers in Human Behavior*, *119*, 106722. https://doi.org/10.1016/j.chb.2021.106722

Cavalheiro, B. P., Prada, M., Rodrigues, D. L., Lopes, D., & Garrido, M. V. (2022). Evaluating the adequacy of emoji use in positive and negative messages from close and distant senders. *Cyberpsychology, Behavior, and Social Networking*, *25*(3), 194-199. https://doi.org/10.1089/cyber.2021.0157 https://doi.org/10.1089/cyber.2021.0157

Cavalheiro, B. P., Rodrigues, D. L., & Prada, M. (2023). Who (and with whom) uses more emoji? Exploring individual, relational, and motivational characteristics driving emoji use. *Telematics and Informatics*, *83*, 102023. https://doi.org/10.1016/j.tele.2023.102023

Chew, S. Y., & Ng, L. L. (2021). *Interpersonal interactions and language learning: Face-to-face vs. computer-mediated communication*. Springer Nature. https://doi.org/10.1007/978-3-030-67425-0

Coyle, M. A., & Carmichael, C. L. (2019). Perceived responsiveness in text messaging: The role of emoji use. *Computers in Human Behavior*, *99*(2019), 181–189. https://doi.org/10.1016/j.chb.2019.05.023

Durante, F., Fiske, S. T., Kervyn, N., Cuddy, A. J., Akande, A. D., Adetoun, B. E., ... & Storari, C. C. (2013). Nations' income inequality predicts ambivalence in stereotype content: How societies mind the gap. *British Journal of Social Psychology*, *52*, 726 –746. http://dx.doi.org/10.1111/bjso.12005

Holtgraves, T., & Robinson, C. (2020). Emoji can facilitate recognition of conveyed indirect meaning. *PLOS ONE*, *15*(4), e0232361. https://doi.org/10.1371/journal.pone.0232361

Koch, T., & Denner, N. (2022). Informal communication in organizations: Work time wasted at the water-cooler or crucial exchange among co-workers? *Corporate Communications: An International Journal*, *27*(3), 494–508. https://doi.org/10.1108/CCIJ-08-2021-0087

Lu, X., Ai, W., Chen, Z., Cao, Y., & Mei, Q. (2022). Emojis predict dropouts of remote workers: An empirical study of emoji usage on GitHub. *PLOS ONE*, *17*(1), e0261262. https://doi.org/10.1371/journal.pone.0261262

Luangrath, A. W., Peck, J., & Barger, V. A. (2017). Textual paralanguage and its implications for marketing communications. *Journal of Consumer Psychology*, *27*(1), 98–107. https://doi.org/10.1016/j.jcps.2016.05.002

McShane, L., Pancer, E., Poole, M., & Deng, Q. (2021). Emoji, playfulness, and brand engagement on twitter. *Journal of Interactive Marketing*, *53*(1), 96–110. https://doi.org/10.1016/j.intmar.2020.06.002

Men, L. R., & Yue, C. A. (2019). Creating a positive emotional culture: Effect of internal communication and impact on employee supportive behaviors. *Public Relations Review*, *45*(3), 101764. https://doi.org/10.1016/j.pubrev.2019.03.001

Miller, H., Kluver, D., Thebault-Spieker, J., Terveen, L., & Hecht, B. (2017). Understanding emoji ambiguity in context: The role of text in emoji-related miscommunication. In *Proceedings of the International AAAI Conference on Web and Social Media*, *11*(1), 152-161.

Nexø, L. A., & Strandell, J. (2020). Testing, filtering, and insinuating: Matching and attunement of emoji use patterns as non-verbal flirting in online dating. *Poetics*, *83*, 101477. https://doi.org/10.1016/j.poetic.2020.101477

Pfeifer, V. A., Armstrong, E. L., & Lai, V. T. (2022). Do all facial emojis communicate emotion? The impact of facial emojis on perceived sender emotion and text processing. *Computers in Human Behavior*, *126*, 107016. https://doi.org/10.1016/j.chb.2021.107016

Prada, M., Rodrigues, D. L., Garrido, M. V., Lopes, D., Cavalheiro, B., & Gaspar, R. (2018). Motives, frequency and attitudes toward emoji and emoticon use. *Telematics and Informatics*, *35*(7), 1925–1934. https://doi.org/10.1016/j.tele.2018.06.005

Rodrigues, D. L., Cavalheiro, B. P., & Prada, M. (2022). Emoji as icebreakers? Emoji can signal distinct intentions in first time online interactions. *Telematics and Informatics*, *69*, 101783. https://doi.org/10.1016/j.tele.2022.101783

Rodrigues, D., Lopes, D., Prada, M., Thompson, D., & Garrido, M. V. (2017). A frown emoji can be worth a thousand words: Perceptions of emoji use in text messages exchanged between romantic partners. *Telematics and Informatics*, *34*(8), 1532–1543. https://doi.org/10.1016/j.tele.2017.07.001

Shamekhi, A., Czerwinski, M., Mark, G., Novotny, M., & Bennett, G. A. (2016). An exploratory study toward the preferred conversational style for compatible virtual agents. In *Intelligent Virtual Agents: 16th International Conference, IVA 2016, Los Angeles, CA, USA, September 20–23, 2016, Proceedings 16* (pp. 40-50). Springer. https://doi.org/10.1007/978-3-319-47665-0_4

Stein, J. P. (2023). Smile back at me, but only once: Social norms of appropriate nonverbal intensity and reciprocity apply to emoji use. *Journal of Nonverbal Behavior*, *47*(2), 245-266. https://doi.org/10.1007/s10919-023-00424-x

Tandyonomanu, D. (2018). Emoji: representations of nonverbal symbols in communication technology. *IOP Conference series: materials science and engineering*, *288*(1), 012052. https://doi.org/10.1088/1757-899X/288/1/012052

Toma, C. L. (2014). Towards conceptual convergence: An examination of interpersonal adaptation. *Communication Quarterly*, *62*(2), 155-178. https://doi.org/10.1080/01463373.2014.890116

Wagner, T., Punyanunt-Carter, N., & McCarthy, E. (2022). Rules, reciprocity, and emojis: An exploratory study on flirtatious texting with romantic partners. *Southern Communication Journal*, *87*(5), 461-475. https://doi.org/10.1080/1041794X.2022.2108889

Weissman, B. (2019). Peaches and eggplants or. . . Something else? The role of context in emoji interpretations. *Proceedings of the Linguistic Society of America*, *4*(1), 29-1. https://doi.org/10.3765/plsa.v4i1.4533

CHAPTER 6

Show Yourself?! Social Presence as a Mechanism for the Effects of Using Different Pictorial Cues in Text-Based Computer-Mediated Communication

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Cavalheiro, B. P., Prada, M., & Rodrigues, D. L. (under review). Show yourself?! Social presence as a mechanism for the effects of using different pictorial cues in text-based computer-mediated communication.

6.1. Abstract

Research has shown that using pictorial cues—emoticons, emoji, memoji—to complement text-based computer-mediated communication (CMC) has benefits for person perception and communication outcomes. Research has recently suggested that perceived social presence (i.e., the extent to which individuals experience human interaction through CMC) may explain such advantages. We conducted two experimental studies to test this hypothesis. In Study 1 (N = 188), participants saw an interaction between two users on Facebook, which could include one of three pictorial cues (i.e., :) vs. 😀 vs. 🤦‍♀️) or not (i.e., control), and evaluated the users and communication outcomes. Study 2 (N = 125) used similar procedures but compared messages with negative emoji (i.e., 🙁) with messages without emoji (i.e., control). In both studies, we found that perceived social presence mediated the positive effect of using pictorial cues (vs. control) in perceptions of warmth and competence, and message's adequacy and efficacy. Taken together, our findings show why pictorial cues (irrespectively of valence) benefit different outcomes in text-based CMC. Further implications for studies in text-based CMC and emoji, as well as limitations are discussed.

Keywords: person perception, emoji, computer-mediated communication, experimental design, social presence

6.2. Introduction

Most people use the internet to communicate through chats, messaging applications, or social networks (Kemp, 2023). These forms of text-based computer-mediated communication (CMC) are often complemented with pictorial cues, such as emoticons and emoji (Dunlap, 2016). Emoticons are symbols created by the combination of punctuation, numbers, and/or letters, whereas emoji are graphic symbols that depict an array of facial expressions, emotions, gestures, animals, activities, or objects (for an overview, see Rodrigues et al., 2018). Both types of pictorial cues have been reported as useful to help users convey their emotions (for a review, see Bai et al., 2019) or interpersonal intentions (e.g., Rodrigues et al., 2022). Moreover, these cues can shape person perception (e.g., emoticons or emoji users perceived to be warmer; Aretz & Mierke, 2019) and improve communication outcomes (e.g., by clarifying and increasing understanding of a message; for a review, see Tang & Hew, 2018). In recent years, a new type of pictorial cue was introduced – the memoji (Apple, 2018), which consists of 3D avatars customizable to resemble users' characteristics (e.g., facial traits, hairstyle). Much like emoticons and emoji, memoji display different facial expressions to convey certain emotions (e.g., happiness; M. Park & Suk, 2022). However, only a few studies have examined *if* and *how* memoji also influence communication outcomes, and whether differences emerge when comparing pictorial cues.

The benefits of using pictorial cues in text-based CMC also extend to perceived social presence (for a review, see Aldunate & González-Ibánez, 2017). For our current purposes, social presence is defined as the extent to which users experience human interaction when exchanging text-based messages (Short et al., 1976) and experience the feeling of being with the other person (Biocca et al., 2003; Öztok & Kehrwald, 2017). Interestingly this experience may emerge even when we are not interacting with humans. For example, chatbots designed to mimic human communication (e.g., speaking in the first vs. third person) were perceived as being more socially present (e.g., participants felt more human contact) which elicited stronger perceptions of trust (Konya-Baumbach et al., 2023). To the best of our knowledge, only two experimental studies extended this reasoning to an interpersonal communication context. The first study showed that text-based messages with (vs. without) pictorial cues (and particularly emoji) elicited stronger perceptions of social presence (i.e., interlocutor using them perceived as more "real" and "present") during a CMC interaction (Petrocchi et al., 2020). The second study showed that perceiving more social presence in text-based messages that included (vs. did not include) pictorial cues fostered more positive interpersonal evaluations (e.g.,

interlocutors using emoji were perceived as more understanding, helpful, considerate; E. K. Park & Sundar, 2015). In the current work, we extended this line of research to important dimensions of person perception (i.e., warmth and competence; for reviews, see Cuddy et al., 2008; Fiske et al., 2007) and communication outcomes (i.e., message adequacy and efficacy), using a different context of interaction. Specifically, we conducted two experimental studies to test if perceived social presence is one of the underlying mechanisms that explain the benefits of pictorial cues use on person perception and communication outcomes. Equally important, we compared if pictorial cues that vary in the extent they resemble the human face (i.e., from the most abstract emoticon to the most concrete memoji) and valence (i.e., positive vs. negative cues) had distinct impacts on the examined outcomes.

6.2.1. Pictorial Cues: Users, Motives, and Impact

Research on pictorial cues, particularly emoticons and emoji, has been expanding in recent years suggesting that use patterns may vary according to individual (e.g., younger individuals and women use pictorial cues more often; Oleszkiewicz et al., 2017; Prada et al., 2018) and motivational differences (e.g., to express feelings, strengthen the content of a message, and make messages more positive; Kaye et al., 2016; Prada et al., 2018; Tandyonomanu & Tsuroyya, 2018). More recently, Cavalheiro et al. (2023) found that being younger and using emoji for personal contact motives (e.g., to better express emotions) contributed to emoji use frequency with closer (e.g., friends, classmates) but not more distant interlocutors (e.g., supervisors, professors). Likewise, emoji use has been shown to signal specific intentions and relational goals (e.g., some emoji may be used to signal friendship intentions while others to signal romantic intentions; Rodrigues et al., 2022).

Moreover, these positive effects of pictorial cues can extend to communication outcomes and how users are perceived. For instance, Holtgraves and Robinson (2020) found that including emoji helps to clarify the meaning of a message (e.g., faster understanding of sarcasm) particularly for those with higher difficulty in interpreting such sarcastic messages (e.g., older individuals, Garcia et al., 2022). Illustrating the effects for person perception, Marder et al. (2020) found that users who included (vs. did not include) emoticon in an e-mail were perceived as warmer. Relatedly, Kim et al. (2022) found that a professor who included (vs. did not include) emoji in an e-mail was evaluated by the students as more authentic (e.g., honest) and intimate (e.g., warmer). Overall, these studies show that pictorial cues are important for text-based CMC as they allow individuals to gather more information about their users and better grasp the content of the messages. Specifically, it has been discussed that such cues are

capable of increasing social presence (Aldunate & González-Ibánez, 2017), which should contribute to more efficient communication processes.

6.2.2. Social Presence as a Mechanism Underlying the Effects of Emoji Use

Compared to face-to-face communication, text-based CMC is restricted in nonverbal information and, as such, more limited in emotional expressiveness and social presence (Aldunate & González-Ibánez, 2017). This is relevant as social presence is an important dimension for interpersonal relationships and CMC outcomes (e.g., persuasion; for a review, see Oh et al., 2018). In text-based CMC, techniques to increase social presence include using different communication styles (e.g., a communication style that emphasizes empathy and intimacy; Song & Hollenbeck, 2015), or even including specific cues (e.g., pictorial cues such as emoticons and emoji; Aldunate & González-Ibánez, 2017; Tang & Hew, 2020). For example, E. K. Park and Sundar (2015) manipulated the presence of emoji in text messages (vs. only text vs. text and picture) in the context of customer support chat and found that social presence mediated the relationship between emoji use and evaluations of the customer service agent performance. Similarly, Petrocchi et al. (2020) invited participants to interact with peers through smartphones and found that emoji use (vs. no use) resulted in higher levels of perceived social presence, and, consequently, social support. The authors argued that emoji can compensate for the lack of nonverbal cues and make the communication partner seem real and present during the CMC interaction.

6.2.3. Overview of the Studies

In two experimental studies, we explored if perceived social presence mediates the impact of using pictorial cues on key dimensions of person perception (i.e., warmth and competence) and CMC communication (i.e., message adequacy and efficacy). In Study 1, we also sought to explore if different pictorial cues would elicit different results. This stems from research suggesting that emoji are more "human-like" than emoticons (Aldunate & González-Ibánez, 2017) and that memoji are capable of reproducing richer facial expressions (Suda & Oka, 2021) to the point of representing specific emotions (e.g., happiness; M. Park & Suk, 2022b). Thus, we sought to compare the impact of each pictorial cue across variables. In Study 2, we sought to disentangle if the expected mediation from social presence was restricted to positive pictorial cues or also extended to negative ones. Briefly, in both studies, participants were presented with a mockup interaction between classmates who were preparing a group assignment. One of the classmates shared part of their assignment on a private Facebook group and the second

classmate commented and shared their feedback. We tested if including a positive pictorial cue (i.e., :), 😀 or 👩; Study 1) or a negative pictorial cue (i.e., 😕; Study 2) in a message (vs. having text-only messages) influenced how participants perceived the interlocutor and the quality of the communication.

6.3. Study 1

We expected participants exposed to messages with any pictorial cue (vs. control) to perceive users as warmer but not necessarily as more competent (H1) and comments as more adequate and efficient (H2). We also expected memoji to have stronger effects, followed by emoji and emoticons (H3), given the extent to which cues differ in their human-face resemblance. Lastly, we expected social presence to mediate the effects of using pictorial cues (vs. control) on person perception and communication outcomes (H4).

6.3.1. Method

6.3.1.1. Participants and Design

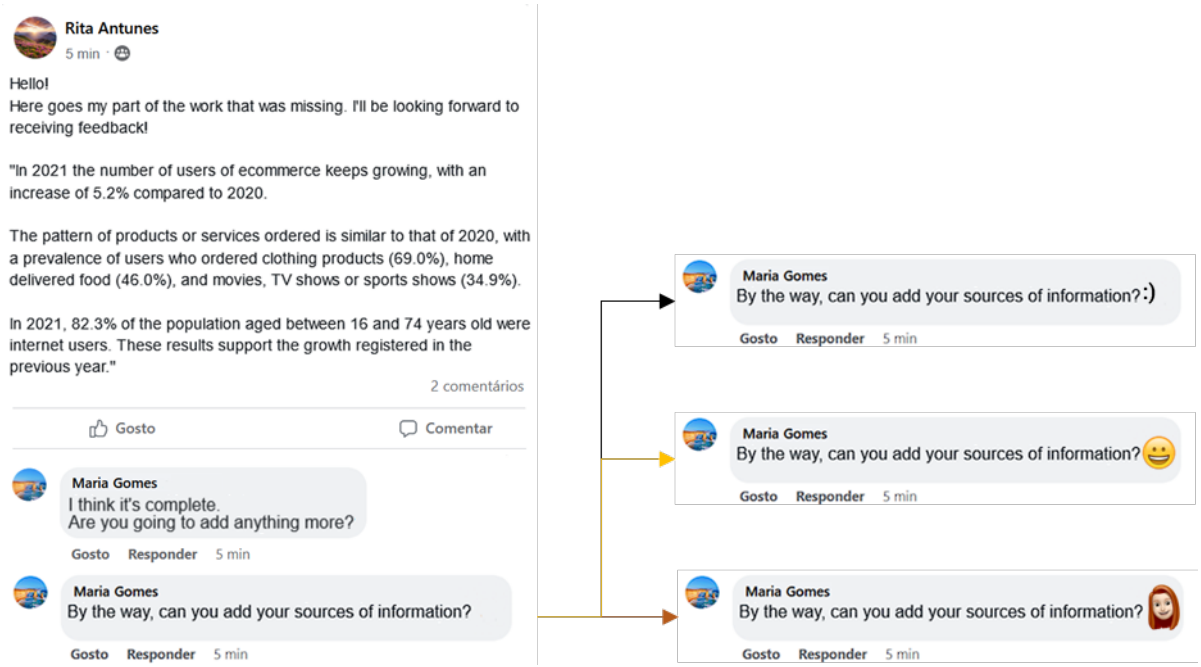
A total of 292 individuals living in Portugal volunteered to participate in an online survey. We excluded participants who did not have Portuguese as their native language (n = 1), failed to answer all dependent measures (n = 81), and failed to correctly answer the manipulation check question (n = 22). The final sample included 188 individuals who were, on average, 27 years old (M = 26.45, SD = 10.27). Most participants identified as women (77.1%), reported having a university degree (57.9%), and were either currently studying (55.3%) or working (30.8%).

Participants were randomly assigned to one of the four experimental conditions in the between-participants design: control vs. :) vs. 😀 vs. 👩.

6.3.1.2. Materials

We developed four mockup scenarios to represent an interaction between two female classmates working on a group assignment together through a Facebook group (see Figure 6.1). Usernames were kept constant across scenarios and profile pictures for each interlocutor were generic landscapes to avoid potential confounds (e.g., similiarity with the memoji). The contents of the interaction were similar across experimental conditions and included a post from one classmate sharing their part of the work (i.e., generic text about e-commerce), followed by two comments made by the second classmate. In the second comment, we manipulated the absence (control condition) or presence of pictorial cues (experimental conditions). When

selecting the pictorial cues to be included in the study, we sought to use cues depicting similar emotions and body parts (i.e., smiley faces) and valence (i.e., positive).



Note. The left image represents the whole interaction (control condition). Images on the right represent the experimental conditions (i.e., type of pictorial cue included in the second comment): emoticon, emoji, and memoji, respectively, from top to bottom. Original materials were presented in Portuguese.

Figure 6.1. *Experimental Scenarios (Study 1)*

6.3.1.3. Measures

Participants on all conditions were asked to evaluate the comments to the original post in terms of perceived social presence (i.e., "I felt that the comments to the post were…": 1 = *Impersonal* to 7 = *Personal*; 1 = *Cold* to 7 = *Warm*; 1 = *Distant* to 7 = *Close*; 1 = *Dehumanizing* to 7 = *Humanizing*; 1 = *Inexpressive* to 7 = *Expressive*; 1 = *Unemotional* to 7 = *Emotional*; 1 = *Insensitive* to 7 = *Sensitive*; Qiu & Benbasat, 2005). Responses were mean-averaged (α = .82), with higher scores indicating stronger perceptions of social presence. Participants also evaluated the adequacy (i.e., "In your opinion, to what extent do you consider that the comments to the post were…": 1 = *Not adequate at all* to 7 = *Very adequate*; adapted from Rodrigues et al., 2017) and efficacy of the comments (i.e., "To what extent do you consider that the comments to the post were efficient in conveying their intended meaning? ": 1 = *Not efficient at all* to 7 = *Very efficient*; adapted from Rodrigues et al., 2017). Then, participants were asked to evaluate the classmate who posted the comments (i.e., "To what extent do you consider that the person who made the comments was…": "…warm", "…well-intentioned"; "…competent",

"…capable", from 1 = *Not at all* to 7 = *Extremely*; Durante et al., 2013). The first two items and the latter two items were mean-aggregated, such that higher scores indicate stronger perceptions of warmth (r_s = .80) and competence (r_s = .94).

6.3.1.4. Procedure

This study was approved by the Ethics Committee at Iscte-Instituto Universitário de Lisboa (#97/2021).

Prospective participants were invited to take part in an online study (hosted on Qualtrics) about digital interpersonal communication through a link shared via e-mail, on social media, and the participants pool available at the university. The general instructions informed about the purpose of the study, expected duration, and ethical aspects (i.e., all data were confidential and anonymous; participants could withdraw from the study at any point without their responses being considered for analysis). Informed consent was required before proceeding to the study. First, participants were asked to answer standard sociodemographic questions (i.e., age, gender, occupation, level of education, native language). Then, participants were randomly assigned to one of the four experimental conditions and were shown a page with the following information at the top: "Next, we will present an interaction that occurred in a Facebook group between two classmates who are working on a group assignment together. Please read the messages carefully". Below this information, participants were shown one of the mockup scenarios and presented with the dependent measures. Manipulation checks differed based on the experimental condition. Participants in the control condition answered three questions, one per pictorial cue, presented in random order "Did any of the comments to the post contained [*emoticon/emoji/memoji*]?". In the experimental conditions, participants answered the same question once and in accordance with the pictorial cue shown in the mockup interaction (e.g., "Did any of the comments to the post contain emoticon?"). Responses were given on 7-point rating scales (from 1 = *Certainly not* to 7 = *Certainly yes*). At the end of the survey, participants were thanked, debriefed about the overall goals of the study, and provided with the contact information of the research team.

6.3.1.5. Data Analytic Plan

First, we computed univariate ANOVAs (pictorial cue: control vs. :) vs.  vs. ) for each dependent variable (warmth, competence, adequacy, and efficacy). We also computed pairwise comparisons with Bonferroni correction when differences were observed. Second, we used the

PROCESS v4.2 macro to compute multicategorical mediation models with 10,000 bootstrap samples (Hayes & Preacher, 2014; Hayes, 2022) for each dependent variable. In all analyses, the experimental manipulation was the independent variable (dummy coded with the control condition as reference) and perceived social presence was the mediator. Age and gender were included as covariates in all models (Cavalheiro et al., 2023; Prada et al., 2018).

6.3.2. Results

We found a main effect of pictorial cues on perceived warmth, $F(3, 182) = 5.92$, $p < .001$, $\eta^2_p = .089$. Post-hoc comparisons showed that comments with emoji (vs. control), $p = .005$, and memoji (vs. control), $p = .002$ were perceived as warmer. No differences between emoticon and control conditions were found, $p = .060$. No other differences between pictorial cues (i.e., emoticon vs. emoji; emoticon vs. memoji; emoji vs. memoji) emerged, all $p = 1.000$. No main effects emerged for perceived competence, $F(3, 182) = 1.66$, $p = .176$, $\eta^2_p = .027$, adequacy, $F(3, 182) = 0.93$, $p = .425$, $\eta^2_p = .015$, or efficacy, $F(3, 182) = 2.62$, $p = .052$, $\eta^2_p = .041$ (see Table 6.1 for detailed descriptive statistics).

Table 6.1. *Descriptive Statistics of Dependent Variables per Condition*

	Warmth	Competence	Adequacy	Efficacy
	M (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
Control	3.87 (1.18)	4.29 (1.31)	4.79 (1.68)	5.00 (1.39)
Emoticon	4.49 (1.22)	4.63 (1.13)	5.07 (1.37)	4.93 (1.64)
Emoji	4.66 (1.19)	4.80 (1.28)	5.18 (1.53)	5.31 (1.52)
Memoji	4.76 (1.06)	4.71 (1.19)	5.28 (1.41)	5.70 (1.21)

Results of the mediation analyses are summarized in Table 6.2. Compared to the control condition, participants perceived more social presence when comments included an emoticon, $p = .017$, emoji, $p = .022$, or memoji, $p < .001$. In all cases, perceived social presence was then associated with stronger perceptions of warmth, $p < .001$, competence, $p < .001$, adequacy, $p < .001$, and efficacy, $p < .001$. All indirect effects were significant, although the direct effect of using emoji (vs. control) on perceived warmth remained significant, $p = .013$. No other direct effects reached significance, all $p \geq .069$.

Table 6.2. *Mediation Analyses*

	M	Warmth	Competence	Adequacy	Efficacy
	b (*SE*)	*b* (*SE*)	*b* (*SE*)	*b* (*SE*)	*b* (*SE*)
Control vs. emoticon (X1)	.48* (.20)	.28 (.20)	.09 (.24)	-.03 (.29)	-.35 (.28)
Control vs. emoji (X2)	.45* (.20)	.48* (.19)	.30 (.23)	.12 (.29)	.05 (.27)
Control vs. memoji (X3)	.71*** (.19)	.36 (.20)	.04 (.24)	.03 (.29)	.26 (.28)
Social Presence (M)	-	.71*** (.07)	.50*** (.09)	.61*** (.11)	.60*** (.10)
Age (covariate)	-.01 (.01)	-.01 (.01)	-.01 (.01)	-.01 (.01)	-.01 (.01)
Gender (covariate)	.01 (.01)	.00 (.01)	.00 (.01)	-.01 (.01)	.00 (.01)
Indirect effects		*b* (*SE*)			
		[LB; UB 95% CI]			
Control vs. emoticon	-	.34 (.14)	.24 (.11)	.30 (.13)	.29 (.13)
		[0.07; 0.63]	[0.05; 0.47]	[0.06; 0.56]	[0.06; 0.56]
Control vs. emoji	-	.32 (.14)	.22 (.10)	.28 (.13)	.27 (.12)
		[0.06; 0.59]	[0.04; 0.45]	[0.05; 0.54]	[0.05; 0.53]
Control vs. memoji	-	.51 (.13)	.35 (.11)	.44 (.13)	.43 (.13)
		[0.26; 0.76]	[0.16; 0.59]	[0.21; 0.70]	[0.20; 0.69]

Note. $^{*}p \leq .050$; $^{**}p \leq .010$; $^{***}p \leq .001$.

6.3.3. Discussion

As expected, the inclusion of emoji and memoji (vs. control) in comments to a post resulted in higher perceptions of warmth (H1). This aligns with previous research that found including positive emoji increases perceptions of warmth (e.g., Boutet et al., 2021), and extends the findings to memoji. However, including emoticon (vs. control) did not impact perceptions of warmth, and thus H1 was partially verified. We also expected including pictorial cues (vs. control) to increase perceptions of the comment's adequacy and efficacy (H2), which was not the case. Our prediction was based on previous research suggesting pictorial cues can complement messages making them more understandable (e.g., reducing ambiguity, clarifying; Kaye et al., 2016). The absence of results in our study may simply suggest that, in our scenarios, the information being conveyed does not need additional cues. That is, if the content of the comments is perceived as straightforward, adding emoji (or other cues) may be irrelevant in

terms of message adequacy and efficacy. We also expected different outcomes according to type of cue (H3). This was, however, not verified as no differences emerged between the three pictorial cues. However, emoticons were the only cue that did not significantly impact perceptions of warmth (while both emoji and memoji did), which may result from a weaker capacity of emoticons to portray emotions (e.g., when compared with emoji; Fischer & Herbert, 2021).

Lastly, results supported H4 and showed that perceived social presence explained why users that included any type of pictorial cue (vs. control) were perceived as warmer and more competent, and the contents of the comments as more adequate and efficient. Findings for emoji are partially aligned with past research, that found social presence to mediate the relationship between emoji use and person perception (e.g., helpfulness, consideration; E. K. Park & Sundar, 2015). In our work, we expanded and studied warmth and competence, important and universal dimensions of social judgment (Cuddy et al., 2008; Fiske et al., 2007), as well as to communicational dimensions (i.e., message adequacy and efficacy). We also extended the literature by showing for the first time similar results with memoji. This may be explained by the fact memoji are avatars, an element known as impactful for perceptions of social presence (e.g., Bente et al., 2008).

Although the direct effect of including positive emoji in the comments (vs. control) on perceptions of warmth remained significant it was, at least in part, explained by higher perceptions of social presence. Knowing that even negative pictorial cues, particularly emoji, are able to accurately elicit their intended emotions (e.g., emoji show similar ability to facial expressions when representing emotions; Fischer & Herbert, 2021), we sought to test if the current findings were independent of valence. Given that no differences between emoji and memoji emerged in the main effect on warmth, that emoji (vs. control) kept its direct effect on the mediation analysis of warmth, and that emoji tend to be used more frequently than other pictorial cues (i.e., emoticons; Prada et al., 2018) we replicated the procedure from Study 1 using a negative emoji (i.e., 🙁).

6.4. Study 2

Extending the results from Study 1, we examined if including a negative emoji (vs. control) in text-based CMC also influenced user perceptions and communication outcomes. Given the negative valence of the emoji (Rodrigues et al., 2018), we expected the inclusion of 🙁 (vs. control) to result in the user being perceived as less warm and competent (H5), and their

communication as less adequate and efficient (H6). Finally, we expected social presence to attenuate the negative effects of 🙁, by being a mechanism driving the effects of using 🙁 (vs. control) on perceptions about the user that included it and on communication outcomes (H7).

6.4.1. Method

6.4.1.1. Participants and Design

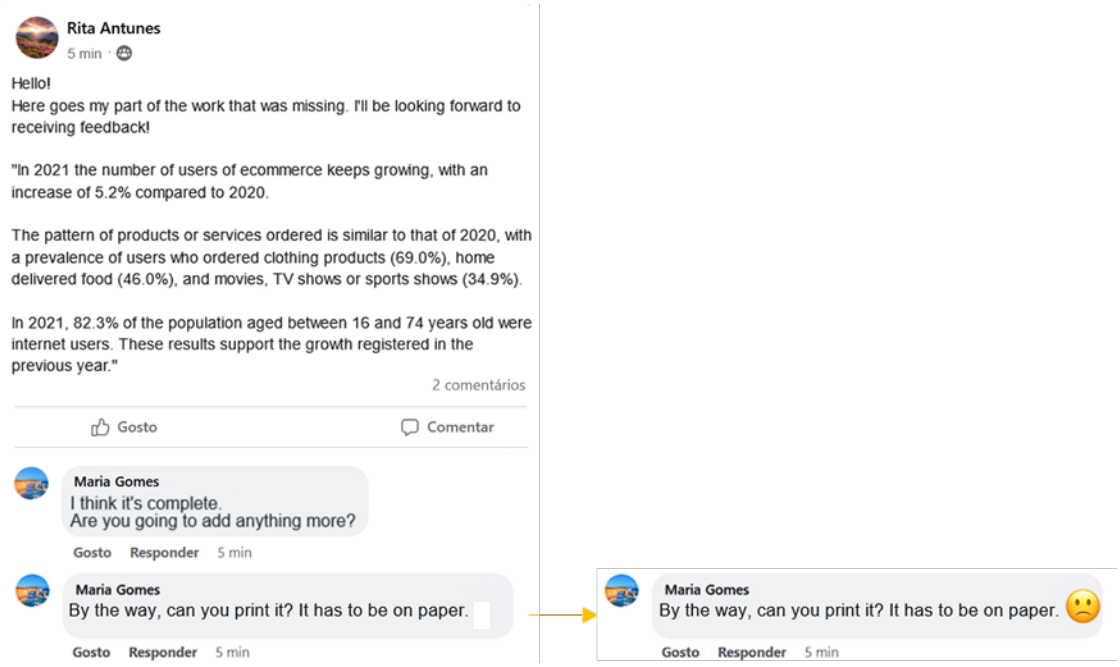
A total of 190 individuals living in Portugal volunteered to participate in an online survey. We excluded participants who did not have Portuguese as their native language (n = 2), failed to answer all dependent measures (n = 55), failed to correctly answer the manipulation check question (n = 4), and identified as non-binary (n = 1)[4]. The final sample included 125 participants who were on average, 21 years old (M = 20.59, SD = 3.51). Most participants identified as women (80.8%), reported to have a high school diploma (56.8%) or a university degree (41.6%), and were studying (90.4%), working (0.8%), or both (8.8%).

Participants were randomly assigned to one of the experimental conditions in a 2 (control, 🙁) between-participants design.

6.4.1.2. Materials

Materials were similar to those used in Study 1, except for the pictorial cue used. In the second comment, we manipulated the absence (control condition) or presence of emoji (experimental condition). When selecting the emoji to be included in this study, we sought to use an emoji depicting similar body parts but with negative valence (i.e., sad face; Rodrigues et al., 2018). This change in valence implied adapting the mockup interaction so that the second comment matched the emoji in valence (see Figure 6.2).

[4] Because we included gender as a covariate in our models, we chose not to include this participant as the comparison between groups would not be equitable.



Note. The left image represents the whole interaction (control condition). The image on the right represents the experimental condition (i.e., type of pictorial cue included in the second comment): emoji. Original materials were presented in Portuguese.

Figure 6.2. *Experimental Scenarios (Study 2)*

6.4.1.3. Procedures and Measures

Both the procedure and measures were similar to Study 1.

6.4.1.4. Data Analytic Plan

First, we computed independent-samples *t*-tests (control vs. 😕) for each dependent variable (i.e., warmth, competence, adequacy, and efficacy). Second, we used PROCESS v4.2 macro to compute mediation models with 10,000 bootstrap samples (Hayes, 2022) for each dependent variable. In all analyses, the experimental manipulation was the independent variable and perceived social presence was the mediator. Age and gender were again included as covariates.

6.4.2. Results

Results showed no differences between conditions in perceived warmth, $t(123) = -0.92$, $p = .359$, perceived competence, $t(123) = 0.10$, $p = .922$, comment's adequacy, $t(123) = 0.58$, $p = .565$, or comment's efficacy, $t(123) = -0.44$, $p = .659$ (see Table 6.3).

Table 6.3. *Descriptive Statistics of Dependent Variables per Condition*

	Warmth	Competence	Adequacy	Efficacy
	M (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
Control	4.08 (1.37)	4.24 (1.21)	5.02 (1.49)	5.31 (1.47)
Emoji	4.30 (1.36)	4.22 (1.16)	4.85 (1.67)	5.43 (1.41)

Results of the mediation analyses are summarized in Table 6.4. Compared to the control condition, participants perceived more social presence when the comments included the emoji, $p = .013$. Perceived social presence was then associated with stronger perceptions of warmth, $p < .001$, competence, $p < .001$, adequacy, $p < .001$, and efficacy, $p < .001$. All indirect effects were significant, although the direct effect of using emoji (vs. control) on perceived adequacy remained significant, $p = .029$. No other direct effects reached significance, all $p \geq .142$.

Table 6.4. *Mediation Analyses*

	M	Warmth	Competence	Adequacy	Efficacy
Predictors	*b* (*SE*)	*b* (*SE*)	*b* (*SE*)	*b* (*SE*)	*b* (*SE*)
Control vs. emoji	.43* (.17)	-.16 (.20)	-.28 (.19)	-.55* (.25)	-.18 (.24)
Social presence (M)	-	.88*** (.11)	.61*** (.10)	.91*** (.13)	.68*** (.13)
Age (covariate)	-.01 (.02)	-.03 (.03)	-.03 (.03)	.02 (.04)	.01 (.03)
Gender (covariate)	-.10 (.21)	-.04 (.25)	.26 (.24)	.11 (.31)	-.09 (.30)
Indirect effects		*b* (*SE*)			
		[LB; UB 95% CI]			
Control vs. emoji	-	.37 (.17)	.26 (.12)	.39 (.17)	.29 (.13)
		[0.08; 0.73]	[0.05; 0.52]	[0.08; 0.76]	[0.06; 0.56]

Note. $^{*}p \leq .050$; $^{**}p \leq .010$; $^{***}p \leq .001$.

6.4.3. Discussion

Contrary to expected, we did not observe differences between the control and emoji conditions in person perception (H5) or communication outcomes (H6). Nevertheless, we did find similar results to those of Study 1 regarding social presence being a mechanism capable of explaining the effects of using (negative) emoji on the abovementioned variables (H7). Specifically, using a negative emoji in a text-based comment increased perceptions of social presence, and consequently increased evaluations of warmth and competence, as well as evaluations of

adequacy and efficacy regarding the comment. As hypothesized, social presence attenuated the potential derogatory effects of using negative emoji.

Despite the direct effect of including positive emoji (vs. control) on perceived comment adequacy remaining significant it was, at least in part, explained by higher perceptions of social presence, reinforcing the importance of this construct as an explaining mechanism.

6.5. General Discussion

Across two experimental studies, we examined whether distinct pictorial cues (i.e., emoticons, emoji, memoji) of different valence (positive vs. negative) impacted person perception (i.e., inferences of warmth, and competence) and communication outcomes (i.e., evaluations of adequacy and efficacy of comments). We also tested whether increased perceptions of social presence in text-based CMC was the explaining mechanism driving these effects.

First, regarding the impact of using pictorial cues (vs. control) on person perception and communication outcomes, we only found a significant impact of emoji and memoji use (vs. control) on perceptions of warmth (H1). These findings align with previous results of emoji effects on perceptions of warmth (e.g., Boutet et al., 2021), and we extended them to memoji. However, including pictorial cues (vs. control) did not impact any other dimensions (i.e., competence, adequacy, efficacy) in either study. We speculate that this may be a result of the context we depicted, as the provided information allowed for limited inferences concerning perceptions of competence, and message adequacy and efficacy. At the same time, the content of the comments may have been simple and straightforward, making the addition of pictorial cues irrelevant and/or redundant.

Second, our studies show that social presence mediated the relationship between pictorial cues use and perceptions of warmth and competence, as well as comment's adequacy and efficacy, supporting both H4 and H7. In both studies including any type of pictorial cue in CMC (vs. text-based only) increased perceptions of social presence in comments to a post on Facebook. Simultaneously, researchers have argued that text-based CMC is among the formats in which users perceive the lowest levels of social presence in comparison to richer CMC formats (e.g., video calls; for a review, see Oh et al., 2018). This is arguably due to the lack of nonverbal cues in text-based communication. For this reason, increasing perceptions of social presence through the inclusion of pictorial cues should also facilitate impression formation, as more information to do so is available. For example, previous studies show that adding social presence cues to messages through a communication style that implies intimacy and empathy

(vs. a colder communication style) improves communication outcomes (e.g., increased interactivity, and effectiveness; Song & Hollenbeck, 2015). Our results clearly showed that using emoticons, emoji, or memoji can increase the perception that users are "closer" and "more present" in text-based CMC, converging with past research arguing that emoticons and emoji can add emotional, affective, and contextual cues to text-based communication (Aldunate & González-Ibánez, 2017; Gunawardena & Zittle, 1997; Pfeifer et al., 2022), and help to customize and humanizing communication (Dunlap et al., 2016). For example, humans and chatbots that use (vs. do not use) emoji in text-based messages are evaluated similarly (e.g., both are seen as more socially attractive, and credible), revealing an ability of emoji to also help chatbots in being perceived as social actors (Beattie et al., 2020). Emoji have been found as useful to display closeness (Sampietro, 2019) and including emoji in text-based CMC can even make the user seem more intimate (e.g., emotionally closer; Kim et al., 2022). The way we elicited social presence may be similar (i.e., by including pictorial cues). Therefore, from a communication perspective, perceiving an interlocutor to be more socially present (i.e., being real and invested in the interaction) during an interaction may result in the overall interaction being evaluated as more fruitful. These effects, however, may be bound to the context of interaction (e.g., including emoji when addressing a more serious situation may result in increased negativity; Rodrigues et al., 2017). Regarding the CMC format considered, future studies could further test if these results would be similar in video-based CMC.

Noteworthy, the direct effects of emoji on perceptions of warmth (Study 1) and adequacy (Study 2) remained significant. The absence of a full mediation in both cases raises questions as to which other variables could mediate the impact of pictorial cues on person perception and communication outcomes. Some researchers have argued that one of the ways pictorial cues contribute to perceptions of social presence is through emotional expression (Aldunate & González-Ibánez, 2017; Petrocchi et al., 2020; Tang & Hew, 2020). Future studies could assess if motives to use pictorial cues (e.g., using emoji to express emotions) and/or the perceived emotionality of different cues (e.g., facial emoji may be deemed more emotional than gesture emoji), could impact the association between using them and increasing social presence. Regarding the direct effect of emoji use on perceptions of adequacy, future studies could evaluate if the use of (negative) cues may parallel with adequacy of emotional expression across different contexts (e.g., it may be deemed more adequate to express negative emotions with friends vs. more distant colleagues). Finally, it is also important to highlight that we conducted two studies to determine if our results would remain consistent irrespective of valence, and our results did confirm that. However, it has been previously found that even negative emoji may

increase perceptions of positivity under certain conditions (Rodrigues et al., 2017). For that reason, future studies could assess the perceived positivity of messages and replicate our models with such a construct, as it could emerge as a relevant variable.

Despite our findings, some limitations must be acknowledged. First, we asked participants to evaluate a mockup interaction as third-party viewers, instead of asking them to take the perspective of a receiver, or actually being the receiver. This may distance our scenarios from actual interactions and resulting communication outcomes in CMC, limiting the generalizability of our current findings. However, we are confident in our results as previous studies that followed different methodologies found similar patterns of results (e.g., Petrocchi et al., 2020). Regarding memoji, these are described as avatars (M. Park & Suk, 2022a), and can be designed after the user's appearance, thus being able to represent someone's actual face. In contrast, emoji and emoticons offer limited customizable features. Thus, a potential limiting factor is this confound in how they were interpreted. Specifically, a memoji may be understood as more than simply a cue complementing text-based information (e.g., can serve to portray a specific emotion, but also a user's real face). Future studies could seek to evaluate if the effects of using memoji could change depending on them matching (vs. mismatching) a user's real picture. Considering the three pictorial cues we used (i.e., emoticon, emoji, memoji), the memoji was the one expected to elicit higher perceptions of social presence, given its resemblance to actual human faces and customizable features. In Study 2, we chose to focus on emoji as these are more frequently used than emoticons (e.g., Prada et al., 2018) and arguably than memoji, as they have been created recently (Apple, 2018). However, as avatars are capable of eliciting social presence (Bente et al., 2008), future studies could further explore the potential of memoji in eliciting social presence and consequently contributing to person perception and communication outcomes.

The current study can have theoretical and applied implications. On the one hand, it confirms different pictorial cues (emoticons, emoji, memoji) are capable of eliciting social presence, which then explains positive outcomes on perceptions of important interpersonal and communication dimensions. This is relevant as we expand this field of research and shed light on why cues such as emoji may have a positive impact during communication processes. On the other hand, our findings may also be of importance for applied fields of communication (e.g., marketing), as our results can inform the development of tailored communication strategies (e.g., including cues to elicit social presence and consequently increase an organization or brand presence, when interacting with customers).

6.6. References

Aldunate, N., & González-Ibáñez, R. (2017). An integrated review of emoticons in computer-mediated communication. *Frontiers in Psychology*, 7, 2061. https://doi.org/10.3389/fpsyg.2016.02061

Bai, Q., Dan, Q., Mu, Z., & Yang, M. (2019). A systematic review of emoji: Current research and future perspectives. *Frontiers in Psychology*, *10*, 2221. https://doi.org/10.3389/fpsyg.2019.02221

Beattie, A., Edwards, A. P., & Edwards, C. (2020). A bot and a smile: Interpersonal impressions of chatbots and humans using emoji in computer-mediated communication. *Communication Studies*, *71*(3), 409-427. https://doi.org/10.1080/10510974.2020.1725082

Bente, G., Rüggenberg, S., Krämer, N. C., & Eschenburg, F. (2008). Avatar-mediated networking: increasing social presence and interpersonal trust in net-based collaborations. *Human Communication Research*, *34*(2), 287–318. https://doi.org/10.1111/j.1468-2958.2008.00322.x

Biocca, F., Harms, C., & Burgoon, J. K. (2003). Toward a more robust theory and measure of social presence: Review and suggested criteria. *Presence: Teleoperators and Virtual Environments*, *12*(5), 456–480. https://doi.org/10.1162/105474603322761270

Boutet, I., LeBlanc, M., Chamberland, J. A., & Collin, C. A. (2021). Emojis influence emotional communication, social attributions, and information processing. *Computers in Human Behavior*, *119*, 106722. https://doi.org/10.1016/j.chb.2021.106722

Cuddy, A. J., Fiske, S. T., & Glick, P. (2008). Warmth and competence as universal dimensions of social perception: The stereotype content model and the BIAS map. *Advances in experimental Social Psychology*, *40*, 61-149. https://doi.org/10.1016/S0065-2601(07)00002-0

Dunlap, J. C., Bose, D., Lowenthal, P. R., York, C. S., Atkinson, M., & Murtagh, J. (2016). What sunshine is to flowers. In S. Y. Tettegah, & M. Gartmeier (Eds.), *Emotions, technology, design, and learning* (pp. 163-182). Elsevier. https://doi.org/10.1016/B978-0-12-801856-9.00008-6

Durante, F., Fiske, S. T., Kervyn, N., Cuddy, A. J., Akande, A. D., Adetoun, B. E., ... & Storari, C. C. (2013). Nations' income inequality predicts ambivalence in stereotype content: How societies mind the gap. *British Journal of Social Psychology*, *52*, 726 –746. http://dx.doi.org/10.1111/bjso.12005

Fischer, B., & Herbert, C. (2021). Emoji as affective symbols: affective judgments of emoji, emoticons, and human faces varying in emotional content. *Frontiers in psychology*, 12, 645173. https://doi.org/10.3389/fpsyg.2021.645173

Fiske, S. T., Cuddy, A. J. C., & Glick, P. (2007). Universal dimensions of social cognition: Warmth and competence. *Trends in Cognitive Sciences*, *11*(2), 77–83. https://doi.org/10.1016/j.tics.2006.11.005

Garcia, C., Țurcan, A., Howman, H., & Filik, R. (2022). Emoji as a tool to aid the comprehension of written sarcasm: Evidence from younger and older adults. *Computers in Human Behavior*, *126*, 106971. https://doi.org/10.1016/j.chb.2021.106971

Gunawardena, C. N., & Zittle, F. J. (1997). Social presence as a predictor of satisfaction within a computer-mediated conferencing environment. *American Journal of Distance Education*, *11*(3), 8–26. https://doi.org/10.1080/08923649709526970

Holtgraves, T., & Robinson, C. (2020). Emoji can facilitate recognition of conveyed indirect meaning. *PLOS ONE*, *15*(4), e0232361. https://doi.org/10.1371/journal.pone.0232361

Kaye, L. K., Wall, H. J., & Malone, S. A. (2016). "Turn that frown upside-down": A contextual account of emoticon usage on different virtual platforms. *Computers in Human Behavior*, *60*, 463–467. https://doi.org/10.1016/j.chb.2016.02.088

Kim, M., Knotts, T. L., Albers, N. D., & James, K. E. (2022). Emoji use as a catalyst for relationship building and sustaining attention in online classes: An empirical study. *Education Sciences*, *12*(12), 874. https://doi.org/10.3390/educsci12120874

Konya-Baumbach, E., Biller, M., & Von Janda, S. (2023). Someone out there? A study on the social presence of anthropomorphized chatbots. *Computers in Human Behavior*, *139*, 107513. https://doi.org/10.1016/j.chb.2022.107513

Marder, B., Houghton, D., Erz, A., Harris, L., & Javornik, A. (2020). Smile(y) – and your students will smile with you? The effects of emoticons on impressions, evaluations, and behaviour in staff-to-student communication. *Studies in Higher Education*, *45*(11), 2274–2286. https://doi.org/10.1080/03075079.2019.1602760

Oh, C. S., Bailenson, J. N., & Welch, G. F. (2018). A systematic review of social presence: Definition, antecedents, and implications. *Frontiers in Robotics and AI*, *5*(114), 1–35. https://doi.org/10.3389/frobt.2018.00114

Oleszkiewicz, A., Karwowski, M., Pisanski, K., Sorokowski, P., Sobrado, B., & Sorokowska, A. (2017). Who uses emoticons? Data from 86 702 Facebook users. *Personality and Individual Differences*, *119*, 289–295. https://doi.org/10.1016/j.paid.2017.07.034

Öztok, M., & Kehrwald, B. A. (2017). Social presence reconsidered: Moving beyond, going back, or killing social presence. *Distance Education*, *38*(2), 259–266. https://doi.org/10.1080/01587919.2017.1322456

Park, E. K., & Sundar, S. S. (2015). Can synchronicity and visual modality enhance social presence in mobile messaging? *Computers in Human Behavior*, *45*, 121–128. https://doi.org/10.1016/j.chb.2014.12.001

Park, M., & Suk, H. J. (2022, September). New mobile adaptation system for better avatar-mediated communication; Facial expressions in memoji. In *Adjunct Publication of the 24th International Conference on Human-Computer Interaction with Mobile Devices and Services* (pp. 1-5). https://doi.org/10.1145/3528575.3551437

Park, M., & Suk, H.-J. (2022b). The characteristics of facial emotions expressed in memojis. *Computers in Human Behavior Reports*, *8*, 100241. https://doi.org/10.1016/j.chbr.2022.100241

Petrocchi, S., Marciano, L., Annoni, A. M., & Camerini, A.-L. (2020). "What you say and how you say it" matters: An experimental evidence of the role of synchronicity, modality, and message valence during smartphone-mediated communication. *PLOS ONE*, *15*(9), e0237846. https://doi.org/10.1371/journal.pone.0237846

Pfeifer, V. A., Armstrong, E. L., & Lai, V. T. (2022). Do all facial emojis communicate emotion? The impact of facial emojis on perceived sender emotion and text processing. *Computers in Human Behavior*, 126, 107016.https://doi.org/10.1016/j.chb.2021.107016

Prada, M., Rodrigues, D. L., Garrido, M. V., Lopes, D., Cavalheiro, B., & Gaspar, R. (2018). Motives, frequency and attitudes toward emoji and emoticon use. *Telematics and Informatics*, *35*(7), 1925–1934. https://doi.org/10.1016/j.tele.2018.06.005

Qiu, L., & Benbasat, I. (2005). An investigation into the effects of text-to-speech voice and 3D avatars on the perception of presence and flow of Live Help in electronic commerce. *ACM Transactions on Computer-Human Interaction*, *12*(4), 329–355. https://doi.org/10.1145/1121112.1121113

Rodrigues, D. L., Cavalheiro, B. P., & Prada, M. (2022). Emoji as icebreakers? Emoji can signal distinct intentions in first time online interactions. *Telematics and Informatics*, *69*, 101783. https://doi.org/10.1016/j.tele.2022.101783

Rodrigues, D., Lopes, D., Prada, M., Thompson, D., & Garrido, M. V. (2017). A frown emoji can be worth a thousand words: Perceptions of emoji use in text messages exchanged between romantic partners. *Telematics and Informatics*, *34*(8), 1532–1543. https://doi.org/10.1016/j.tele.2017.07.001

Rodrigues, D., Prada, M., Gaspar, R., Garrido, M. V., & Lopes, D. (2018). Lisbon Emoji and Emoticon Database (LEED): Norms for emoji and emoticons in seven evaluative dimensions. *Behavior Research Methods*, *50*, 392–405. https://doi.org/10.3758/s13428-017-0878-6

Sampietro, A. (2019). Emoji and rapport management in Spanish WhatsApp chats. *Journal of Pragmatics*, *143*, 109–120. https://doi.org/10.1016/j.pragma.2019.02.009

Song, J. H., & Hollenbeck, C. R. (2015). The value of social presence in mobile communications. *The Service Industries Journal*, *35*(11–12), 611–632. https://doi.org/10.1080/02642069.2015.1062880

Suda, M., & Oka, M. (2021, July). Evaluation of the effect of mimicry on facial expression in Avatar-Mediated Communication. In *Artificial Life Conference Proceedings 33* (Vol. 2021, No. 1, p. 48). MIT Press.

Tandyonomanu, D. (2018). Emoji: representations of nonverbal symbols in communication technology. In *IOP Conference series: materials science and engineering* (Vol. 288, No. 1, p. 012052). IOP Publishing. https://doi.org/10.1088/1757-899X/288/1/012052

Tang, Y., & Hew, K. F. (2018). Emoticon, emoji, and sticker use in computer-mediated communications: Understanding its communicative function, impact, user behavior, and motive. In *New Media for Educational Change: Selected Papers from HKAECT 2018 International Conference* (pp. 191-201). Springer. https://doi.org/10.1007/978-981-10-8896-4_16

Tang, Y., & Hew, K. F. (2020). Does mobile instant messaging facilitate social presence in online communication? A two-stage study of higher education students. *International Journal of Educational Technology in Higher Education*, *17*(1), 1-17. https://doi.org/10.1186/s41239-020-00188-0

CHAPTER 7

Concluding Remarks

7. Concluding Remarks

7.1. Summary

The main objective of the present work was to contribute to a better understanding of emoji use as a communication tool and its impact on text-based CMC. First, we identified under which conditions emoji use was deemed more adequate (i.e., contexts of communication, defined by the specific interlocutors and the valence of the messages). Second, we explored which individual characteristics (e.g., age, gender, personality) were more strongly associated with the frequency of emoji use. Third, we examined whether specific communication strategies (i.e., reciprocity in emoji use patterns) determined the impact of emoji use. Lastly, we explored potential mechanisms, namely perceived social presence, that could explain the impact of emoji use on multiple communication outcomes. Across all articles, we used multiple methodologies (correlational and experimental approaches) and a large sample size (overall $N = 2.040$).

In Article 1 (Cavalheiro et al., 2022a), we sought to identify contexts of interaction deemed more adequate for emoji use using an experimental approach. Results showed that using emoji with closer interlocutors (i.e., romantic partners, friends, family members, colleagues) was considered more adequate than using emoji with more distant interlocutors (i.e., brands, organizations or service providers, potential employers and supervisors, or even professors). Results also showed that emoji use was considered less adequate in negative messages when compared to positive messages.

Extending these results, in Article 2 (Cavalheiro et al., 2022b) we adopted a cross-sectional approach and examined perceptions about emoji use by brands in specific communication scenarios. In line with the results from the previous Article, results showed that emoji use by brands is not always considered adequate. Indeed, people considered it more adequate for brands to use emoji when advertising on social media, replying to consumers' social media posts, and announcing new products. In contrast, emoji use was considered less adequate when brands reply to consumers' requests for services or announce the callback of defective products. Informed by previous research (Prada et al., 2018) and partially by results from Article 1 (i.e., specifically regarding the frequency of emoji use), we also examined the potential role of individual characteristics (i.e., age) and behaviors (i.e., frequency of emoji use), as well as views about emoji (e.g., perceived usefulness) for these perceptions. Results showed that being younger, using emoji more frequently, and considering them more useful and formal resulted in more positive perceptions about emoji use by brands.

Building upon the results from the previous Articles, in Article 3 (Cavalheiro et al., 2023) we adopted a cross-sectional approach with the objective of identifying the relative contribution of individual, relational, and motivational variables to emoji use frequency with closer and more distant interlocutors. Not only did we consolidate previous evidence showing the relevance of individual variables (e.g., Prada et al., 2018) and personality traits (e.g., Marko, 2022) for emoji use frequency but we also expanded the literature by including specific relational dimensions and motivations for emoji use. Results showed that being younger, scoring higher on conscientiousness, and using emoji for personal contact motives contributed to using emoji more frequently with closer interlocutors (e.g., friends). In contrast, being older, scoring lower on agreeableness, and perceiving more relational intimacy contributed to using emoji more frequently with more distant interlocutors (e.g., supervisors).

In Article 4 (Cavalheiro et al., in press), we adopted an experimental approach to examine an important dimension of interpersonal communication—accommodating to an interlocutors' communication style by reciprocating emoji use. As suggested by previous studies (e.g., Nexø & Strandell, 2020; Rodrigues et al., 2017), we tested if the impact of emoji use on interpersonal communication outcomes was dependent upon reciprocal emoji use between interlocutors, and if conflict level could determine this impact. Results showed that neither reciprocity of emoji use, nor the level of conflict were determinant for the impact of emoji use on person perception and communication outcomes. Instead, we found that interlocutors were perceived more positively (e.g., warmer, more playful, more positive messages) by merely using emoji. Thus, either reciprocity in this type of scenario and interaction is not as relevant, or the absence or results may be a consequence of our methodological decisions (e.g., we used few emoji and the conversation was short; or the fact participants were observers led them to attribute less importance to reciprocity).

Finally, in Article 5 (Cavalheiro et al., submitted) we adopted an experimental approach and conducted two studies to test if using different pictorial cues had distinct impacts on person perception and communication outcomes, and if perceived social presence was one of the underlying mechanisms for such impact. Results showed that all the tested pictorial cues (emoticons, emoji, memoji) elicited higher perceptions of social presence. Moreover, social presence explained the impact of emoji use on interpersonal dimensions (i.e., perceptions of warmth and competence) and communication outcomes (i.e., message adequacy and efficacy).

From a theoretical perspective, our major contribution is at the level of mapping contexts' adequacy for emoji use. Whereas some of these findings may be expected as they (at least partially) align with previous research on patterns of emoji use (e.g., emoji use is more frequent

with closer interlocutors and in positive contexts; Liu, 2023), Article 1 contributes to the field of cyberpsychology and communication by systematizing evaluations of emoji use across several contexts of interaction, with a wide set of interlocutors and messages of varying valence. Importantly, our work allowed us to identify interlocutors with whom it is more (e.g., individuals typically deemed closer, such as friends, and family members) or less (e.g., individuals usually considered more distant, such as supervisors, or professors) adequate to use emoji. We also contribute with separate ratings for different positive and negative scenarios, which can be used to increase methodological rigor in future studies. These are important contributions as previous research has mostly focused on assessing emoji use with a limited set of interlocutors. At the same time, these contributions highlight that emoji use can have a positive (e.g., perceived as warmer) or negative (e.g., perceived as less competent) impact, depending on the contexts of interaction. For example, people may benefit from being aware of the potential implications when using emoji to communicate with a closer (e.g., colleague) or more distant (e.g., supervisor) interlocutor in a work context. These results also constitute an important contribution to applied fields, such as marketing and other communication-related sciences, as some of the scenarios were specifically related to brand communication and went beyond typical interpersonal relationships. Article 2 expanded on this idea and focused on brand communication scenarios specifically, as brands tend to resort to emoji when communicating online (e.g., Casado-Molina et al., 2019). This article provides important conceptual contributions as they may challenge the current *status quo* of brands frequently using emoji. Indeed, brands and organizations often rely on emoji to communicate with consumers (e.g., to garner their attention; Bai et al., 2019). Recent studies found support for the positive impacts of doing so in terms of overall perceptions (e.g., service perceived as warmer, more competent, more modern; Prada et al., 2022) and also specific behaviors (e.g., emoji use on social media messages increased engagement with the brand; McShane et al., 2021). And yet, emoji use by brands is not straightforward and brands should take into consideration the context or purpose of the messages that include emoji. As indicated by our results, some contexts are more adequate than others, suggesting that brands may benefit from a strategic reflection on how to better integrate emoji (e.g., see Casado-Molina et al., 2019). Otherwise, emoji use by a brand may even lower perceptions of competence, as shown in previous studies (e.g., Li et al., 2018).

Another important theoretical contribution from the current work is the inclusion of multiple individual, relational, and motivational variables as correlates of emoji use frequency. We innovated by systematically assessing the contribution of these dimensions while distinguishing interlocutors. Overall, considering individual characteristics (i.e., age, gender,

and personality) seems to be crucial for an emoji user to successfully address their interlocutors. Relational dimensions, such as perceived intimacy and acceptance, are a novelty in this line of research. These dimensions are particularly interesting as they may relate to the specific interlocutors and contexts of communication. For example, although using emoji with certain interlocutors may be considered less adequate (e.g., supervisor), it may be possible that if an individual is more intimate with that interlocutor, perceptions of adequacy change (e.g., an individual may feel intimacy with a supervisor and, therefore, consider emoji use more adequate). Thus, individual and relational dimensions may shift perspectives regarding emoji use. Regarding Article 4 and our inconclusive evidence regarding the role played by reciprocity of emoji use, there are still important implications. Specifically, we found that emoji use impacted interpersonal evaluations *per se*, contributing to the consolidation of previous findings (e.g., Boutet et al., 2021) regarding the value of emoji use for crucial interpersonal dimensions (i.e., warmth and competence; Cuddy et al., 2008; Fiske et al., 2007). Results from Article 4 also suggest that under certain conditions, such as when a situation may carry a degree of conflict, emoji use may be inadequate or actually irrelevant (e.g., see Rodrigues et al., 2017).

Finally, we sought to identify an explaining mechanism for emoji use impacts on person perception and communication outcomes. Based on previous research, in Article 5 we explored if social presence could be such a mechanism. Indeed, although similar effects had been observed previously (e.g., Park & Sundar, 2015; Petrocchi et al., 2020), our work adds to the literature by expanding these findings to perceptions of warmth and competence, two determinant dimensions of person perception literature (Cuddy et al., 2008; Fiske et al., 2007). Furthermore, we also innovated by including different pictorial cues - emoticons, emoji, and the recently created memoji -, as well as by testing cues of different valence (i.e., negative and positive cues). This article, therefore, has important theoretical contributions. First, we showed that different pictorial cues are equally likely to elicit social presence and, in turn, determine person perception and communication outcomes. Second, as our results were consistent with negatively- and positively-valenced pictorial cues, this was not merely the product of positivity bias. Noteworthy, findings from this article also offer interesting insights for applied domains, including communication professionals (e.g., marketers and community managers), who seek to create connections with their interlocutors through text-based CMC, or engineers and data scientists who seek to increase social presence perceptions of non-human entities (e.g., artificial intelligence, bots).

Overall, emoji use is prolific and common across several contexts, not only among individuals for interpersonal goals but also by brands and organizations for business purposes.

It is usually expected that emoji use has a positive impact on communication outcomes. Still, the current project highlights that such impact may be dependent on contextual features (i.e., interlocutors, message valence) and individuals' characteristics (e.g., demographic information, and motivations for emoji use). Without contemplating such dimensions, emoji use may have derogatory effects, contrary to what is typically expected.

7.2. Limitations and Suggestions for Future Research

Similar to other research projects, some limitations must be acknowledged and discussed. First, it is worth considering our overall methodological approach, as it may have limited the generalizability of our results. When assessing the adequacy of emoji use across different contexts in Article 1, we chose to do so without presenting participants with actual interactions (e.g., depicting an actual interaction between two interlocutors). A similar approach was adopted in Article 2 regarding perceptions of brands using emoji in several contexts. Despite providing a solid basis for future studies to build on, it can be argued that our results are limited due to the lack of contextualization of the communication or interactions. It is possible that each participant envisioned messages with different emoji when asked to make their evaluations. For example, although we categorized romantic partners and friends as closer interlocutors, emoji use patterns may still vary depending on the degree of closeness. Indeed, Thomson et al. (2018) found that individuals use certain emoji more frequently with romantic partners to express love (e.g., ❤️), and others with friends to display humor (e.g., 😂). This suggests that emoji use patterns may differ even among interlocutors categorized similarly. Other interlocutors' characteristics may also play a role in emoji interpretation. Cui et al. (2023) observed that messages can be perceived differently depending on our interlocutors and associated expectations (e.g., we expect a comedian to be more sarcastic than a firefighter, and thus may perceive a message more, or less, sarcastically depending on who sends it). This strengthens the idea that emoji interpretation can be highly dependent on both the context of interaction and the interlocutors. Another dimension worth considering is that emoji have several characteristics (e.g., valence, meaningfulness; Rodrigues et al., 2018). Thus, future studies may benefit from more contextualized materials for a more realistic evaluation of the adequacy of emoji use, or by presenting actual interactions (e.g., data mined from social media platforms), while contemplating both the complexity of social interactions and the complexity of emoji as stimuli.

Another potential methodological limitation was the choice of having participants as third-party viewers, particularly in the studies presented in Articles 1, 4, and 5. Instead of inviting participants to have text-based CMC interactions (e.g., Marko, 2022), we asked participants to observe and evaluate interactions between individuals, without having them participating or imagining to be one of the interlocutors. In actual interactions, individuals are (almost always) interlocutors themselves. It can be argued that participants may be less invested when asked to evaluate an interaction (vs. participating in it) or make overall different evaluations as they are observing instead of being impacted by the messages. These results may limit our capacity to generalize our findings.

Regarding Article 4, we found no support for the hypothesis that reciprocity in emoji use impacts communication outcomes and person perception. The way we portrayed reciprocity made it impossible to disentangle if reciprocity of emoji use contributed, or not, to communication outcomes, or if our methodological decisions limited our understanding regarding the impact of reciprocity. For example, we used different emoji, which may have not been a proper representation of emoji use reciprocity of emoji use between interlocutors. As such, the possible contribution of reciprocity remains unanswered by our work and more research is needed to assess the importance of reciprocating emoji use. Future studies could benefit from inviting participants to have actual conversations (e.g., Coyle & Carmichael, 2019), while also seeking to include similar emoji throughout the interaction (e.g., by giving clear instructions to one of the participants to reciprocate with similar communication style and/or emoji).

Finally, we did not assess how emoji use could impact specific behavioral outcomes. This could have been an interesting avenue to explore, particularly in brand-communication scenarios. At the same time, we explored different scenarios of interaction, but some contexts, such as healthcare communications and adherence to health-related recommendations, would also be worth analyzing given their social relevance. For example, previous research has hinted that emoji could be useful in promoting positive healthcare prevention measures (i.e., raising awareness and educating people about healthy behaviors, such as promoting hand hygiene; Lotfinejad et al., 2020). Considering the documented potential of emoji in promoting specific behaviors in fields closer to marketing (e.g., Prada et al., 2022), one can wonder about its usefulness in a socially relevant context such as healthcare or even education.

7.3. Conclusion

Overall, our findings support that emoji use is highly dependent upon the context of communication. Specifically, this work shows that emoji use may be more adequate in scenarios in which interlocutors are closer to each other (e.g., with friends), and less so when interlocutors are more socially distant (e.g., with doctors). It also establishes the idea that messages of negative valence are less adequate for emoji use. Importantly, we also found that different individual characteristics determine emoji use patterns. This highlights that emoji use effectiveness may not only be bound to the context of interaction but also to our interlocutors and given characteristics. Ultimately, this work also shows that emoji are important pictorial cues that help complement text-based communication, contributing to impression formation (i.e., in terms of warmth, and competence) and communication outcomes (e.g., message efficacy). Noteworthy, the current work also found that pictorial cues, including emoji, are capable of making an interlocutor seem more socially present in text-based CMC. Notably, even negative emoji are capable of eliciting perceptions of social presence and influence person perception and communication dimensions, thus showing the generalizability of our findings across message valence.

Emoji are one of many cues that may be used to complement text-based CMC. And when used, emoji compete with several other sources of information, from the prominent verbal content of a message to simple punctuation. For this reason, the capacity of a single (or a few) emoji to influence person perception dimensions and communication outcomes, as documented in our work, is impressive and highlights the potential of emoji.

7.4. References

Bai, Q., Dan, Q., Mu, Z., & Yang, M. (2019). A systematic review of emoji: Current research and future perspectives. *Frontiers in Psychology, 10*, 2221. https://doi.org/10.3389/fpsyg.2019.02221

Boutet, I., LeBlanc, M., Chamberland, J. A., & Collin, C. A. (2021). Emojis influence emotional communication, social attributions, and information processing. *Computers in Human Behavior, 119*, 106722. https://doi.org/10.1016/j.chb.2021.106722

Casado-Molina, A. M., Rojas-de Gracia, M. M., Alarcón-Urbistondo, P., & Romero-Charneco, M. (2019). Exploring the Opportunities of the Emojis in Brand Communication: The Case of the Beer Industry. *International Journal of Business Communication*, 1–19. https://doi.org/10.1177/2329488419832964

Cavalheiro, B. P., Prada, M., Rodrigues, D. L., Garrido, M. V., & Lopes, D. (2022). With or without emoji? Perceptions about emoji use in different brand-consumer communication contexts. *Human Behavior and Emerging Technologies*, *2022*, 1–8. https://doi.org/10.1155/2022/3036664

Cavalheiro, B. P., Prada, M., Rodrigues, D. L., Lopes, D., & Garrido, M. V. (2022). Evaluating the adequacy of emoji use in positive and negative messages from close and distant senders. Cyberpsychology, Behavior, and Social Networking, 25(3), 194-199. https://doi.org/10.1089/cyber.2021.0157

Cavalheiro, B. P., Rodrigues, D. L., & Prada, M. (2023). Who (and with whom) uses more emoji? Exploring individual, relational, and motivational characteristics driving emoji use. *Telematics and Informatics*, *83*, 102023. https://doi.org/10.1016/j.tele.2023.102023

Coyle, M. A., & Carmichael, C. L. (2019). Perceived responsiveness in text messaging: The role of emoji use. *Computers in Human Behavior*, *99*(2019), 181-189. https://doi.org/10.1016/j.chb.2019.05.023

Cuddy, A. J., Fiske, S. T., & Glick, P. (2008). Warmth and competence as universal dimensions of social perception: The stereotype content model and the BIAS map. *Advances in Experimental Social Psychology, 40*, 61-149. https://doi.org/10.1016/S0065-2601(07)00002-0

Cui, J., Dandan, Y. R., & Jiang, G. (2023). Judging emoji by occupation: A case of emoji-based sarcasm interpretation. *Acta Psychologica*, *234*, 103870. https://doi.org/10.1016/j.actpsy.2023.103870

Fiske, S. T., Cuddy, A. J. C., & Glick, P. (2007). Universal dimensions of social cognition: Warmth and competence. *Trends in Cognitive Sciences, 11*(2), 77–83. https://doi.org/10.1016/j.tics.2006.11.005

Li, X., Chan, K. W., & Kim, S. (2019). Service with emoticons: How customers interpret employee use of emoticons in online service encounters. *Journal of Consumer Research*, *45*(5), 973-987. https://doi.org/10.1093/jcr/ucy016

Liu, M. (2023). Are you really smiling? Display rules for emojis and the relationship between emotion management and psychological well-being. *Frontiers in Psychology*, *14*, 1035742. https://doi.org/10.3389/fpsyg.2023.1035742

Lotfinejad, N., Assadi, R., Aelami, M. H., & Pittet, D. (2020). Emojis in public health and how they might be used for hand hygiene and infection prevention and control. *Antimicrobial Resistance & Infection Control*, *9*, 1-6. https://doi.org/10.1186/s13756-020-0692-2

Marko, K. (2022). "Depends on Who I'm Writing To"— The influence of addressees and personality traits on the use of emoji and emoticons, and related implications for forensic authorship analysis. *Frontiers in Communication*, *7*, 840646. https://doi.org/10.3389/fcomm.2022.840646

McShane, L., Pancer, E., Poole, M., & Deng, Q. (2021). Emoji, playfulness, and brand engagement on twitter. *Journal of Interactive Marketing*, *53*, 96–110. https://doi.org/10.1016/j.intmar.2020.06.002

Nexø, L. A., & Strandell, J. (2020). Testing, filtering, and insinuating: Matching and attunement of emoji use patterns as non-verbal flirting in online dating. *Poetics*, *83*, 101477. https://doi.org/10.1016/j.poetic.2020.101477

Park, E. K., & Sundar, S. S. (2015). Can synchronicity and visual modality enhance social presence in mobile messaging? *Computers in Human Behavior*, *45*, 121–128. https://doi.org/10.1016/j.chb.2014.12.001

Petrocchi, S., Marciano, L., Annoni, A. M., & Camerini, A.-L. (2020). "What you say and how you say it" matters: An experimental evidence of the role of synchronicity, modality, and message valence during smartphone-mediated communication. *PLOS ONE*, *15*(9), e0237846. https://doi.org/10.1371/journal.pone.0237846

Prada, M., Saraiva, M., Cruz, S., Xavier, S., & Rodrigues, D. L. (2022). Using emoji in response to customer reservation requests and service reviews. *Human Behavior and Emerging Technologies*, *2022*, 1–10. https://doi.org/10.1155/2022/1433055

Rodrigues, D., Lopes, D., Prada, M., Thompson, D., & Garrido, M. V. (2017). A frown emoji can be worth a thousand words: Perceptions of emoji use in text messages exchanged between romantic partners. *Telematics and Informatics*, *34*(8), 1532–1543. https://doi.org/10.1016/j.tele.2017.07.001

Rodrigues, D., Prada, M., Gaspar, R., Garrido, M. V., & Lopes, D. (2018). Lisbon Emoji and Emoticon Database (LEED): Norms for emoji and emoticons in seven evaluative dimensions. *Behavior Research Methods*, *50*, 392–405. https://doi.org/10.3758/s13428-017-0878-6

Thomson, S., Kluftinger, E., & Wentland, J. (2018). Are you fluent in sexual emoji?😉: Exploring the use of emoji in romantic and sexual contexts. *The Canadian Journal of Human Sexuality*, *27*(3), 226-234. https://doi.org/10.3138/cjhs.2018-0020

Appendix A

Supplementary Table A1. *Descriptives (M, SD, 95% CI) for emoji evaluation across evaluative dimensions from Article 5.*

	👎		✍️		💪		🤦‍♂️	
Dimension	*M* (*SD*)	[LB, UB]	*M* (*SD*)	[LB, UB]	*M* (*SD*)	[LB, UB]	*M* (*SD*)	[LB, UB]
1.Conflict level	4.37 (1.74)	[3.68, 5.06]	2.30 (1.51)	[1.70, 2.90]	2.15 (1.23)	[1.66, 2.64]	3.59 (1.39)	[3.04, 4.14]
2.Familiarity	5.74 (1.56)	[5.12, 6.36]	3.48 (1.78)	[2.78, 4.19]	5.96 (1.02)	[5.56, 6.37]	5.56 (1.31)	[5.04, 6.07]
3.Clarity	6.26 (1.29)	[5.75, 6.77]	3.74 (1.83)	[3.02, 4.47]	5.37 (1.86)	[4.63, 6.11]	5.11 (1.91)	[4.36, 5.87]
4.Valence	2.26 (1.32)	[1.74, 2.78]	4.67 (0.96)	[4.29, 5.05]	6.04 (1.06)	[5.62, 6.45]	4.00 (1.11)	[3.56, 4.44]
5.Adequacy in work context	3.93 (2.07)	[3.11, 4.75]	4.89 (1.50)	[4.29, 5.48]	4.48 (1.70)	[3.81, 5.15]	3.26 (1.81)	[2.54, 3.98]

Note. Results of an online post-test (n = 27, 59.3% men, 74.1%, M_{Age} = 30.19, SD = 6.83) of emoji evaluation (7-point rating scales; 1= *Low in conflict*, 7 = *High in conflict*; 1= *Not very familiar*, 7= *Very familiar*; 1= *Very ambiguous*, 7= *Very clear*; 1= *Very negative*, 7= *Very positive* 1= *Not very adequate in a work context*, 7= *Very adequate in a work context*). Emoji and evaluative dimensions were presented in random order.LB = Lower Bound of 95% CI; UB = Upper Bound of 95% CI.s