

Research Article

Emoji Use in Computer-Mediated Communication

Emmanouela E. Manganari*

*School of Business Administration, Department of Tourism Administration, Hellenic Open University, Athens, Greece***ARTICLE INFO***Article History*

Received 02 November 2020

Accepted 05 January 2021

*Keywords*Emoji
emoticon
user
reader
demographics
review**ABSTRACT**

The purpose of this paper is to provide a critical review of extant knowledge on emoji use in Computer-Mediated Communication (CMC). A compilation of 46 empirical studies published between 1998 and 2020 are presented as a critical review and in a Summary Table that reports the methodology, sample, key findings, user status and context of use for each paper. The classification of findings is based on user status (i.e. individuals who use emojis vs. individuals who view emojis). Regarding emoji users, extant insights on emojis' functions, popularity and frequency of use, profile of emoji user and condition that favour their use are presented. Then, the effect on emojis in both personal and business contexts are presented. Finally, the paper aims at setting the future research agenda in the area of emoji use in CMC by highlighting areas where results are equivocal, areas with limited research attention and research issues that would enhance our academic knowledge and current business practice.

© 2021 *The Authors*. Published by Atlantis Press International B.V.This is an open access article distributed under the CC BY-NC 4.0 license (<http://creativecommons.org/licenses/by-nc/4.0/>).**1. INTRODUCTION**

The penetration of Computer-Mediated Communication (CMC) along with the absence of affective non-verbal cues, have favoured the use of emoticons and emojis as a simple way to communicate the sender's emotions and enrich online communication [1–3]. A news report states that 74% of Americans regularly use emojis to convey feelings and emotions while the average daily number of emojis used is 96 via text message and social media [4]. It is estimated that daily more than 5 billion emojis are sent on Messenger alone while 90% of Facebook users use emoticons [5,6]. Emojis are commonly used nowadays in Instant Messaging (IM), in social network sites (i.e. Facebook, Instagram, Twitter, etc.), in email communication and in Online Consumer Reviews (OCRs) [7]. Although in the early stages of emoji adoption they were mainly used in informal communication, nowadays individuals use emojis both in formal and informal communication and both in personal and business contexts [8].

An emotion icon is a metacommunicative pictorial representation of a facial expression (i.e. happiness, disappointment, anger, joy, etc.). Originally, emoticons were a composition of special characters and letters, with an implied direction from left to right or vice versa, that communicated a human expression. The text-based emoticons (e.g. “:-)”) or “:-(”) as symbols of happy and unhappy faces accordingly) were later enriched or replaced by emojis which are graphical emoticons (e.g. “😊” or “😞”) as symbols of happy and unhappy faces accordingly).

The two main roles of individuals regarding emoji use are: individuals who use emojis (users) and individuals who receive emojis

(viewers). Extant research supports that the use of emojis has positive effects both for individuals that use them and for those who receive them. Emoji users experience higher enjoyment, social connectedness, usefulness and playfulness [1,9]. On the viewer perspective, emojis enrich communication and the value of advice, transmits positive emotions, and heighten individuals' attention [10–13]. Still, the literature also highlights the potential dark side of emoji use that can lead to lower message credibility and lower perceived employee competence [13,14].

After establishing that emojis do make a difference in CMC and identifying the diverse functions of emojis along with issues that request further research attention, it is very timely and fruitful to concentrate extant research regarding emoji use in CMC in a systematic and structured way. A holistic approach is followed that examines if, why and in which circumstances individuals use emojis but also how emoji viewers respond to them. Thus, the purpose of the current paper is:

- to organize and synthesize research findings regarding emoji use.
- to organize and synthesize research findings regarding emoji effects based on viewers' perceptions.
- to discuss current research trends and fields where no consensus has yet been reached, and
- to identify future research issues that would further advance academic and managerial knowledge.

In the current paper, prior research regarding emoji use in CMC is presented in the “Background Literature” sections and through a Summary Table. A structured, iterative search strategy in academic databases (i.e. ABI Inform, Business Source Complete, Emerald, JSTOR, EBSCOhost and Science Direct) resulted in a significant pool of empirical papers. Papers were then screened

*Email: eam@aueb.gr

based on publication date, publication title, language, relevance, applied methodology and contribution. The two main keyword descriptors (i.e. emoticons and emojis) were used. The Summary Table reports on the methodology, sample, findings/contribution or research findings, participant status and context of emoji use of 46 key studies published between 1996 and 2020. Although the papers may contain multiple research findings, we focus on the main contribution. The papers are classified based on: (a) the status of the participants (i.e. emoji user vs. emoji viewer) and (b) the context of emoji use (i.e. personal vs. business context). Thus, in the last two columns of the Summary Table we identify which of the above two subject areas are addressed in each paper (Table 1).

2. BACKGROUND LITERATURE

Extant research insights are classified in this section based on individual's status. First, we present findings regarding emoji use, followed by the effects of emojis on viewers.

2.1. Emoji Use in Online Communication

In this section we report the findings regarding emoji use in online communication. We have organized extant knowledge in the following five subjects:

- How do emojis function?
- Which emojis are more popular?
- How frequently are emojis used?
- Who is using emojis?
- Which conditions favour emoji use?

2.1.1. How do emojis function?

Emoji use has a positive effect on consumers' enjoyment, perceived information richness, perceived usefulness and playfulness, and social connectedness and Word of Mouth (WOM) intention in the context of IM [1,9]. Emojis are not only fun to use but are further associated with consumer value as they enhance perceived information richness [1]. Still, it is found that emojis' main function is to contextualize or modify an utterance [15].

Emojis are used in order to express emotion, sarcasm, boredom, enhance conversation, flirt, to put emphasis as friendship markers and to reduce the formality of communication [2,16]. More explicitly, emojis underline the senders' positive attitude when placed after a signature, act as a joke/irony after humorous utterances, they strengthen/soften the magnitude of an expressive speech act, while can soften the scale of a directive. Emojis also function as a means of clarifying the message content [17]. Emojis (e.g. smiles, hearts or kisses) are used to make a conversation less formal or even inset a flirtatious tone on social media conversations [18]. Emoji use aids emotional expression (either by establishing a "personal" tone or by communicating a "lighter" and more positive mood), reduces ambiguity [7].

2.1.2. Which emojis are more popular?

A small portion of emojis accounts for a large share of total emoji used [19]. More explicitly, a mere 3.5% of emojis represent more than 99% of all emoji usages on Twitter [19]. In a similar vein, the 15 most popular emoticons account for 99.6% of all emoticons used in Facebook. This may be attributed to the positive effect of perceived familiarity on emoji usage [20]. Emojis are usually inserted before or after complete statements without interrupting the structure of the text [21]. In most cases, emojis are placed after the statements [16].

The emojis most frequently used are the smile and laugh emojis [15,16,21–23]. The top three emojis (happy, sad, and very happy) account for 70% of the total amount of emojis used [24]. Winking emojis are used more by users without a profile picture, while the "LOL" emoji is particularly popular among students [22,25].

In the case of horizontal emojis, the shape of the mouth acts as the main emotional signal, while in vertical emojis the expression of emotion relies mainly on the shape of the eyes [19]. Tongue face, wink face, and ellipsis emojis occurred more frequently with sarcastic than literal comments, frowns occurred more with criticism and smiles with praise [17]. Thus, it seems that emojis are also content specific when they are used to clarify the content [17].

Interestingly, odor emoticons – i.e. an olfactory method to convey emotions during communication – were adopted by users but to a lesser extent compared to visual emoticons [26]. Odor emoticons are easy to use and enhanced user experience only when combined with visual emoticons [26].

2.1.3. How frequently are emojis used?

Other than emoji function and popularity of specific emojis, prior research provides significant insights regarding the frequency of emoji use. The popularity of emojis has evolved over the years. In an early study emoticon use ranged from 0% to 25% depending upon the time period and the source of message [27]. In a study with real communication data, only 4.24% of all messages contained emojis while most users use a single emoji in one message [24]. In the food sector, 24% of food-related tweets included either emoticons or emoji [23].

Emojis are used more frequently in text messages, than email and in social networking sites [7]. Interestingly, although users' self-reports suggest that more emojis are used in text-messages, followed by Facebook and email texts, actual emoji usage was highest on Facebook, followed by email then text messages [28]. In a study with 86,702 Facebook users, 90% of them post emojis [6]. Also, emojis seem to be used more compared to emoticons [23]. It becomes apparent that there are diverse findings regarding the frequency of emoticons, while the context of usage also influences the frequency of use.

2.1.4. Who is using emojis?

Emoticon use maybe dependent on user's profile [27]. Prior research has mainly focused on the effects of user demographic characteristics

Table 1 | Publications about emoji use in online communication in 1996–2020

Citations	Methodology	Sample	Findings/Contribution	Participant status	Context of use
Tompson and Foulger (1996)	Experiment	164 Subjects	The presence of emoticons in not antagonistic messages, reduces perceptions of flaming (i.e. hostile verbal behavior). Emoticons seem to alert readers that a message may be taken less seriously.	Reader	Personal and business
Rezabek and Cochenour (1998)	Content analysis	839 Messages	6.08% (51 out of 839) messages posted contained emojis. The most frequently used emoji was a traditional smiley face.	User	Personal
Derks et al. (2007)	Experiment	157 Secondary school students	Students used more emojis in socio-emotional than in task-oriented social contexts. In negative, task-oriented (socio-emotional) contexts subjects used the least (most) emojis.	User	Personal
Provine et al. (2007)	Field study	226 Website users/1000 emojis	The most commonly used emojis are the “smile” and the “laugh”.	User	Personal
Huang et al. (2008)	Survey	216 students	Emoji use results in enjoyment, personal interaction, perceived information richness, and perceived usefulness.	User	Personal
Cui et al. (2010)	Experiment	152 Students	The presence of emojis in online consumer comments enhances consumers’ perceptions of control, synchronicity, responsiveness and attitude toward the website.	Reader	Business
(Ted) Luor et al. (2010)	Survey and experiments	6000 Message logs generated by 199 employees (1st) and 32 employees (2nd) and 76 employees (3rd exp.)	Negative emojis cause a negative effect in both simplex and complex task-oriented communication. Positive emojis created a positive effect only in complex communication and for female employees in simplex communication. Neutral emojis have no effect on the receivers’ emotion in both simplex and complex task-oriented communication. Gender has no effect on emoji use, though a tendency of female employees is documented.	Reader and user	Business
Pfug (2011)	Content analysis	376 Postings from German and Indian forums	Members of high-context-cultures (i.e. Indians) used more emojis members than low-context cultures (i.e. German), reflecting the higher importance of nonverbal communication in high-context cultures.	User	Personal
Yuasa et al. (2011)	Experiments using fMRI	15 Students (male)	Sentences with an emotive kanji character that contain both verbal and nonverbal information enrich sender-recipient communication.	Reader	Personal
Ganster et al. (2012)	Experiment	127 Participants	The valence of the cue (smiley or emoji) affects the corresponding impression formation. Smiling smilies have a stronger impact on personal mood than smiling emojis.	Reader	Personal
Kim and Gupta (2012)	Experiments	129 (1st exp.) and 138 (2nd exp.) students	Negative emotions in a negative review result in lower perceived reviewer rationality, thereby decrease the review informative value and the negative impact on product evaluations.	Reader	Business
Tossell et al. (2012)	Quasi-experimental approach	21 Students 158,098 text messages	Females sent out almost two times the number of emojis compared to males. Still, males used a more diverse range of emojis. The top three emojis (happy, sad, and very happy) made up 70% of the total amount of emojis sent across all participants.	User and reader	Personal

(Continued)

Table 1 | Publications about emoji use in online communication in 1996–2020—Continued

Citations	Methodology	Sample	Findings/Contribution	Participant status	Context of use
Comesaña et al. (2013)	Masked priming experiment	18 Spanish students	The processing of emojis is privileged relative to the words to which they refer. The effect of priming was observed with negative emojis.	Reader	Personal
Fullwood et al. (2013)	Content analysis	114 Chat room users/441 emojis used	Women are more likely to use emojis compared to men. There is no difference between genders in the variety of emojis used. There is no difference in the overall use of emojis between age groups. Users without a profile picture were more likely to use winking emojis. The “18–29” group used a significantly higher percentage of cheeky emojis than the “40+” group.	User	Personal
Ogletree et al. (2014)	Survey	183 Students	Students used very frequently a “smiley face” and “LOL” compared to other emojis. Students used emojis more frequently than abbreviations, especially vulgar abbreviations. Femininity but not gender, predicted frequency of emoji use.	User	Personal
Parks et al. (2014)	Big data-driven content analysis	1,755,925,520 tweets, 54,981,152 users	People within individualistic cultures favor horizontal and mouth-oriented emoticons like :). People within collectivistic cultures favor vertical and eye-oriented emoticons like ^_^. The 517 most popular emoticons (out of 15,000) account for more than 99% of all emoticon usages.	User	Personal
Skovholt et al. (2014)	Content analysis	1606 e-mail messages from three Nordic companies	Emojis’ main function is to contextualize or modify an utterance, not to indicate emotion. Emojis function as markers of the sender’s positive attitude after a signature, as joke/irony markers following humorous utterances and as strengtheners/softeners after expressive speech acts/ directives. Overall, the traditional smiley, :-) and :) are the most popular.	User	Business
Fullwood et al. (2015)	Experiment	167 participants (volunteers)	The author was considered more emotional stable, but less conscientious and less open, when he/she used textpeak (i.e. emojis etc.).	Reader	Personal and business
Park and Sundar (2015)	3 × 3 factorial experiment	108 students	Participants in high synchronicity and text & emoji conditions felt higher social presence and perceived the Customer Service Agent (CSA) more positively than those in other conditions. Emoji modality had a significant effect on affective social presence, evaluation of the customer service agent and task impression. The weeping emoji, led respondents to infer affective understanding of their situation by the CSA and thereby conveyed “empathy”. Emojis can be powerful conveyors of affective presence by triggering the “social presence heuristic”.	Reader	Business
Brook and Servátka (2016)	Experiment	188 students	The use of emojis can discourage selfish behavior.	Reader	Personal

Table 1 | Publications about emoji use in online communication in 1996–2020—*Continued*

Citations	Methodology	Sample	Findings/Contribution	Participant status	Context of use
Chang (2016)	Discourse analysis	104 peer reviews produced by 13 students	The most popular emoji was the smiley face. Emojis were more often used in positive (80%) than negative (20%) contexts. Emoji use can express affection, reduce the formality of peer response, punctuate sentences, hedge statements or to mark friendship.	User	Business
Kaye et al. (2016)	Online survey	92 students	Emojis are used more in text messages, than email and social networking sites. Email platforms were considered inappropriate for emoji use. Emojis are important emotional aids for communication. Emoji use contributes to personal expression and reduces ambiguity.	User	Personal
Thompson and Filik (2016)	Experiments	51 participants (1st exp.) and 113 participants (2nd exp.)	Emojis contribute to message clarification with sarcastic content. Emoji use was much higher in sarcastic comments than literal comments. Tongue and wink emojis are the principal indicators of sarcastic intent. Ellipsis is associated more with criticism, rather than with sarcasm. No gender effect on overall likelihood of producing an emoji is documented. Emojis with the nose element were unlikely to be used.	User	Personal
Wall et al. (2016)	Experiments	92 students (1st exp.) – 7 observers-378 judgments	Emoji use was reported as more popular in text messages (89.1%), compared to Facebook (76.1%) and email contexts (15.2%). Frequency of actual emoji usage is highest in Facebook, followed by text messages and email texts. Agreeableness is positively related with emoji usage in Facebook. Openness to experience was positively correlated with usage of “other” emojis (e.g. “wink” face), and conscientiousness was marginally negatively related to usage of “sad” emojis. Positive correlations exist between targets’ use of “happy” emojis and observers’ assessments of agreeableness, conscientiousness, and openness.	User and reader	Personal
Ouytsel et al. (2016)	11 focus groups	57 adolescents	Emojis like smileys, hearts or kisses are used to enhance a flirtatious conversation on social media.	User	Personal
Thompson et al. (2016)	Lab experiment	53 participants	Emoji use results in higher arousal, reduced frowning, and enhanced smiling compared to messages without an emoji.	Reader	Personal
Vidal et al. (2016)	Content analysis	12,260 tweets	Overall, a significant proportion of the tweets studied included emoticons or emoji (24.0%). Emoticons and emoji are used in tweets to express mostly positive rather than negative reactions/associations. Emoticons are used to express emotion and not specific situations. Emoji were used more frequently than emoticons (68.1% vs. 30.9%). Emoticons and emojis are rarely used concurrently in a single tweet (1%). The most frequently used emoji was face savouring delicious food. Smiley and happy faces were the most frequently used emoticons.	User	Personal

(Continued)

Table 1 | Publications about emoji use in online communication in 1996–2020—*Continued*

Citations	Methodology	Sample	Findings/Contribution	Participant status	Context of use
Xiang et al. (2016)	Survey and experiment	98 students and 54 students	Odor emoticons -an olfactory method to convey emotions during communication-induce more chatting, help participants perceive and convey emotions and are easy to use but requires guidance the first time. Odor emoticons were perceived less useful than visual emoticons. The addition of odor emotions only when visual emoticons were present enhanced users experience. Participants in the olfactory and visual condition sent 16.44 messages, while those in the visual condition sent 12.91 messages. The most frequently chosen emoticon was happiness and the least chose emoticon was envy.	Reader and user	Personal
Chen and Siu (2017)	In depth interviews and survey	Four interviewees and 347 respondents	Most frequently used emojis: 'happy', 'nothing to say' and 'sad'. Most users used emojis to convey positive rather than negative emotions: 78.39% chose 'happy' emojis when communicating with friends. The findings revealed four key dimensions of emoji use: accuracy, sociability, efficiency and enjoyment.	User	Personal and business
Hsieh and Tseng (2017)	Online survey	201 respondents	Emoji use in text messaging increases information richness, resulting to perceived playfulness and consequently social connectedness and Word of Mouth (WOM) intention.	User	Personal
Lohmann et al. (2017)	Experiment	1745 female participants	Smileys influence readers' emotions through the process of emotional contagion. The negative smiley leads to higher distress and lower joy. Interestingly, the positive smiley leads to lower joy and slightly higher distress.	Reader	Personal
Manganari and Dimara (2017)	Experiment	248 respondents	The presence of emojis in negative reviews strengthens the review credibility and usefulness, but attenuates consumers' attitude toward the hotel and their booking intention.	Reader	Business
McLean and Osei-Frimpong (2017)	Survey	302 respondents	The use of emojis by a service representative can enhance the perception of empathy and satisfaction with the experience.	Reader	Business
Oleszkiewicz et al. (2017a)	Experiment	68 children (4–8 years)	Children can accurately attribute emotions to emojis. This ability develops earlier in girls than boys. Children were most accurate when identifying happiness and sadness. Emotion of disgust and fear were difficult for children to recognize.	Reader	Personal
Oleszkiewicz et al. (2017b)	Online survey and actual Facebook data	86,702 Facebook users	90% of Facebook users use emoticons. The most popular 15 emoticons account for 99.6% of all emoticons used. The frequency of emoticon usage was predicted mainly by demographic characteristics (i.e. age and gender). Psychographic characteristics predict a very small percentage of emoticon use.	User	Personal
Rodrigues et al. (2017)	Two experiments	232 (1st exp.) and 219 (2nd exp.) participants	The use of emojis in positive messages has an impact. In the case of negative messages, the use of a sad emoji reinforces feelings of being hurt by the partner and leads to the perception of greater interest in the relationship.	Reader	Personal

Table 1 | Publications about emoji use in online communication in 1996–2020—*Continued*

Citations	Methodology	Sample	Findings/Contribution	Participant status	Context of use
Riordan (2017)	Experiment	1502 participants	Non-face emojis can fulfill two of the same roles as face emojis i.e. disambiguated messages and communicate affect to the reader. The extent to which an emoji transmits affect is related to how much it disambiguates a message.	Reader	Personal
Duan et al. (2018)	Lab experiment	42 students (1st exp.) and 126 students (2nd exp.)	Advice containing emojis is more likely to be adopted than advice without emojis especially when consumer engage in more peripheral, low effort decision-making. Individuals are more likely to use advice with emojis in low involvement situations and when they have a low need for cognition, rather than a high need for cognition.	Reader	Personal
dos Reis et al. (2018)	Experiment	164 students	Intentional, designed with user participation, can be more representative in certain contexts compared to emoticons selected by designers.	Reader	Personal
Prada et al. (2018)	Survey	474 participants	Overall, participants reported using emoji (vs. emoticons) more often. Use attitudes are more positive toward emoji compared to emoticons. Young users use emojis more than older users, but no ages differences are reported for emoticon use. Ratings were higher among younger participants.	User	Personal
Willoughby and Liu (2018)	Experiment	426 students	The use of many emojis in mobile messages results in higher attention compared to the low-emoji and the no-emoji conditions. Messages without emojis were perceived more credible and resulted in more processing compared to messages with emojis (low or high emoji condition). Low emojis condition results in perceptions of higher personalization.	Reader	Personal
Li et al. (2019)	Lab and field experiments	118 students, 3000 students, 509 Participants, 909 real online shoppers	Customers perceive service employees who use emojis as warmer but less competent compared to those who do not use emojis.	Reader	Business
Tseng and Hsieh (2019)	Online survey	202 respondents	Both the utilitarian (emoji familiarity and perceived synchronicity) and the self-concept route (self-image congruity between emojis and individuals) determine individual's emoji usage, which in turn influences WOM intention and perceived enjoyment of emoji use.	User	Personal
Coyle and Carmichael (2019)	Lab experiment	179 students	More participants used emojis when the responder used emojis. Emojis are used in order to express emotion, sarcasm, boredom, enhance conversation, flirt or to put emphasis. In positive event interactions, convergence in emoji use affects participants' ratings of responsiveness and their impression of the respondent.	Reader and user	Personal
Jones et al. (2020)	Experiment	299 female students	Neutral and negative emojis were perceived as more negative by females compared to males. No gender differences are found for positive emojis. Females experienced higher familiarity with the smiley emojis compared to males.	Reader	Personal
Robus et al. (2020)	Experiment	41 participants	Emojis positioned at the end of the sentence (sentence-final) lead to longer reading time.	Reader	Personal

in segmenting emoticon users. Most insights report differences in emoji use based on gender and age [6]. More explicitly, females tend to use more emojis compared to males [24,25]. Males use a wider variety of emojis compared to females [24]. Still, other studies found no gender effects in the variety of emojis used [17,25]. Femininity but not gender predicts frequency of emoji use [22]. Although there is no significant difference between female and male in using emojis in IM in a business context, female participants exhibited a tendency toward using emojis more compared to males [29].

Although there are no age differences regarding the overall use of emojis, young consumers (i.e. the 18–29 age group) use a significantly higher percentage of cheeky emojis compared to users aged more than 40 years [3,25].

The individualism–collectivism and the femininity–masculinity dimensions of national culture has predicting power regarding emoji use [19]. In a comparison between German and Indian users it was found that the later used more emojis indicating that members of high-context-cultures value more nonverbal communication [30]. In collectivistic cultures vertical emoticons are favored while in individualistic cultures horizontal emoticons are more popular [19]. Users' psychological traits have an effect on emoticon usage [28], and this effect may be different depending on the online platform. Other findings challenge the power of psychographic characteristics in explaining emoji use [6]. Finally, superiors may use emojis to appear less authoritative, thus emojis act as solidarity markers [15].

2.1.5. Which conditions favour emoji use?

Overall, emojis are mainly used to communicate positive rather than negative reactions [16,23]. In positive (negative) context consumers use positive (negative) emojis while there is no difference in the number of emoji used between positive and negative contexts [31]. Overall, consumers used less emojis in negative task-oriented contexts [31]. Finally, consumers use more emojis in socio-emotional compared to task-oriented social contexts [31] in accordance with findings that supported that emojis used maybe dependent on the communication formality level [27].

Emoji use is affected both by utilitarian and self-concept aspects [20]. That is, consumers' familiarity with an emoji and perceived synchronicity of emojis shapes emoji usages but also perceived psychological ownership of emojis enhances their use [20]. Emoji accuracy, sociability, efficiency and enjoyment are the key dimensions that users highly value [32]. Convergence between sender and receiver emoji use in a positive event interaction leads to a more positive evaluation of the level of responsiveness and the overall responder impression [2]. Emoji are also more likely to be used in order to facilitate understanding in sarcastic comments than literal ones [17].

2.2. Emoji Viewing in Online Communication

In this section we present insights about readers perception regarding emojis. Elaborating on the research knowledge we have organized the findings in two major sections:

- (a) Perceptions about emojis viewed in a personal context. In this sub-section the subjects addressed are:
- Which are the effects of emoji viewing?

- What do readers infer about the writer based on the emojis used?
- What do readers infer based on emoji valence or message valence?

(b) Perceptions about emoticons viewed in a business context. In this sub-section the subjects addressed are:

- The effect of the valence of emojis
- The effect of emojis in OCRs

Research findings presented below highlight the positive but also the negative aspects of emoji use in diverse contexts and target audiences.

2.2.1. Perceptions about emoji viewed in a personal context

2.2.1.1. Which are the effects of emoji viewing?

The presence of emojis enriches online communication, disambiguates the message, leads to higher arousal, positive emotions, smiling and reduced frowning, results in higher attention to the message, signals interest in romantic partners' relationship, while it can discourage selfish behavior [11–13,33–35]. When emojis are placed in a final-sentence position, they lead to longer reading time [36]. In the context of advice taking, the presence of emojis enhances the value of advice especially in the case of low involvement and low need for cognition [10]. Interestingly emojis are more effectively processed by individuals compared to the words they represent [37].

Interestingly, emotion is conveyed with emoji use also to young children. Children between 4 and 8 years old can accurately attribute emotions to emojis [38]. Happiness and sadness were easier to be conveyed to children through emojis while girls seem to develop this ability earlier compared to boys.

Two other forms of emojis are presented in the literature along with their effects on readers. Intentional emojis are a set of emojis designed with user participation [39]. Intentional emojis can be more representative in certain contexts compared to emojis [39]. A prototype system—Olfacticon—that emits odor emoticons was developed [26]. Odor emoticons were examined in online text chatting and voice mail receiving. Results showed that odor emoticons are useful but less useful compared to visual emoticon [26]. The addition of odor emoticon on top of visual emoticons enhances users experience [26].

Emojis can convey emoticon and enrich communication but may also have negative effects. The presence of emojis results in lower message credibility and less processing compared to the absence of emojis [13]. The authors further support that the presence of a few emojis leads to the maximum perceived personalization compared to the presence of many or no emojis in a message.

2.2.1.2. Inferences for the personality of the writer

The extent to which a reader can form an accurate perception based on “chat” data from Facebook profiles was examined. Results support that extraversion and openness are highly associated with accurate judgments about the user [28]. Readers perceive that the

author of a message is more emotional stable, but less conscientious and less open, when he/she uses emojis [40]. The writer was perceived to be more extrovert when using a positive cue than when using a negative or no cue [41]. Overall, convergence in emoji use between two confederates results in more positive perceptions for the confederate [2].

2.2.1.3. Inferences based on emoji valence or message valence

Readers perceive a message supplemented with positive emoji as more positive and with more humor compared to a message with a negative emoji [41]. Still, positive smileys failed to enhance the level of perceived joy in a sample of female participants [42]. In support of the negativity bias, females tend to evaluate neutral and negative emojis more negatively compared to males [43]. A study with female participants further supports the higher emotional changes attributed to negative smileys [42].

The presence of emojis in a negative message between romantic partners through IM signalled greater interest in the relationship [34]. This effect was not evident in positive replies between romantic partners. Also, in positively interactions, convergence in emoji use between respondents affects ratings of responsiveness and their impression of the responder [2].

2.2.2. Perceptions about emojis viewed in a business context

In business contexts or formal communication, the use of emojis results in warmth, perceived empathy and enhanced social presence but also lower competence attributions [44,45,14]. That is, customers perceive that service employees who use emoji are warmer but also less competent [14]. Although it is found that emoji use may lead to higher customer satisfaction other findings support the that lower perceived competence of the service employees that use emojis leads to lower service satisfaction [14,45]. The use of the smiley face and the weeping emojis by the service employee lead respondents to feel higher empathy [44].

2.2.2.1. The effect of the valence of emoticons

The effect of emoji use in IM communication was examined in the workplace [29]. Negative emojis increase negative emotions in both simplex and complex IM communication, while positive emojis have a positive effect only in complex communication. Positive emojis in simple communication have an effect only in female recipients [29]. The greater relative impact of negative emojis compared to positive ones was further supported [37].

2.2.2.2 The effect of emojis in online consume reviews

The presence of emojis in online consumer reviews enhances consumers' perceptions of control, synchronicity, responsiveness and attitude toward the website [46]. Interestingly, the presence emojis may alert readers to consider a review as less solid [47]. Although emotional expression does not affect the power when inserted in

positive reviews, they lessen the power of negative reviews as readers consider the review less rational [48]. Contrary, the presence of emojis in negative reviews strengthens the review credibility and usefulness but attenuates consumers' attitude and booking intention [8].

3. CONCLUSION AND MANAGERIAL IMPLICATIONS

The current status of research about emoji use in CMC provides important insights demonstrating diverse motives for emoji use. Emojis are used to express emotions, to put emphasis, to make the communication more informal, to reduce ambiguity, to communicate the sender's mood, to mark friendship, to discourage selfish behavior, to flirt, to express boredom or sarcasm etc. [2,15–17,35]. Three emojis (i.e. happy, sad, and very happy) account for 70% of the total amount of emojis used [24]. The most frequently used emoji is the smiley face [21,27,32]. This implies that there are several emojis that are rarely or almost never used. At the same time, new forms of emojis or other pictorial representation (i.e. stickers, emoticons, and odor emoticons) emerge that aim at enhancing user experience [26].

Another very interesting issue that emerged from this review is the divergence identified between individuals reported and actual emoji use. That is, individuals reported using emojis more in IM but emoticon use was higher in Facebook when their actual use was captured [28]. This raises an issue regarding the ability of individuals to self-report emoji use and the methodological tools used by researchers to examine emoji use.

The penetration and impact of OCRs, acted as a springboard for research attention in the effects of emoji use in OCRs [8]. Extant research provides ambivalent insights regarding the effects of emojis in OCRs documenting both positive and negative effects [8,46,48]. In the case of negative emojis in negative OCRs research findings are contradicting, supporting both that emojis act as consumer safeguards by strengthening the review credibility and usefulness [8] and that emojis attenuate the reviewer credibility and the informative value of the review [48].

Extant insights about emoji use in CMC can be used to develop some guidelines for practitioners. First, the availability of emojis and easy access to their use is important to allow or facilitate the communication of emotion for both users and readers. Regarding emoji users, practitioners can focus on making available to them the most popular emojis (i.e. happy, sad, and very happy), test the effectiveness of emerging forms of emojis or pictorial symbols (e.g. emoticons, etc.) and probably eliminate emojis that are not at all or rarely used. As depicted from our study, most papers focus on emoji use in personal and not business contexts. One may assume that in actual practice, emoticons are also more frequently used in personal rather than business communication. Elaborating on the fact that emojis make a difference also in business settings, the provision of a comprehensive list of emojis is likely to enhance the users' and the readers' experience. Elaborating on the negative effects that of emoji use by employees, managers should encourage a focused and carefully designed use of emojis. Finally, the field of OCRs also deserves managers' attention as online users are nowadays heavily involved as content co-creators and possess an unprecedented power in affecting other consumers' decision making [8].

4. FUTURE RESEARCH

To date, research evidence regarding emoji use in CMC is quite comprehensive providing insights regarding both users and viewers but can be considered also inconclusive or scarce in some other areas of interest. The research challenge today lies in pursuing a deeper understanding of emoji use in CMC and on resolving ambiguity in regard to specific issues. The literature is conclusive regarding individuals' propensity to use emojis to convey positive emotions [21,31]. Although several researchers support that emojis communicate emotion, Skovholt et al. [15] claim that emojis are a means of contextualizing or modifying an utterance, not to indicate emotion. This finding is counterintuitive and deserves further research attention as it challenges one of the core functions of emoji use as documented in several research findings. Elaborating on the several and even divergent functions of emoticons use, it would be interesting to link the purpose of using emojis with specific individual profiles (i.e. demographic, psychographic characteristics) and specific context of communication.

From this literature review, it becomes apparent that a very small number of emojis accounts for the majority of emoticons used [6,19]. This raises a question regarding the need for a reconsideration of the list of emojis based on users' preferences. This reconsideration may also capture and address cross-cultural differences [19,30]. Future research should also encompass emerging forms of emojis that may prevail in the future along with managers' perceptions and attitudes toward emoji provision in CMC. Elaborating on the great customization capabilities in CMC this may enhance emoji value.

Elaborating on the findings regarding the effects of emojis use in OCRs, further research can focus on the valence of the message and under which conditions and for which individuals emojis (e.g. demographic, psychographic and behavioural profile) have an effect. Thus, further research should enhance our understanding regarding the effect of emojis both in positive and negative OCRs. This has important carry-over implications in several online business sectors that heavily rely on OCRs (i.e. tourism and hospitality; electronic appliances; fashion, service providers, etc.).

One can note in the Summary Table that most papers focus on emoji use in personal contexts, while there is growing interest in their effects in business interactions. Although emoji use by a service representative leads to higher satisfaction [45], emoji use was also associated emoji use with lower employee competence and customer satisfaction [14]. Thus, one lingering question is in what type of business communications, under which conditions and toward which recipients are emojis effective and when can this effect backfire? To conclude, emoji use is not a new but is a current and growing trend that makes a difference in online communication. Thus, further research attention can contribute to the maximization of emoji value.

CONFLICTS OF INTEREST

The author declares no conflicts of interest.

REFERENCES

- [1] A.H. Huang, D.C. Yen, X. Zhang, Exploring the potential effects of emoticons, *Inform. Manage.* 45 (2008), 466–473.
- [2] M.A. Coyle, C.L. Carmichael, Perceived responsiveness in text messaging: the role of emoji use, *Comput. Human Behav.* 99 (2019), 181–189.
- [3] M. Prada, D. Rodrigues, M.V. Garrido, D. Lopes, B. Cavalheiro, R. Gaspar, Motives, frequency and attitudes toward emoji and emoticon use, *Telemat. Inform.* 35 (2018), 1925–1934.
- [4] C. Seiter, The psychology of emojis. 2015. Retrieved from: <http://thenextweb.com/insider/2015/06/23/the-psychology-of-emojis/>.
- [5] Emoji Pedia Blog. 5 Billion Emojis Sent Daily on Messenger. 2017. Available from: <https://blog.emojipedia.org/5-billion-emojis-sent-daily-on-messenger/>. (accessed January, 2021).
- [6] A. Oleszkiewicz, M. Karwowski, K. Pisanski, P. Sorokowski, B. Sobrado, A. Sorokowska, Who uses emoticons? Data from 86 702 Facebook users, *Personal. Individ. Diff.* 119 (2017b), 289–295.
- [7] L.K. Kaye, H.J. Wall, S.A. Malone, “Turn that frown upside-down”: a contextual account of emoticon usage on different virtual platforms, *Comput. Human Behav.* 60 (2016), 463–467.
- [8] E.E. Manganari, E. Dimara, Enhancing the impact of online hotel reviews through the use of emoticons, *Behav. Inform. Technol.* 36 (2017), 674–686.
- [9] S.H. Hsieh, T.H. Tseng, Playfulness in mobile instant messaging: examining the influence of emoticons and text messaging on social interaction, *Comput. Human Behav.* 69 (2017), 405–414.
- [10] J. Duan, X. Xia, L.M. Van Swol, Emoticons' influence on advice taking, *Comput. Human Behav.* 79 (2018), 53–58.
- [11] D. Thompson, I.G. Mackenzie, H. Leuthold, R. Filik, Emotional responses to irony and emoticons in written language: evidence from EDA and facial EMG, *Psychophysiology* 53 (2016), 1054–1062.
- [12] M. Yuasa, K. Saito, N. Mukawa, Brain activity when reading sentences and emoticons: an fMRI study of verbal and nonverbal communication, *Electron. Commun. Japan* 94 (2011), 17–24.
- [13] J.F. Willoughby, S. Liu, Do pictures help tell the story? An experimental test of narrative and emojis in a health text message intervention, *Comput. Human Behav.* 79 (2018), 75–82.
- [14] X. (Shirley) Li, K.W. Chan, S. Kim, Service with emoticons: how customers interpret employee use of emoticons in online service encounters, *J. Consum. Res.* 45 (2019), 973–987.
- [15] K. Skovholt, A. Grønning, A. Kankaanranta, The communicative functions of emoticons in workplace e-mails : :-), *J. Comput. Med. Commun.* 19 (2014), 780–797.
- [16] C.Yh. Chang, EFL reviewers' emoticon use in asynchronous computer-mediated peer response, *Comput. Compos.* 40 (2017), 1–18.
- [17] D. Thompson, R. Filik, Sarcasm in written communication: emoticons are efficient markers of intention, *J. Comput. Med. Commun.* 21 (2016), 105–120.
- [18] J. Van Ouytsel, E. Van Gool, M. Walrave, K. Ponnet, E. Peeters, Exploring the role of social networking sites within adolescent romantic relationships and dating experiences, *Comput. Human Behav.* 55 (2016), 76–86.
- [19] J. Park, Y.M. Baek, M. Cha, Cross-cultural comparison of nonverbal cues in emoticons on twitter: evidence from big data analysis, *J. Commun.* 64 (2014), 333–354.
- [20] T.H. Tseng, S.H. Hsieh, Determinants of emoticon usage in mobile instant messaging: a construal level theory perspective, *Behav. Inform. Technol.* 38 (2019), 289–301.
- [21] R.R. Provine, R.J. Spencer, D.L. Mandell, Emotional expression online: emoticons punctuate website text messages, *J. Lang. Soc. Psychol.* 26 (2007), 299–307.
- [22] S.M. Ogletree, J. Fancher, S. Gill, Gender and texting: masculinity, femininity, and gender role ideology, *Comput. Human Behav.* 37 (2014), 49–55.
- [23] L. Vidal, G. Ares, S.R. Jaeger, Use of emoticon and emoji in tweets for food-related emotional expression, *Food Qual. Prefer.* 49 (2016), 119–128.

- [24] C.C. Tossell, P. Kortum, C. Shepard, L.H. Barg-Walkow, A. Rahmati, L. Zhong, A longitudinal study of emoticon use in text messaging from smartphones, *Comput. Human Behav.* 28 (2012), 659–663.
- [25] C. Fullwood, L.J. Orchard, S.A. Floyd, Emoticon convergence in internet chat rooms, *Soc. Sem.* 23 (2013), 648–662.
- [26] W. Xiang, S. Chen, L. Sun, S. Cheng, V. Michael Bove, Odor emoticon: an olfactory application that conveys emotions, *Int. J. Human Comput. Stud.* 91 (2016), 52–61.
- [27] L. Rezabek, J. Cochenour, Visual cues in computer-mediated communication: supplementing text with emoticons, *J. Vis. Lit.* 18 (1998), 201–215.
- [28] H.J. Wall, L.K. Kaye, S.A. Malone, An exploration of psychological factors on emoticon usage and implications for judgement accuracy, *Comput. Human Behav.* 62 (2016), 70–78.
- [29] T. (Ted) Luor, L.I. Wu, H.P. Lu, Y.H. Tao, The effect of emoticons in simplex and complex task-oriented communication: An empirical study of instant messaging, *Comput. Human Behav.* 26 (2010), 889–895.
- [30] J. Pflug, Contextuality and computer-mediated communication: a cross cultural comparison, *Comput. Human Behav.* 27 (2011), 131–137.
- [31] D. Derks, A.E.R. Bos, J. von Grumbkow, Emoticons and online message interpretation, *Soc. Sci. Comput. Rev.* 26 (2008), 379–388.
- [32] X. Chen, K.W.M. Siu, Exploring user behaviour of emoticon use among Chinese youth, *Behav. Inform. Technol.* 36 (2017), 637–649.
- [33] M.A. Riordan, The communicative role of non-face emojis: affect and disambiguation, *Comput. Human Behav.* 76 (2017), 75–86.
- [34] D. Rodrigues, D. Lopes, M. Prada, D. Thompson, M.V. Garrido, A frown emoji can be worth a thousand words: perceptions of emoji use in text messages exchanged between romantic partners, *Telemat. Inform.* 34 (2017), 1532–1543.
- [35] R. Brook, M. Servátka, The anticipatory effect of nonverbal communication, *Econ. Lett.* 144 (2016), 45–48.
- [36] C.M. Robus, C.J. Hand, R. Filik, M. Pitchford, Investigating effects of emoji on neutral narrative text: Evidence from eye movements and perceived emotional valence, *Comput. Human Behav.* 109 (2020), 106361.
- [37] M. Comesaña, A.P. Soares, M. Perea, A.P. Piñeiro, I. Fraga, A. Pinheiro, ERP correlates of masked affective priming with emoticons, *Comput. Human Behav.* 29 (2013), 588–595.
- [38] A. Oleszkiewicz, T. Frackowiak, A. Sorokowska, P. Sorokowski, Children can accurately recognize facial emotions from emoticons, *Comput. Human Behav.* 76 (2017a), 372–377.
- [39] J.C. dos Reis, R. Bonacin, H.H. Hornung, M.C.C. Baranauskas, Intentional selection of emoticons for communication of intentions, *Comput. Human Behav.* 85 (2018), 146–162.
- [40] C. Fullwood, S. Quinn, J. Chen-Wilson, D. Chadwick, K. Reynolds, Put on a smiley face: textspeak and personality perceptions, *Cyberpsychol. Behav. Soc. Netw.* 18 (2015), 147–151.
- [41] T. Ganster, S.C. Eimler, N.C. Kramer, Same same but different!? The differential influence of smilies and emoticons on person perception, *Cyberpsychol. Behav. Soc. Netw.* 15 (2012), 226–230.
- [42] K. Lohmann, S.S. Pyka, C. Zanger, The effects of smileys on receivers' emotions, *J. Consum. Market.* 34 (2017), 489–495.
- [43] L.L. Jones, L.H. Wurm, G.A. Norville, K.L. Mullins, Sex differences in emoji use, familiarity, and valence, *Comput. Human Behav.* 108 (2020), 106305.
- [44] E.K. Park, S.S. Sundar, Can synchronicity and visual modality enhance social presence in mobile messaging?, *Comput. Human Behav.* 45 (2015), 121–128.
- [45] G. McLean, K. Osei-Frimpong, Examining satisfaction with the experience during a live chat service encounter—implications for website providers, *Comput. Human Behav.* 76 (2017), 494–508.
- [46] N. Cui, T. Wang, S. Xu, The Influence of social presence on consumers' perceptions of the interactivity of web sites, *J. Interact. Advert.* 11 (2010), 36–49.
- [47] P.A. Tompsen, D.A. Foulger, Effects of pictographs and quoting on flaming in electronic mail, *Comput. Human Behav.* 12 (1996), 225–243.
- [48] J. Kim, P. Gupta, Emotional expressions in online user reviews: how they influence consumers' product evaluations, *J. Bus. Res.* 65 (2012), 985–992.