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Digitally saving face: An experimental investigation of cross-cultural differences in the use of emoticons and emoji

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ABSTRACT

Across three experiments we examined cross-cultural differences in the use of emoticons (Experiment 1) and emoji (Experiments 2 and 3) when sending text messages. In all experiments, participants wrote text messages to another person based on different hypothetical situations (varying in valence or face-threat). We assume that digital CMC cues can serve a face-management function. Hence, based on the assumption that East Asians, relative to Americans, tend to be more concerned with face-management, we expected East Asians to use more emoji and emoticons than Americans, especially in threatening situations. Our results supported our hypotheses: East Asians used significantly more CMC cues overall, and displayed greater situational sensitivity (i.e., used more situationally-congruent CMC cues). Moreover, there were significant, positive correlations between emoji use and scores on collectivism and interdependent self-construal. The preference for emoji use by East Asians does not appear to be a function of poorer English language proficiency; in Experiment 3 there was a significant positive correlation between ESL proficiency and emoji use. We discuss these findings in the context of past cross-cultural communication research as well as politeness theory and face-negotiation theory.

1. Digitally saving face: cross-cultural differences in the use of emoticons and emoji

In face-to-face (FtF) communication, there are a range of paralinguistic and gestural features that can facilitate recognition of a speaker's intended meaning and facilitate repair sequences when miscommunication occurs. But how do these features manifest in communication settings where the speakers are not in immediate proximity of each other? Research surrounding one such form of communication, computer-mediated communication (CMC), has attempted to answer these types of questions by examining people's usage of CMC cues, such as emoticons and emoji, in digital communication (e.g., Derks et al., 2008b; Lo, 2008; Sampietro, 2019). Although this area of research has been fruitful in providing insight into how the usage of CMC cues in CMC mirrors communication behavior in FtF communication, relatively little empirical attention has been given to the pragmatics of CMC cue use and how their usage might differ across cultures (for exceptions, see Cheng, 2017; Pflug,

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2011). Like all types of behavior, communication behavior is largely a byproduct of one's cultural upbringing (Gudykunst et al., 1996). Given the ubiquity of CMC cues in electronic communication, we believe examining how cultures differ in their usage of them in CMC is warranted. Thus, in this research we examined cultural differences in the use of emoticons and emoji in text-based CMC, as well as what contexts and psychological variables underlie such differences.

2. Emoticon and emoji

Emoticons are text-based representations of faces in text-based CMC. These faces are derived from a specific combination of keyboard characters that usually resemble various emotional facial expressions (though there are non-face emoticons, such as <3). For example, ':)' represents a happy, smiling face, whereas ':(' represents a sad, frowning face. Similarly, kaomoji are a unique style of emoticon which are particularly popular in Japan. Compared to more traditional emoticons, kaomoji are more complex in their design and are often comprised of a wider array of characters (e.g., (◕‿◕) represents a joyful face). Relative to emoticons, emoji are similar in their functionality (Riordan, 2017), but are more nuanced in their design. This is because, unlike emoticons, emoji are pictographs designed by the Unicode Consortium. Hence, what an emoji can look like is not limited to the characters on a keyboard, but instead can depict a myriad of different facial expressions with varying levels of detail (e.g., sweat rolling down one's face, reddened cheeks). Additionally, emoji are not just limited to faces; emoji exist resembling an array of different objects (e.g., national flags, vehicles, food), animals, hand gestures (e.g., thumbs up), and behaviors (e.g., dancing, running).

Some researchers argue that the primary function of emoticons and emoji is to convey affective meaning. That is, they are used in the absence of nonverbal cues (e.g., facial expressions) in order to convey emotions like one would do in a FtF context (Derks et al., 2008b; Lo, 2008; Pflug, 2011; Sarkar et al., 2017). For example, Derks et al. (2008a) found that when participants rated messages that included emoticons, they rated the emotional intensity of those messages as stronger than messages that did not include emoticons. They also found that emoticons strengthen the valence of a message when the valence of the message and the valence of the emoticon are congruent. For instance, messages with positively valenced text and a positively valenced emoticon were rated more positively than messages with positively valenced text and a negatively valenced emoticon. Participants who rated messages with mixed valenced text and emoticons rated the messages more neutrally, but the rating tended to be toward the valence of the text (e.g., if the message contained positively valenced text with a negatively valenced emoticon, the message would be rated positively). More recently, Boutet et al. (2021) found similar effects of emoji's influence on information processing; processing speed and understanding of messages was augmented when the valence of the message's text and emoji were congruent.

Other scholars have argued that emoticons cannot simply be equated with emotions (e.g., Albert, 2020), and that they in fact serve multiple (often pragmatic) functions such as helping to disambiguate the sender's intention, and structuring or partitioning complex utterances (Dresner & Herring, 2010). For example, Thompson and Filik (2016) asked participants to attempt to make their intentions clear in a texting situation and provided them with the option of including emoticons in their texts. Participants were more likely to use emoticons when their intent was to be sarcastic rather than to be literal. In a related study examining perceptions of messages, Filik et al. (2016) found that when the intended meaning of a message was ambiguous, the inclusion of an emoticon (wink emoticon) increased the likelihood of an intended sarcastic intent being recognized. More recently, Holtgraves and Robinson (2020) demonstrated that in certain contexts, emoji can facilitate the recognition of conveyed indirect meaning.

In sum, it has been established that CMC cues such as emoticon and emoji serve a variety of functions in CMC. However, little empirical attention has been given to discerning whether the aforementioned motivations for including CMC cues in digital messages are consistent across cultures. Given cultures differ in norms surrounding interpersonal communication, we believe there is theoretical value in examining whether differential patterns of CMC cue use emerge cross-culturally, as well as identifying the underlying motivations for such differences.

3. Cultural differences in communication

Past cross-cultural research has identified numerous ways in which communication varies as a function of culture (Gudykunst et al., 1996; Park & Kim, 2008). For example, Hall (1976) proposed that cultures differ in the amount of contextual information that they utilize when communicating. High-context communication is communication that heavily relies on contextual information to communicate messages. In other words, high-context communication is indirect, and places more emphasis on paralanguage and other nonverbal cues to convey meaning. In contrast, low-context communication is more direct, language dependent communication, wherein explicit, spoken word carries most of the meaning. In other words, the majority of communication in these cultures is based on what is being said verbally.

Such cultural differences in communication styles can be attributed to the nature of the cultures themselves. As Gudykunst et al. (1996) outline, people's communication behavior is derived from the internalization of their culture's values. In other words, people are socialized to communicate in a way that is consistent with their cultures' norms. One of the most studied variables when it comes to explaining cultural differences in communication behavior is individualism-collectivism (Gudykunst et al., 1996; Park and Kim, 2008). More individualistic cultures are characterized by norms emphasizing that people should be motivated by their own preferences and needs, whereas more collectivistic cultures are characterized by

norms emphasizing that people should be motivated by their social group's preferences and needs (Triandis, 1995; Triandis et al., 1988). Individualism-collectivism has also been linked to how people define their sense of self across cultures, also known as self-construal. Specifically, people from more individualistic cultures (e.g., the United States) tend to have a more independent self-construal, a self predicated on automaticity, self-expression, and self-interest. In contrast, people from more collectivist cultures (e.g., China) tend to have a more interdependent self-construal, a self predicated on social relationships, intragroup harmony, and commitment to others (Markus and Kitayama, 1991). It should be noted that no one culture is solely individualistic or collectivistic; both tendencies and associated outcomes (e.g., communication style, self-construal) exist in all cultures (Hofstede, 2001; Oyserman et al., 2002). Hence, although any particular culture might be predominantly individualistic or collectivistic, that does not suggest that the opposing value is entirely non-existent in that culture. Thus, one should think of these variables (e.g., individualism-collectivism, high and low-context communication) as existing along a continuum rather than being discrete phenomena.

Research demonstrates a relationship between collectivism and high-context communication; cultures that tend to emphasize group harmony and attending to one's social group's needs also embrace a more indirect communication style (Gudykunst, 1997; Hall, 1976). For example, indirect communication has been found to be produced, interpreted, and valued more by those from collectivistic cultures relative to those from individualistic cultures (Holtgraves, 1997; Park and Kim, 2008).

One explanation as to why people from collectivist cultures value indirectness is Ting-Toomey's (1988, 2004) face negation theory as well as Brown and Levinson's politeness theory (1987). Face refers to an individual's self-image in the context of social interactions (Goffman, 1967). Facework, then, refers to the approaches an individual can take to maintain and save face (i.e., maintaining a positive public image when one believes they are being judged for their behavior). Relatedly, politeness theory (Brown and Levinson, 1987) posits there are a range of interpersonal outcomes that can threaten one's *positive* face (i.e., desire to feel positively about one's self and be respected by others) and *negative* face (i.e., desire for autonomy). Examples of positive face-threatening behaviors include expressing negative evaluations about someone (e.g., criticizing, accusing) and expressing disagreement, whereas examples of negative face-threatening behaviors include pressuring someone to do something (e.g., requesting, suggesting) and imposing potential positive outcomes that might put the listener in "social debt" (e.g., promising not to tell anyone a secret).

Face has been demonstrated to be a universal concept,[1] but various facework strategies have been found to differ across cultures. Specifically, research suggests that individuals with a more interdependent orientation (collectivist) tend to emphasize attention to other-face (i.e., concern for another's image), whereas individuals with a more independent orientation (individualist) tend to emphasize attention to self-face (i.e., concern for one's own image; Oetzel and Ting-Toomey, 2003; Zane and Yeh, 2002). Because of collectivisms' emphasis on maintaining group harmony, it is extremely advantageous to avoid confrontation in more collectivist cultures. Being assertive, explicit, and direct is frowned upon in these cultures (Nisbett and Masuda, 2003), so exercising self-control and using more indirect and ambiguous communication allows for individuals from collectivist cultures to simultaneously avoid intragroup conflict and save face. Thus, saving face allows for people to avoid feelings of shame, negative feelings deriving from engaging in behavior that reflects poorly on one's social group.

4. Cross-cultural differences in usage of CMC cues

Given that people with a more collectivist orientation display enhanced sensitivity to attending to another's face, and given how that enhanced sensitivity drives subsequent communication behavior, it seems likely that cultural differences in FtF communication settings occur also in CMC settings. There are, however, only a few studies examining this possibility, and many of these studies were concerned primarily with whether members of certain cultures preferred using a particular type of CMC cue (e.g., eye versus mouth-oriented emoticons; Park et al., 2014; Yuki et al., 2007). More relevant studies include Pflug's (2011) content analysis of online forum postings to examine whether there were cultural differences in emoticon usage. They found that high-context communicators (Indians) used more emoticons in online forum postings than did low-context communicators (Germans). More recently, Kavanagh (2016) investigated emoticon use in online blogs. He used Brown and Levinson's (1987) politeness theory as a framework for examining blog comments from Japanese and Americans and found significantly more emoticons in the Japanese corpus than in the American corpus. Additionally, both Japanese and Americans included emoticons for positive politeness strategies more than for negative politeness strategies. However, Japanese bloggers used emoticons to emphasize positive politeness strategies (but not negative politeness strategies) to a greater extent than did Americans, although Japan is often viewed as a negative politeness culture. It is possible that blog users may compliment and support each other through an emphasis on positive politeness rather than negative politeness.

[1] The cross-cultural validity of Brown and Levinson's (1987) distinction between positive and negative face has been questioned (e.g., Matsumoto, 1988; Fukada and Asato, 2004; Gu, 1990) and some (e.g., Arundale, 1999) have proposed alternative conceptualizations. However, Brown and Levinson's (1987) original conceptualization is useful in experimental research due to its hierarchical nature, making it easier to isolate specific variables to examine (i.e., usage of positive and negative politeness strategies across different contexts). Hence, given its utility, we opted to retain Brown and Levinson's (1987) original framework.

Cheng (2017) investigated cultural differences (Spaniards and Chinese) in preferences for using CMC cues depicting certain emotions (e.g., happy, sad, angry) for events with a similar emotional charge. He found that these cultures did not differ in their preference for using CMC cues in neither happy situations or angry situations. They did, however, differ in their CMC cue preferences for sad situations. Specifically, Chinese participants opted to use plain-text significantly less often than did Spanish participants.

5. The present research

The reliance on paralanguage by individuals from predominantly collectivist cultures suggests that these individuals might also rely on emoji and emoticons when engaged in CMC. The examination of online posts (Kavanaugh, 2016; Park et al., 2014; Pflug, 2011) is consistent with this, as is Cheng's examination of cultural differences in CMC cue preference. Although past work has provided evidence of cultural differences in CMC cue use when communicating with CMC, no one has examined whether such differences exist as a function of the communicative context or cultural psychological variables (e.g., self-construal). In this research we conducted three experiments to examine this possibility. Participants in these experiments were asked to create text messages to convey certain meanings and were given the option of including emoticons (Experiment 1) and emoji (Experiments 2 and 3) in their texts. In Experiment 3 we also examined how English speaking proficiency influences CMC cue usage, if at all. In all experiments we expected individuals from predominantly collectivist cultures (East Asians) to use more CMC cues than individuals from predominantly individualist cultures (Americans), especially in face-threatening situations. We base this hypothesis on collectivism's greater emphasis on context, and in particular paralinguistic cues, when communicating FtF. We assume that CMC cues are essentially digital substitutes for these cues (Derks et al., 2008b; Lo, 2008). In addition, as Kavanagh (2016) has suggested, CMC cues may function as politeness markers, and hence serve as a means of managing face. If so, then East Asians' greater sensitivity to situational variability (Holtgraves & Yang, 1992) should result in their greater use of CMC cues, especially in face-threatening situations. For all experiments, participants provided informed consent prior to participation. Data, analysis scripts, and materials for all studies are available on this project's page on the Open Science Framework (https://osf.io/3s8xa/).

6. Experiment 1

In this experiment we examined cultural differences in the use of emoticons. To do this, we recruited participants from predominantly individualistic (United States) and collectivistic (United States residents from the East Asian countries Japan, China, and South Korea) cultures. We expected East Asians to include more emoticons in their text messages than Americans, and that this difference would be especially large for negative (i.e., face-threatening) situations.

6.1. Method

6.1.1. Participants

The sample consisted of 92 Amazon's Mechanical Turk (MTurk) Workers (59 males, 33 females; $M_{age} = 29.03$, $SD = 6.56$) who received $.75 USD for their participation. Sampled participants were either born and raised in the United States (the American sample; $N = 55$) or were first-generation immigrants to the United States from either South Korea, Japan, or China (the East Asian sample; $N = 39$). Two participants from the East Asian sample were removed for failing an attention check (final $N = 37$).

6.1.2. Procedure

Participants first provided demographic information; this included a screening question asking participants to identify their country of origin. To ensure we only collected data from Workers from the countries of interest, Workers that accessed the survey but picked a country aside from the United States (individualist), China, Japan, or South Korea (collectivist) were forwarded to the end of the survey. Participants were then presented with six different scenarios and were asked to imagine themselves being in each one. For each situation they were asked to compose a text message that they would use in that situation. The scenarios were either positive (thanks, congratulate, and compliment) or negative (sadness, apologize, and forgive) in valence. Participants were instructed to respond in whatever language they felt most comfortable using. All scenarios can be found in the online supplement.

Participants were also told that in order to make the experiment more realistic, they had the option of including emoticons in their message. However, they were instructed only to use any of the fourteen emoticons that appeared on the screen. These emoticons were selected to portray various emotions as well as differ in eye-mouth orientation (Yuki et al., 2007; Park et al., 2014). Three graduate research assistants rated both the emotional valence and orientation of the

emoticons. Inter-rater reliability was adequate for both valence ($\alpha = .78$) and orientation ($\alpha = .83$). These emoticons can be seen in Table 1[2].

Table 1
Emoticons used in Experiment 1.

Emoticon valence	Emoticon orientation	
	Mouth	Eye
Positive emoticons		^ ^
Happy	:)	_
Negative emoticons		
Sadness	:(	T_T
Troubled	D:	>_<
Annoyed	:/	<_<
Neutral emoticons		
Surprised	:O	o_o
Skeptical/Confused	:S	x_x
Wink	;)	^_~

7. Results and discussion

Initial analyses indicated no cultural differences in the use of eye and mouth emoticons. Hence, we collapsed over this variable and conducted a 3 × 2 × 2 Emoticon Valence (Positive, Neutral, Negative emoticons) x Scenario Valence (Positive, Negative) x Culture (Americans, East Asians) mixed model Analysis of Variance (ANOVA) with repeated measures on all but the last factor. The dependent variable for this analysis was the proportion of emoticons used throughout all messages generated.

Although East Asians included more emoticons in their texts ($M = .150$; $SE = .014$) than did Americans ($M = .122$; $SE = .011$), the Culture main effect was not statistically significant, $F(1, 86) = 2.46$, $p = .120$. There was, however, a significant three-way Culture by Emoticon Valence by Scenario Valence interaction, $F(1.73, 148.68) = 6.239$, $p < .05$[3], as well as a significant two-way Scenario Valence by Emoticon Valence interaction, $F(1.73, 148.68) = 127.03$, $p < .001$, and a significant Cultural Orientation by Emoticon Valence interaction, $F(2, 172) = 3.06$, $p = .05$[3]. The pattern of means is displayed in Table 2. As can be seen in that table, all participants were more likely to use positive emoticons in positive situations than in negative situations, and negative emoticons in negative situations than in positive situations. However, this Emoticon Valence by Scenario Valence interaction was more pronounced for East Asians than Americans, although the interaction was significant for both. Follow-up contrasts indicated that East Asians used more negative emoticons than Americans for the negative situations; there were no cultural differences for positive situations.

Table 2
Mean (standard error) emoticon use as a function of emoticon valence, situation valence, and culture.

Culture	Scenario valence	Emoticon valence		
		Positive	Negative	Neutral
American	Positive scenarios	.228 (.027)	.022 (.010)	.102 (.021)
	Negative scenarios	.040 (.011)	.278 (.038)	.062 (.015)
East Asian	Positive scenarios	.279 (.034)	.020 (.013)	.118 (.026)
	Negative scenarios	.015 (.013)	.436 (.048)	.034 (.019)

Overall, the results for Experiment 1 provided partial support for our initial hypotheses. Although East Asians used more emoticons than Americans, the difference failed to reach statistical significance ($p = .12$). Instead, we did find East Asians to be particularly sensitive to negative situations, and to use significantly more emoticons in those situations than did Americans. This is consistent with our view that emoticons serve as politeness markers, in that people with greater collectivist orientation show greater attention to other's (i.e., the text's recipient) face, resulting in attempts to seem less imposing in negative

[2] At the time this data was collected and analyzed (spring 2017), there was no established literature on what many emoticons are interpreted as. As such, we classified the emoticons used in Experiment 1 based on our own understanding of their meaning in additional to online anecdotal evidence. However, research has since been published that has provided insight into what many emotions and emoji are often interpreted as. As it relates to Experiment 1, x_x has recently been found to mean 'dead' (Rodrigues et al., 2018). Hence, x_x should be considered a negatively valenced emoticon. When this change is taken into consideration, the overall pattern of results for Experiment 1 does not change except for the Culture by Emoticon Valence, $F(2, 172) = 2.158$, $p = .12$.

[3] The Greenhouse-Geisser correction for sphericity was used whenever indicated.

social situations. This is also consistent with past cross-cultural CMC research suggesting that East Asians use more CMC cues in negatively-valenced scenarios (e.g., expressing sadness; Cheng, 2017). Last, these results also successfully replicated past research demonstrating that people tend to use emoticons whose valence is congruent with the valence of the message's text (Derks et al., 2008a).

8. Experiment 2

The number of emoticons used in Experiment 1 was rather low, perhaps due to the now more frequent use of emoji. The purpose of this experiment was to extend our research by examining cross-cultural differences in emoji use. Further, Experiment 1's results are only theoretically meaningful under the assumption that our two sub-samples actually differed in cultural orientation. To address this shortcoming, for this experiment we had participants complete a measure of collectivism and self-construal. We expected Americans to score significantly lower on collectivism and significantly lower on interdependent self-construal than would East Asians. As in Experiment 1, we expected East Asians to use more emoji than Americans, and for this difference to be especially large for negative (i.e., face-threatening) situations.

8.1. Method

8.1.1. Participants

The sample consisted of 93 MTurk Workers (56 males, 37 females; $M_{age} = 32.77$, $SD = 10.53$) who received $1.00 USD for their participation. Sampled participants were either born and raised in the United States (the American sample; $N = 51$) or were first-generation immigrants to the United States from either South Korea, Japan, or China (the East Asian sample; $N = 47$). Five participants from the East Asiant sample were removed for failing an attention check (final $N = 42$).

8.1.2. Measures

9.1.2.1. Collectivism. Collectivism as defined by Hofstede (2001) was assessed using the CVSCALE developed by Yoo et al. (2011). Collectivism was measured using six items (e.g., "Group success is more important than individual success."). Items are anchored at 'strongly disagree' (1) and 'strongly agree' (5).

9.1.2. 2. Self-construal. Self-construal was assessed using Singelis' (1994) measure of self-construal. The scale consists of 24 items measuring self-construal across two dimensions: independent and interdependent self-construal. A sample item assessing interdependent self-construal is "It is important to me to respect decisions made by the group," whereas a sample item assessing independent self-construal is "I enjoy being unique and different from others in many respects." Each dimension was measured using twelve items. All items are anchored at 'strongly disagree' (1) and 'strongly agree' (7).

8.1.3. Procedure

We used the same format as in Experiment 1 but with three differences. First, we developed a new set of scenarios: four that created face-threatening (and hence negative) situations (accuse, argue, refuse, criticize) and four that created non-face threatening situations (praise, encourage, recommend, remind).

Second, instead of emoticons (as in Experiment 1), participants were given the option of including emoji with their messages. Participants were allowed to choose from a list of 15 emoji (see Fig. 1). These 15 emoji were selected based on the five most frequently used emoji in the Emoji Sentiment Ranking from the pool of all positive, negative, and neutral emoji (Novak et al., 2015). These 15 emoji were then piloted with MTurk Workers ($N = 100$; 51 individualists, 49 collectivists) who rated the emotionality of each emoji. The scale was anchored at 'negative (1) and 'positive' (7); 'neutral' (4) served as the scale's midpoint. Based on these ratings, the emoji were classified as either negative (N = 7) or positive (N = 8; see the online supplement for more detail).

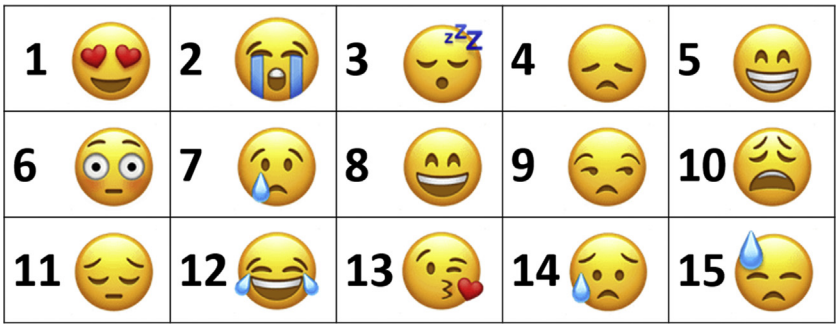

Fig. 1. Array of emoji participants could choose from in Experiment 2.

To include an emoji in their message, they were instructed to type the corresponding number of the emoji as it was displayed in Fig. 1. If participants wanted to include multiple emoji in succession, they placed a comma between the numbers (e.g., "I'm so sad today 2, 2, 2"). The final procedural change was the inclusion of the collectivism and self-construal measures; participants completed these after responding to the texting scenarios.

9. Results and discussion

A series of independent samples t-tests were conducted to determine how the two sampled groups differed in individualism-collectivism and self-construal. As hypothesized, Americans scored significantly lower ($M = 3.13$, $SD = .86$) on collectivism than did participants who identified as being first-generation immigrants to the United States from either South Korea, China, or Japan, ($M = 3.53$, $SD = .88$) $t(91) = -2.23$, $p < .05$. Additionally, there were also group differences on scores of interdependent self-construal $t(91) = -3.33$, $p < .001$; Americans scored lower on interdependence ($M = 4.29$, $SD = 1.08$) than did first-generation immigrants from East Asia ($M = 5.03$, $SD = 1.05$). The two groups did not differ on scores of the independent dimension of self-construal ($p = .91$). Overall, these results suggest that the sampling approach used in this experiment did successfully capture differences in cultural orientation between participants born and raised in the United States and first-generation immigrants from East Asia.

We conducted both ANOVAs and correlations to test our main hypotheses. First, we analyzed emoji use with a 2 (Threatening vs. Non-threatening scenario) x 2 (Positive vs. Negative Emoji valence) × 2 (American vs. East Asian) mixed model ANOVA with repeated measures on all but the last factor. As predicted, there was a significant main effect for Culture, $F(1, 91) = 9.87$, $p < .01$[3]; East Asians used significantly more emoji ($M = 2.38$, $SE = .20$) than did Americans ($M = 1.52$, $SD = .18$).

In addition, there were significant main effects for face-threat, $F(1,91) = 9.11$, $p < .01$[3] (more emoji were used in non-face-threatening situations than threatening situations), emoji valence, $F(1,91) = 25.86$, $p < .001$ (overall, more positive emoji were used than negative emoji), and a significant Face-threat by Emoji Valence interaction, $F(1,91)$ 143.72, $p < .001$[3] (more negative emoji were used in face-threatening than non-face-threatening situations with the reverse occurring for positive emoji; see Table 3). Also, there was a statistically significant three-way interaction between Culture, Face-threat, and Emoji Valence, $F(1,91) = 6.44$, $p < .05$[3]. As can be seen in Table 3, all participants used more positive emoji in non-face-threatening scenarios as well as more negative emoji in face-threatening scenarios. Thus, the same pattern observed in Experiment 1 with emoticons was replicated in Experiment 2 with emoji. Similarly, although the interaction was significant for both, as in Experiment 1, this pattern was more pronounced for East Asians than Americans. Follow-up contrasts indicated that East Asians used more positive emoji in non-face-threatening situations, and more negative emoji in face-threatening situations, than did Americans.

Table 3
Mean (standard error) emoji use as a function of emoji valence, situation face-threat, and culture for Experiment 2.

Culture	Situation	Emoji valence	
		Positive	Negative
American	Non-face-threatening	2.94 (.42)	.28 (.10)
	Face-threatening	.59 (.15)	2.28 (.30)
East Asian	Non-face-threatening	4.86 (.46)	.43 (.11)
	Face-threatening	.98 (.17)	3.24 (.33)

We also examined the relationships between emoji use and scores on the collectivism and self-construal scales. Consistent with the results of the ANOVA, there was a significant, positive correlation between emoji use and interdependent self-construal ($r = .37$, $p < .001$), and between emoji use and collectivism ($r = .31$, $p < .01$). In addition, there was a significant correlation between emoji use and independent self-construal ($r = .29$, $p < .01$). Hence, for all participants, increasing levels of collectivism and interdependent and independent self-construal were associated with increased emoji use. In addition, there was variability in these correlations as a function of type of emoji use, variability that paralleled the results of the ANOVA. Specifically, collectivism and interdependent self-construal were significantly ($p < .05$) correlated with the use of negative emoji in threatening situations ($r = .33$, $r = .31$) but not positive emoji in threatening situations ($r = .01$, $r = .03$). Similarly, collectivism and interdependent self-construal were significantly ($p < .05$) correlated with the use of positive emoji in non-threatening situations ($r = .38$, $r = .28$) but not negative emoji in non-threatening situations ($r = .18$, $r = .19$).

Overall, these results demonstrate that East Asians are more inclined to use emoji than are Americans, and their use of emoji is more sensitive to the situational context. That is, East Asians, relative to Americans, were more likely to use negative emoji when the situation was face-threatening and positive emoji when the situation was not face-threatening. This pattern was observed in both mean-level and correlational analyses.

10. Experiment 3

The purpose of Experiment 3 was twofold. First, we aimed to replicate the findings of the previous experiments. Second, we wanted to discern whether participant's English language proficiency influenced our previous findings. An

alternative interpretation of the previous experiments' results is that our East Asian participants used more CMC cues in their text messages because English is not their first language. Indeed, past research has shown that both vocabulary richness and emoji diversity tend to differ for those whom English is their first (as compared to their second) language (Feldman et al., 2017a; Feldman et al., 2017b). To this end, we examined ESL proficiency in Experiment 3 to get a better idea as to whether our results were actually due to cultural differences as hypothesized and *not* due to differences in communicating in English as a first (Americans) or second language (East Asians). Although in Experiments 1 and 2 we instructed all participants to write their messages in whatever language they felt most comfortable with, all wrote their messages in English (except for one participant in Experiment 2 whom wrote in Korean). Hence, it could be the case that our East Asian participants chose to communicate more so via CMC cues due to limited proficiency communicating in English as a second language (ESL).

10.1. Method

11.1.1. Participants

The sample consisted of 90 MTurk Workers (45 males, 45 females; $M_{age} = 33.49$, $SD = 8.98$) who received $1.00 USD for their participation. Sampled participants were either born and raised in the United States (the American sample; $N = 51$) or were first-generation immigrants to the United States from either South Korea, Japan, or China (the East Asian sample; $N = 62$). Twenty-three participants from the East Asian sample were removed for failing an attention check (final $N = 39$).[4]

11.1.2. Measures

11.1.2.1. ESL proficiency. ESL proficiency was assessed using two measures. The first measure was the Vocabulary Knowledge Scale (Paribakht and Wesche, 1993, 1996). This measure assesses participants' English vocabulary over a range of words varying in difficulty and common usage. For each of 30 words, participants are asked to identify to what extent they are familiar with the word and their ability to either define it or properly use it in a sentence (Iqbal & Komal, 2017). For each word, participants receive between 1 and 5 points based on their ability to define or use the word properly in a sentence. Participants' final VKS scores are their mean score for the 30 words.

Following Ji et al. (2004), the second measure of ESL proficiency was a series of self-report items assessing the extent to which participants used English in their day-to-day lives. Specifically, participants reported their perceived overall English proficiency, how often they speak English as an adult, how often they speak English at home and work/school, how often they speak English with their parents and friends, how often they watch TV/movies in English, and how often they send text messages in English. The item assessing their overall English proficiency was anchored at 'know little' (1) and 'fluent' (5), whereas all other items were anchored at 'never' (1) and 'always' (5). All items were averaged into a composite item ($\alpha = .82$).

10.1.3. Procedure

The procedure for this experiment was identical to that of Experiment 2 with the only difference being the inclusion of the ESL proficiency measures. Participants completed the VKS and the self-report ESL proficiency items immediately after responding to the trait collectivism and self-construal measures. Presentation of the VKS and self-report ESL items were counterbalanced to avoid order effects.

11. Results and discussion

As with Experiment 2, we first examined whether our two subsamples differed in terms of trait collectivism and self-construal via a series of independent samples t-tests. As hypothesized, Americans scored significantly lower ($M = 2.91$, $SD = .99$) on collectivism than did participants who identified as being first-generation immigrants to the United States from either South Korea, China, or Japan, ($M = 3.62$, $SD = .68$), $t(87) = -3.85$, $p < .001$. Additionally, there were also group differences on scores of interdependent self-construal $t(87) = -4.65$, $p < .001$; Americans scored lower on interdependence ($M = 4.21$, $SD = 1.06$) than did first-generation immigrants from East Asia ($M = 5.17$, $SD = .83$). The two groups did not differ on scores of the independent dimension of self-construal ($p = .12$). Overall, there appears to be sufficient evidence suggesting our two subsamples differed in cultural orientation.

We also conducted a series of independent samples t-tests examining whether our two subsamples differed in English proficiency. Unsurprisingly, the results suggest they did. Americans rated their overall English proficiency higher than that of East Asians, $t(88) = 4.81$, $p < .001$. Similarly, Americans reported using English more frequently than did East Asians, $t(88) = 9.62$, $p < .001$. Last, Americans performed significantly better than East Asians on the VKS, $t(87) = -3.85$, $p < .001$. Descriptive statistics for each variable can be found in Table 4.

[4] Although the attention check failure rate was relatively high, we deemed it more important to exclude participants in order to maintain data quality. Moreover, recent evidence suggests that the inclusion of attention checks does not have a negative impact on scale validity (Kung et al., 2018).

Table 4
Mean (standard deviation) ESL scores by cultural orientation.

ESL variable	Culture	
	American	East Asian
Perceived English proficiency	4.98 (.14)	4.56 (.60)
Frequency of English use	4.96 (.15)	4.13 (.59)
VKS score	4.42 (.82)	2.84 (1.06)

The three measures of ESL proficiency (VKS scores, perceived English proficiency, frequency of current English use) were significantly and positively correlated ($r = .33$-$.59$); hence, we summed the three measures to create a composite ESL proficiency measure. To examine whether emoji use was related to ESL proficiency, we computed correlations between our ESL measures (perceived English proficiency, frequency of current English use, VKS scores; overall composite) and emoji use. None of these correlations approached statistical significance (all $ps > .14$). However, when examined separately for East Asians and Americans a divergent pattern was observed. Specifically, for Americans, there was a significant negative correlation between emoji use and overall ESL proficiency, $r = -.313$, $p < .03$. In direct contrast, for East Asians there was a significant positive correlation between emoji use and overall ESL proficiency ($r = .36$, $p < .02$).

We then analyzed emoji use with a 2 (Threatening vs. Non-threatening scenario) × 2 (Positive vs. Negative Emoji valence) × 2 (American vs. East Asian) mixed model ANOVA with repeated measures on all but the last factor. As in Experiment 2 there was a significant main effect for Culture, $F(1, 88) = 5.48$, $p < .05$[3]; East Asians ($M = 2.39$, $SE = .22$) used more emoji than did Americans ($M = 1.70$, $SE = .19$). There was also a significant main effect for emoji valence, $F(1, 88) = 23.18$, $p < .001$[3]; positive emoji ($M = 2.43$, $SE = .19$) were used more than negative emoji ($M = 1.66$, $SE = .14$).

Additionally, there was a significant Emoji Valence by Face-threat interaction, $F(1, 88) = 128.02$, $p < .001$[3], and, of importance, a significant Face-threat by Culture interaction, $F(1, 88) = 13.65$, $p < .001$[3]. The pattern of means for this analysis can be found in Table 5. As can be seen in the table, as predicted, East Asians used more emoji in their messages than did Americans. Although this experiment failed to replicate the significant three-way interaction from the prior two experiments, these analyses support the original hypothesis that East Asians would include more CMC cues in face-threatening situations, which suggests greater sensitivity to the social context.

Table 5
Mean (standard error) emoji use as a function of emoji valence, situation face-threat, and cultural orientation for Experiment 3.

Culture	Situation	Emoji valence	
		Positive	Negative
American	Non-face-threatening	3.63 (.38)	.33 (.11)
	Face-threatening	.59 (.22)	2.26 (.31)
East Asian	Non-face-threatening	3.92 (.43)	.64 (.13)
	Face-threatening	1.56 (.25)	3.41 (.35)

We then examined the relationships between emoji use and scores on the collectivism and self-construal scales. Consistent with the results of the ANOVA, there was a significant, positive correlation between emoji use and interdependent self-construal ($r = .35$, $p < .001$), and between emoji use and collectivism ($r = .21$, $p < .05$). There was not a significant correlation between emoji use and independent self-construal, r = .07, ns.

Overall, the results of this experiment paralleled the results of Experiment 2. Again, East Asians used more emoji than did Americans. Importantly, this difference appeared not to be a function of ESL proficiency as the correlation between emoji use and ESL proficiency was significant and positive for East Asians; the better their English skills the more they used emoji. At the same time, this pattern was reversed for Americans for whom there was a negative correlation between ESL proficiency and emoji use.

12. General discussion

Past research has provided evidence that cultures differ in the way they communicate in FtF settings, including differences in the use of context in communication or how directly one communicates (e.g., Gudykunst et al., 1996; Holtgraves, 1997). Our research suggests that such differences extend to CMC, and that these differences are in-part due to the communicative context and cultural psychological variables. Our underlying assumption was that CMC cues (emoji and emoticons) function as substitutes for nonverbal behavior (e.g., Derks et al., 2008a, 2008b), and in so doing serve, among other things, a politeness function. Because cultures vary in their concern with face management and politeness, we expected those differences to emerge with the use of CMC cues. More specifically, we expected people from predominantly collectivist cultures (East Asians), relative to those from predominantly individualist cultures (Americans), to use more emoticons and emoji in text messages, particularly in negative, face-threatening situations.

Across three experiments we examined cross-cultural differences in emoticon (Experiment 1) and emoji (Experiments 2 and 3) usage in text messages. Although the results across the three experiments differed slightly, the overarching findings were very similar. To explore this in more detail we combined the hypothesis-relevant outcomes of our three experiments. Following the recommendation of Rosenthal (1978), we used Mosteller and Bush's (1954) technique of combining z-scores as a means of combining results from independent studies. In this analysis, the overall Culture main effect was significant ($p < .01$); hence, when the three experiments are combined, East Asians used significantly more CMC cues (emoticons and emoji) than Americans. Note that this relationship held at the individual level as well; in experiments 2 and 3, collectivism and interdependent self-construal were positively and significantly correlated with emoji use.

We also hypothesized that this cultural difference would be particularly pronounced for negatively valenced (Experiment 1) and face-threatening scenarios (Experiments 2 and 3). The Culture by Scenario Valence by Emoji Valence interaction was significant in Experiments 1 and 2 but not in Experiment 3. However, the interaction is significant ($p < .05$) when the three experiments are combined. Hence, overall, our results show an enhanced sensitivity on the part of East Asians to the social context, that is, a tendency to use more situationally-congruent CMC cues.

There are of course language differences between individuals from predominantly collectivist and individualist countries, a difference that makes research on cross-cultural communication particularly challenging. In the present research, our participants from collectivist cultures were not native speakers of English. Hence, differences in emoji use could be a result of this difference. However, our results suggest otherwise. Although the ESL proficiency of East Asians was significantly less than that of Americans in Experiment 3, there was no overall relationship between emoji use and ESL. More importantly, for East Asians there was a significant, positive relationship between emoji use and ESL proficiency, a relationship that was significant and negative for Americans. For East Asians, then, decreased ESL proficiency was associated with decreased (rather than increased) emoji use.

One potential issue is whether people (especially those from collectivist cultures) use emoji as a substitute for words. If so, there should be a negative correlation between the number of words in one's texts and the use of emoji in those texts. In order to explore this, we examined the correlations between text message word count and emoji use, both overall and separately for East Asians and Americans. In neither Experiment 2 or 3, both overall and for cultures separately, did these correlations approach significance. Hence, it does not appear that emoji are being used as substitutes for words, at least in these contexts.

Our findings suggest some interesting avenues for future research. One would be to explore the consequences of these cultural differences, namely in terms of cross-cultural communication and perception. For example, do these differing cultural communication frames increase the likelihood of communicative misunderstandings? Do people from predominantly individualistic cultures fail to appreciate the role of CMC cues in a communicated message from people from predominantly collectivistic culture, and hence fail to recognize the underlying message that is being sent? Do people from predominantly collectivistic cultures perceive people from predominantly individualistic cultures as impolite due to their relative tendency to not include CMC cues in their messages? And of course, our research only examined a small set of emoji (currently over 3000); hence we only scratched the surface in terms of possible cross-cultural differences in the use and interpretation of other types of emoji.

Overall, then, our research provides novel insight into culture's influence in CMC, namely regarding CMC cue usage. The current research also extends past cross-cultural CMC findings (e.g., Kavanagh, 2016; Pflug, 2011) by demonstrating cultural differences in an experimental context, one involving CMC, and by providing an underlying theoretical account for these cultural differences, thus opening the door to a rich area for subsequent research with both theoretical and practical implications.

We note here several limitations of our research. First, we did not include any measures in Experiment 1 to verify whether our sampled groups actually differed in cultural orientation. However, our inclusion of measures of collectivism and self-construal in Experiments 2 and 3 provided support for the notion that our sampling approach did capture differences in cultural orientation. A related limitation regards our sampling approach. Specifically, although the three cultures our East Asian participants immigrated from are predominantly collectivistic, these three cultures are not purely identical in terms of cultural makeup (Hofstede, 2001; Matsumoto and Hwang, 2017). Thus, although we observed significantly different patterns in CMC cue usage between members of predominantly individualistic and collectivistic cultures, we caution readers from generalizing the observed patterns among our East Asian participants to all East Asian cultures.

Second, all participants ultimately completed this research in English. Although we instructed participants they could respond in any language of their choosing, no one did. Given the relationship between language and cognition, it is possible that by completing the experiment in English, participants might have completed the experiment with a more “individualist mindset” (Hong et al., 2000; Luk et al., 2012). Note, however, that if this is the case it would actually work against our hypothesis. Additionally, our analyses regarding ESL proficiency in Experiment 3 show that emoji usage was not related to one's ESL proficiency, but still was related to cultural variables such as collectivism and self-construal. Further, this interpretation is qualified by the significant Culture, Scenario Threat, and Emoji Valence interactions.

Third, our research only investigated cultural differences between East Asian and American populations. Future research should examine whether other social groups that have similar cultural values regarding interdependence (e.g., Latinx, Native American populations) demonstrate similar patterns of CMC cue usage (Gaines et al., 1997; Markus and Kitayama, 1991).

There are also a few limitations regarding the experiments’ design that should be noted. First, in Experiments 2 and 3, participants were provided a limited number of emoji to choose from. Further, the means by which participants included emoji in their messages (i.e., writing the number of the corresponding emoji from Fig. 1) could be argued as being non-

naturalistic and that having participants include emoji in this manner could have made them more aware of their CMC cue choices.[5] To this end, future research could benefit by expanding upon our findings by investigating cross-cultural differences in CMC cues in naturally occurring settings (e.g., scraping social media postings). Relatedly, in the countries our East Asian participants came from, there are CMC platforms that are particularly popular in their respective countries (e.g., Sina Weibo in China, KakaoTalk in South Korea), and these platforms allow users to use CMC cues that are unique to that platform (e.g., animated "stickers" on KakaoTalk). Thus, although users still have the option to use the types of emoticon and emoji examined in our experiments on these platforms, in real-world CMC users may opt to use the platform-specific cues as opposed to emoticon or emoji. An additional methodological limitation is the number of scenarios participants responded to in each study was relatively small (three per condition in Experiment 1 and four per condition in Experiments 2 and 3). To this end, future research would benefit from examining cultural differences in CMC cues across a wider range of social contexts. Finally, there have been some recent criticisms regarding the validity of the data collected on the MTurk platform (e.g., Paolacci and Chandler, 2014). To the extent that these criticisms are valid, subsequent attempts to replicate and extend our findings via other recruitment procedures would be warranted.

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Declaration of competing interest

The authors report no conflict of interest.

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[5] At the end of each experiment, participants were asked how similar the experimental procedures were to their normal texting experience. Across all three experiments, participants who responded to this item were virtually unanimous in claiming the procedures were "very similar" and "realistic." Due to this participant feedback coupled with the emoji participants were provided with (i.e., the most frequently used), although not a 1-to-1 match to real world texting experiences, we believe the procedures used were ecologically valid enough that our findings are generalizable beyond our experimental setting.

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