Emoticon, Emoji, and Sticker Use in Computer-Mediated Communication: A Review of Theories and Research Findings

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In this study, we conduct a systematic review of the theories and empirical research findings related to the use of emoticons, emoji, and stickers in computer-mediated communication. The studies were collected from 11 databases in the fields of communication, linguistics, and psychology between 1996 and 2017. A total of 51 articles were analyzed. This study offers 3 new contributions. First, it clarifies the definitions of emoticon, emoji, and sticker to reduce the terminological confusion in the literature. Second, it presents a scheme for classifying theories/models into two main orientations— relationship and understanding—providing a parsimonious way of examining how various theories/models have underpinned different research studies. Third, it synthesizes the main research findings on why and how people use emoticons, emoji, and stickers and the effects of using these elements. We conclude with a discussion of the limitations in this study and recommendations for further inquiry.

Keywords: emoticon, emoji, sticker, computer-mediated communication, theories, findings

Nonverbal cues in face-to-face communication, such as facial expression, body movement, and voice tones, can communicate emotion and help manage the relationship between messages and meaning (Murphy, 2017). In computer-mediated communications (CMCs), online visual communicative elements are termed as "graphicons" (graphical icons) by Herring and Dainas (2017), which include emoticons, emoji, GIFs, images, and videos. They support the otherwise thoroughly text-based interaction in much the same way that facial and body expressions do in face-to-face communication (Lo, 2008). This study is inspired by the unprecedented prevalence of mobile instant messaging (MIM) and the increased adoption of emoticons, emoji, and stickers in MIM-supported communication, especially in Asian countries. Emoticons, emoji, and stickers are three substantial types of graphicons in MIM, and they are easily sent with the simple acts of clicking or tapping on smartphones.

Graphicons have changed the visual display of CMCs drastically over the years. Since the first emoticon ":-)" was created in 1982 on a Carnegie Mellon bulletin board, these ASCII-based emotional

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icons have been widely used in CMCs to express human emotions. Iconic of digital interaction (Ljubešic & Fišer, 2016), the emoji is probably the most popular form of digital expressions, as 2.3 trillion messages were sent with emoji in 2016 (Emogi Research Team, 2016). Most recently, sticker use becomes a massive communication phenomenon. The first formalized sticker was introduced in Japan in 2011. In 2016, more than 2.4 billion stickers were sent per day on the LINE app (Smith, 2018). The sticker market has also witnessed a successful monetization, as MIM apps allow users to purchase sticker sets in addition to free ones. In 2015, sticker sales generated nearly 30% of LINE's company revenue (Seward, 2016). Stickers are a crucial contributing factor to the global MIM success (Jessica & Franzia, 2017).

Some researchers proposed that online graphicons may become a universal symbolic language (Azuma & Ebner, 2008) to address linguistic and cultural differences. For example, people from Asian countries used emoji in trading activities to exchange business messages (Feng, Qiu, Li, & Yang, 2016). However, other researchers think that more specifics should be considered about this universality claim. For example, one may find differences in the renderings of the same emoji. The Unicode character U+1F606 is rendered as the pictograph 😆 on Windows devices, but as 😆 on Apple devices (Miller et al., 2016). There are also cultural differences. Ge and Herring (2018) found that an emoji sequence might be easily comprehensible to a Chinese user, but very confusing to a Westerner. They concluded that "while emoji may be evolving into a language, emoji language is not the same across cultures" (Ge & Herring, 2018, Discussion section, para. 8).

Researchers noticed the conflation among graphicon types (Herring, 2018), as studies have interchangeably used terms such as "emoticons," "emoji," "smileys," and "nonverbal cues." For example, Ma (2016) used "emoticon" as an umbrella term for different graphicons, and what W. Wang, Zhao, Qiu, and Zhu (2014) referred to as emoticons were actually emoji—specifically, facial expression icons. In addition, De Seta (2018) observed that in China, online users adopted a general term, *biaoqing*, for most of the genres without differentiation. Therefore, although it is beyond the scope of the current study to discuss all types of graphicons and address their sociocultural heterogeneity, we consider it is valuable to first differentiate emoticons, emoji, and stickers from a historical viewpoint, to lay a clearer conceptual foundation for this study and avoid potential confusion in the future.

Differentiating Nontextual Symbols

Emoticon is a portmanteau of "emotion" and "icon," suggesting an icon that indicates emotional expression. It first occurred in 1982 in the Western cultures. Specifically, an emoticon is ASCII-based and typographically composed of keyboard symbols. Emoticons can be pictorial, such as *<\;-) (Santa Claus), or they can represent an emotional status, such as :-D (laughing; Gettinger & Koeszegi, 2015). Kigou is a type of emoticon, referring to pictographic elements such as ☆♪♡ (Nishimura, 2015). Emoticon is indigenized in China when Chinese users creatively incorporated mandarin characters with keyboard-based symbols, such as : 目 (grinning teeth face; De Seta, 2018).

Emoji were created in Japan in 1997, comprising actual pictures, such as a face 😊, grapes 🍇, or a panda 🐼. Emoji require specific software support; otherwise they will appear as placeholder icons or blank spaces. Commonly used emoji have been coded in Unicode standard since 2010. As of June 2018, 2,823 Unicode emoji were recorded by the emoji reference website Emojipedia (2018). In CMC, it is the code rather than the emoji picture that is transmitted. Therefore, companies can decide how to visually display emoji on their products. Some platforms in China, such as QQ and Sina Weibo, have developed proprietary and platform-specific emoji, which are more popular than Unicode emoji in China (De Seta, 2018; Ge & Herring, 2018).

Two factors may have contributed to the widespread confusion between "emoticon" and "emoji." First, the two terms are spelled similarly and are both CMC graphicons. Yet the similarity in spelling is purely coincidental (Taggart, 2015). Second, some programs, such as Microsoft Word, automatically convert emoticons, such as **:-)** to 🙂, because pictures are considered more vivid (Amaghlobeli, 2012). This interchangeability may cause confusion.

Stickers are now commonly used in mobile messages. Characterizing stickers as larger scale emoticons (Chen & Siu, 2017) fails to clarify the difference between stickers and other symbols. De Seta (2018) defined stickers as "images, usually larger than graphical emoticons and emoji, offered as thematic sets in the communication interfaces of instant messaging apps and social networking services, often organized in tabs and personalized collections" (Stickers section, para. 1). Stickers can be comprehensive representations of various elements such as environmental descriptions, facial/body language, and textual illustrations.

Compared with emoticons and emoji, stickers are probably more expressive. They can be textual, pictorial, or a combination of both, and can be static PNG images or animated GIFs (De Seta, 2018). Another unique feature of stickers is the high level of personalization. Many MIM apps allow users to create their own stickers through a series of simple steps: upload pictures or capture real-time photos, then add personalized elements such as textual descriptions. In addition, users can purchase stickers in the dedicated stores enclosed in the MIM apps, or design and launch sticker sets for sale to make profits.

Previous Reviews

To date, four reviews have been published concerning emoticon use in CMC. Aldunate and González-Ibáñez (2016) examined the psychological effects of emoticons, but they found little evidence on how these symbols were processed in the cognitive dimensions of human communication. Derks, Fischer, and Bos (2008) reported that emoticons were regularly used in CMC to either stress the sender's feelings or to soften the tone of negative messages. Dunlap et al. (2015) reviewed emoticon use in online learning and suggested that such symbols could improve communication, enhance social presence, and build a sense of community among students. Finally, Jibril and Abdullah (2013) informed that emoticons possessed word functions, rather than merely serving as add-on paralanguage elements.

However, the extant reviews have failed to provide evidence that their searches are systematic. Three of the four reviews (Aldunate & González-Ibáñez, 2016; Derks et al., 2008; Jibril & Abdullah, 2013) did not state the number of primary studies identified, included, or excluded, nor did they explain the reasons for any such exclusions. Second, terms such as "emoticons," "emoji," "smileys," and "nonverbal cues" have been used interchangeably across different studies (Carter, 2003), but the terminological differentiation has not been sufficiently addressed. Stickers did not receive the same level of attention as emoticons and emoji, even though their use has grown tremendously over the past years. Third, various theories and models have been used to guide relevant studies, but there has been no attempt to examine these theories/models or to identify their main tenets. Fourth, no published study to date has summarized the empirical research findings.

To address these gaps, we present a systematic literature review on the use of emoticons, emoji, and stickers. This study aims to answer two research questions:

RQ1:   *What theories and/or models have guided previous research on the use of emoticons, emoji, and stickers in computer-mediated communication? What are the main tenets of these models? What are the main representative research questions?*

RQ2:   *What have studies found concerning how people use emoticons, emoji, and stickers in computer-mediated communication?*

Method

The process of article selection followed the Preferred Reporting of Items for Systematic Reviews and Meta-Analyses (PRISMA) Statement (see Figure 1; Moher, 2009).
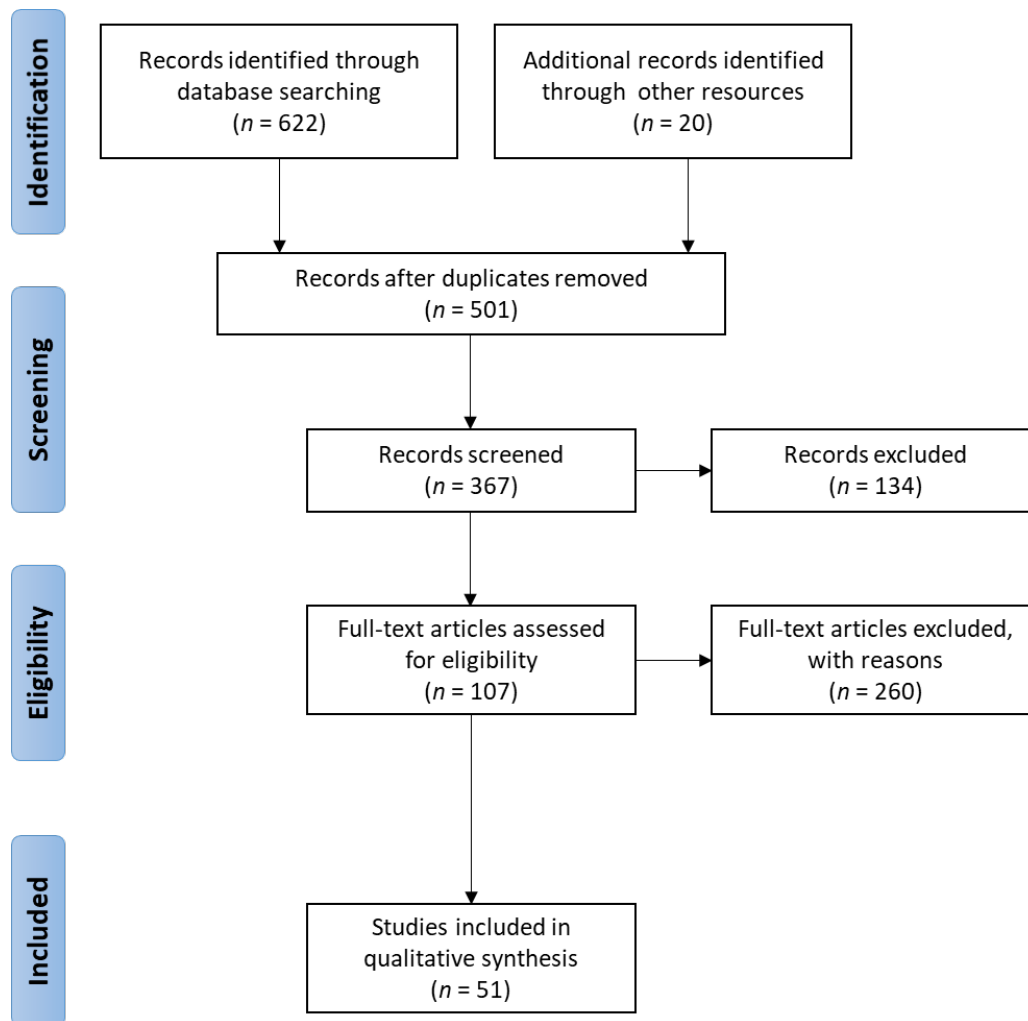
Figure 1. Literature search and selection.

A search for articles was conducted across 11 databases that cover various disciplinary areas (business, communication, information science, and education), including Academic Search Complete; Business Source Complete; Communication & Mass Media Complete; Educational Resources Information Center; Library Literature & Information Science Full Text; Library, Information Science & Technology Abstracts; Library & Information Science Abstract; MEDLINE; PsycINFO; Scopus; and Web of Science.

The following Boolean search was carried out: (emoticon OR emoji OR sticker OR nonverbal) AND ("online communication" OR "online interaction" OR "computer mediated communication" OR "CMC"). Up to June 8, 2017, 622 potential studies were identified. We focused mainly on peer-reviewed journals to achieve high academic rigor, but also included conference proceedings that might contain work not yet published in

journals. Thirty-one eligible studies were identified, after we applied the following inclusion criteria: (1) English; (2) full-text available; (3) focusing on the use of emoticons, emoji, and stickers; (4) reporting a systematic data collection and analysis method; (5) examining the use of emoticons, emoji, and stickers in CMC. Studies that did not focus on communication-related purposes, such as using emoticons as instrument scalers, were filtered out. Next, we investigated the reference lists of identified studies and collected another 20 articles. This snowballing method is a powerful approach for identifying high-quality sources published in obscure locations (Greenhalgh & Peacock, 2005). The total number of studies were 51.

Content analysis was adopted to analyze the data. To address the first question, we extracted the theories and conceptual frameworks that were directly associated with the research design and explicitly highlighted in each publication. The identified theories/models were first put into three categories: relationship oriented, understanding oriented, and others. We then examined the specific aspects these studies had addressed. To answer the second question, we adopted a grounded theory approach (Glaser & Strauss, 1967) and particularly analyzed the findings, discussions, and conclusions. Three themes emerged from the data: (1) the motives of using emoticons, emoji, and stickers; (2) the ways in which people use emoticons, emoji, and stickers; and (3) the impact of using emoticons, emoji, and stickers.

We randomly selected and separately analyzed 13 studies (25%). A typical practice employed in review studies includes selecting a sample of articles (which may range from 5% to 30%) to be coded by two or more coders (e.g., Fumero, Marrero, Voltes, & Penate, 2018; Kim & Weaver, 2002; Sheridan, Smith, Kim, Beretvas, & Park, 2019). The Cohen's kappa coefficient was calculated to be .87. We then discussed the discrepancies and modified the operationalization of each category until consensus was reached. The first author finished analyzing the rest of the data. Any uncertainty regarding the coding was resolved by discussion.

Results

The 51 studies spanned 20 years from 1996 to 2017 (see the Appendix). Most of the previous studies were conducted with instant messaging ($n = 12$), e-mails ($n = 9$), or online chats ($n = 9$) from the various media or platforms that support emoticon, emoji, or sticker incorporation. A survey of the geological distribution indicated a well-balanced result. The research contexts included Asia ($n = 16$), North America ($n = 18$), and European countries ($n = 16$). One study (Vidal, Ares, & Jaeger, 2016) did not specify where the research was focused. Only 15 studies provided explicit theoretical underpinnings, from which nine theories or models were identified.

Theories and Models

As a goal-driven behavior, human communication contains two main types of message: relationship oriented and understanding oriented (Habermas, 1984). Therefore, the nine theories/models were assessed based on these two categories.

Relationship Orientation

The first principal theoretical orientation is a focus on developing interpersonal relationships in CMC. Five theories deal with this aspect—namely, social presence theory, social information processing theory, uncertainty reduction theory, politeness theory, and the intimacy model. Each theory/model bears different emphasis of examining the affective dimensions of communication. Delineating the differences between theories will help researchers understand what approaches have been taken, and what aspects of this orientation have been explored. Table1 summarizes their main tenets, representative research questions, and findings.

Table 1. Relationship-Oriented Theories and Major Findings.

Theory/model	Main tenets	Representative questions	Representative findings
Social information processing theory	Users take time to adapt to a medium, and find ways to overcome the shortage of cue systems.	How do emoticons, influence affects or relationships over time?	Emoticon use positively correlates with online friendship development (Utz, 2000).
Uncertainty reduction theory	Users search for cues to reduce uncertainty toward the sender and to predict others' attitudes and behaviors.	How do different users form impressions of senders who use or do not use emoticons?	Recipients of e-mails with a smiley emoticon perceive the sender as more likable (Byron & Baldridge, 2007).
Intimacy model	Self-disclosure in CMC increases the sense of connectedness and perceived intimacy.	How do emoticons influence people's perception of intimate experiences?	Increased use of emoticons leads to increased perception of intimacy (Janssen, IJsselsteijn, & Westerink, 2014).
Social presence theory	The feeling of being connected to another "real person" is influenced by the level of intimacy and immediacy in CMC.	Do emoticons increase the degree of awareness regarding another person?	Dynamic emoticons produce a higher level of social presence than static emoticons do (Tung & Deng, 2007).
Politeness theory	Participants in an interaction share mutual interests in maintaining each other's "face."	How do senders use emoticons to redress perceived affronts to a recipient's face?	Senders use emoticons to soften a face-threatening request or to strengthen the positivity of an affirmative message (Skovholt, Grønning, & Kankaanranta, 2014)

Awareness of others. Social presence evaluated the degree to which users perceive others and their interpersonal relationship (Short, Williams & Christie, 1976). In particular, if users can experience immediate and intimate responses, they will probably feel more emotionally connected, resulting in a higher level of social presence in the online environment. Guided by the social presence theory, Tung and Deng (2007) found that emoji intensified the sense of connectivity and the level of social presence, and, specifically, dynamic emoticons produced higher levels of social presence perception than static ones did.

Relationship development overtime. Users of CMC need time to adapt to a medium and to overcome the relative shortages of cue systems in the online environment (Walther, 1992). In previous studies, emoticon use in CMC was assessed as an adaption to compensate for the lack of visual cues (e.g., Rezabek & Cochenour, 1998). Several studies were based on this social information processing theory. Utz (2000) found that multiuser dungeon players used more emoticons over time, and they indicated that using emoticons positively correlated with the development of online friendships. Walther and D'Addario (2001) found that a smiley emoticon, :-), coupled with a positive text conveyed greater positivity than a positive text alone, and that a frown emoticon, :-(, reduced the positivity of a positive message, but did not make negative messages seem more negative.

Perception of intimacy levels. Intimacy measures the feeling of closeness in human interactions (S. S. Wang, 2016). Research has shown that an increase in intimacy is elicited by an increase in self-disclosure, and emotional self-disclosures (as when one describes his or her emotions) have a strong impact on perceived intimacy (Laurenceau, Barrett, & Pietromonaco, 1998). One popular way of displaying emotional self-disclosure in CMC is through the use of emoticons, emoji, and stickers. According to the intimacy model, the increased use of emoticons leads to an increased perception of intimacy (Janssen et al., 2014). Senders could use cartoon-like stickers with detailed illustrations resembling real-life nonverbal cues to express intimacy in CMC (S. S. Wang, 2016).

Uncertainty reduction. The uncertainty reduction theory indicates that communicators actively seek available cues to reduce uncertainty and predict the attitudes or behaviors of others (Berger & Bradac, 1982). Because of the limitations on expressing emotions physically, online message recipients commonly seek cues such as emoticons to make sense of other people, and to reduce the uncertainty in their future relationships. Byron and Baldridge (2007) found that the recipients of e-mails that included a smiley-face emoticon, :-), perceived the senders as being more likable than recipients who received e-mails without such symbols. The results further suggested that whereas the use of all capital letters increased uncertainty in a message, the inclusion of a smiley-face emoticon reduced uncertainty by signaling a positive affective tone (Byron & Baldridge, 2007).

Face protection. "Our face is on the line every time we interact" (Goldsmith & Normand, 2015, p. 268). According to the politeness theory, every person has a positive face that one desires, and a negative face that refers to the freedom from being controlled or imposed on by others (Brown & Levinson, 1987). The function of politeness is to protect face and to reduce the degree of face-threatening behavior. Central to politeness theory is the notion of "hedge." A hedge (e.g., very, perhaps, I think) is used to show the level of confidence and to avoid threatening another person's face. Hedges can be either "strengtheners" that emphasize the message or "softeners" that weaken the content. Researchers have found that people use

emoticons like :) as a mitigative strategy to reduce the impact of face-threatening actions (like making complaints), and that they use emoticons like :) to express friendliness when they perform affirmative actions such as voicing agreement (Golato & Taleghani-Nikazm, 2006; Skovholt et al., 2014).

Understanding Orientation

Another theoretical orientation concerns the degree of mutual understanding toward the messages (see Table 2). Related theories focus on questions such as how people interpret textual and nontextual elements, or what nonemotional communicative functions are served by emoticons, emoji, and stickers.

Table 2. Understanding-Oriented Theories and Major Findings.

Theory/model	Main tenets	Representative questions	Representative findings
Cognitive dissonance theory	Users instinctively reduce cognitive contradictions between emoji and text.	How do emoji influence recipients' understanding of a text message?	When the contents of an emoji and a text are incongruent, the text takes prevalence over the emoji (W. Wang et al., 2014).
Speech act theory	A social action is performed when the user makes an utterance.	What nonemotional communicative functions do emoticons serve?	Emoticons indicate illocutionary forces, as clues of tone in making a request (Dresner & Herring, 2010).

Verbal versus nonverbal cues. When people are presented with conflicting thoughts, they are motivated to reduce the dissonance by various means, such as by changing an action, discounting the importance attached to a particular conflicting opinion, or attaching more importance to another message (cognitive dissonance theory; Festinger, 1957). W. Wang et al. (2014) paired supporting specific, constructive text feedbacks with a liking emoji (e.g., a smiley face 😃), and unspecific, less constructive feedbacks with a disliking emoji (e.g., an angry face 😡). In these situations, the emoji-based cognition was consonant with the text-based cognition. However, when constructive feedback was paired with a disliking emoji, or when less constructive feedback was paired with a liking emoji, dissonance occurred. The study found when the emoji-based and text-based cognitions were dissonant, the recipients were inclined to discount the message of the emoji, and to rely primarily on the text. In other words, textual cognition overpowered the emoji-based cognition. One reason might be that text was deemed less ambiguous, and users who experienced dissonance tended to attenuate the importance attached to the emoji and attached more value to the text (W. Wang et al., 2014).

Communicative functions. Dresner and Herring (2010) found that emoticons are often indicative of the "illocutionary force" of the text they accompany. According to Austin's (1962) speech act theory, when people produce utterances, they simultaneously perform three kinds of speech acts: locutionary, illocutionary, and perlocutionary. The locutionary act expresses a literal meaning; the illocutionary act expresses the action performed through the utterance, and the perlocutionary act is the consequence of the utterance. For example, two friends go to a restaurant, and one says, "There are too many people." The

literal meaning of this sentence is the locutionary act. The illocutionary act is, "I want to go to another restaurant." The perlocutionary act is the consequence of the utterance (e.g., going to another place). Dresner and Herring presented an example that the winking emoticon indicates that the preceding utterance is intended as a joke. The winking emoticon here performs illocutionary force. It is a sign regarding the force of what has been textually said, rather than as an indication of emotion (Dresner & Herring, 2010).

Other Theories/Models

Two theories cannot appropriately fit into either category. The media richness theory describes the ability of a communicative channel to convey information. The richer a medium is, the easier the recipient understands the intended message. Another is the cognitive-affective model of organizational communication, which provides a step-wise analytical tool for examining communications in terms of the input, the process, and the complexity involved.

Media features. Media richness theory provides a framework to evaluate a medium's capabilities of delivering messages in multiple dimensions, including whether the medium enables immediate feedback, the number of cues it can express, and its capacity to convey user personalization (Daft & Lengel, 1986). Based on this theory, online text messages are leaner than telephone messages because text cannot convey audio information, and telephone is leaner than video because it fails to convey visual images. The richest medium is face-to-face interaction. Hsieh and Tseng (2017) found that emoticons could increase information richness by conveying emotional and facial expressions, and lead to greater perceived playfulness and enjoyment. Perceived playfulness helps to decrease the psychological distance between people, increases their sense of social connectedness, and establishes a feeling of relatedness (Hsieh & Tseng, 2017).

Communicative process. The cognitive-affective model draws on several theories to describe how three basic factors in communication—inputs, process, and impact—affect one another (Te'eni, 2001). For example, it offers several propositions concerning communication strategies and media attributes based on media richness theory. Gettinger and Koeszegi (2015) examined how the uses of emoticons could affect the communication strategy (i.e., negotiation behavior) with different media and feedback immediacies (such as asynchronous e-mail or synchronous chat). They found that emoticons could decrease negative affect in synchronous negotiations and enhance positive effect in asynchronous negotiations (Gettinger & Koeszegi, 2015). Pesendorfer and Koeszegi (2006) referred to synchronous negotiation as a "hot debate" and to asynchronous negotiation as a "cool conversation." The former was found to induce more competitive and less friendly behavior, as the participants had less time to analyze the actual situation or to consider alternatives than they did during the asynchronous interactions (Gettinger & Koeszegi, 2015). Emoticons helped to "cool down" synchronous negotiations.

Research Findings

Findings of the 51 studies are grouped into three topics, as summarized in Table 3.

Table 3. Summary of Findings.

Topic	Findings	Sample studies
Why do people use emoticons emoji and stickers?	1. To express emotions. 2. To avoid misunderstanding and to substitute textual expressions. 3. For enjoyment and fun. 4. For social purposes.	Derks et al. (2008); Lee, Hong, Kim, Oh, & Lee (2016); Zhou, Hentschel, & Kumar (2017)
How do people use emoticons, emoji, and stickers?	1. People tend to use emoticons that are understandable, in positive contexts, and for more socialization than tasks. 2. People tend to use more negative emoticons in synchronous communication, but more positive emoticons in asynchronous contexts. 3. Females tend to use more emoticons, but males tend to use a wider range of emoticons.	Braumann, Preveden, Saleem, Xu, & Koeszegi (2010); Gettinger & Koeszegi (2015); Tossell et al. (2012); Wolf (2000)
What is the impact of using emoticons, emoji, and stickers?	1. More emoticons lead to a higher level of perceived intimacy in CMC. 2. Senders of friendly emoticons would be perceived as more outgoing and favorable. 3. Excessive emoticons have adverse effect. The senders might be considered as insincere. 4. Using emoticons directs the intended meaning of the message. 5. Emoticons mitigate the negativity and strengthen the positivity. 6. Cues cannot overpower texts.	Byron & Baldrige (2007); Janssen et al. (2014)

Why Do People Use Emoticons, Emoji, and Stickers?

Five studies gathered subjective data to explore why people use emoticons, emoji, and stickers. The results show that in addition to expressing emotions, people use these cues to perform pragmatic functions, such as assisting message interpretation, avoiding misunderstanding, or substituting textual expressions. Using graphicons, especially stickers, creates an improved level of individualization and amusement.

Derks et al. (2008) found that varying the valences of emoticons and messages could cause ambiguity, indicating that emoticons may shape the communicative content. Lee et al. (2016) found it was common for the interviewees to use stickers to strategically manage their social status and relationships or to serve other functions, such as substituting for or supplementing textual messages. Zhou et al. (2017)

interviewed 30 participants on their motivations for choosing stickers over emoji. The participants revealed various motivations, including elevated levels of personalization, expressiveness, humor, and enjoyment. One interviewee noted, "Sometimes you don't want to talk, and when you send stickers, you feel entertained" (Zhou et al., 2017, p. 755). Chen and Siu (2017) surveyed 347 Chinese young people and summarized accuracy, sociability, efficiency, and enjoyment as their four main motives for using emoticons, emoji, and stickers. Moreover, using these symbols was a means of communication that rising numbers of young people are embracing (Chen & Siu, 2017).

How Do People Use Emoticons, Emoji, and Stickers?

Seventeen studies examined how people strategically adopted emoticons, emoji, and stickers in different contextual environments. In general, using these cues was a highly personal behavior (Rezabek & Cochenour, 1998) that could be influenced by communicative purposes and social situations (Vandergriff, 2013, 2014).

Regarding the choice of cues, some studies indicated that users tended to use emoticons that they understood (Cao & Ye, 2009). Tossell et al. (2012) found that females tended to use more emoticons, but males used a wider diversity of emoticons. Interestingly, Wolf (2000) reported that when males moved from a single-gender group to a mixed-gender group, they commonly switched from being emotionally inexpressive to matching the females in making greater use of emotional expressions.

Context-wise, people used more emoticons in positive than in negative contexts (Ahn, Park, & Han, 2011), and more for social/emotional purposes than in task-related purposes (Derks, Bos, & von Grumbkow, 2007; Xu, Yi, & Xu, 2007). Braumann et al. (2010) found that more negative emoticons were used in synchronous communication, whereas more positive emoticons were used in asynchronous contexts. Users may also adopt different strategies in asynchronous as opposed to synchronous contexts. In asynchronous negotiations, emoticons were mainly used to increase the sense of positivity, but in synchronous negotiations these symbols were primarily used to decrease the sense of negativity (Gettinger & Koeszegi, 2015).

What Is the Impact of Using Emoticons, Emoji, and Stickers?

More than half (*n* = 29) of the 51 studies examined the impact of emoticon, emoji, and sticker use in CMC. Overall, these studies showed that the use of nonverbal cues could supplement affective expressions and influence interpersonal relationships, and it could also direct the intended interpretations and strengthen or mitigate the intensity of verbal messages.

Several studies have shown that emoticon use can influence how people perceive each other. For example, more emoticon use led to higher levels of perceived intimacy in online communications (Janssen et al., 2014). The senders of friendly emoticons or emoji, such as the smiley face, **:-)**, were generally perceived as more outgoing and favorable (Byron & Baldridge, 2007; Fullwood & Martino, 2007; Wibowo et al., 2017). Utz (2000) found that the more people used emoticons, the more friendships they formed in the virtual society. However, excessive emoticon use tended to generate an adverse effect in forming

impressions. The senders of excessive emoticons could be considered as careless, insincere, or as trying to hide their real feelings (Yoo, 2007).

Other studies have shown that using emoticons, emoji, and stickers can assist with mutual understanding of a message. For example, using emoticons might mitigate the anger in a verbal expression (Thompsen & Foulger, 1996). Thompson and Filik (2016) found that emoticons (such as a tongue-and-wink images) could help recipients to correctly comprehend ironic expressions in a message. However, the meanings of textual messages could conflict with those of the nonverbal cues, and that in such cases people tended to rely mainly on the verbal parts of the expression (Derks et al., 2008). In other words, if the verbal message was negative, even though a positive emoticon was inserted, the overall tone of the message would be perceived as negative. Nonverbal cues could complement, but not overpower, the meaning of the verbal expression.

Discussion

This study first clarifies the definitions of emoticons, emoji, and stickers to address the terminological confusion in the literature. It then highlights the various theoretical underpinnings that have guided prior related research, and to discuss the different research foci (and their findings). By describing the main tenets of the theories and the main research questions they focus on, this work provides a schema for conceptually organizing a body of literature. Theories/models can provide useful insight into what aspects have been inspected, thereby broadening our understanding of the phenomena concerned. An important value of this work is that it encourages researchers to be cognizant of existing theories and to apply the most relevant ones to their own work. The use of theory can also increase a researcher's success of generalizing the findings to other contexts (Moore, 1991). Finally, this study seeks to understand why and how people use emoticons, emoji, and stickers, and to learn about their influence on human communication.

It seems the use of theories is not keeping pace with the increase in the quality and range of relevant studies. Fewer than expected, only about 30% of the surveyed studies explicitly referred to a specific theory/model. Therefore, we call for more studies to clearly structure their research with clearly presented theoretical underpinnings. In reviewing the nine theories, we noticed that efforts to understand emoticon, emoji, and sticker use in CMC have taken two main orientations. One strand has examined the influence on human relationships, and the other has focused on the effects on cognitive understanding of the messages. Five theories/models fell under the first category, "relationship orientation," indicating that the major focus of prior research has been on determining how emoticons, emoji, and stickers can compensate for the lack of emotional nonverbal cues, and how these symbols influence the ways people affectively perceive each other in CMCs. Within this category, researchers examined various aspects such as user awareness of others, relationship development over time, and intimacy levels. Fewer studies have focused on how using these symbols can affect the mutual understanding of messages. Even though several studies have shown that graphicons can function like actual words in CMC, this line of research has been comparatively neglected. More empirical research may need to consider how graphicons can affect mutual understanding.

Tung and Deng (2007) showed that sixth-grade children viewing a dynamic cue perceived a higher degree of social presence than those viewing a static cue. It would be interesting to investigate the differences

in affect between moving and nonmoving visual cues for people of other age groups, in other contexts, and in relation to other indicators (such as message comprehension). Other related research questions include, What are the specific roles of modes in communication? For example, does a moving image enhance or hinder message interpretation, compared with a static image? How does the receiver interpret a communication emotionally and socially when the modality varies? These questions touch on an area scarcely explored in earlier studies.

Previous scholarship has examined how people use emoji differently across cultures. For instance, Park, Barash, Fink, and Cha (2013) reported that users from Asian cultures prefer vertical emoticons with eye-shape variations, such as ˆ_ˆ and T_T, whereas users from Western cultures favor horizontal emoticons based on different mouth shapes, such as :-) and :-D. Lu et al. (2016) examined more than 400 million emoji-containing messages, sent by 3.88 million users from 212 countries and regions, and found significantly different user behaviors across cultures. For example, French like ❤️ the most, whereas 😂 is the top emoji used by seven other countries, including the U.S., Russia, and Indonesia (Lu et al., 2016). Ge and Herring (2018) found that Chinese microblog users invented their own patterns of emoji ordering (two or more emoji with meanings that stand together to form sentence-like utterances), and that emoji use seemed to be further advanced in China than in Western cultures. Although emoji sequences in Western cultures primarily repeated the text they follow (McCulloch & Gawne, 2018), those in China were used to evaluate and elaborate on the text (Ge & Herring, 2018). In addition, although users in English-speaking contexts often simply substitute emoji for English word for word (Danesi, 2016), Chinese users employ emoji more innovatively to express their unique personality, create shared meanings, poke fun at one another, and invoke solidarity and affiliation (Andersen, 2018). Stickers are extremely popular in Asia, but this may not be the same case in Western markets (Russell, 2013). Therefore, more culturally situated research is needed on different graphicon types (Herring, 2018).

Limitations

This study has two limitations. Our work was inspired by the main types of graphicons that are popular in MIM apps—namely, emoticons, emoji, and stickers. It did not cover other types of graphicons in CMCs, such as images, videos, or animated GIFs—which is considered as a type of sticker in MIM communication. Therefore, the list of studies reviewed should not be seen exhaustive. In addition, as online graphicon use is still evolving, it is beyond the capability of this study to capture all the nuances and diversity of visual communicational resources. We were not capable of thoroughly addressing the diversity of graphicons, their sociocultural tie-ins, or design considerations. It is our interest to continue expanding the understanding in this field, and we invite future scholarship to do so.

This study is limited by our search range of disciplinary areas. The reviewed studies were mainly extracted from the fields of communication, linguistics, and psychology. We are aware that emotional expressions in digital communication is a relevant topic in other disciplines, such as anthropology, sociology, and media studies. However, we were not able to exhaustively examine all other related disciplines in this study and were therefore cautious about the generalizability of the present conclusions to other fields. The focus is confined to the literature sampled here and the specific criteria used in the search process.

Future Research

Many studies thus far have focused on emoticons and emoji. In our sample, only four studies have specifically examined the use of sticker emoticons (two of which used the term "emoticons" to describe graphic icons that were actually stickers). Therefore, future work may examine why and how people use stickers in online communication, such as users' choices between stickers and emoji in online messages, and the rationales behind the preferences. Future studies may also investigate whether using stickers serves a speech-act function, or whether stickers generate any unique speech act functions that have not been previously identified.

Indeed, because of the limitation of our search range, this study did not cover all disciplinary areas and related works. The scholarship from other disciplinary areas (e.g., Lim, 2015; Nishimura, 2015) may not be sufficiently presented in this study. Future studies may extend the search to other disciplines for a wider scoped view about this topic of interest.

Future studies are encouraged to be situated in specific authentic and naturalistic contexts, with clear descriptions of communicative goals. This type of research can be particularly meaningful for comparing user behaviors in different real-life situations, and for uncovering user intentions of applying different graphicons. More than half of our 51 surveyed studies (n = 28) were conducted in contrived lab settings. The remaining 23 studies examined real-life naturalistic communications (such as responses to questionnaires asking about users' preferences), but only seven of them examined user behaviors related to specific communicative activities (e.g., workplace e-mail communications, classroom interactions). These studies failed to situate the reported communications in relation to specific activities or tasks. We may benefit from a more purposive exploration of how emoticons, emoji, and stickers are used in specific, authentic communicative tasks. Such studies need to collect naturalistic data, such as student discussions on assignments or employee negotiations on business projects.

Another future direction is to compare the actual outcomes of different communications. No study in our sample has examined the degrees to which the senders' communicative goals are achieved. In previous studies, analyses of the senders' interpretations were questionable, as none of the researchers asked the actual senders about their intentions. These studies merely used coders (not the senders) to interpret the emoticons. To overcome this limitation, future studies may pursue answers to the following questions. First, are there any patterns of misunderstanding between actual senders and recipients about the meanings of graphicons? If yes, what is the influence of such misunderstandings? Second, what are the reasons for such misunderstandings? Third, how can those misunderstandings be avoided?

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Appendix

Table A1. Summary of Studies.

	Study	Type	Country	Context	Participants	Design	Theory/ Model
1	Ahn et al. (2011)	10 emoticons	Korea	Text message	27 univ-students	E	None
2	Braumann et al. (2010)	6 emoticons	France	N-swan (a text-based electronic communication system)	112 univ-students	E	None
3	Byron & Baldridge (2007)	:-)	Austria	E-mail	293 univ-students	E	Uncertainty reduction theory
4	Cao & Ye (2009)	Stickers	U.S.	Forum	Not specified	D	None
5	Chang (2016)	Emoji	China	Forum	13 univ-students	D	None
6	Chen & Siu (2007)	Graphicons	Taiwan	MIM	347	D	None
7	Derks et al. (2007)	6 emoticons	China	Chat	157 secondary school students	E	None
8	Derks et al. (2008)	3 emoticons	U.S.	E-mail	105 secondary school students	E	None
9	Derks et al. (2008)	6 emoticons	Netherlands	Chat	925	E	None
10	Dresner & Herring (2010)	Emoticons	Netherlands	Various	n/a	D	Speech act theory
11	Filik et al. (2015)	Emoticons	Netherlands	Online message	144 univ-students	E	None
12	Fullwood & Martino (2007)	3 emoticons	UK	IM	32 univ-students	E	None
13	Ganster et al. (2012)	Emoticons: :-), :-(Emoji: ;	UK	Chat	127 online participants	E	Social information processing theory

14	Gettinger & Koeszegi (2015)	6 emoticons	Europe	Text message	98 univ-students	E	Cognitive-affective model
15	Golato &Taleghani-Nikazm (2006)	Emoji	Germany	Webchat	Online participants	D	Politeness model
16	Halvorsen (2012)	Emoticon	U.S.	Forum	13 adults	D	None
17	Hsieh & Tseng (2017)	Graphicons	Taiwan	MIM	201 online participants	D	Media richness theory
18	Huang et al. (2008)	Graphicons	U.S.	IM	216 univ-students	D	Media richness theory
19	Ip (2002)	Emoticon	U.S.	IM	11	E	None
20	Janssen et al. (2014)	Happy and sad emoticons	Netherlands	Emotional responses to movies	46 vs. 34 univ-students	D	Intimacy model
21	Kalyanaraman & Ivory (2006)	Emoticon	U.S.	Chat room	120	E	None
22	Kato et al. (2007)	Emoticon	Japan	E-mail	22 univ-students	E	None
23	Kato et al. (2009)	4 emoticons	Japan	IM	120 univ-students	D	None
24	Lee et al. (2016)	Stickers	Korea	IM	10	D	None
25	Lo (2008)	6 emoticons	Taiwan	IM	137	E	Social information processing theory
26	Luor et al. (2010)	Emoticon	Taiwan	IM	108	D and E	None
27	Markman & Oshima (2007)	Emoticon	US	Various	n/a	D	None
28	McDougal et al. (2011)	Emoticon	U.S.	IM	32 univ-students	E	None
29	Provine et al. (2007)	Emoticon	U.S.	Online boards	226	D	None
30	Rezabek & Cochenour (1998)	Emoticon	U.S.	E-mail	univ-students	D	None

31	Rivera et al. (1996)	6 emoticons	U.S.	Lab	23	E	None
32	Skovholt et al. (2014)	Emoticons	Europe	E-mails	1,606 e-mails	D	Speech act and politeness theory
33	Smith (2015)	Emoji	UK	IM	150	E	None
34	Thompsen & Foulger (1996)	Emoticon	U.S.	E-mail	161	E	None
35	Thompson & Filik (2016)	Emoticon	UK	Text message	51 & 113	E	None
36	Thompson & Filik (2016)	tongue-face emoticon	UK	Message	47 univ-students	E	None
37	Tossell et al. (2012)	Emoticon	U.S.	Text message	21 univ-students	E	None
38	Tung & Deng (2007)	Stickers	Taiwan	A feedback-provision program	173 six graders	E	Social presence theory
39	Utz (2000)	Happy **:-)** Sad **:-(**	Europe	multi-user-dungeons	103 online participants	D	Social information processing theory
40	Vandergriff (2013)	Emoticon	U.S.	Chat room	univ-students	D	none
41	Vandergriff (2014)	Emoticons: smile, frown, and wink	U.S.	IM	univ-students	D	None
42	Vidal et al. (2016)	Emoticon & emoji	N/A	Twitter	Online participants	D	None
43	Wall et al. (2016)	Emoticon	UK	Facebook and online chat	92 & 54 univ-students	C	None
44	Walther & D'Addario (2001)	Emoticons :-) :(or ;-)	U.S.	Mock e-mails	226 univ-students	E	Social information processing theory
45	W. Wang (2016)	Stickers	Taiwan	MIM	300 online participants	E	Intimacy model
46	S. S. Wang et al. (2014)	8 selected emoji	China	MSN	198 univ-students	E	Cognitive dissonance theory

47	Wibowo et al. (2016)	Emoji	Indonesia	Lab	45 univ-students	E	None
48	Wolf (2000)	Emoticon (smile, frown, and wink)	U.S.	Newsgroup	236 online participants	D	None
49	Xu et al. (2007)	Emoji (happy and sad)	Singapore	IM	120 univ-students	D	None
50	Yoo (2007)	Emoticon	U.S.	E-mail	447	E	None
51	Zhou et al. (2017)	Emoji and sticker	China	MIM	30	D	None

Note. E = experimental; D = descriptive; C = correlational.