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Interpreting Emoji Pragmatics

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Abstract

This chapter describes the methods and the overall findings of the Understanding Emoji Survey, which we administered online in early 2018 to determine how social media users interpret the pragmatic functions of popular emoji types in the discourse context of comments posted to public Facebook groups. The findings generally validate Herring and Dainas's (2017) taxonomy of graphicon functions for emoji, although survey respondents (n=523) overwhelmingly preferred one function, *tone modification*, over the others. Moreover, preferred interpretations of pragmatic function varied according to emoji type. Based on these findings, we argue for the importance of analyzing emoji meaning from the perspective of pragmatics.

Introduction

The popular press (at least in the English-speaking world) is currently rife with speculation that emoji are becoming a new, global "language."[1] However, in order for a set of symbols to become a language that can be used to communicate effectively with other people, users of the symbols must agree on their meanings, and a number of studies have shown that even within the same culture, internet users often disagree in their interpretations of emoji (e.g. Miller, Thebault-Spieker, et al. 2016; Tigwell and Flatla 2016). Starting from the assumption that the basic function of emoji is to express emotion, most of these studies have focused on the emotion, sentiment, or mood conveyed by individual emoji in experiments involving emoji presented either in isolation (e.g. Jaeger and Ares 2017, Miller, Thebault-Spieker, et al. 2016) or in the context of Twitter tweets (e.g. Miller, Kluver, et al. 2017). A limitation of this approach, however, is that it views meaning as residing solely on the semantic level, in the emoji icons themselves, rather than in emoji-in-use. Emoji do not only express emotions such as 'happy' or 'sad', or 'positive' or 'negative' sentiment; they also have pragmatic functions whose meanings derive from the contexts in which they are embedded, such as tone modification, illustration or repetition of accompanying text, and performance of virtual actions (e.g. Herring and Dainas 2017). Thus research that seeks to understand how emoji are interpreted in authentic contexts of use – which is where most people encounter them, rather than as isolated tokens – needs to account for their pragmatic functions.

To address this need, we conducted an online survey, the Understanding Emoji Survey, to determine how social media users interpret the pragmatic functions of 13 popular types of emoji (smiles, frowns, winks, etc.) in the discourse context of comments posted to public

[1] See e.g. Cohn (2015), Oliveira (2017), and Thompson (2016). Emoji are small, colorful graphical icons used in text fields in digital communication and that represent facial expressions, objects, actions, and symbols. The word emoji comes from Japanese *e-* ('picture) + *moji* ('character').

Facebook groups. For each emoji-containing comment, respondents selected from a list of functions that was adapted from Herring and Dainas's (2017) taxonomy of graphicon functions. This chapter describes the survey study methodology and reports on its overall findings. Drawing on example survey items and the responses they received, we demonstrate that although the semantics of individual emoji inform their pragmatic uses, understanding emoji semantics is often insufficient to understand the intended meaning of emoji-containing messages. Further, different emoji types specialize to varying degrees in expressing particular pragmatic functions.

Another goal of the survey was to compare our interpretations, as researchers analyzing the functions of emoji-in-use, with those of ordinary social media users, as a validity check. The survey included anonymized examples of emoji-containing Facebook comments that we had found challenging to classify in earlier research.[2] The respondents' interpretations of these examples turned out to be less nuanced than ours: Tone modification was their default interpretation, although the other categories from the Herring and Dainas (2017) pragmatic function taxonomy were selected by a majority of respondents for at least some survey items, thereby validating the taxonomy. Agreement rates among respondents and between respondents and the researchers varied according to emoji type and function. Even with this variance, the agreement levels far exceeded random chance, especially when we accounted for respondents' preference for tone modification. From this, we surmise that intersubjective agreement on other, less challenging emoji uses should be even higher, increasing the generalizability of the survey findings.

In the last sections of the chapter, we revisit the issue of emoji ambiguity and consider the effectiveness of providing social media discourse context to clarify emoji users' intended meanings. Based on our findings, we also (re)evaluate the status of emoji as a "language" with shared conventions and meanings.

Background Literature

Emoji as Language

Scholars of language and communication are increasingly joining journalists in advancing the claim that emoji are developing into an independent, visual language. There is evidence for this claim on multiple levels. Emoji use in social media is on the rise (Pavalanathan and Eisenstein 2016; Pohl, Domin, and Rohs 2017), including uses of emoji alone without any accompanying text. Emoji can serve various structural linguistic functions, such as letter replacement and word replacement (Cramer, de Juan, and Tetreault 2016; Dürscheid and Siever 2017), as well as substituting for entire propositions (Herring and Dainas, 2017). Because they mostly appear at the end of sentences, they can also mark sentence boundaries (Cramer et al. 2016), functioning like punctuation. Indeed, Pohl et al. (2017) argue that although emoji lack a phonetic interpretation, they are themselves a form of text:

[2] E.g. Herring and Dainas (2017) and subsequent unpublished research.

> What makes emoji special as a means of adding visuals to texts is that they *are* text. Instead of sending images of smileys or airplanes, characters representing them are transmitted (they form a logographic writing system). Hence, in contrast to images, they can be used in places such as URLs, email subjects, or usernames. (6:5)

In addition, sequences or strings of emoji exhibit grammar-like properties, such as subject- or stance-first word order (e.g. Danesi 2016; Steinmetz 2014). Danesi (2016) also suggests that some strings of emoji have an iconic conceptual structure, and he notes the practice of calquing, whereby emoji are directly mapped onto morphemes, words, or utterances of the verbal language. The relationship of emoji and emoji sequences to the text they follow can also be described in syntactic terms (Cramer et al. 2016; Pohl et al. 2017).

Most scholars stop short of considering emoji a fully-functioning language, however. They point out that emoji mostly denote concrete objects, anthropomorphic facial expressions, and (occasionally) actions, and that emoji sets lack icons for abstract concepts and grammatical categories such as tense and number, articles, and conjunctions, which verbal languages typically possess (e.g. Cohn 2015; Dürscheid and Siever 2017). Moreover, using only emoji, one could not embed propositions inside other propositions or refer to strings of events other than in chronological sequence.

Difficulties also exist at the level of meaning. As Miller, Kluver, et al. (2017:152) note, "in order to avoid miscommunication incidents, people must interpret emoji characters in their exchanges in the same way (and they must know that they are interpreting them the same way)". However, a number of studies have found that people vary in their understanding of emoji semantics. These studies are discussed in the following section.

Emoji Semantics

Most research on receiver interpretations of emoji has focused on emoji semantics, either in isolation or in very limited discourse contexts. As an example of the first type, Miller, Thebault-Spieker, et al. (2016) asked Amazon Mechanical Turkers to rate the sentiment and also describe the meaning of various isolated emoji renderings. They found within-platform disagreement on sentiment in 25% of emoji renderings, as well considerable variation in both within- and across-platform semantic descriptions of emoji. Tigwell and Flatla (2016) had 70 participants situate eight Android OS emoji renderings and eight Apple OS emoji renderings on a two-dimensional space, where the vertical axis represented intensity and the horizontal axis represented a scale of negative to positive sentiment. They found individual differences along both scales for each emoji. Further, the Apple and Android renderings of the same emoji displayed distinctly different sentiment and intensity scores.[3]

Similar studies have been conducted in non-Western contexts. Annamalai and Abdul Salam (2017) surveyed Malaysian students for their interpretations of isolated WhatsApp emoji renderings. Not only were there varying levels of agreement among respondents on what a

[3] In this chapter, we include sentiment and intensity, along with emotion, under the general domain of semantics.

given emoji means, but the respondents often did not describe the emoji as intended by the Unicode Consortium, the organization that approves emoji for inclusion in Unicode and standardizes their definitions.[4] In another study, Jaeger and Ares (2017) surveyed the dominant consumer interpretations of isolated facial emoji by Mainland Chinese participants. Out of 33 emoji, some (15) mapped to one emotion, another group (10) mapped to multiple related emotions, and a final group (8) had multiple unrelated meanings.

In studies that consider emoji semantics in context, the context is usually a single Twitter tweet (Barbieri et al. 2016; Miller, Kluver, et al. 2017). For example, Miller and colleagues (2017) collected public English language tweets containing misinterpretation-prone emoji. They filtered the tweets to exclude retweets, user mentions, hashtags, URLs, and other attached media. Amazon Mechanical Turkers rated the sentiment of the emoji in the context of the tweets, but agreement did not improve compared to Miller, Thebault-Spieker, et al. (2016). In fact, the tweet context actually decreased the rate of agreement for some emoji. However, it is not clear what role the context of the tweet itself played in this study's results, considering the length restrictions on tweets (120 characters at the time of the study), the fact that no prior discourse context was included, and the fact that tweets containing retweets and hashtags – common interactive components of tweets – were excluded.

Explanations for Semantic Ambiguity

Aside from insufficient context, a number of explanations have been proposed for the semantic ambiguity of emoji. First, some emoji are inherently more ambiguous than others. Miller, Thebault-Spieker, et al. (2017) found that the grinning face with smiling eyes (😁), the unamused face (😒), and the smirking face (😏) (as rendered by Apple IOS, like some of the emoji in the present study) had the most disparate agreement rates, whereas raters agreed most on the sentiment of the heart eyes (😍), sleeping (😴), and crying face emoji (😢). Similarly, for Jaeger and Ares's (2017) Chinese social media users, the tears of joy (😂), blushing face (😳), grimacing face (😬), and smirking face mapped to multiple unrelated meanings, while the throwing (sic) a kiss (😘), loudly crying (😭), winking (😉), heart eyes, smiley (☺️), and the tongue out (😛) faces mapped predominantly to just one emotion. The varying levels of ambiguity in emoji may be a feature that is inherent to depictions of facial expressions (Choi, Hyun, and Lee 2017).

Further, as has often been pointed out, emoji render differently across platforms. The Unicode Consortium creates a code for each emoji but does not specify how to render them. While the letter A is almost always recognizable as the letter "A" regardless of its rendering, emoji are more open to interpretation. Research shows that variations in rendering can significantly alter the perceived meaning of some emoji (e.g. Miller, Thebault-Spieker, et al. 2016; Tigwell and Flatla 2016). This creates opportunities for miscommunication.

Finally, social and cultural factors may affect how users interpret emoji. While studies have not found strong gender differences in emoji interpretation (Herring and Dainas 2018; Jaeger et al. 2017), age may (Gullberg 2016; Herring and Dainas under review) or may not (Jaeger

[4] http://unicode.org/reports/tr51/

et al. 2017) be a factor. Experience with emoji (Jaeger et al. 2017) and familiarity with one's online interlocutors (Tigwell and Flatla 2016) may also make emoji easier to interpret. Finally, the language and culture of the community of users may influence emoji usage and meaning (e.g. Barbieri et al. 2016).

In a departure from other researchers, Pohl et al. (2017) suggest that the ambiguity of emoji may in fact be a strength: "Emoji meaning is fluid and subject to contextual and cultural … interpretation. It is this malleability that makes emoji attractive from an expressive point of view" (6:2). This observation underscores the importance of studying contextualized interpretations of emoji-in-use.

Emoji Pragmatics

Compared to emoji semantics, less research has focused on the pragmatic functions of emoji. However, numerous studies have identified pragmatic functions of emoticons, the antecedents of emoji (e.g. Liebman and Gergle 2016; Lo 2008; Yus 2014; Walther and D'Addario 2001). For example, research has shown that emoticons help clarify a sender's intended meaning, tone, emotion, attention, and self-presentation (Lo 2008; Ganster, Eimler, and Krämer 2012). Yus (2014) created a taxonomy of pragmatic functions of emoticons that includes mitigating, intensifying, or contradicting the propositional attitude expressed in the sender's text. Comparative studies show that emoji and emoticons share pragmatic functions, especially tone marking (Herring and Dainas 2017), and do not appear to affect message interpretation differently (Ganster et al. 2012). Despite this, users perceive emoji as more appealing, familiar, clear, and meaningful (Rodrigues et al. 2018). Emoji also have a stronger influence on the perceived mood and commitment of the sender (Ganster et al. 2012) than emoticons.

There is evidence that lay users are to some extent aware of the pragmatic functions of emoji beyond simply expressing emotion. Kelly and Watts (2015)'s interviewees reported using emoji to maintain or end conversations, to be playful, and to build rapport through shared idiosyncratic uses. Participants in Gullberg (2016)'s focus group agreed to differing extents that emoji could serve to enhance emotion, confirm receipt of a message, manage the conversational climate (as a signal of friendliness, anger, or sincerity), maintain relationships, and express one's personal aesthetic.

The above studies were based on qualitative interviews and focus groups. In contrast, only three studies to our knowledge have attempted a systematic accounting of the pragmatic functions of emoji. Cramer et al. (2016) collected the most recently sent messages containing emoji from 228 participants, along with user-reported descriptions of the emoji's intended meaning and function. The user descriptions revealed three categories of motivation for emoji use: to add emotional or situational meaning, to add tone to text, and as a social tool used to add flair, manage the conversation, and maintain relationships. The researchers also identified three functions of emoji use: repetition of text, complementary usage, and text replacement. Na'aman, Provenza, and Montoya (2017) attempted to train a classifier to identify three high-level categories – Function, Content, and Multimodal – of emoji in tweets based on annotations by four computational linguistics graduate students. The classifier

performed poorly, particularly with the Multimodal label, which was most akin to our understanding of pragmatic functions, because there was low agreement among coders on these variables. Na'aman et al. (2017) concluded that it is difficult to interpret emoji functions even in context. Herring and Dainas (2017) adopted a more fine-grained, grounded theory approach in describing pragmatic functions of graphical icons (*graphicons*[5]), including emoji, in comments posted to public Facebook groups. In addition to tone modification, they found that emoji perform virtual actions, express emotional reactions, mention (repeat or illustrate) textual content, riff or elaborate playfully on prior messages, and appear together in narrative sequences.

While Herring and Dainas (2017) were able to reach a high level of agreement in coding graphicons after discussion, their taxonomy is based on researcher interpretations, which may not correspond to how the pragmatic functions of emoji are understood by a lay audience or the intended receivers. For one thing, researchers may spend time scrutinizing instances of emoji use where most social media users would gloss over them. Yet there has been, to our knowledge, no systematic comparison of researcher interpretations of emoji to those of lay users. In the present study, we survey lay users about their interpretations of emoji functions in context, using a modified version of the Herring and Dainas (2017) taxonomy of pragmatic functions, and compare them to our researcher interpretations.

Research Questions

The general research question we seek to answer is: How do social media users interpret the pragmatic functions of emoji in the discourse contexts in which they occur?

Specifically, we aim to address three questions:

RQ1: Which emoji functions are chosen most often, and for which emoji types?

We are interested to know if some pragmatic interpretations of emoji are preferred over others, and also whether there are associations between the type (or the rendering) of an emoji and the functions it expresses.

RQ2: To what extent do users agree among themselves on emoji functions?

Addressing this question should shed light on how ambiguous the functions are, and how subject they are to misconstrual. It should also provide a basis for evaluating the efficacy of discourse context in resolving pragmatic ambiguity.

RQ3: To what extent do user interpretations of emoji functions agree with the researchers' interpretations?

We address this to test the validity of our previous analyses and to validate the taxonomy of pragmatic functions proposed in Herring and Dainas (2017).

[5] Graphicons are graphical icons, including emoji, emoticons, stickers, images, GIFs, and video clips, that can be used to convey propositional content in message exchanges (Herring and Dainas 2017).

Methods

Survey Design

Survey Items and Discourse Context

To construct the Understanding Emoji Survey, we collected 46 different examples of emoji and their relevant prior discourse context from 14 public Facebook groups. These groups were selected for their relatively high density of graphicon content as compared with other public Facebook groups.[6] Each example of emoji-in-use consisted of the message in which the emoji appeared and the previous message(s) to which it most likely responded, as determined by the researchers after reading the full comment thread. Due to space limitations and to reduce possible distractions, we kept this context to a minimum, while preserving the essential contextual information from the comment thread.

The most relevant discourse context was typically a post to the Facebook group to which the emoji-containing message responded. This is because public Facebook comment threads are usually prompt focused, meaning that most users respond directly to the prompt or initial post of a thread rather than to other users (Herring 2013). Only a few examples (10.9%) required reference to prior local (non-prompt) messages. The original prompt often contained a large colorful image, GIF, or video together with text. In such cases, to minimize distraction, we substituted a brief verbal description of the prompt for the original multimodal prompt (e.g. Figure 1).

Each survey item included a Facebook comment containing (typically) a single emoji. In the rare cases where an item included two or more different emoji, the instructions directed respondents to focus on only one of them. Initially, items were selected based on the difficulty we had encountered in coding those items in previous research. To these, we added items to expand the representation of emoji types and pragmatic functions. The selected messages were anonymized and simplified for the survey. We replaced user IDs with pseudonyms that preserved the gender and nationality implied by the original names, in case that information was relevant to the interpretation of the messages. For some items, we modified the text of the message to make the topic of discussion accessible to a wider variety of users. For example, we changed a reference to to a lesser-known book series to a better-known book series.

Figure 1 shows an example of an emoji-containing message as it appeared in the survey, along with its prior discourse context.

[6] The Facebook groups that provided examples were: EmojiXpress, CatGIFs, AnimeGIFs, Nihilist Memes, Grumpy Cat Memes, Smiley, Stickers, StickersFB, Rise of the Guardians, The Chronicles of Narnia, Star Wars, Percy Jackson, Jared Padalecki, Selena Gomez.

[Prompt: Image announcing that a new book in a series is now available]

Alyssa Mueller: Either my parents won't buy it or I'm not getting it until the 28th, which is my birthday

Cecelia Silva: My baby's birthday is also the 28th. Lol had to throw that out there 😉 happy early birthday

Figure 1. An emoji-containing message and its prior discourse context

Emoji Types

The emoji included in the survey represent 13 of the most common emoji types (smile, big smile, frown, wink, blush, grimace, tears of joy, heart, heart eyes, blowing a kiss, crying, tongue out, and "meh"[7]), which were rendered in the survey to match the emoji that appeared in the original Facebook messages. For some types, the emoji renderings varied across examples. We assume this is because the emoji were posted from different platforms (the Facebook website or the mobile app) or from different mobile platforms (e.g., Apple or Android), since emoji renderings differ on each of these (Miller et al. 2016). To preserve the original context, in the survey we used a combination of Apple iOS 10 renderings and screenshots of the emoji as they appeared on Facebook (Table 1).

Our pool of 46 messages included two to five examples of each emoji type. Four balanced versions of the survey were created, each consisting of the same example question at the beginning and 12 items drawn from the 45 remaining messages, with three items being repeated once. The repeated questions were ones that we determined from our experience and a pilot study to be most challenging; these were placed toward the end of the survey. Thus each version of the survey contained at least one example of most of the 13 emoji types and had a similar progression from easier-to-code items to more difficult ones.

Label	Emoji	Label	Emoji
"meh"	😕	Heart Eyes	😍
Big Smile	😀	Kiss	😘
Blush	😊 😳 ☺️	Smile	🙂
Crying	😭 😢 😥	Tears of Joy	😂
Frown	☹️ 😟	Tongue Out	😛 🤐
Grimace	😬	Wink	😉 😉
Heart	❤️		

Table 1. Emoji types and emoji included in the survey

[7] We use these shortened terms henceforth, rather than the Unicode labels, for the sake of brevity.

Pragmatic Functions

Herring and Dainas (2017) identified eight pragmatic functions of graphicons: Tone Modification, Reaction, Action, Mention, Riff, Sequence, Ambiguous, and Other. (See Table 2 for a description of each function.) Emoji constituted the most frequent graphicon type in that study, and emoji were used in all eight functions. Thus we consider the taxonomy to be well-suited to the analysis of emoji alone.

The original taxonomy was derived using a rigorous grounded theory approach. We allowed the eight functions to emerge from our dataset of Facebook comments. Then we successively refined our observations into a systematic coding scheme consisting of exhaustive, logically-independent categories. Interrater reliability measures were calculated and proved acceptable, and we discussed disagreements until consensus was reached; this process led to further refinements to the coding scheme.

However, the rigor of this process notwithstanding, the pragmatic function taxonomy is based on observations by researchers, who may tend to perceive more fine-grained distinctions than ordinary social media users, in that the latter normally do not spend as much time interpreting each instance of emoji use. Thus one goal of the current study is to investigate whether or not the identified functions are also recognized by lay users and thus can be said to have real-world validity. In order to achieve this, we simplified our definitions of each function and translated them into language that is more accessible to a lay audience. For example, rather than asking the respondents if an emoji was functioning as a "mention", the survey asked if the emoji was "being used to illustrate the text of the message comment".

We modified the pragmatic function taxonomy in several respects for the purposes of the Understanding Emoji Survey. First, we separated the Tone Modification code into two codes: *tone modification* proper, or the use of an emoji to attribute a manner, attitude, or emotion to the text it accompanies, and *softening*, the use of an emoji to hedge the illocutionary force of the accompanying text (cf. Dresner and Herring 2010) in order to mitigate, "soften", or render more polite the act performed by the text. We included this function because softening is sometimes associated with emoticon and emoji use in the CMC literature (e.g. Baron and Ling 2011; Eisenchlas 2011).

Second, we added two logically possible categories that we expected might be chosen by some respondents. *Decoration* indicates that the emoji is merely being used as decoration without adding other meaning to the message. *Physical* action indicates that the message sender was physically making the facial expression or doing the action depicted by the emoji. We also added the option *"I don't know*", and renamed the Ambiguous function *multiple functions*. Respondents who chose *multiple functions* or *other* were asked to write in an explanation.

Finally, we determined that two of the codes from the original taxonomy were unnecessary, given the examples included in the survey and our focus on emoji rather than graphicons more generally. We omitted the Riff function, which we previously found to be associated

more with larger graphicons like GIFs. We also omitted Sequence, since it applies only to two or more different emoji in a row, and no such examples were included in the survey.[8]

Function	Formal Descriptions (Herring and Dainas 2017)	Survey Options: The emoji shows that the user is...	Additional Clarification
Tone Modification	Graphicon directly modifies text, clarifying how a message should be interpreted	Associating a specific tone (e.g. happy or some related tone) with their comment	That is, the emoji tells the reader how the comment is intended to be interpreted.
Softening	N/A	Softening their comment	For example, making the comment less forceful or more polite.
Reaction	Graphicon used to portray a specific emotion in response to something that has been posted	(Virtually) expressing an emotion in response to previous content, not necessarily related to the text of their comment	That is, reacting directly to the prompt.
Action	Graphicon used to portray a specific physical action	(Virtually) saying [Text of Message], and then performing a virtual action (e.g. smiling)	That is, performing each part of the comment in sequence, one part after the other.
Mention	Mentioning a graphicon rather than using it, e.g., Use: "I'm so excited! :-) Mention: "That jerk had the nerve to send me a :-)	Illustrating the text of their comment	That is, the emoji is a graphic illustration of some word(s) in the comment.
Riff	Graphicon is a humorous elaboration on, play on, or parody of a previous graphicon or comment.	N/A	N/A
Sequence	A series of consecutive graphicons (often of the same type) that convey a narrative of some kind as opposed to a composite message	N/A	N/A

[8] Several survey items had two or more emoji in a row, but they were the same or semantically similar emoji repeated for emphasis.

Physical Expression	N/A	Literally (physically) doing what the emoji expresses (e.g. smiling) while typing their comment	At the time the message was typed, the Facebook user was actually feeling or doing what the emoji expresses.
Decoration	N/A	Just using the emoji as decoration.	The emoji has no function except to make the text more visually interesting or appealing.
Ambiguous	The graphicon has multiple, distinct meanings	More than one function is equally plausible (Specify/Explain your choices)	After considering all of the options, you think there is no one best answer.
Other	Cases that cannot be accounted for by the coding scheme	Other (Explain)	None of the above options captures how you think the emoji functions in this comment. Instead you think...
"I don't know"	N/A	I have no idea	You totally give up

Table 2. Formal and lay descriptions of pragmatic functions of emoji based on Herring and Dainas (2017)

Table 2 shows the formal definitions of the pragmatic functions identified by Herring and Dainas (2017), as well as the general function descriptions shown to the survey respondents. Not shown are the specific versions of the function descriptions we crafted to match each item in the survey. The last column in Table 2 shows the clarification of the pragmatic function meanings provided in the example question at the beginning of each version of the survey.

Multiple-Part Items

In the majority of survey items (n=37), the list of function options appeared directly below the emoji-containing message. In addition to items of this basic type, we also created nine multi-part items, in which there was a preliminary question that respondents had to answer before being asked about the pragmatic function of the emoji in the message. Of these, six were cases where the emoji was located in the middle of a textual string rather than at the end or the beginning. Respondents first had to answer which part of the message the emoji was associated with. Based on their answer, they were then shown a customized version of

the pragmatic function options. If they chose "I have no idea" for the first question, they were advanced to the next item in the survey (Figure 2).

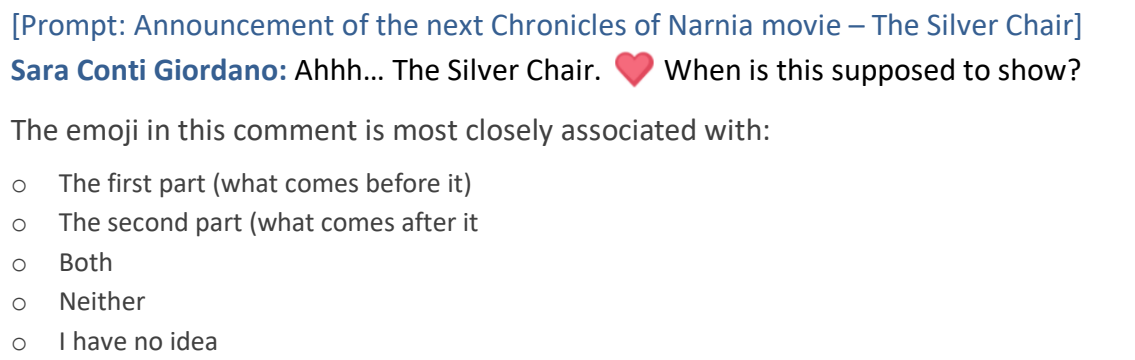


Figure 2. First part of a multiple-part survey item

The other three multiple-part questions featured the grimace face emoji. Many studies have found that this emoji is prone to ambiguity and misunderstanding; we have also found it difficult to interpret in our research. In order to get a sense of how the grimace emoji was perceived in context, we asked respondents first to identify what emotion/attitude they thought the emoji was expressing. Respondents were then shown a customized version of the pragmatic function options based on their answer to that question. If respondents chose "I have no idea" for the first question, they were advanced to the next item in the survey (Figure 3).

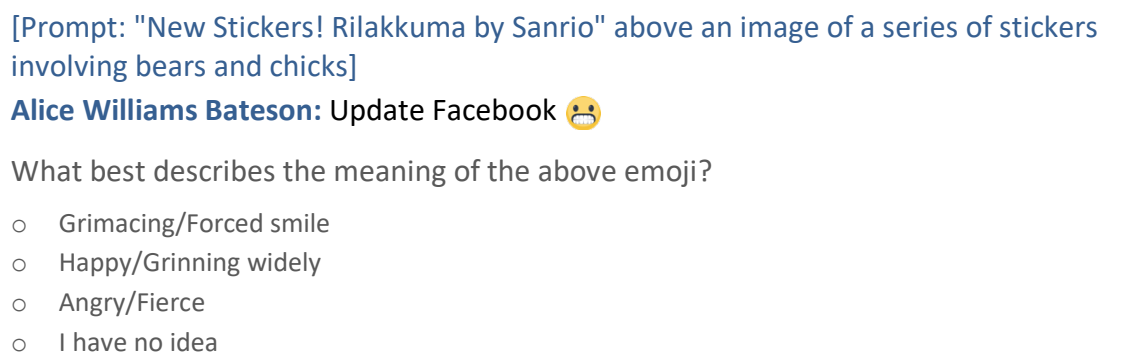


Figure 3. First part of a grimace face multiple-part survey item

Pilot Study

As part of the process of developing the survey, we created two pilot versions, each containing 23 emoji items drawn from the original pool of 46 messages. These versions were shared with 14 individuals[9] in the fall of 2017. The results of the pilot study were used to refine the survey instrument. For example, based on feedback that the survey took too long, we shortened it to 13 questions and created four versions of the survey instead of two. Based

[9] The participants in the pilot study were graduate students in Information Science and friends and family of the researchers, ranging in age from 25 to 62.

on confusion that some respondents had about the simplified descriptions of the pragmatic functions, we fine-tuned the descriptions and added a sample question at the beginning of the survey containing the expanded definitions of the pragmatic functions in Table 2.

Final Survey Structure

The final survey was created using Qualtrics,[10] a cloud-based survey tool. Respondents took the survey using Qualtrics' online interface, and the outputted results of the survey were collected using Qualtrics software.

When a potential survey respondent clicked on the link to the online survey, they were provided with the study information sheet[11] and were asked if they agreed to take the survey.[12] If they selected "I agree", they were considered to have given informed consent, and they continued to take the survey. If a respondent selected "I do not agree", they were sent to the end of the survey and thanked for their time.

The continuing respondents were next shown a block of demographic and social media usage questions. Questions asked about the respondent's gender, age, first language, and country of residence. The questions about social media practices included whether the respondent had an active Facebook account at the time. If so, they were asked about their posting frequency, emoji use, and time spent on Facebook. All respondents were asked "In general, how confident are you that you understand the intended meaning of emoji (other than reaction emoji) when you see them in social media?"

Following these questions was the sample emoji item described earlier, presented with expanded definitions of the pragmatic functions (see Table 2). Each continuing survey respondent saw this sample item. Next, each respondent was randomly assigned one of the four versions of the emoji item blocks by the Qualtrics Survey Software. Items were presented one at a time.

After finishing the block of emoji items, the respondent was asked to rate how difficult it was to interpret the emoji in the survey and to rate their confidence in their own answers. They were also asked which graphicons they normally used (i.e. emoji, emoticons, stickers, images, GIFs, video clips) and what other social media platforms they had accounts on. The last question in the survey was open ended and asked "Do you have any other comments about emoji use in social media?"

Distribution

The Understanding Emoji Survey ran between January 11 and February 20, 2018. The link to the survey was shared with students and colleagues at a large North American university as well as with friends, family members, and strangers via social media sites (i.e. Facebook, Tumblr, Reddit, Twitter, and Ravelry). Initial respondents were encouraged to share the link

[10] Versions available between August 2017 and February 2018. Copyright © 2005 Qualtrics. https://www.qualtrics.com.
[11] The information sheet stated that respondents should be between 18 and 75 years old.
[12] The study was approved by the Indiana University Internal Review Board on August 9, 2017.

on their social media accounts as well as with other people they felt might be interested in the survey, and in this way, the survey was distributed to a wider audience.

Quantitative Measures

The survey responses were analyzed in Microsoft Excel 2013. The results are presented using descriptive statistics.

The frequency distributions of the responses to the multiple-choice items, normalized as percentages, are presented in charts (e.g. Figures 4-14) and/or described in prose. For the open-ended questions, including the 'other' and 'multiple choice' options where respondents were asked to provide further details, the authors jointly conducted thematic content analysis to group the responses into categories (Bauer 2000). The results of one of these analyses are presented in Table 6; other results are discussed in prose.

Three kinds of agreement measures were also calculated. The first measured the degree to which the respondents agreed among themselves on their preferred (top) function codes (see Table 3). The second measured the degree to which the respondents agreed among themselves on their top choice of function code (regardless of what it was) for each emoji type (see Table 4). The final measure assessed the extent to which the respondents' coding choices agreed with the researchers' codes (see Table 5). The details of these calculations are described in the *Agreement* section further below.

Findings

Respondent Demographics

In all, 658 surveys were collected. In order to maximize the amount of usable information, we analyzed the responses from all surveys in which a respondent selected both a gender[13] and chose a function code for at least one emoji item beyond the sample question. 523 surveys met these requirements and were used for the analyses reported in this chapter.

The gender breakdown for the 523 surveys was 352 females, 121 males, and 50 'other'. The average age was 28.6 (range: 18 to 70+). Most of the respondents (74.2%) were native English speakers; the next most common native language was German (5.5%). Three-quarters (75%) of the participants reported their country of residence as the U.S., while 4.4% were based in Canada, 4.2% in Germany, and 2.7% in the U.K.

Respondents' Social Media Usage

The survey respondents were active Facebook users and active emoji users. Most respondents (n=445; 85.1%) reported having an active Facebook account. Of these, 74.4% (n=331) said they check Facebook at least once a day, and 67.6% reported posting or commenting on Facebook at least once a month. The majority of these respondents also

[13] The survey findings are analyzed by gender in Herring and Dainas (2018) and by gender and age in Herring and Dainas (under review).

reported using emoji on Facebook (not including the reaction emoji available after each Facebook post and comment) 'sometimes' (38.9%), 'often' (31.2%), or 'in every message' (1.6%). Only 19.1% indicated that they use emoji 'rarely', and 9.2% said they 'never' use emoji. Respondents reported using emoji most 'mainly in private chat' (42.2%), followed by 'in any kind of message' (34.3%), and least often 'mainly in [non-private] posts and comments' (14.8%). Only 8.5% of respondents with a Facebook account indicated that they did not use emoji on Facebook.

The respondents were confident emoji interpreters. Of all who started the survey, the vast majority reported being 'very confident' (55.4%) or 'somewhat confident' (39.2%) of their ability to understand the intended meaning of emoji (other than reaction emoji) when they encountered them in social media. Only 5.4% reported being 'not at all confident' in their ability to understand the meaning of emoji. After responding to the survey items, however, the respondents reported somewhat less confidence. Of the 454 people who finished all of the emoji items, 34.6% reported being 'very confident' in their answers, 62.5% reported being 'somewhat confident', and 2.9% reported being 'not at all confident'. The lower degree of (strong) confidence is perhaps not surprising, given that many of the survey items were included precisely because, in our estimation, they were difficult to interpret. Nonetheless, 15% of respondents reported that the survey was 'very easy', 52% said it was 'somewhat easy', and 20.3% found it 'neither easy nor difficult'. Only 12.3% reported that the survey was 'somewhat difficult', and only 0.4% reported that it was 'very difficult.'

The survey respondents were active social media users. On average, respondents reported having accounts on three social media platforms, not including Facebook. Out of the 433 people who responded, the majority reported having an Instagram account (62.1%), a Twitter account (59.6%), and/or a Tumblr account (57.7%). Smaller numbers reported having a Snapchat (44.6%), WhatsApp (33.5%), Reddit (20.6%), or Imgur (5.1%) account, and 17.1% of users reported having at least one account on some other social media platform besides the ones listed in the survey.

Respondents' Interpretations of Pragmatic Functions

Overall

The function chosen most often in response to the emoji survey items was *tone modification* (52.6%). *Tone* was the predominant choice for 39 out of the 49 items included in the survey. *Tone* was followed by *action* (13.4%), *mention* (7.8%), *softening* (6.3), *reaction* (5.5%), *multiple functions* (4.4%), *decorative* (3.3%), *other* (2.7%), *"I don't know"* (2.5%), and *physical* (1.4%), as shown in Figure 4.

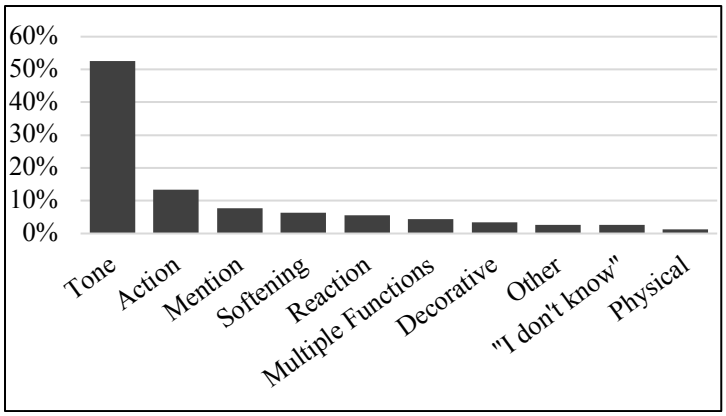


Figure 4. Overall distribution of pragmatic function codes (N=6330) chosen by the survey respondents

By Emoji Type

When broken down by emoji type, each pragmatic function has a distinctive emoji profile. Hearts and kisses were especially interpreted as expressing virtual *actions* (Figure 6); smiles and winks as *softening* the force of a message (Figure 7); grimaces and tears of joy as *reactions* to a prompt (Figure 8); and kisses as *mentions* that illustrate message content (Figure 9). Even *tone* marking was associated more with certain emoji (tongue out, crying, frown) and less with others (e.g. grimace, kiss) (Figure 5). As for the additional options that we included to supplement Herring and Dainas's (2017) taxonomy, big smiles and hearts were interpreted as *decorative* by some respondents (Figure 10), and some respondents interpreted the heart eyes emoji as describing a *physical action* (described in the survey as "looking adoringly" at one's computer screen) (Figure 12). Finally, the fact that a number of respondents chose *multiple functions*, *other*, or "*I don't know"* suggests that for some emoji items, the respondents were either not satisfied with the options provided in the survey, or the functions of those emoji were especially difficult to interpret. The tears of joy emoji, in particular, was said by several respondents to have *other* functions (e.g. laughing in a mocking way) (Figure 14), and the grimace emoji received the most *"I don't know"* responses (Figure 11).

Individual Items

The survey did not generate enough replies to conduct meaningful quantitative analysis of interpretation of function by emoji type at the level of individual emoji items. Nonetheless, we observed variation among the items within a given emoji type, albeit not always where variation might be expected. For the five emoji types with different renderings (blush, crying, frown, tongue out, and wink; see Table 1), respondents choose the same top function (*tone*) for each individual item. Conversely, the big smile, grimace, and heart were rendered exactly the same in all survey items, yet the items elicited different functional interpretations – for example, the three heart items had *action*, *tone*, and *mention* as their respective top function choices. We can infer from these examples that the local discourse context, rather than the emoji themselves, determined the respondents' interpretation of the emoji's function.

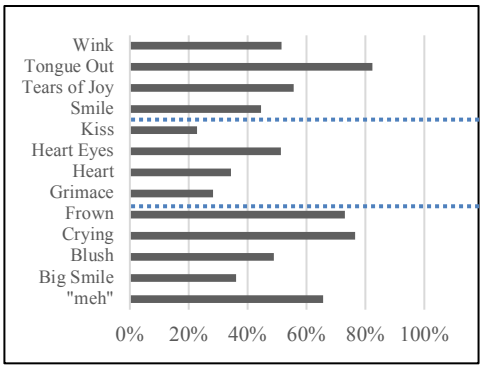


Figure 5. Tone

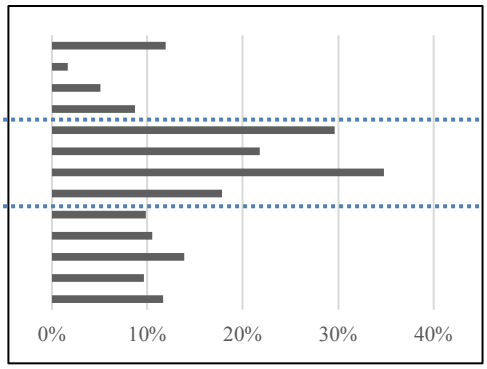


Figure 6. Action

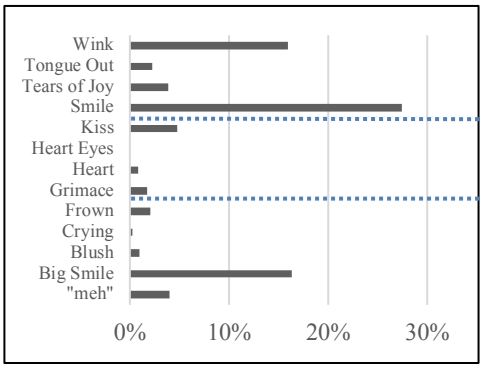


Figure 7. Softening

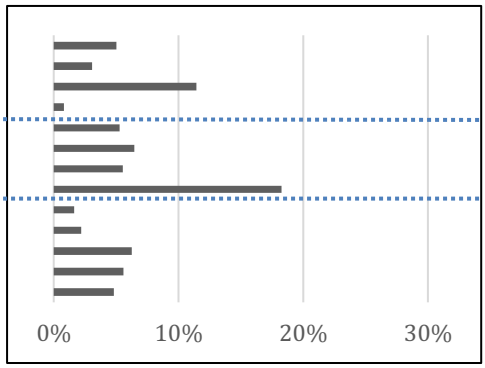


Figure 8. Reaction

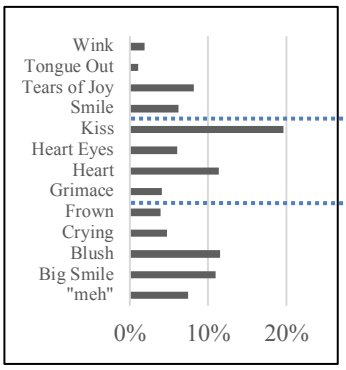


Figure 9. Mention

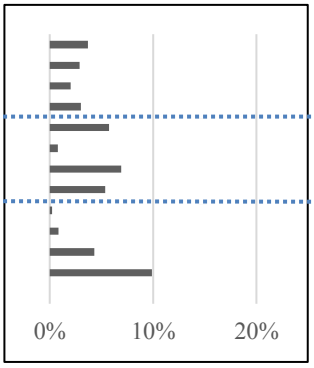


Figure 10. Decorative

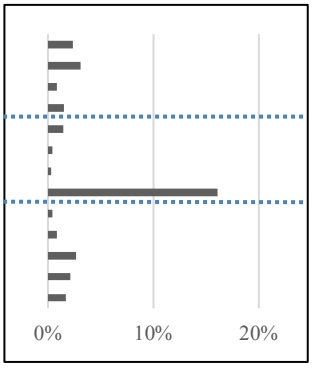


Figure 11. “I don’t know”

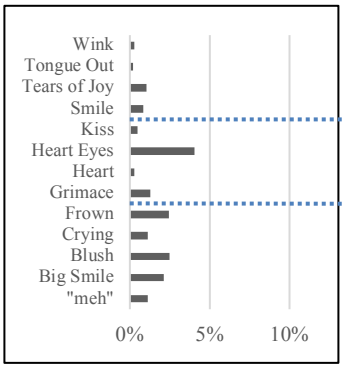


Figure 12. Physical

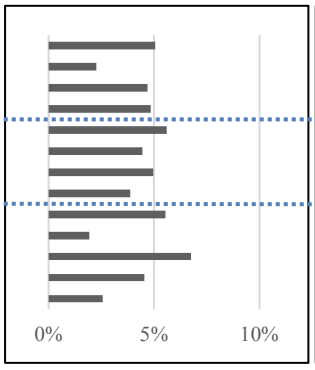


Figure 13. Multiple

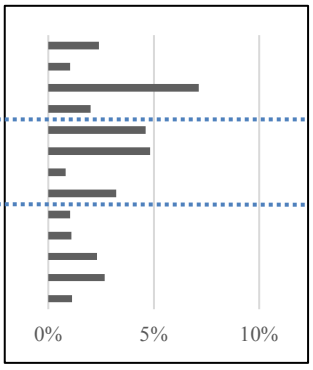


Figure 14. Other

The importance of context is also highlighted in cases where there is a mismatch between the semantics of an emoji in isolation and how that emoji functions pragmatically in a Facebook comment, as in the four examples that follow. Each example starts with a table that displays the Unicode label for the emoji and the semantic labels applied to that emoji in isolation by participants in previous studies. This is followed by a survey item containing that emoji, a bar chart showing our respondents' choices of pragmatic function for that item (with the researchers' interpretation circled), and a bar chart showing respondent choices for all survey items containing that emoji type.

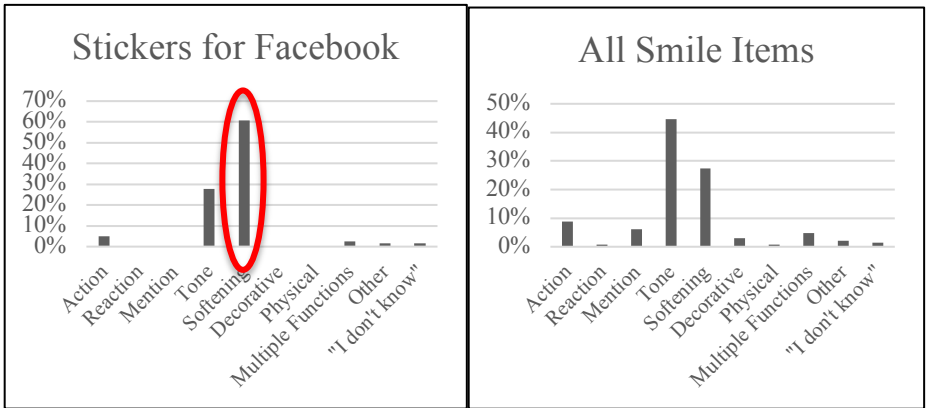
(1)

Rendering	Unicode	Jäger and Ares (2017)	Internet sources (from Jäger and Ares 2017)
🙂	Slightly smiling face	Happy (53%) Content/satisfied (31%) Pleasure (28%) Good (25%) Fun (20%)	Smile, joy, happy, grinning

[Prompt: Image of a sticker store page featuring a few examples of the sticker set]

Margaret Blakey: I still can't get that one. Any idea when?

Stickers for Facebook: Just wait, pls! it'll slowly appear in your Sticker store! It's system is similar to fb interface Update, some people's fb is updated, and others still not. please be patient! 🙂



Previous research (Jäger and Ares 2017) found that the slightly smiling face in isolation has meanings such as "happy", "content", "good", and "joy". However, the smiling emoji as used by Stickers for Facebook in example 1 cannot be interpreted as expressing positive emotion. The text of the message expresses the commenter's irritation and perhaps frustration with Margaret Blakey asking (potentially repeatedly, given the word "still") when a new sticker set will become available. The emoji serves to soften or mitigate Stickers for Facebook's irritated response; accordingly, *softening* was the preferred interpretation of both the survey respondents and the researchers. *Tone* was selected more often for smile-

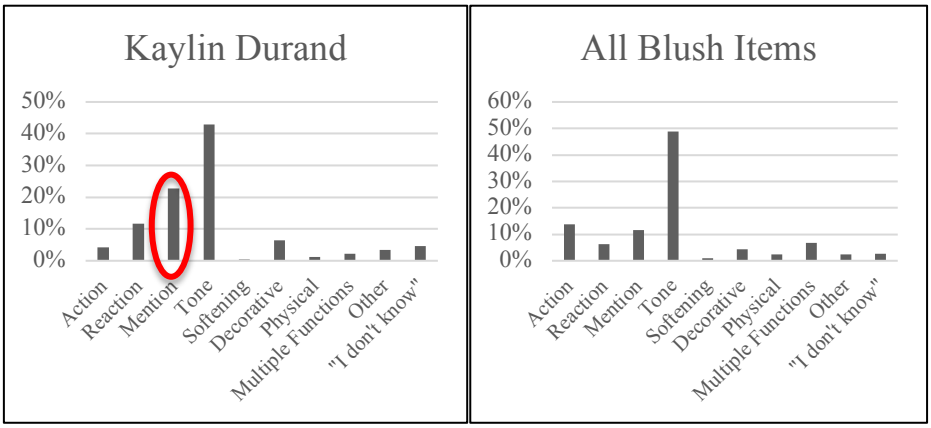
containing survey items overall, though, suggesting that the contexts of the other smile items were different from that for Example 1.

(2)

Rendering	Unicode	Jäger and Ares (2017)	Annamalai and Abdul Salam (2017)
😳	Flushed face	Surprised/shocked (37%)	Surprised (40%) Flushed (32.9%) Shocked (27.1%)

[Prompt: Video of bloopers from the television show Supernatural]

Kaylin Durand: Are my eyes vibrating?? 😳



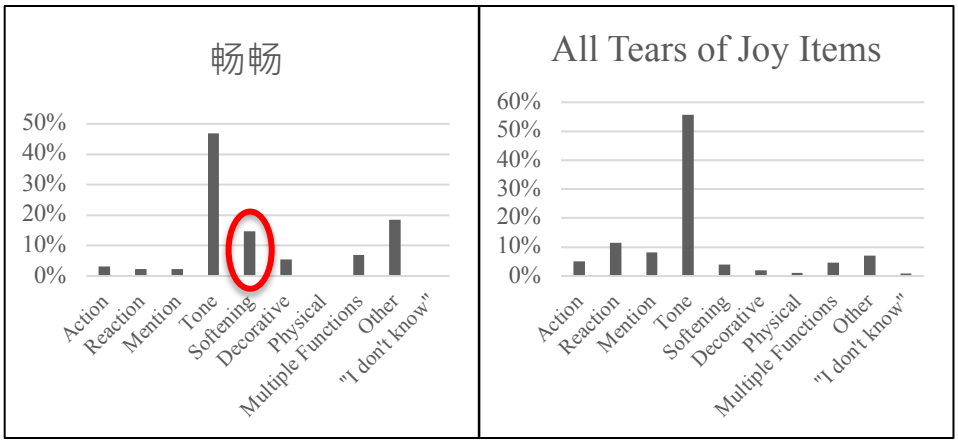
In previous research on emoji interpretation (Annamalai and Abdul Salam 2017; Jäger and Ares 2017), the flushed face presented in isolation was ascribed meanings such as surprised, shocked, and flushed. While it is possible that Kaylin Durand was shocked or embarrassed by the video of bloopers (humorous out-takes) from the American television show Supernatural, it seemed more likely (to us, and to many of our survey respondents) that Kaylin chose this emoji to humorously illustrate vibrating eyes, since the eyes of the emoji appear to be vibrating. This would be an example of the *mention* function. For this and the other blush emoji examples, though, *tone* was the preferred respondent interpretation.

(3)

Rendering	Unicode	Jäger and Ares (2017)	Annamalai and Abdul Salam (2017)
😂	Face with tears of joy	Happy (30%) Excited (21%)	Tears of joy (87.1%) Funny (12.9%)

[Prompt: Image of a new book (play script), Harry Potter and Cursed Child]

畅畅: I want to buy~ But, my country haven't translation. And my English isn't good. 😂

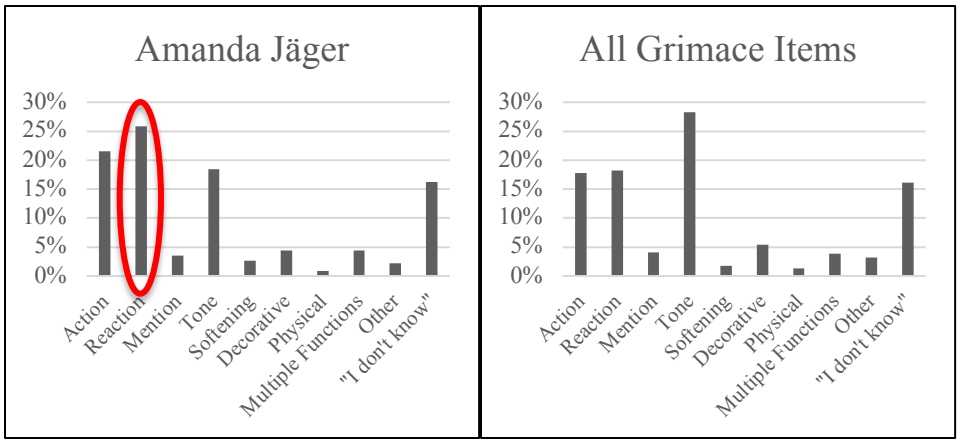


The tears of joy emoji, in isolation, expresses joy, happiness, excitement, and amusement (Annamalai and Abdul Salam 2017; Jäger and Ares 2017). However, none of these meanings is clearly present in 畅畅's use of the emoji in example 3; rather, the commenter is describing negative circumstances: lack of a translation of a book they want to read and inability to read it due to their poor language skills. We (the researchers) interpreted this emoji usage as softening or mitigating what could otherwise be construed as a complaining or whining comment. The survey respondents preferred tone ("associating a highly amused tone with their comment"), which was the preferred function for the tears of joy emoji items overall, and nearly 20% of respondents chose other; softening was their third choice. Cultural differences in interpretation may be at work here. When the second author presented this example in a talk recently, a Chinese woman in the audience recognized the softening use of the tears of joy emoji and said it is not uncommon among Chinese social media users.

(4)

Rendering	Unicode	Jäger and Ares (2017)	Internet sources (from Jäger and Ares 2017)
😬	Grimacing face	Surprised/shocked (18%)	Surprised, awkward, nervous, grimace

[Prompt: Image of a malevolent looking cat sitting in a box that says "Sour Puss"]
Amanda Jäger: Abdul Rahal 😬😬😬



The grimacing face emoji, considered in isolation, is thought to express surprise, awkwardness, or nervousness (Jäger and Ares 2017). Survey respondents who agreed among themselves that 'grimacing/forced smile' was the meaning of the emoji in this item did not, however, agree on the pragmatic function of the emoji. A narrow majority chose *reaction* (to the prompt), as did the researchers, but *action*, *tone*, and *"I don't know"* were also popular choices. A similar lack of consensus is evident for all grimace face items. Thus this emoji is ambiguous functionally as well as semantically.

Agreement

The charts in examples 1-4 show varying levels of respondent agreement, both among themselves and with the researchers' interpretations. To assess agreement levels overall, we first calculated the degree to which the respondents agreed among themselves on their top choice of function code for all the survey items. This was done by first counting the number of items where each function was the predominant choice. The total number of respondents who agreed with the predominant code was divided by the total number of respondents who selected a code for those items; the results are shown in Table 3.

Excluding *multiple functions* and *other*, there are eight non-overlapping function options. Five of these were selected as top choices for at least one item. Unsurprisingly, respondents most often chose *tone modification* as their top choice, and they agreed most on that choice at 59.7%, whereas they agreed least on *reaction* (only 25.9% of respondents chose it for the two items where it was the top choice). Thus there was considerable disagreement on the assignment of the five top pragmatic functions.

Nonetheless, all of the percentages are well above the level of chance, given the number of possible code options provided in the survey. If the answers had been evenly distributed across the eight non-overlapping function codes, we would expect each option to be selected 12.5% of the time. Or, since we know from Figure 4 that function codes were not evenly distributed, if we take that distribution as a baseline and adjust it to exclude *multiple functions* and *other*, the expected percentages would be as shown in the right-most column of Table 3. For all functions except *tone*, which is only slightly more preferred as a top choice than it was selected overall, the actual percent agreement on top choice functions is between

two and seven times greater than would be expected based on the adjusted overall distribution of the function codes. From this we may conclude that respondents tended to converge on functional interpretations of the emoji items, even though they did not approach 100% agreement.

	Items on which Resp. Agreed with Themselves	Codes Assigned to Agreed-Upon Top Functions	Total Codes Assigned to Items	% (Actual)	Expected % (random dist.)	Expected % (adjusted dist.)
Action	3	186	369	50.4%	12.5%	14.5%
Mention	3	139	360	38.6%	12.5%	8.4%
Reaction	2	59	228	25.9%	12.5%	6.0%
Softening	3	168	375	44.8%	12.5%	6.8%
Tone	39	3058	5124	59.7%	12.5%	56.7%
Total	50*	3610	6456	n/a	62.5%**	91.4%**
Average				55.9%		

* There was a tie between *softening* and *tone* for one item, and each code was counted.

** Excluded from these totals are the percentages for *decorative*, *physical*, and "*I don't know",* which were not top choices for any item.

Table 3. Inter-respondent agreement on top choice of pragmatic function

The degree of consensus among respondents varied by emoji type. Respondents agreed most on the function of the tongue out emoji (82.5%), followed by the crying (74.9%) and frown (73%) emoji. These are emoji for which *tone* was the most common top function choice. The respondents had the lowest level of intersubject agreement on the functions of the grimace (32%) and big smile emoji (38%), for which the top choices included *reaction*, *softening*, and *mention* (Table 4). These results were calculated by dividing the total number of respondents who chose the predominant choice for each item for each emoji type by the total number of function codes that were assigned to each item for each emoji type.

Next we assessed the extent to which the respondents' coding choices agreed with ours. This involved calculating the number of items for which the respondents' predominant function choice and our choice were the same. When only their first or top choice was considered, the respondents agreed with our *tone modification* codes in 100% of cases, although the respondents coded more examples as *tone* than we did. The agreement rates for the other functions were between 33.3% and 43.3% (Table 5). Examples 1 and 4 above illustrate items where the respondents' first choice agreed with our choice.

	Survey Items	Codes for Top Choice	All possible Codes	%	Top Functions
Tongue Out	4	400	485	82.5%	tone
Crying	4	658	878	74.9%	tone
Frown	4	356	488	73.0%	tone
"meh"	3	230	351	65.5%	tone
Tears of Joy	4	278	490	56.7%	tone
Smile	5	318	598	53.2%	tone, softening
Wink	3	194	377	51.5%	tone
Heart Eyes	2	127	248	51.2%	tone
Blush	5	296	606	48.8%	tone
Kiss	5	267	607	44.0%	action, tone, mention
Heart	3	156	362	43.1%	action, tone, mention
Big Smile	3	142	374	38.0%	tone, softening, mention
Grimace	4	149	466	32.0%	tone, reaction
Total (Avg.)	49 (3.8)	3571 (274.7)	6330 (486.9)	56.4%	n/a

Table 4. Inter-respondent agreement on top choice of pragmatic function by emoji type (with number of survey items for each emoji type)

However, the distribution of respondents' function codes is skewed in favor of *tone* at the expense of other functions. To adjust for this, we calculated a second agreement measure in which we considered whether either the first or second choice of the respondents agreed with our choices. This raised the agreement rate dramatically on *virtual action*, for example, from 33.3% to 83.3%, and it raised the overall level of agreement between researchers and respondents from 67.3% to 95.9% (Table 5). Example 2 above illustrates an item for which the respondents agreed with us on their second choice. On only four items (8.2%) did the respondents not agree with our interpretations in either their first or second choice; example 3 above is one such case.

	Researcher Choices	Agreed w/ Researchers on 1st choice	%	Agreed w/ Researchers on 1st or 2nd choice	%
Action	6	2	33.3%	5	83.3%
Mention	7	3	42.9%	7	100.0%
Reaction	6	2	33.3%	4	66.7%
Softening	7	3	42.9%	6	85.7%
Tone	23	23	100.0%	24	100.0%
Total	49	33	67.3%	45†	91.8%

† This value is one less than the sum of the numbers in the column, because the respondents had *tone* as their top choice one more time than the researchers did, and that was not counted as an agreement.

Table 5. Number and percentage of questions for which respondents agreed in their first- or second-most-frequent choice with the researchers' top code assignments

Multi-Part Questions

The survey included two kinds of multiple part questions. In the four out of six cases where an emoji was located in the middle of a textual string rather than at the end or the beginning, 80% or more of respondents felt that the emoji was most closely associated with the first part of the textual string. This is consistent with the tendency of emoticons and emoji to appear at the end of textual strings (Cramer et al. 2016; Provine, Spencer, and Mandell 2007). Respondents associated a variety of pragmatic functions with these emoji, except for *reaction*, which was described in the survey as an emotional reaction unrelated to the text of the message. For the other two multi-part items of this type, respondents slightly associated the emoji with the first part of the text in one, and slightly associated it with the second part in the other. In these examples, the favored pragmatic functions differed depending on how respondents interpreted the positioning and scope of the emoji, although there were not enough data to identify any recurring patterns.[14]

For the other kind of multi-part question, where the first part concerns the emotion/attitude expressed by the grimace face, there was less consensus. The interpretation "grimacing/forced smile" was preferred in all three examples, but only between 48% and 72% of respondents agreed on this categorization. Moreover, in two items, the second choice interpretation was "happy/grinning widely", and in the third it was "angry/fierce". Overall, 12.3% of respondents said that they did not know what the emotion/attitude of the grimace face was. There was also little consistency in pragmatic functions associated with each emotion/attitude. This was particularly evident in one grimace item that was repeated in two of the survey versions; interpretations of pragmatic function differed in the two iterations of the same example. (One multi-part positioning item was also repeated, but its responses did not show much variation.) These findings support previous research on the ambiguity of the grimace face emoji.

[14] The emoji differed in each of the six cases.

Open-Ended Responses

If respondents chose *multiple functions,* as they did in 257 cases, they were asked to list which functions the emoji expressed. The most common combination of functions indicated was *tone* and *virtual action* (18.7%). This confirmed our intuition that these two functions are closely related, because we also sometimes had difficulty deciding between them in our previous research. The next most common combination mentioned was *tone* and *softening* (14.8%), which also makes sense, given that *softening* can be considered a subtype of *tone modification* (and was not distinguished from it in the original Herring and Dainas taxonomy). Most responses invoked one or more of the functions provided in the survey. Respondents were most likely to include *tone modification* (79%) as one of the *multiple functions* in a given example, followed by *virtual action* (33.9%) and *mention* (22.6%); this distribution mirrors the overall distribution of function choices in Figure 4. Other combinations of functions were idiosyncratic and did not fall into consistent categories, and 11% of combinations were indicated only once. Finally, some portion of the respondents appeared not to have understood the functions provided, because they used the Multiple Functions free response box to write in their own description of a single function that matched one of those already provided (10.1%).

Respondents who chose *other* (n=157) were also asked to describe the function of the emoji. The largest portion of *other* responses (51.6%) repeated the function categories provided in the survey, such as *tone modification* or *virtual action*, with slightly different wording or different descriptions of the emoji. The next most common *other* function (12%) mainly described the emotion conveyed by the emoji. The remaining *other* function descriptions fell into three main groups: 1) meta-pragmatic emoji functions such as signaling friendliness, playfulness, or sarcasm (cf. Dresner and Herring 2010), 2) descriptions of the content of the message, rather than the function of the emoji, and 3) item-specific observations (e.g. word replacement, emoji misuse, evaluation, apology).

Of the 433 people who arrived at the end of the survey, approximately 25% responded to the open-ended question asking if they had additional comments about emoji use in social media. The results of a rough content analysis of those comments revealed eight basic categories. The frequencies of these categories are presented in Table 6.

Comment Categories	**#**	**%**
I Love and Use Emoji (Like This)	28	27.5%
Emoji as a New Language	16	15.7%
Emoji are Annoying	14	13.7%
Ways Emoji Could be Better	14	13.7%
Comments on the Survey	9	8.8%
Emoji Rendering Problems	8	7.8%
Age Differences in Emoji Use	7	6.9%
Other Responses	6	5.9%
Total	102	100.0%

Table 6. Classification of comments in response to the question, "Do you have any other comments about emoji use in social media?"

The comments were also revealing about respondents' folk understandings of emoji meanings and use. Some respondents asserted that emoji always or mainly express emotions:

> *Always used to express a mood. Emojis are used to express emotion, mood, and represent items. When you tag a person and put a loving emoji next to it, it is the feeling of those emoji that are connected to the person. Emojis are great for their purpose of expressing feelings.*

Other respondents focused on the tone modification function of emoji, e.g. *I think it helps convey tone, whereas plain text alone can make that difficult* and *Sometimes words can't convey the proper tone; thats why emojis are so important*.

Still other comments seemed to acknowledge that emoji fulfill other pragmatic functions, e.g. *It's an interesting way of conveying intent without words, and it's interesting to see how a certain emoji can convey different meanings. (ie. sarcastic use vs. genuine use).* Finally, a few respondents highlighted the importance of the wider context to emoji interpretation, e.g. *Like any other form of communication, context matters, and the age, educational and cultural background of the person using the emoji are significant to its interpretation.*

Discussion

Research Questions Revisited

The overarching research question in this study was: How do social media users interpret the pragmatic functions of emoji in their naturally-occurring discourse contexts? Specifically, we first asked: Which emoji functions are chosen as interpretations most often, and for which emoji types? The most common function chosen by our survey respondents was overwhelmingly *tone modification.* At least 20% of respondents thought that the emoji was functioning as a *tone* modifier in every item, with very few exceptions. Thus *tone modification* appears to be the basic 'meaning' of emoji. Indeed, one could interpret almost every item in the survey as tone marking, and the message would still be interpretable. We might even go so far as to suggest, based on these results, that popular face-representing emoji add tone by default, and that the other functions are in addition to tone marking. This would capture the intuitions of the respondents who selected *multiple functions* and specified *tone* in addition to another function. *Virtual action* was the second most common overall function selected by the survey respondents, consistent with previous research on the use of emoticons and emoji to represent nonverbal behavior (e.g. Derks, Bos, and Von Grumbkow 2007; Novak et al. 2015), followed by *mention, softening,* and *reaction.* With the exception of *softening*, none of the options that we added to the original Herring and Dainas (2017) taxonomy of pragmatic functions were chosen as top functions for any survey item.

The pragmatic interpretations preferred by the respondents varied by emoji type, as shown in Figures 5-14. About 38% of the emoji types in the survey (big smile, grimace, heart, kiss,

and smile) included items for which the top choice of pragmatic function was something other than *tone modification*. However, inter-respondent agreement rates were generally higher for emoji types that favored *tone* (e.g. "meh", blush, crying, frown, heart eyes, tears of joy, tongue out, wink) (see Table 4). If inter-respondent agreement is taken as a measure of the ambiguity of an emoji, emoji types that mainly express *tone* tend to be less ambiguous than emoji that express other functions.

These findings correspond to some extent with the findings of studies of emoji semantic ambiguity. Emoji with high agreement rates for pragmatic function include the crying and tongue out faces, consistent with Miller, Thebault-Spieker, et al. (2016)'s and Jaeger and Ares (2017)'s findings that these are some of the least ambiguous emoji semantically. The blush and grimace emoji, which we found to have low inter-respondent agreement, were similarly identified by Jaeger and Ares (2017) as especially ambiguous. However, we found the tears of joy emoji to be less ambiguous pragmatically than Jaeger and Ares (2017) found it to be ambiguous semantically (it marks *tone*, independent of how one interprets that tone). Moreover, the kiss emoji is pragmatically somewhat ambiguous (is it performing a virtual action? Imbuing the text with a loving tone? Illustrating the word 'kiss' in the message?), whereas semantically it is unambiguous (Jaeger and Ares 2017). Interestingly, variations in rendering did not noticeably impact how the emoji in the survey were interpreted, despite the fact that some individual emoji of each type appear quite distinct (see Table 1).

The previous paragraph partially answers our second research question, which asked: To what extent do users agree among themselves on emoji functions? The survey respondents agreed on their top interpretations at a rate higher than chance, although agreement varied according to emoji type, as noted above. The respondents agreed most on *tone modification* and least on *reaction* and *mention*. Most lack of agreement resulted from some respondents choosing *tone* as the default while other respondents chose less common functions. However, even those lower rates of agreement were higher than chance. Thus, although the survey respondents were probably unfamiliar with many of the pragmatic function options they were asked to discriminate among, they were able to achieve a significant level of agreement on their interpretations.

At the same time, overall agreement rates on functions did not exceed 60% (see Table 3). While differences in methods mean that this number cannot be compared directly with the numeric results of previous semantic studies of emoji ambiguity, this percentage shows that there is considerable overall variability in the interpretation of emoji functions, even when local discourse context is provided, leaving room for misconstrual and ambiguity.

Finally, in response to the third research question – To what extent do user interpretations of emoji functions agree with the researchers' interpretations? – the respondents agreed with some of our interpretations for each of the five most commonly-selected functions: *tone modification, virtual action, softening, mention,* and *reaction*, even when we interpreted agreement strictly and considered only first choices, and when both their first and second choices were considered, respondents agreed with most of our interpretations (see Table 5). They agreed most with us on *tone* and least on *action* and *reaction*. These findings validate the distinctions proposed in the taxonomy of pragmatic functions (Herring and Dainas 2017),

while also revealing that the distinctions are not all equally robust. *Tone* clearly outweighs the others and, as suggested above, has a special status.

Emoji Ambiguity: Pros and Cons

Previous research has found that individual emoji tend to be semantically ambiguous (e.g. Miller, Thebault-Spieker, et al. 2016). Our findings show that emoji tend to be pragmatically ambiguous, as well, and that some emoji are more functionally ambiguous than others. That said, it is unclear how much of an impediment misconstrued emoji pragmatics are to successful communication. The flexibility of emoji use could be an advantage, rather than a disadvantage, as suggested by Pohl et al. (2017). It allows users to be suggestive and to leave their meanings open to interpretation, which might be desirable in some contexts. However, it could also be a disadvantage if the message sender believes that they have communicated clearly, but the recipient interprets the message in a different way.

Interlocutors may not realize that they have not understood a communication as it was intended. Even though we found mixed levels of agreement, the respondents reported generally high levels of confidence in their responses. Kruger, Epley, Parker, and Ng (2005) identified a tendency for people to be overconfident in their ability to communicate seriousness, sarcasm, anger, sadness, and humor over plain text email, as well as in their ability to understand what was intended. Because of this overconfidence, interlocutors may not realize that they have misunderstood, and communication may suffer as a result. However, this problem is not limited to emoji; it also occurs in spoken communication (Gumperz and Tannen 1979).

The Role of Discourse Context

Context plays an important role in discourse understanding. Our findings underscore the importance of the local discourse context in determining emoji meanings. This context matters more than the rendering of the emoji, as illustrated by the heart emoji items in the survey (which render the same but occur in different contexts and have different interpretations). Context also sometimes counts for more than emoji semantics, as illustrated in examples 1-3, where the semantics of the emoji in isolation are marginally or not at all relevant to the intended meaning of the emoji in the messages. This is not to imply that emoji semantics play no role in the interpretation of pragmatic functions. In the case of *tone marking*, for example, the actual tone conveyed (e.g. positive, loving, teasing, playful, disgruntled) is usually cued by the sentiment of the emoji as well as the context. However, the semantic meaning of an emoji alone is often insufficient to allow a recipient to interpret the intended meaning (the illocutionary force) of an emoji-containing message.

Earlier, we suggested that the context of a tweet in previous studies may have been insufficient to determine emoji meaning. The context we provided was richer. Although the Facebook messages themselves were sometimes brief, we included prior context, as well as user IDs that preserved gender and ethnicity information. Even so, our emoji items had varying levels of contextual information, and the amount of available context appears to affect the interpretability of the emoji. For example, the heart and grimace emoji items

tended to have limited context and correspondingly lower rates of agreement on their functional interpretation.

The Status of Emoji as a Language

Meaning in language resides not just in the semantics of lexical items but also in the pragmatics of their use. This study reveals emergent patterning for emoji at the level of pragmatics, a level not previously considered in the debates about emoji as language. Our findings strongly suggest that rather than simply expressing emotion, *tone modification* is the basic function of emoji.

Emoji that function as *tone* modifiers, along with *action* and *reaction* emoji, could conceivably be categorized as paralanguage, features that accompany verbal language that "contribute to communication but are not generally considered to be part of the language system."[15] Paralanguage includes facial expressions and gestures. Many emoji are faces, and some emoticons and emoji reportedly function like gestures (Liebman & Gergle 2016; McCulloch & Gawne 2018; Na'aman et al. 2017).

However, some emoji functions in the taxonomy used in this study do not clearly fit the characterization of paralanguage (e.g. mention, decoration, some narrative sequences), suggesting that while emoji can fulfill paralinguistic functions, their pragmatic range is more expansive. Moreover, emoji are technically text (Pohl et al. 2017). Unlike paralanguage, they are written (typed); there are a finite number of them; and they can substitute for words and punctuation (Albert 2015). Like punctuation, they are illocutionary force markers (cf. Dresner and Herring 2010). As such, emoji must be considered to be part of online language at the pragmatic level.

This conclusion does not mean that emoji constitute a stand-alone language system. Evidence from the literature indicates that emoji meanings and structural patternings, at least in English-language contexts, are not (yet) conventionalized (e.g. Tatman 2016). Currently their usage is flexible; their intended meanings can be open ended and imprecise, as suggested by the variation in our survey responses. An exception is *tone* marking, which appears to have become the conventional (default) interpretation of emoji use.

Conclusions

The Understanding Emoji Survey asked survey respondents to apply a taxonomy of pragmatic functions to examples of emoji use in their local discourse contexts. Lay users were able to assign pragmatic functions to emoji, despite not having seen the categories of the taxonomy before, legitimizing the taxonomy but also revealing the privileged status of *tone modification* as the default interpretation of emoji-in-use. It follows, therefore, that researchers interested in how social media users understand emoji should not restrict their study to emoji semantics but should also consider the pragmatic functions that motivate their use. Also important is the finding that emoji are not functionally interchangeable: Different

[15] Source: http://www.dictionary.com/browse/paralanguage

emoji types specialize to some extent for specific functions. This exploratory study has provided preliminary insights into the functional specialization of 13 popular emoji.

The study also contributes to emoji research methodologically. Miller and her colleagues used surveys effectively to collect evidence of how people understand emoji semantics. Our study showed that surveys can also be used to assess lay user understandings of the pragmatic functions of emoji-in-use. Further refinement of the survey method could lead to more systematic study of which emoji are typically used for which specific functions, as well as teasing out the contributions to overall meaning of the semantics versus the pragmatic functions of emoji.

A limitation of this study is that the context provided for the Facebook messages was local discourse context only. A thorough study of emoji pragmatics requires consideration not just of the local discourse context,[16] but also situational, interpersonal, and cultural contexts. Even so, as Cramer et al. (2016) note, it may not be possible to interpret some emoji usage correctly without understanding the sender's intention due to idiosyncrasy (e.g. in-jokes, private language). A possible way around this is to supplement survey and experimental research with focus groups and interviews, ideally with the individuals who used the emoji.

An important variable is respondent age. A number of respondents commented at the end of our survey that there are generational differences in emoji usage and understanding. Indeed, Herring and Dainas (2018) found that the responses of the 'other' gender, which comprised the youngest group of respondents, differed from those of the male and female respondents, who were somewhat older on average. More recently, Herring and Dainas (under review) analyzed the survey results based on respondents' self-reported age and found systematic generational differences in some emoji interpretations. This is an area in need of further investigation.

In other future research, the pragmatic function taxonomy – expanded to include *softening* – could be used to classify emoji meanings on other social media platforms, in order to support and generalize from the present findings. Manual analysis could be supplemented by automated analysis based on the taxonomy to allow larger amounts of data to be analyzed. Researchers should also investigate the private usage of emoji in texting and chat, as public comment threads may not be representative of other kinds of message exchanges.

Finally, the taxonomy could be applied to study how social media users understand other types of graphicons-in-use. Emoji are currently the most popular graphicon type, but on some platforms stickers, GIFs, and image macros are prominent features of computer-mediated communication (Herring, 2018). Their interpretations by lay social media users have yet to be explored.

[16] Including the context of the thread. In this study, because of the prompt-focused nature of the Facebook threads, the other comments were typically judged irrelevant to the interpretation of a given emoji-containing comment.

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